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THE 'CENTRAL ORAVA' MICROREGION DURING THE LATE HALLSTATT TO MIDDLE LA TÈNE PERIOD[1]

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The Iron Age is a period during which many mountainous areas of East Central Europe, usually considered marginal or contact zones, were intensively settled, and exploited. We bring results of archaeological excavations of two hilltop fortified sites – Nižná, Ostražica, and Podbiel, Biela skala (district of Tvrdošín, northern Slovakia) and systematic long-term surface prospection of their environs within the 'Central Orava' microregion. Recovered assemblages of pottery, plant macro remains, animal bones, radiocarbon dates on short-lived ecofacts and spatial analyses of available data bring evidence on more precise dating and character of human activities at and around these two sites. The findings at Ostražica show the continuity of the material culture tradition of the so-called 'Orava group of the Lusatian culture' (OLC) and the 'pre-Púchov stage' (PPS) from the stage Ha C2 or Ha D1 to Lt C1, the period correlated with the earliest significant occupation phase of Ostražica hilltop. Several new contemporary habitation areas and zones with scarcity or absence of artefactual evidence were detected by prospection. They were interpreted as economic hinterland ('settlement area' sensu E. Neustupný 1986 and site catchment analysis theory – maximum measured time estimated for the effort used to attain grass for flocks varies from ca. 1 hour to 2 hours) of the local, almost exclusively, agro-pastoral communities. The concentration of sites around the hilltop ('settlement complex') covers approximately 200 ha and includes residential areas, fields, and pastures (determined by a combination of archaeological excavation, prospection and GIS-based analysis – slope analysis, path distance analysis, and Travel time using Tobler's hiking function). A similar situation is expected at Biela skala. Positions (areas and zones including the area of the burial ground) that have been evaluated as negative by repeated surveys limit the extent of settlement complexes and represent their possible boundaries, which might be sporadically exploited for hunting or collecting raw materials. The results of our study help to understand the lives of human societies inhabiting the mountain and/or marginal zones of Iron Age Central Europe.

INTRODUCTION

The 'Central Orava' microregion can be described as the area around the Iron Age hilltop hillforts – Ostražica in Nižná, and Biela skala in Podbiel; located in the district of Tvrdošín. We use the term 'Central Orava' to more accurately define the area since it is located on the border of the so-called Lower and Upper Orava regions. Recently, B. Lofajová Danielová has carried out archaeological excavations at both sites. In the microregion, she and her team have been carrying out surface collection surveys for the last five years years at several upland locations intending to find new archaeological sites. In 2022, a detailed detector and surface survey took place in the surroundings of the Ostražica hillfort, where no archaeological sites were known until now. The goal was to identify whether there are contemporary settlements, and/or other sites, in the area of the hillfort, as in the Biela skala area. Based on a detailed prospecting of the microregion – including archaeological excavation, radiocarbon dating, archaeobotanical and archaeozoological analysis – the paper aims to define the extent of settlement complexes and presume their settlement areas by a combination of archaeological research and GIS-based slope and path distance analysis. The estimated travel time from settlements was calculated using Tobler's hiking distance function (*Tobler 1993*) to the current DEM data of the territory of Slovakia (data source:

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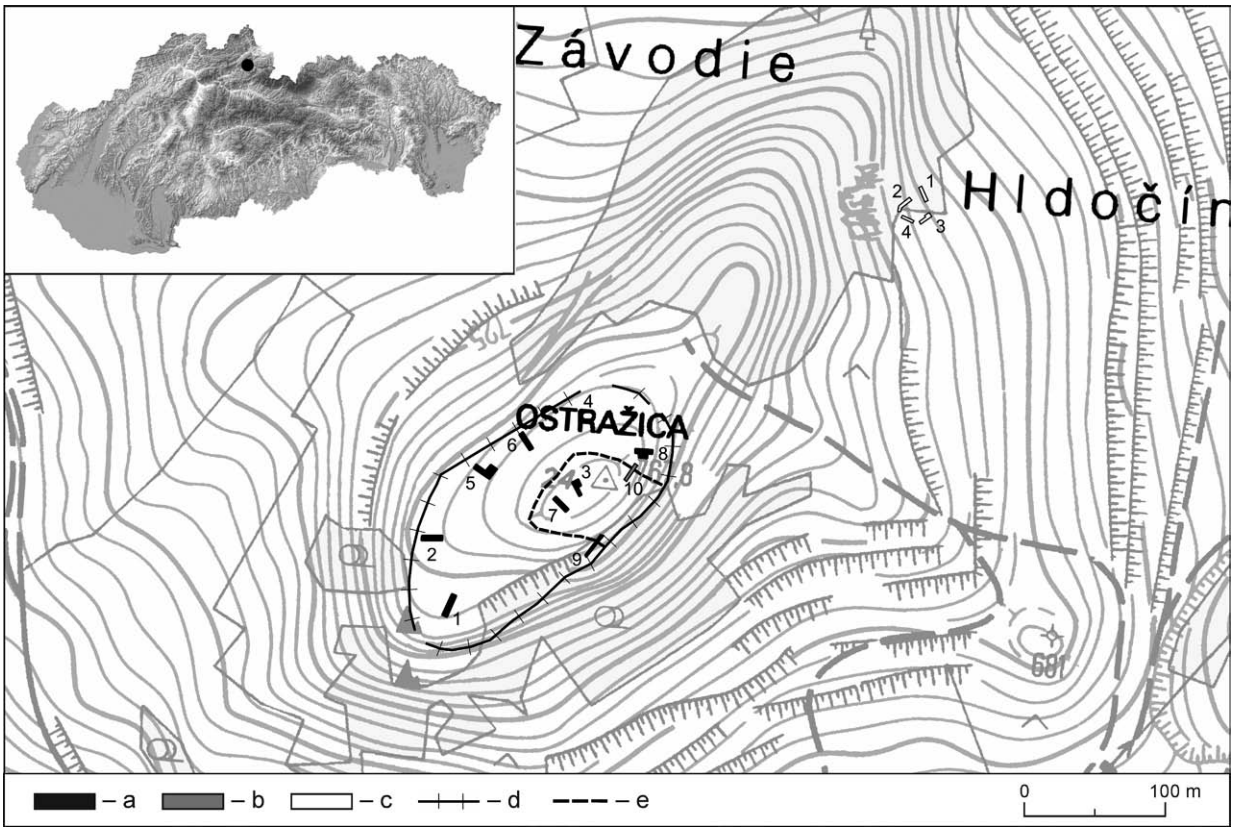

Fig. 1. Nižná, sites Ostražica and Hldočín. Excavated area and fortifications system. Legend: a – trenches 2018; b – trenches 2019; c – trenches 2020; d – palisade; e – rampart. Data source: ZBGIS (www.geoportal.sk). Author B. Lofajová Danielová.

ÚGKK SR[2]). We also attempt to discuss the possible economy, and probable function, of the upland sites in the microregion of 'Central Orava' during the Late Hallstatt to Middle La Tène periods. In the paper, we use two terms for upland archaeological site/settlement: 'hilltop' (situated on a peak that can be fortified traditionally called a 'hillfort' or unfortified/open) and 'hillside' (situated on the slope of the hill that is unfortified/open).

NIŽNÁ, OSTRAŽICA

Archaeological excavation

Ostražica is a limestone hill (767 m a.s.l.), which towers over a bend in the Orava River. It was previously excavated and researched in the 19th century (*Kubínyi 1892*, 160, 161), then by Orava Museum over several years (1965, 1979, and 1989) – focusing on the fortification system. The terrain of the hilltop area has been modified by construction of two separate fortification systems. The first of them lines the terrain below the summit (peak) in the form of a palisade. The second fortification system was supposed to be a timber-laced rampart with stone facing from both sides, according to P. Čaplovič, which enclosed the peak ('acropolis'). He identified the site as a 'Hallstatt hillfort' (*Čaplovič 1987*, 149–155, fig. 73). In 2018, the first author carried out an archaeological excavation in the inner area of the fortification to identify the occupation layer, and possibly the settlement features (within the scope of employment at the Orava Museum; *Lofajová Danielová 2019*).[3] Eight trenches were excavated (Fig. 1: a). Based on the relative chronology of the archaeological finds (pottery), the site was dated to the following phases: from the Late Hallstatt to the Early La Tène period (the so-called Orava group of the Lusatian culture;

[2] Online available at: https://zbgis.skgeodesy.sk/mkzbgis/sk.

[3] Head of research Ľ. Záhorec, ARCHEOVÝSKUM, Ltd.

Table 1. Nižná, Ostražica. Results of radiocarbon AMS dating carried out by M. Krąpiec (Laboratorium Datowań Bezwzględnych, Kraków). Calibrated by OxCal v4.4.4. IntCal 20 curve (*Bronk Ramsey 2021*; *Reimer et al. 2020*). Online available at: https://c14.arch.ox.ac.uk/oxcal.html.

ID	Laboratory code	BP	Sample type	Context	cal BC/AD 2σ
1	MKL-A5002	2154 ±19	*Triticum spelta*	Feautre No. 1/18	351–293 cal BC (32.4%) 209–102 cal BC (62.8%)
2	MKL-A5003	2497 ±19	*Triticum spelta*	Feature No. 4/18	771–725 cal BC (18%) 706–662 cal BC (18.9%) 651–544 cal BC (58.6%)
3	MKL-A5004	2179 ±18	*Hordeum vulgare*	Feature No. 4/19	356–280 cal BC (56.3%) 232–167 cal BC (38.5%)
4	MKL-A5005	2159 ±21	*Ovis aries*	K5; Layer 207	352–287 cal BC (38.1%) 211–106 cal BC (55.9%)
5	MKL-A5006	2386 ±22	*Bos taurus*	K4; Layer 206	540–397 cal BC (95.4%)
6	MKL-A5035	2291 ±24	*Ovis aries*	Feature No. 6/19	402–355 cal BC (71%) 282–231 cal BC (24.4%)
7	MKL-4210	2200 ±70	wood; unidentified conifers	Feature No. 1/18	395–93 cal BC (92.6%) 77–55 cal BC (2.9%)
8	MKL-4211	1970 ±100	wood; unidentified conifers	Feature No. 4/18	201 cal BC–253 cal AD (93%)

hereinafter referred to as 'OLC'), from the Early to the Middle La Tène period (the so-called pre-Púchov stage; hereinafter referred to as 'PPS', the archaeological material of PPS is most likely synchronic with the OLC in the Early La Tène period) and to the La Tène phase of the Púchov culture (hereinafter referred to as 'PC'). In 2018, two samples (charred wood taxonomically not identified) from Features 1/18 and 4/18 were dated by radiocarbon analysis (*Lofajová Danielová 2019*, 107).

In 2019, a magnetometric geophysical survey of the entire fortified area was carried out.[4] It discovered that the rampart descends on the steep south-eastern slopes below the acropolis, which would imply that the acropolis was not enclosed. The archaeological excavation in 2019 was therefore focused on verifying this information (Fig. 1: b). A large number of geomagnetic anomalies that were discovered within the fortifications indicate a well-organised layout of the settlement space, and the presence of settlement features also outside the area surrounded by the palisade (*Felcanová/Felcan/Lieskovský 2021*, 101–112; *Lofajová Danielová et al. 2021*, fig. 1). The collected archaeobotanical samples were prepared by the first author[5] and analysed by M. Hajnalová. Animal bones were analysed by K. Šimunková.

Two test trenches (9/19 and 10/19) confirmed that the rampart ran across the steep south-eastern slope, and thus, that P. Čaplovič's assumption about the enclosure of the acropolis (*Čaplovič 1987*, 151) was incorrect. Two 'terraces' were surrounded by the rampart – the acropolis, and the southeast terrace – between which there is a slope with a gradient of more than 25°, and with an elevation of 13 m. The rampart was constructed on a levelled gravel base (K4; Fig. 2: B) as a gravel-clay embankment, probably with a timber-laced construction which was approx. 4 m wide (K1). The frontal wall from sandstone blocks was also identified (K2, 9, 10; Fig. 2; 3). It is a type of the so-called *Pfostenschlitz* wall, i.e. wall face featuring dry stone masonry interrupted by vertical earthfast posts which are cross-anchored in the earth rampart. They appear in the Northwest Alpine Hallstatt Circle from the Late Hallstatt period (*Ballmer 2018*). In front of the outer facade in the trench 10/19 (K9) was a protruding stone foundation (K11), on which a wooden structure stood, and may have been connected to the fortifications (K11; Fig. 3). The space between the rampart and the timber structure was initially empty, and it was only filled with a layer of gravel (K12) after the outer shell began leaning towards the interior of the embankment. The recorded construction of the rampart is typical for the territory of Northwestern Slovakia during Lt B2, and especially in Lt C stages – for example at Liptovská Sielnica, Liptovská Mara I (*Pieta 1996*, 60). In both trenches, previous settlement activities were captured – in trench 9/19, a burnt feature/layer (K5) and an occupation layer in the SE parts (K6; Fig. 2), in trench 10/19, it is Feature No. 6 located under the rampart (K13; Fig. 3). Samples of charred cereal grains and animal bones from the abovementioned strata were analysed by the radiocarbon method. Because the life expectancy of

[4] Financed by the municipality of Nižná.

[5] Flotation was carried out manually, on a 0.25 mm analytical sieve using the 'flotation' and 'wash-over' techniques.

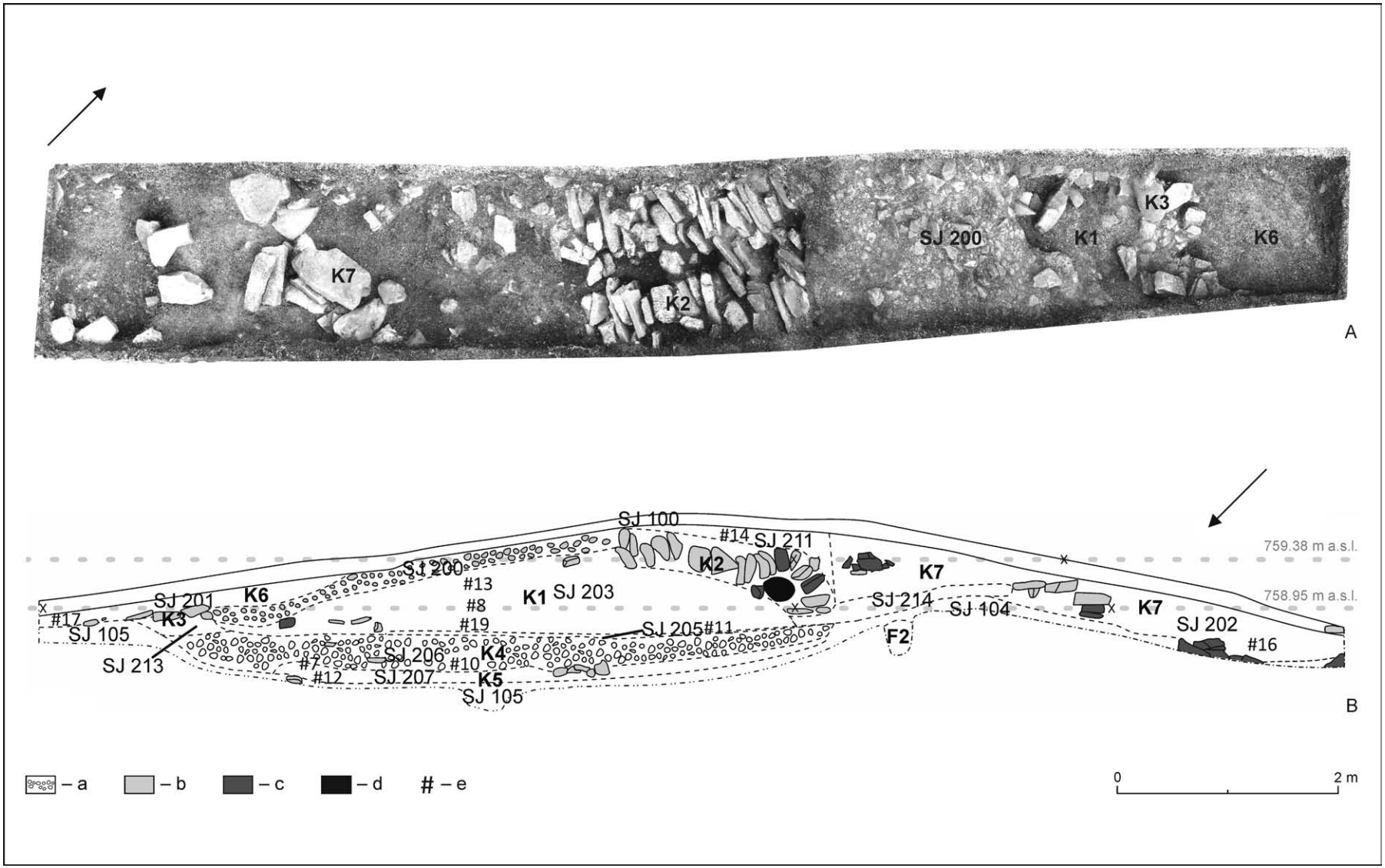

Fig. 2. Nižná, Ostražica. Trench 9/19. A – ground plan on the level of the destruction of the embankment; B – SE profile. Legend: a – gravel; b – sandstone; c – limestone; d – river stone; e – archaeobotanical sample position; SJ – stratigraphic unit; K – context. Author B. Lofajová Danielová.

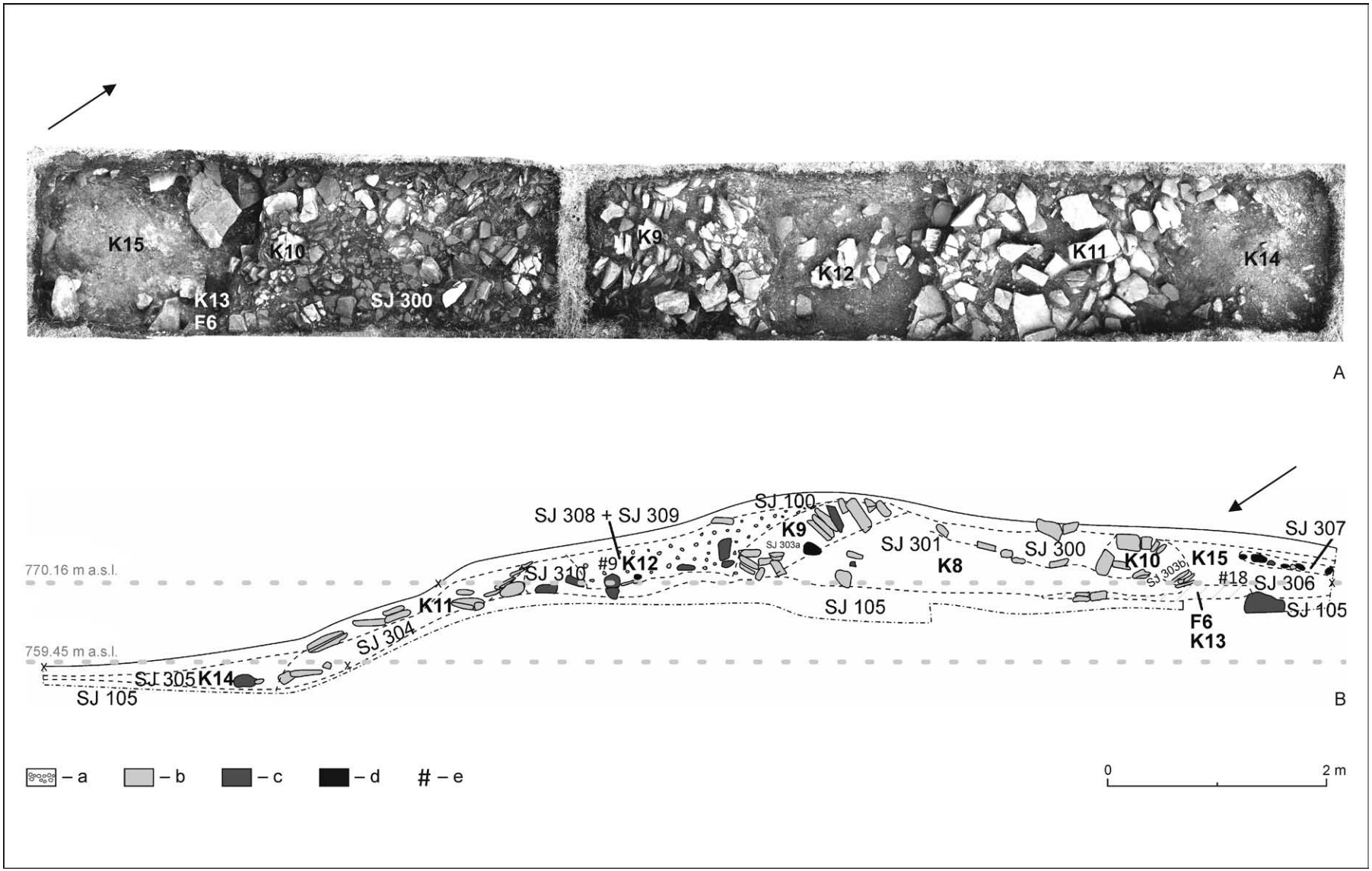

Fig. 3. Nižná, Ostražica. Trench 10/19. A – ground plan on the level of the destruction of the embankment; B – SE profile. Legend: a – gravel; b – sandstone; c – limestone; d – river stone; e – archaeobotanical sample position. Author B. Lofajová Danielová.

herbivore animals (like sheep and cattle) with a typically not aquatic diet is up to 20 years, we view the ^{14}C sample from the bone collagen, similar to dates on cereal grains, as a short-lived sample. This is because, from the point of measurement uncertainty in conventional ^{14}C age (e.g. 20 BP-yrs), the lifetime of the animal is covered by the error term. Accordingly, the calibrated age of such a sample is *a terminus a quo* for human activity associated with the animal's life and a *terminus post quem* for any later human activity. The samples were selected as their stratigraphic position suggests the *post quem* date for the fortification. A total of eight samples from the Ostražica hilltop settlement were dated, which determines the age of the embankment in trenches 9/19, and 10/19, and date the features numbered 1/18 and 4/18 (Table 1). Most of the dates have already been published (*Lofajová Danielová 2019*; *Lofajová Danielová et al. 2021*). The new AMS dates are discussed below.

Chronology

Bronze hoards from the Late (Nižná, Lazy) and Final Bronze Age (Tvrdošín, Medvedzie) near the site indicate that Ostražica could have been already inhabited in the Bronze Age (*Čaplovič 1987,* 161–167; *Kavuljak 1940*). L. Benediková assigns the site to the Late Bronze Age based on the amphora fragment (*Benediková 2006*, fig. 50: 4). However, this dating is not archaeologically supported by new research – neither in any archaeological material or radiocarbon-dated plant and animal remains.

Although the site is known as the 'Hallstatt Hillfort' (*Čaplovič 1987,* 149–155), during the latest research we found that the rampart fortification of the site was built in La Tène period (see below; *Lofajová Danielová et al. 2021*). There might have been a simple palisade constructed during the Hallstatt period (*Čaplovič 1987,* 150), but this needs to be confirmed by new archaeological excavation. Some pottery fragments (from the inner area or embankment of the rampart) have analogies in the OLC, and we could date them to the turn of the Late Hallstatt and La Tène periods. These are primarily amphora-shaped vessels, with four handles, decorated with horizontal and obliquely engraved lines, for example, in Feature No. 1/18 (Fig. 4: 1; Pl. I: 1). Amphora fragments were found on the bottom of the feature where some wood was laid that resembled a trough (Fig. 4: A, B). The sample of indeterminate coniferous wood was AMS dated to 395–93 (92.6%), which corresponds to a long interval Lt B–Lt D1, and partially fits the assumption of the dating of these vessels to the stage Ha D–Lt A/Lt B1 (*Lofajová Danielová 2019*, 107; pl. 1). However, recently dated spelt grains (*Triticum spelta*) from this feature, originate with the 62.8% probability from the period 209–102 cal BC (Table 1), which in relative chronology corresponds to Lt C1–Lt D1 (*Venclová et al. 2013*, 21, 22). Therefore, based on the above, the material within the feature (and the feature itself) could be dated to the Middle La Tène period. The material from Feature No. 3/18 (Fig. 4: A), which is stratigraphically older (disturbed by Feature No. 1/18), mainly contained sherds from barrel-shaped pots with circular and tongue-shaped plastic protuberances (Fig. 4: 4–7). The fragment of a handle decorated with irregularly engraved lines (Fig. 4: 4) resembles the handle decoration on amphora-shaped vessels from the turn of the Hallstatt and La Tène periods – to which it was originally dated by the first author (*Lofajová Danielová 2019,* 105). However, it is a handle placed on the rim of the vessel — cup/jug with analogies in the PPS material (compare Pl. I: 5). Therefore, we could also date Feature No. 3/18 to the La Tène period (from the Lt B stage at the earliest). The archaic sherds in Feature No. 1/18 could be a consequence of the location in a secondary position, or it could possibly document the long-term use of archaic pottery, and continuity in ceramic production.

The charred seed of *Triticum spelta* from Feature No. 4/18 (Fig. 5; Table 1) most likely (58.6%) dates back to the Hallstatt period (651–544 cal BC). In relative chronology, it is the stage Ha C2–Ha D1/2 (*Trachsel 2004*). In this case, the accompanying ceramic material belongs to the period of the PC (Fig. 5: 1–5), including the date of the charred wood sample (*Lofajová Danielová 2019,* 105). A date obtained from a fragment of the femur of a *Bos taurus* extracted from the gravel layer under the La Tène rampart in the trench 9/19 (K4; Fig. 2: B) falls most likely, to the interval 540–397 cal BC (95.4%), which corresponds to Ha D2–Lt A (Table 1; Pl. I). The bone was found in a levelled layer – so, it could have originated in any part of the site (feature/occupation layer). Although both ecofacts from the Hallstatt period are located in a secondary position, they confirm the settlement of the hilltop position from at least the Late Hallstatt period – when probably only a simple fortification (palisade) existed. Ceramic finds of the oldest phase from Ostražica represent several fragments from different contexts (layers, features – see above, e.g., Feature No. 1/18; Fig. 4: 1). Sherds from amphora-shaped vessels decorated with engravings belong there (Pl. I: 1, 3), which have numerous analogies in the OLC material, for example, in the burial ground in Dolný Kubín, position II (*Čaplovič 1977*). A fragment of the amphora/vase decorated with an engraved

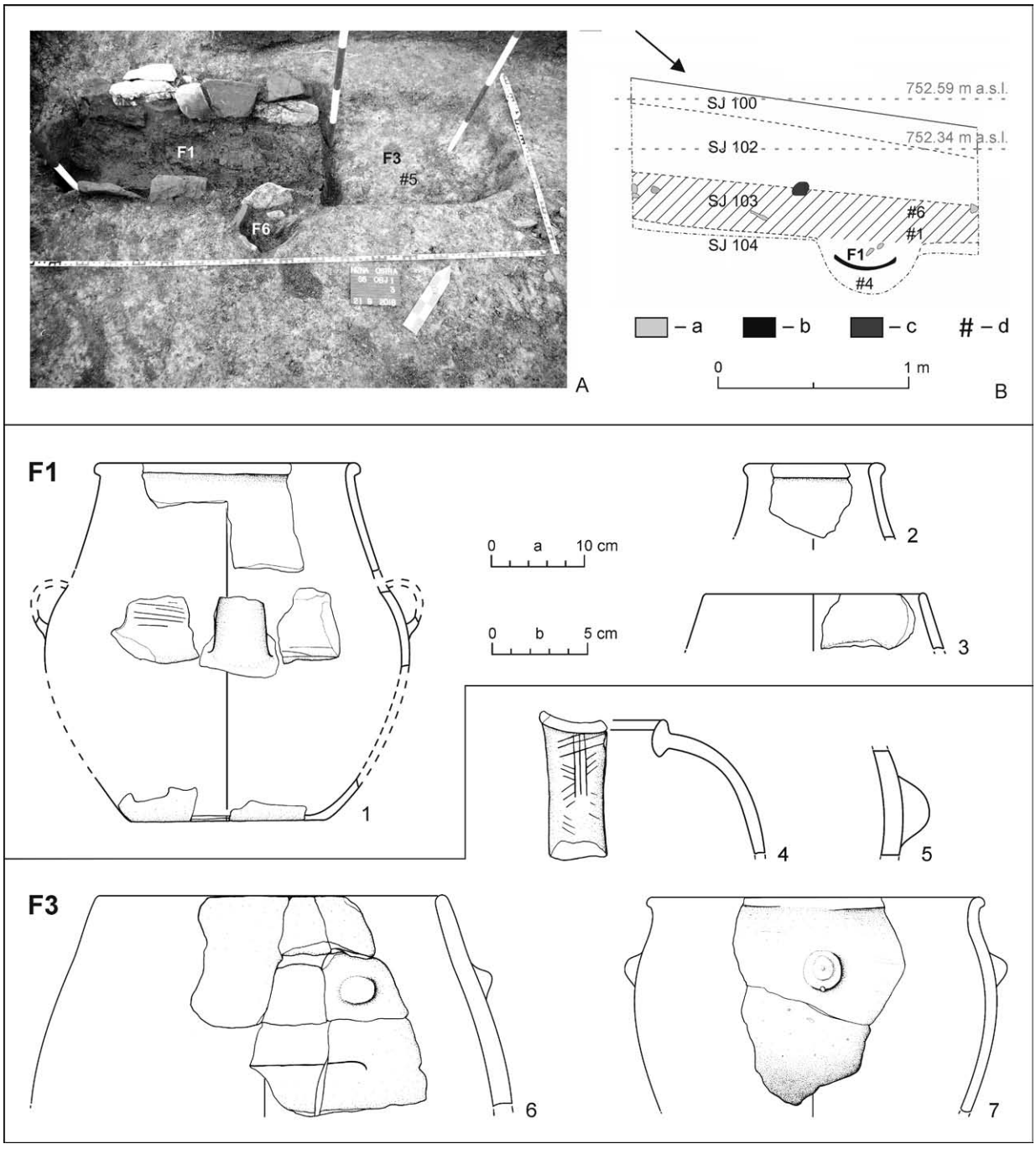

Fig. 4. Nižná, Ostražica. Features Nos. 1/18, 3/18, and 6/18 (trench 5/18). A – ground plan; B – SW profile; 1–7 – the selection of pottery from feature 1/18 and 3/18. Legend: a – sandstone; b – charred wood; c – limestone; d – archaeobotanical sample position; Sj – stratigraphic unit; F – feature; K – context. Scale: a – 1; b – 2–7. Photo and drawing B. Lofajová Danielová.

inverted hatched triangle could also be dated to the oldest phase (Pl. I: 2). Irregular narrow engravings are characteristic of the material from the Hallstatt period. Hatched triangles are often represented in this period, e.g. on a terrine vessel from territorially close Kvašov, Ostrá hora, which L. Benediková dates to Ha C–Ha D1 (*Benediková 2006*, 241 f., pl. LXVII: 2).

The next phase of the Ostražica settlement is represented by the settlement in the PPS period, which is characterised by pottery with various plastic applications in the form of horseshoe-shaped and vertical protuberances, strap handles, variously decorated jugs, cups (also partly jiggered), and amphora-shaped vessels (*Benediková/Pieta 2020*; *Pieta 1982*, pl. XXII; XXIII; *2008*, pl. 89: 1–7, 9, 10). This pottery was found

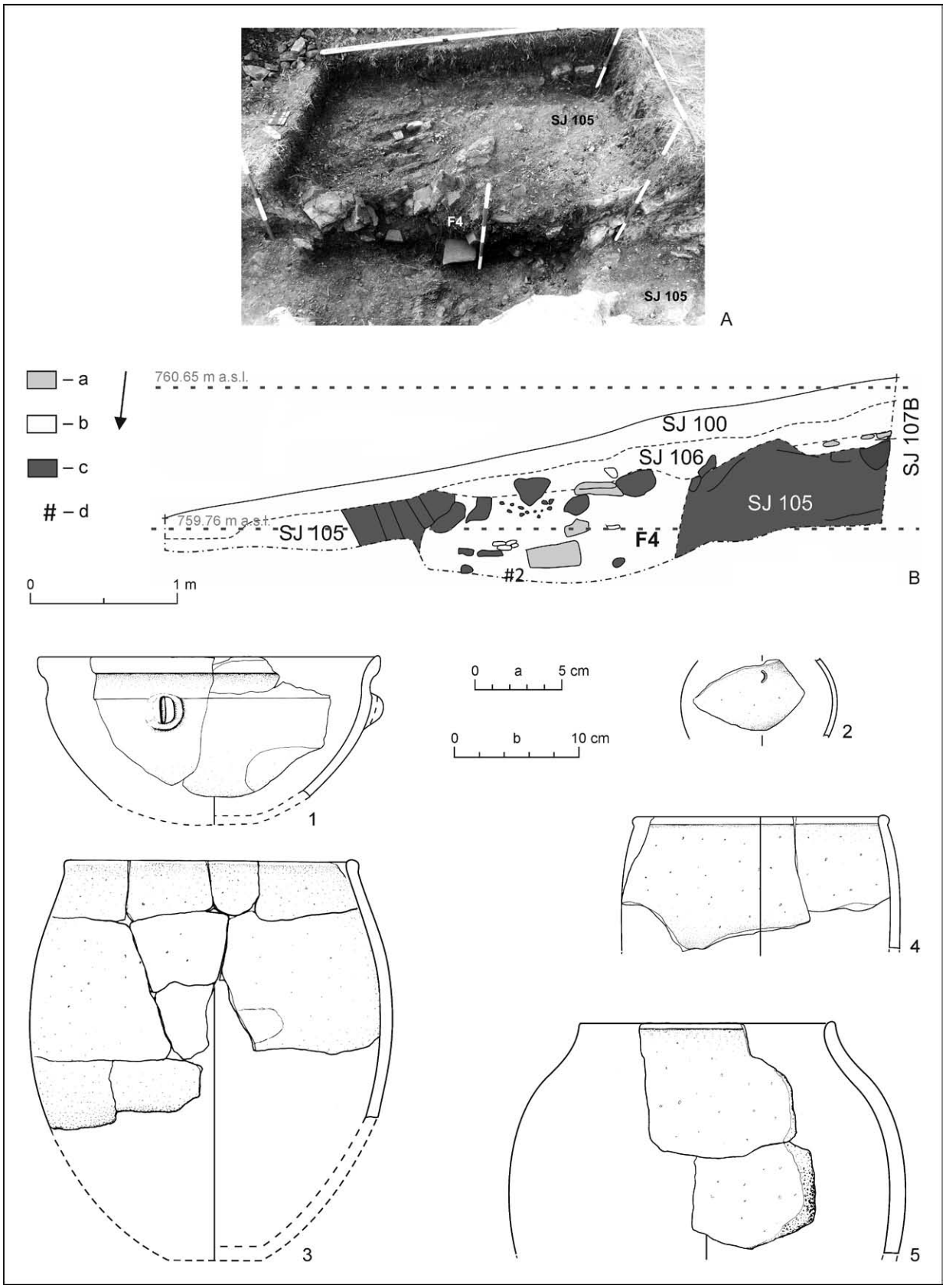

Fig. 5. Nižná, Ostražica. Feature No. 4/18 (trench 8/18). a – ground plan of feature No. 4/18 at the level of bedrock; b – S profile of trench 4/18; 1–5 – selection of pottery. Legend: a – sandstone; b – pottery fragments; c – limestone; d – archaeobotanical sample position; SJ – stratigraphic unit; F – feature. Scale: a – 1, 2, 4, 5; b – 3. Photo and drawing B. Lofajová Danielová.

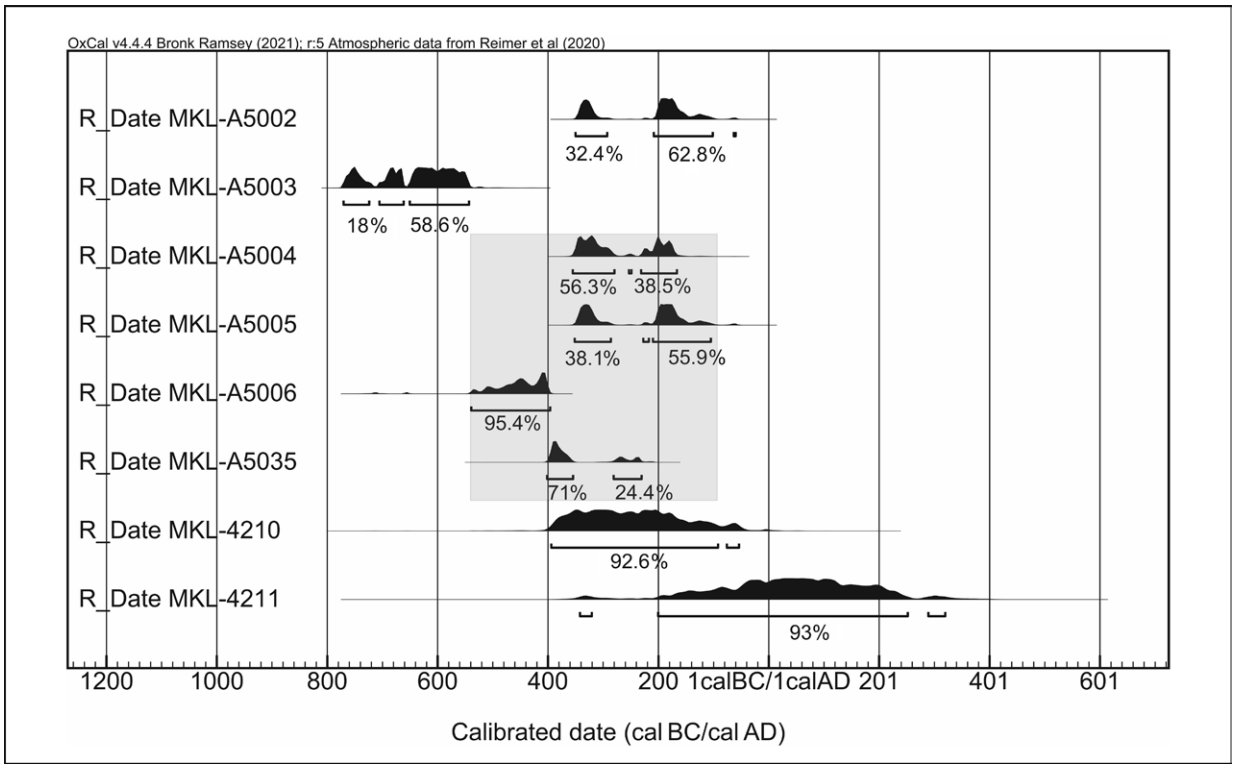

Fig. 6. Nižná, Ostražica. Radiocarbon data after calibration. Grey area – strata under the rampart construction. By OxCal v4.4.4. IntCal 20 curve (*Bronk Ramsey 2021*; *Reimer et al. 2020*). Online available at: https://c14.arch.ox.ac.uk/oxcal.html.

mainly in the embankment and strata related to its construction (Pl. I: 5–7; *Lofajová Danielová et al. 2021*, fig. 13). The rampart fortifications were dated to approximately the same period in both locations – strata under the construction of the rampart have been dated to 540–106 calBC. With the exception of the Hallstatt period sample, which was probably in secondary position (MKL-A5006), the others are most likely to be from 402–287 calBC. Sample MKL-A5005, although dated towards 211–106 calBC (55.9% probability), is most likely to be earlier, from 352–287 calBC (38.1% probability), considering the other samples (MKL-5004 and MKL-A5035) and the archaeological finds (Table 1; Fig. 2; 3; 6). In cooperation with M. S. Przybyła, the results were compared with the Maszkowice, Góra Zyndrama, and Zabrzeź, Babia Góra hillforts in Lesser Poland (*Lofajová Danielová et al. 2021*). The archaeological materials from all the aforementioned sites are related to and correspond to the archaeological materials of the PPS. The dating of all the fortifications overlaps in the 4th–3rd century BC, which is significantly earlier than PPS horizon has been dated in the past (to stages Lt B2–Lt C2; *Pieta 1982*, 157). After comparison with the relative chronology (*Ballmer 2018*), we can date the first construction of the Ostražica hillfort probably to the stages Lt B1 and Lt B2, perhaps at their transition (Fig. 6). This assumption is confirmed by the fact that finds with analogies in the previous phase were found sporadically in the embankment, but finds that could be associated with the following La Tène phase of the PC were absent. The presumption of K. Pieta about the dating of the rampart to the Late La Tène period was incorrect (*Pieta 2008*, 119). Similar result – the long existence of the PPS already from stage Lt B1 is demonstrated by new studies in the Liptov region (*Benediková/Pieta 2020*), inclusive of radiocarbon data (*Pieta/Barta/Benediková 2021*).

The third phase of the settlement could be associated with the La Tène phase of the PC. It is presented by fragments of graphite situla-shaped vessels with combing (Pl. I: 11, 12), as well as the bead rim of a barrel-shaped vessel that could belong to the Middle and Late La Tène period (Pl. I: 10). From residents we have oral information about the recovery of 'Celtic coins' at the site with metal detectors, but the artefacts are unavailable.

K. Pieta assumed that the site was settled by the PC only in the La Tène phase (*Pieta 1982*, 221). However, the latest surface survey proved that the site was also inhabited at the beginning of the Roman period (Pl. I: 14). The pottery fragment with fingernail and finger-tip-impressed decoration (*Fingertupfen*) has analogies with, for example, the settlement at Slovenské Pravno, Feature No. 1/70, which the author

dates to the younger phase of the Early Roman period – stages B2–B2/C1 (*Pieta 1982*, 167, pl. LIII). A pottery fragment from the occupation layer in the trench 4/18 could also belong to this period (*Lofajová Danielová 2019*, pl. 1: 10). The radiocarbon dating of the charred wood fragment from Feature No. 4/18 (Table 1; Fig. 6; *Lofajová Danielová 2019*, 105) fits within the 400-year interval from the Late La Tène to the Early Roman period. An S-shaped probably-jiggered bowl (Fig. 5: 1; Pl. I: 9) corresponds typologically to bowls from stages Lt C1 and Lt C2 (*Repka 2020*, 142). The fingernail decoration (Fig. 5: 2), and the S-shaped pot (Fig. 5: 5), could also belong to the Roman phase of the PC (*Pieta 1982*, pl. L; LIII). Continuity between the Late La Tène and Early Roman phases is currently not proven. According to K. Pieta the fortified hilltop settlements of the PC settled mostly in the Late La Tène period were abandoned in the younger phase of the Early Roman period, and only a few of them were used sporadically – the authors consider them rather as refuge places than settlements. During this period, we document the large settlements in the lowlands in the territory of the Púchov culture in NW Slovakia (*Ježišková/Pieta 2019*, 84; *Pieta 2008*). Elevated open settlements in the younger phase of the Early Roman period were recently documented in the Liptov region – Likavka, Predné Hony/Predný Lán (*Benediková et al. 2020*), or Liptovský Ján, Pod hrádkom (*Furman/Repková 2016*). Based on the small scale of the excavations at the Ostražica hillfort, we cannot rule out settlement activities on the hilltop in this period.

The radiocarbon data and ceramic material from Ostražica, reflect a long-lasting and most likely continuous settlement of the hilltop from the Hallstatt period (starting from Ha C2 or Ha D1) to the beginning of the Middle La Tène period (Lt C1). Most likely the site was used continuously also during the later stages of the La Tène period (Lt C2–Lt D), it means during the PC. The latest studies, which also include radiocarbon data from Liptovská Sielnica, Liptovská Mara II, and Demänovská hora in the Liptov region also point to continuity between the OLC and PPS materials (*Benediková/Pieta 2018; Pieta/Barta/Benediková 2021*). We presume a similar situation also at other sites in the northern part of the Western Carpathians – NW Slovakia (e.g. in Turiec, or the upper Považie regions). Here we also document predominantly repeatedly used upland sites settled in both phases (OLC and PPS), and an almost identical settlement strategy – the choice of the same type of landscape (promontories, and hilltops mostly with lower elevation), the close distance to the main waterways (Váh, Orava, and Turiec rivers), and a preference for limestone/dolomite substrate.[6]

Archaeobotany

With the aim to provide information about the plant-food-related economy and to secure samples suitable for dating of human activities at Ostražica hillfort, nineteen deposit samples for flotation and subsequent archaeobotanical analyses were collected during the 2018 and 2019 excavations. They originate from variety of contexts – the fills of four pits Nos. 1/18 (#4; Fig. 4: B), 3/19 (#5; Fig. 4: A), 4/18 (#2; Fig. 5: 1–5), 4/19 (#15), the layers below, or possibly forming the base of the rampart (#7, 10, 11, 12; Fig. 2; 3), the layers forming the body of the rampart (#8, 13, 19; Fig. 2), layer connected to the rampart destruction (#14 and possibly #9; Fig. 2; 3) and various cultural layers situated *intra-* (#1, 3, 6; Fig. 4: B) and *extra muros* (#17, 16; Fig. 2). Plant macro remains were extracted from the deposits in laboratory using the combination of three manual flotation[7] methods (flotation, wash-over and wet sieving, with the smallest mesh of 0.25 mm; cf. *Hajnalová M. 2022*, 46–54). The dried light fractions were sorted[8] in their entirety. Wood charcoal fragments were only sorted and counted from a fraction larger than 2 mm and they are not yet taxonomically identified. Material suitable for AMS dating – represented by short-lived samples (charred grains of cereals) was selected and dated from four samples (#2, 4, 10, 15; Fig. 2–4).

In total the deposit samples provided 199 plant macro remains and over 1250 wood charcoal fragments. In general terms, it is a very modest 'finds-poor' assemblage, where 79% of seeds concentrate in two samples (#1 and 2) and seven samples (#6, 7, 11, 14, 16, 18, 19) do not contain any seeds. Despite these obstacles, we use archaeological and radiocarbon dating for diachronic evaluation of the material (Table 2; Fig. 7).

One sample (#2) from the Late Hallstatt phase (Ha C2–Ha D) of the occupation of Ostražica is the richest in the assemblage and comprises 68% of all charred seed finds. There are four species of

[6] A detailed analysis of upland sites of NW Slovakia is published in a dissertation by *B. Lofajová Danielová* (*2024*).

[7] Flotation was carried out by Barbora Lofajová Danielová.

[8] Sorting of the samples was done by Ing. Eva Hajnalová, DrSc.

Table 2. Nižná, Ostražica. Plant macro remains grouped according to dating. Numbers refer to NISP values. Underlined are samples with specimens dated by AMS. Author M. Hajnalová.

Phase	Ha C2–Ha D	Ha D2–Lt A	Lt B1–Lt B2	Lt C(1?)	Ha C2–Lt C(1?)	Lt C2–Lt D	Lt D	Ha C2–Lt D
No. of samples	1	1	7	2	1	2	1	4
Volume (l)	3.5	5	28	6	4	9	3	25
Crops								
Triticum spelta	33	–	1	3	2	6	–	1
Triticum monococcum	–	–	–	–	–	1	–	–
Triticum sp.	–	–	–	–	–	6	–	–
Hordeum vulgare	–	–	5	1	–	4	–	5
Triticum/Hordeum	23	–	1	2	1	–	–	3
Setaria italica	2	–	–	–	–	–	–	–
Panicum miliaceum	–	–	1	1	–	1	–	–
Avena sp.	4	–	–	–	–	1	–	–
Cerealia	–	–	3	–	–	–	–	–
Triticum spelta (glume bases)	6	–	–	–	1	–	–	–
Cerealia (nodium)	1	–	1	–	–	–	–	–
Vicia faba	2	1	–	–	–	–	–	–
Pisum sativum	11	1	–	–	–	–	–	–
Pisum/Vicia	1	–	–	–	–	–	–	–
Wild plants								
Fallopia convolvulus	14	–	1	–	–	–	–	–
Chenopodium/Atriplex	11	–	1	–	–	–	–	–
Atriplex spp.	5	–	–	–	–	–	–	–
Galeopsis cf. *segetum*	6	–	–	–	–	–	–	–
Galium spurium	3	–	2	–	–	–	–	1
Vicia cf. *tetrasperma/hirsuta*	3	–	–	–	–	–	–	–
Melilotus alba/officinalis	–	–	–	2	–	–	–	–
Medicago lupulina	–	–	2	–	–	–	–	–
Polygonum aviculare	3	–	–	–	–	–	–	–
Persicaria maculata	1	–	–	–	–	–	–	–
Polygonaceae	2	–	–	–	–	–	–	–
Bromus cf. *arvensis*	2	–	–	–	–	–	–	–
Euphorbia helioscopia	–	–	1	–	–	–	–	–
Cardaria draba	–	–	–	–	–	1	–	–
Brassicaceae	1	–	–	–	–	–	–	–
Valerianella dentata	1	–	–	–	–	–	–	–
indet.	3	–	1	–	–	–	–	–
Wood charcoal fragments	399	53	313	149	75	75	1	192
Uncharred seeds	–	–	1	–	–	1	50	338
Density of charred seeds	39.4	0.4	0.7	1.5	1.0	2.2	0	0.4

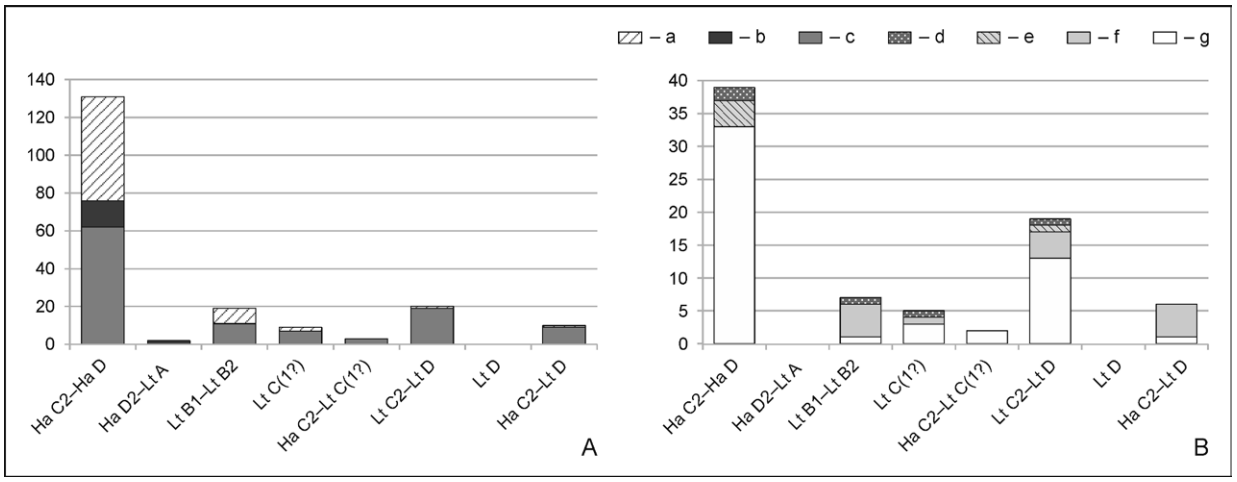

Fig. 7. Nižná, Ostražica. Charred plant macro remains. A – the proportion of main types of macro remains (excluding wood charcoal); B – proportion of determined cereal crop species. Numbers on the left axes represent NISP values. Legend: a – weeds; b – pulses; c – cereals; d – millets; e – oat; f – barley; g – glume wheats. Author M. Hajnalová.

cereals – spelt (*Triticum spelta*), einkorn (*T. monococcum*), foxtail millet (*Setaria italica*) and oat (*Avena* sp.), two pulse crops – sweet pea (*Pisum sativum*) and Celtic bean (*Vicia faba*), and twelve wild plants taxa typical of arable or garden plots. The sample (#10) from the next phase from the end of the Hallstatt and the beginning of the La Tène period (Ha D–Lt A) provided only two seeds of pulses. From the following, the Early and Middle La Tène period (Lt B–Lt C), the plant macro-remains are rare, even though there are nine samples available (three from the pits, and six from the rampart). Pulse crops and foxtail millet disappear from the record. From cereals, there are only spelt, and broomcorn millet (*Panicum miliaceum*) accompanied by five species of possible arable weeds. The sample (#9) dated less precisely (Ha C2–Lt C[1?]) contains the same taxa as recorded in previous phases. In the sample dated to Lt C2–Lt D einkorn appears for the first time, and is accompanied by spelt, barley, millet, and oat. However, the only sample dated exclusively to the Lt D (#14), and possibly representing the rampart destruction, contained a single (misplaced?) charcoal fragment and no seeds. Among the remaining four samples dated widely as the Iron Age (Ha C2–Lt D) two did not contain any seeds (#16, 18) and two (#3, 17) had few grains of already identified taxa.

Identified species of crops fit well with data from the contemporary sites in the mountain regions of Northern Slovakia (see below) and it is clear, that they do not indicate settlement activities at Ostražica in other archaeological or historical periods.

The remains of recovered charred seeds could be interpreted as residues from household activities. The wide spectrum and high proportion of weeds (ca. 40%) in the sample from the Hallstatt period indicate that it represents the crop cleaning residue, possibly mixed with some kitchen (food) waste. The high density of finds points to the primary context (finds *in situ*). The other, younger samples, with a much lower density of plant remains probably represent moved, (possibly repetitively) displaced household wastes. The absence of finds in two (out of possibly three) youngest samples either from the transition of the Middle to the Late or Late La Tène period may indicate that the intensity of household-related settlement activities at the site changed or ceased in excavated areas.

Archaeozoology

The presented results are based on a study of a total of 554 bone fragments weighing approx. 2.7 kg. Of these, 60 bone fragments originating from layers that could have been contaminated by modern intrusions, were excluded from interpretation. The osteological material could be divided into three time periods (Table 3): 1. OLC and PPS (219 bone fragments), 2. La Tène phase of the PC (51 bones) and 3. Iron Age to the younger phase of the Early Roman period – from the Hallstatt period to the Roman phase of the PC (224 bones coming from shallow occupation layers destroyed by erosion at the top of the acropolis).

Table 3. Nižná, Ostražica. Quantitative representation of animal species at Ostražica hillfort. Author K. Šimunková.

Species		OLC + PPS			La Tène phase of PC			Iron Age to Roman phase of PC		
		NISP	MNI	Weight [g]	NISP	MNI	Weight [g]	NISP	MNI	Weight [g]
Cattle	*Bos taurus*	48	2	711.22	9	1	77.78	25	1	290.79
Sheep/goat	*Ovis/Capra*	72	3	295.09	10	2	32.13	83	3	328.6
Pig	*Sus domesticus*	20	1	150.55	2	1	21.07	33	4	223.92
Chicken	*Gallus domesticus*	1	1	1.86	–	–	–	2	1	0.71
Red deer	*Cervus elaphus*	–	–	–	2	1	48.03	10	1	98.57
Roe deer	*Capreolus capreolus*	1	1	33.13	–	–	–	–	–	–
Hare	*Lepus europaeus*	–	–	–	–	–	–	4	1	2.01
Beaver	*Castor fiber*	–	–	–	–	–	–	2	1	3.71
Wild boar	*Sus scrofa*	1	1	23.67	–	–	–	2	1	12.45
Fish	*Pisces* sp.	2	1	0.34	–	–	–	–	–	–
Indet.		30	–	7.63	21	–	1.13	21	–	22.34
Small mammal		1	–	0.65	–	–	–	7	–	5.13
Medium mammal		35	–	25.87	6	–	5.8	28	–	39.19
Large mammal		8	–	13.32	1	–	13.41	7	–	29.32
Total		219		1263.33	51		199.35	224		1056.74

Among the analysed species, the following were determined: domestic species represented by a domestic bull (*Bos taurus*), domestic sheep (*Ovis aries*), domestic pig (*Sus domesticus*) and domestic chicken (*Gallus domesticus*). Wild species were represented by red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), European beaver (*Castor fiber*), hare (*Lepus europaeus*) and wild boar (*Sus scrofa*). The bones, which were not determined by species, were classified into groups: sheep/goat (*Ovis*/*Capra*), fish (*Pisces* sp.), and unidentifiable fragments were marked with the abbreviation *Indet.* The auxiliary categories 'small mammal', 'medium mammal' and 'large mammal' were also used based on the size, weight, and structure of the fragment.

Unidentified fragments (along with the auxiliary categories small, medium, and large mammal) accounted for 33.4%, indicating relatively high fragmentation. The size of the individual fragments also proves the high level of fragmentation, with 47.8% of the bones reaching only 10 to max. 25% of the size of the corresponding bone. According to *A. K. Behrensmeyer* (*1978*), the state of preservation of the bones was relatively good and fell into grades 1 to 3. This indicates that the bones were relatively little subject to abiotic factors such as weathering or soil pH. Of the entire assemblage, only 77 bone fragments (15.6%) showed contact with fire, and only 20 fragments (4%) bore traces of chopping and cutting.

As can be seen from Table 3, the fewest animal bones came from the La Tène phase of the PC. Despite the disparity in values, it is possible to say a few interesting results. Although we have a greater number of wild species (wild boar, fish, roe deer) in the period of the OLC and PPS, and we also have more bone remains, we have no evidence of deer. Also, in this phase of settlement, a low percentage of wild animals was found (only 1.8%), while in the La Tène phase of the PC, it is up to 3.9% (although a very small sample of material must be considered), and in the wider period of the Iron Age do Early Roman period the percentage is wild animals 8%. The wild species present point to the existence of a mixed forest in the vicinity of the site.

Domestic animals were approximately equally represented in all monitored periods, around 63.8–64.4%. The same anatomical elements were observed in both periods. There were fragments of skulls (lower jaws, horns, individual teeth), lower and upper limbs (especially their fleshy parts), but also a few finger joints. We, therefore, assume that whole animals were butchered at the hillfort, and exclude the import of only certain parts of animals. Similar results are documented in the Liptov region – the predominance of cattle and sheep/goat breeding in the long period from the Later Prehistory to the

Early Roman period, e.g. in Liptovská Sielnica, Liptovská Mara settlements (*Bielichová 2019*, 215–217), or in Ploštín (hilltop fortification Rohačka and open settlement Pod Rohačkou). The authors presume the continuity of herding of small ruminants and cattle in the mountainous regions throughout the Iron Age and PC period, which is different from the La Tène settlements from Southwestern Slovakia, where an increasing number of domestic pigs is recorded (*Benediková et al. 2019*, 70, 71).

However, the picture obtained from Ostražica can be influenced both by the size and significant fragmentation of the osteological sample as well as by the uncertainty of dating for majority of the samples.

NIŽNÁ, HLDOČÍN

The Hldočín site is located on the north-eastern and eastern slopes of Ostražica Hill. During an archaeological excavation in Ostražica; a local citizen informed us that in the past he found sherds in a badger burrow, which he believed to be prehistoric. During the surface survey in 2019, we found several sherds that came from the occupation layer contemporary with the hilltop settlement (*Lofajová Danielová 2020*, pl. I–V). The burrow was located near large stone blocks that seemed to be placed in a circle; indicating a cult site. Close to the largest of the rocks the archaeological findings were concentrated. The first author carried out an archaeological excavation in August 2020 (the Orava museum in cooperation with the Nižná municipality).[9] Its goal was to identify the character of the archaeological site (settlement or possibly cult place), and its chronology. At the same time, the intention was to find out whether the stone blocks were part of the archaeological site, or not related to it. Four trenches were excavated around the stone blocks, and on the nearby terrace (Fig. 1: c). An occupation layer (Fig. 8; SJ 111, 104, 106), and two probable features were found (Fig 8: A, B, E). In the area containing the stone blocks; a large number of pottery, and animal bones, were found. In these places the occupation layer was mixed with strata of stone destruction (Fig. 8: A–D), which also contained recent waste (plastics, glass, etc.). The stratigraphic situation of the stone blocks documents that they fell on the site long after their persistence. They probably fell on the site from a nearby quarry during some blasting in the last century. The quarry was located above the researched settlement underneath the hilltop. Activities in the quarry also caused the disturbance and replacement, of the occupation layer in the area of Trenches 2 and 4 – within which there was recent material (Fig. 8: A–D). Trenches on the terrace (1, 3) likewise proved an occupation layer, however, mostly disturbed by topsoil (SJ 103; Fig. 8: E).

Apart from the occupation layer, the settlement character of the newly discovered site is well documented by artefacts (Pl. II; III: 1–7): pottery (fragments of a strainer, and storage vessels), building construction imprints in daub (wattle and daub construction of buildings), animal bones, and small objects (fragments of a round loom weight, and whetstones).

Pottery

The pottery fragments can be assigned to different phases of the Iron Age. Among the most chronologically sensitive are decorated fragments of amphora-shaped vessels, bowls, and pots. The rim of the pot/vase with horizontally engraved lines, and short oblique notches (Pl. II: 1), is similar the urns found in the burial ground Podbiel, Za Bielym (*Čaplovič 1968*, fig. 10: 2; 12: 4). The horizon of the mentioned grave pottery is dated by L. Benediková to Ha D2/3 – Lt A/Lt B1 (*Benediková 2006*, 144). Analogies are also found in the settlement Podbiel, Biel, and several sites in the Liptov region (*Lofajová Danielová 2022*, 34, fig. 15: 1; 19: 1–4; with references). To the oldest phase, we could date a fragment of a fine-grained smooth-surfaced amphora that is decorated with engraved horizontal lines, and a bunch of oblique/round lines (Pl. II: 4). There are numerous analogies to this, for example, in the burial ground Dolný Kubín II (*Čaplovič 1977*). Fragments of coarse-grained reduction-fired amphora decorated with deeply engraved lines come from similar vessels (Pl. II: 6).

The classification of the rim of the bowl that has a pair of tongue-shaped protuberances under the rim, and bunches of obliquely engraved lines is questionable (Pl. II: 3) – we have not found an ap-

[9] Head of research Ľ. Záhorec, ARCHEOVÝSKUM, Ltd. The detailed filed situations will be published in a dissertation by the author of the research.

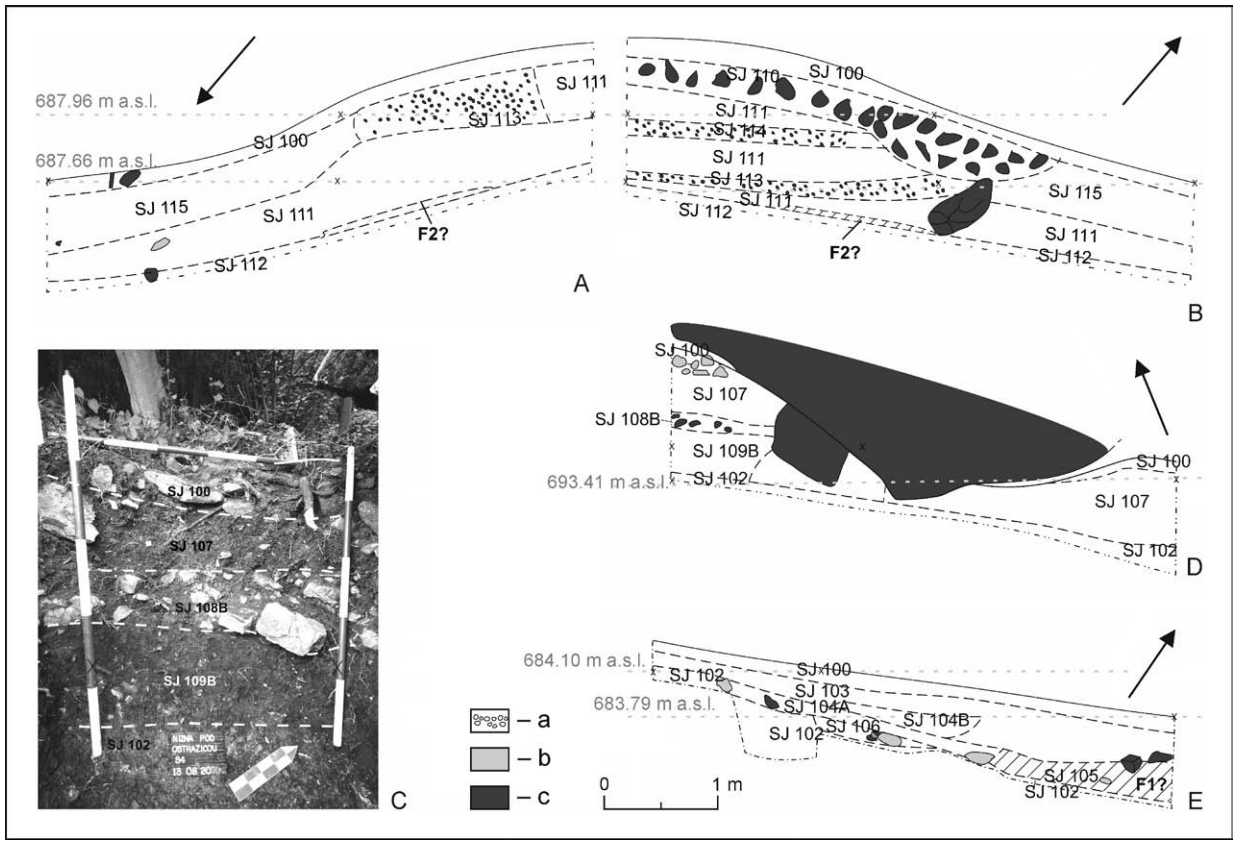

Fig. 8. Nižná, Hldočín, excavation in 2020. A – trench 2/20, SE profile; B – trench 2/20, NW profile; C – trench 4/20, NW profile; D – trench 4/20, NE profile; E – trench 3/20, NW profile. Legend: a – gravel; b – sandstone; c – limestone; Sj – stratigraphic unit; F – feature. Photo and drawing B. Lofajová Danielová.

propriate analogy. Double plastic protuberances without engraved decoration appear in the settlement Detva, Kalamárka (*Šalkovský 2002*, fig. 4: 8), which dates to the interval of the Early to Middle La Tène period (*Benediková 2006*, pl. LVII: 8; *Šalkovský 2002*, 103–107). In terms of production material, the sherd does not differ from the others – it is made of fine-grained clay, with reduction firing, and a smooth surface. A fragment of a fine-grained polished vase/cup with irregular bunches of obliquely engraved lines (Pl. II: 9) has direct analogies at the Ostražica hillfort — under the embankment in a burnt layer dated to PPS (Pl. I: 5). A fragment of an orange thin-walled fine-grained vessel with a polished surface, decorated with wide vertical grooves (Pl. II: 5), may also come from the PPS period. Parallels are, for example, in bowls from Liptovská Sielnica, Liptovská Mara II (*Pieta 2000*, fig. 8: 5). The fragment from the context SJ 115 (Pl. II: 2) is made of the same ceramic material and has the same surface finish. The rim of a bottle-shaped vessel (Pl. II: 12) is similar to the La Tène type dated back to the Lt C1 stage (*Repka 2020*, 142, 143). Ceramic material, which would be typical for the Púchov culture, is absent from the Hldočín settlement.

The most represented ceramic types from the settlement are bowls or pots with round plastic protuberances below the rims (Pl. II: 8, 10, 11). They occur over a large horizon from the Late Hallstatt to the Middle La Tène period – for example, in the secondary graves of the mound in Liptovský Trnovec, Konislava, dated to the OLC (*Benediková/Pieta 2018*, pl. I: 12, 16). They also appear in the PPS material, e.g., Liptovská Sielnica, Liptovská Mara VII (*Pieta 1982*, pl. XXIII: 8).

Fragments of daub were found mainly in the occupation layer. They are marked exclusively by wattle impressions with a diameter of approx. 2.4–4.2 cm (Pl. III: 1, 3, 5–7) – some of them come from the walls of the structures (Pl. III: 2, 4, 5). One daub fragment has an imprint of a board (Pl. III: 1) probably coming from the inner wall of a building with an unknown function. Fragments from Feature No. 2 (Fig. 8: A, B; Pl. III: 3) come from the wall of a wicker structure with a diameter of approx. 5 cm.

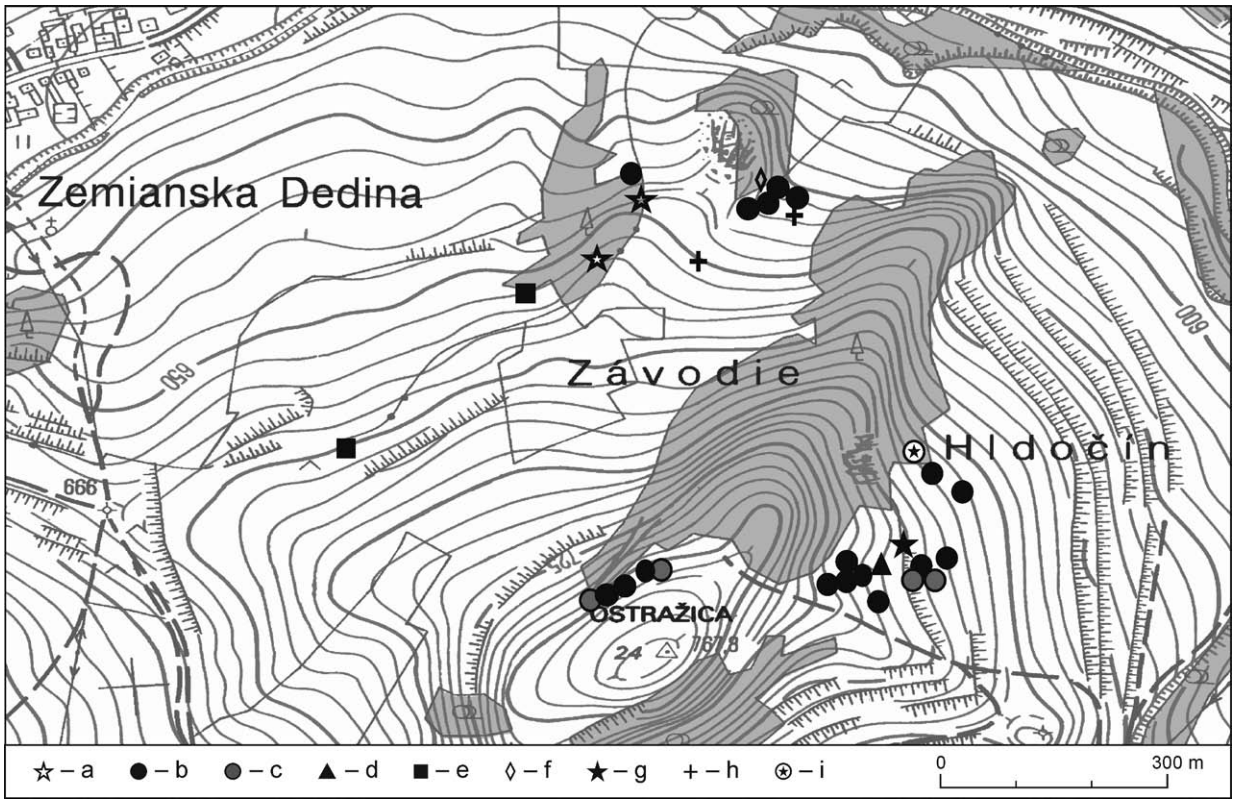

Fig. 9. Nižná, sites Skalica/Závodie and Hldočín. Survey in 2022 of the surroundings of Ostražica. The relevant archaeological finds. Legend: a – bronze; b – pottery; c – iron; d – daub; e – hand grinding stone; f – sandstones; g – test pit; h – water spring; i – the location of the archaeological excavation in 2020. Data source: ZBGIS (www.geoportal.sk). Author B. Lofajová Danielová.

Survey prospecting 2022

A detailed prospection of the position Hldočín was carried out in May 2022, by detector survey, and surface collection, as part of a detailed prospecting of the Ostražica area. The initial goal of the survey was to determine the extent of the settlement. The eastern slope and meadows are currently used as pastures. No finds were found there, nor on the eastern edge of the terrace above the stream. We assume that the settlement did not interfere with this space. In the south-western direction towards the Ostražica hillsides, several sherds were found in the place of the 'basin' that is protected from bad weather, and also at two short artificial terraces in the forest (Fig. 9). Due to the increased concentration of findings, a test pit was carried out (Trench 1; Fig. 9: g). Sherds, including decorated ones, and daub fragments, were found (Pl. III: 8–18), which correspond to the presented findings from research in 2020 (Pl. II; III: 1–7). The finds are concentrated in the primary position in the occupation layer, and document settlement activities in this space. Only ceramic material comes from the site, all metal objects from the site are recent. An animal bone from trench 1 of the cultural layer was dated with the highest probability (95.4%) to the Hallstatt period 770–544 calBC (Ha C1–Ha D1), with a higher probability (60.6%) to 651–544 calBC, which in relative chronology represents the period Ha C2–Ha D1 (*Lofajová Danielová 2024*, 193, fig. 92).

We assume that it was probably one open hillside settlement from Ha C2–Lt C1 (Fig. 11: 2). It was situated on the artificial terraces of the eastern and north-eastern slopes of Ostražica hill, which, according to the current state of knowledge, has a total area of at least 5.5 ha (Fig. 14: a). Continuation of the settlement in a south-eastern direction is probable.[10]

[10] This area was not researched for legislative reasons. The parcels were not part of the Monument Board in Žilina's ruling.

NIŽNÁ, THE NORTHERN SLOPES OF OSTRAŽICA HILL (SITE SKALICA/ZÁVODIE)

On the north-western slope, in front of the fortification, there is a shorter artificial terrace (Fig. 9). A detailed prospection in 2022 revealed atypical sherds at this position – probably from the Iron Age. At this location, recent ploughing has also been documented, and two fragments of an iron sickle have been found (Pl. IV: 1) This finding can probably be dated to the Iron Age, or at the earliest; to the turn of the Hallstatt and the La Tène period (*Lofajová Danielová/Furman 2022*, 103, with references). There is a relatively large area on the artificial terrace suitable for agricultural activities. Subsequently, the forest access road to the Ostražica hillfort from the north-eastern side was researched. This part is also assumed to be the entrance to the hillfort, as the slope is too steep on all the other sides, and no significant breaches of the fortification system are visible on the LIDAR images. No relevant finds were found in either of these locations.

The survey also aimed on the meadows near the so-called 'Skalica' – a recent quarry (Fig. 11: 4) that destroyed the 'Hallstatt' site already mentioned by *P. Čaplovič (1987*, 155). Through surface prospection we have found small pottery fragments and also sandstones on the surface, confirming this information. In addition, small sherds were also found in the nearby meadow — in the area of the spring, and even directly in the spring (Fig. 9: h; 11: 7). There was a relatively-deep disturbed profile to a depth of about 2 m, based on which we propose that no occupation layer is present in these places. The springs now serve as water sources for a herd. The site may have been used for these purposes in the Iron Age as well.

On the north-western slopes of Ostražica, the metal detector survey was complicated – due to the influence of long years of ploughing; only recent iron objects were found. This area is also intensively used as grazing land, and some places cannot be explored at all. No relevant finds were detected by the surface survey, only a granite stone that was probably a grinding stone (Fig. 9: e), and may document settlement activity in this area as well.

Through surface survey at the site Závodie (a promontory west of the Skalica site), we have found prehistoric sherds – mainly on the slopes (Fig. 9; 11: 3). In some places artificial 'terraces' are recognizable in the terrain. However, the surface has been destroyed, and the occupation layer was not recorded in this position. In addition to the sherds, a larger bronze ingot (probably waste from production), and a fragment of a bronze bracelet were found (Fig. 9: a; Pl. IV: 2). A grinding stone was also found at the secondary position (Fig. 9: e). Since no remains of occupation strata were recorded at any site (nor in tree uproots, and exposed slopes), we assume that the site was destroyed by stone quarrying similar to the 'Skalica' site. Either that, or this situation is related to activities conducted during World War II, as is generally known in this location. This would be confirmed by the terrain situation of large craters throughout the slope, which are probably not natural. Based on the archaeological material (grinding stone, bronze ingot), and the presence of artificial terraces, we suggest that there may have been a terraced Iron Age settlement most likely contemporary with the fortified area at Ostražica hilltop.

NIŽNÁ, KRIVÉ HONY

This location represents the southern and south-eastern slopes of Ostražica Hill with a moderate slope (gradient 3°–7°) at an altitude of 595 m a.s.l. In 2018, the first author found pottery fragments here (Fig. 10: A: 2; *Lofajová Danielová/Furman 2019*). This position today has been built on by a house (Parcel KNC-1188/3). During the inspection by M. Furman (Regional Monument Board Žilina) of the nearby house construction in 2019 on plot No. KNC-1188/37, he documented a disturbance of the occupation layer at the NE part of the house (Fig. 10: A: 1), but the foundations were already concreted. In agreement with the owner, M. Furman prescribed archaeological excavation in the place of the disturbed layer. Archaeological excavation was carried out by the first author in April 2020. A trench measuring 7 × 1.6 × 2.8 m was dug around the terrace of the house in the northern and north-eastern corners of the terrace (Fig. 10: B).

Relevant archaeological layers were only recorded to the north-east from the terrace of the house. Two layers were recognisable: in the northern part, a layer of clay consistency with archaeological material (sherds, animal bones, daub, polishing stone, and whetstones), and in the southern part, a clay layer with only small fragments of pottery. As a consequence of groundwater displacement, it was not possible to excavate the layers down to the subsoil level, and therefore impossible to specify more precisely if

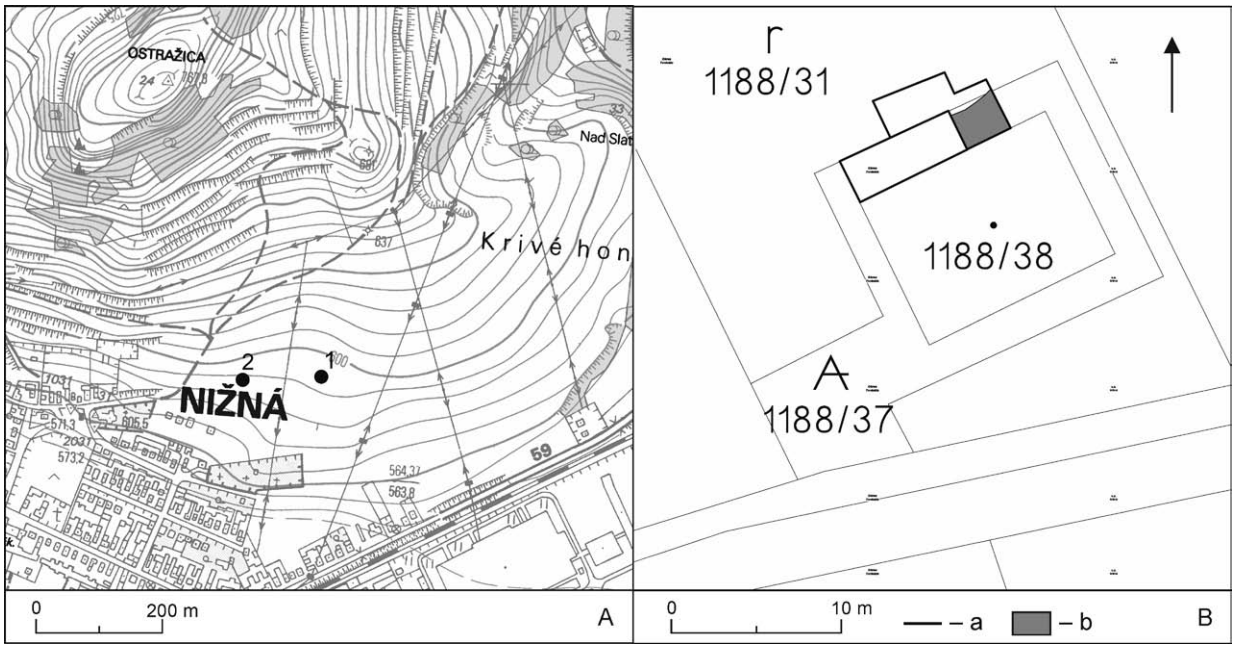

Fig. 10. Nižná, Krivé Hony. A – position of the excavated area under a family house in 2020 (1) and the pottery fragments found by surface collecting in 2018 (2); B – excavated trench in 2020 on the cadastral map. Legend: a – trench; b – archaeological feature/occupation layer. Data source: ZBGIS (www.geoportal.sk). Author B. Lofajová Danielová.

it is a larger settlement feature, or an occupation layer. Based on the archaeological material – which includes pottery (Pl. IV: 4–8, 11, 12), small fragments of daub, animal bones, a fragment of red radiolarite core (Pl. IV: 9), three sandstone whetstones, one polishing stone (Pl. IV: 10), and a fragment of grinding hand stone – this is most likely a settlement. Based on analogies to pottery, e.g. the rim of a vase-shaped reduction-fired vessel with a smooth surface (Pl. IV: 5), which has parallels among pots in the Biela skala area (*Čaplovič 1968*), the fragment of a larger coarse-grained brownish-black amphora (Pl. IV: 8), we date the settlement to the turn of the Hallstatt and La Tène periods at the earliest. Barrel-shaped bowls/pots (Pl. IV: 6, 7) can be dated in a wide range from the Late Hallstatt to the Middle La Tène period (see above).

Detailed survey prospecting was also carried out at other locations west of Ostražica. Seven positions were studied in detail, of which only two could be associated with the prehistoric or protohistoric settlement – Rúbanka (Fig. 11: 6), and Lazy (Fig. 14: g). Although the other researched locations are in strategic positions – Lučivný vrch, Kováčová, Klinková, Červená skala, or Kozí vŕšok (above the bend of the Orava River, near the confluence with Studený potok) – no relevant archaeological finds have been identified. In these places we have found finds from the Middle Ages, the Modern Age and the World Wars.

THE SETTLEMENT COMPLEX NIŽNÁ, OSTRAŽICA

In several years of detailed research (surface collection and metal detector surveys), and also in cooperation with local citizens, we have identified eight new sites in the vicinity of Ostražica (Fig. 11). Three of them – the sites Hldočín, Krivé Hony and Závodie (Fig. 11: 2–5) – can be defined as open settlements. The predominant pottery acquired from these settlements is dated to the long interval from the Late Hallstatt to the beginning of the Middle La Tène period. We assume the continuous occupation of hillside open settlements, as similarly demonstrated by the proposed chronology of the Ostražica hilltop settlement (Pl. I). The second and third phases at Ostražica, with the material of the Púchov culture (the La Tène and Early Roman phases), are not proven at any newly discovered open hillside settlement. It is therefore likely that the settlements were contemporary with the hillfort only in the first phase of settlement and were subsequently abandoned. Open settlements of the Púchov culture could be concentrated in the lowland (cf. *Pieta 1982*), or settlement density may have been reduced. Lowland sites in 'Central Orava' are not known from the studied period, except for the mention of two urns from the intramural area of

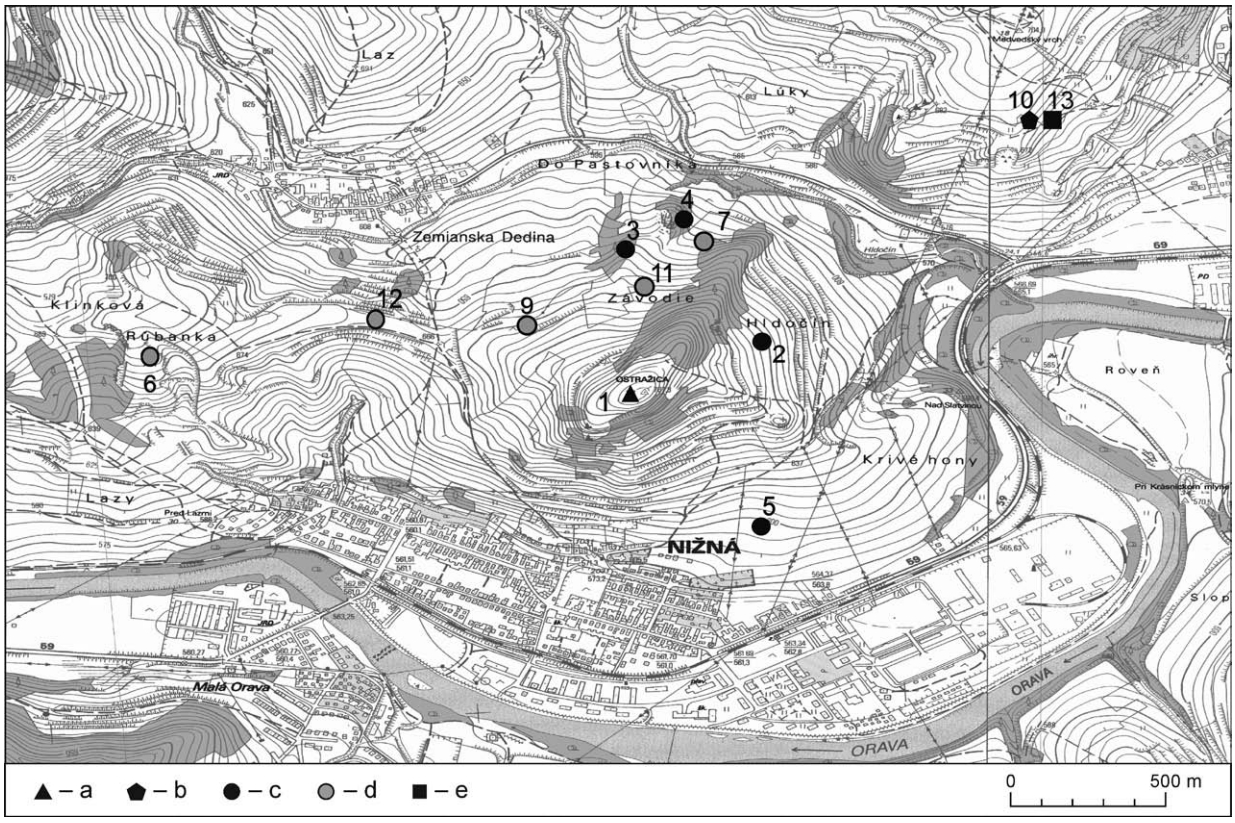

Fig. 11. Sites and interpretation of findings in the surroundings of the Ostražica hill. a – fortified settlement; b – fortified settlement?; c – unfortified settlement; d – stray finds?; e – hoard. 1 – Ostražica; 2 – Hldočín; 3, 7, 9, 11 – Závodie; 4 – Skalica; 5 – Krivé Hony; 6 – Rúbanka; 10, 13 – Vápence; 12 – Tvrdošín (numbering corresponds to table 4). The source of the ALS Products: 'ÚGKK SR'. Author B. Lofajová Danielová.

Zemianska Dedina, which were found with a bronze inventory (the material has been lost).[11] The result of prospection in the lowland zone, on the first terraces of the Orava River – nowadays used as arable land – is problematic. Until the regulation of the river and the construction of the Orava water reservoir, the area was regularly flooded. There is a river alluvium (silt) over 2 m thick in these places. The archaeological material-bearing layer can be therefore buried very deep and is not disturbed by ploughing (a deep-buried occupation layer from the Iron Age is recorded, e.g., in Lower Orava region). The first author has recently documented a new settlement in a lowland (valley bottom) zone north of the Ostražica – which at the moment represents the northernmost Iron Age archaeological site of Orava. Therefore, we should consider the possibility of Iron Age settlement activities also in some valley-bottom positions. Based on the archaeological artefacts, we can assume hillside settlements in Krivé Hony and Hldočín locations (Fig. 11: 2, 5) where settlement features, and buildings, are documented by daub and cultural layer. Daub is absent only from the Skalica/Závodie site, which were destroyed by quarrying. Moreover, the survey at Závodie location was limited to non-destructive prospection. A bronze ingot was found at Závodie site (probably a settlement), and may evidence bronze casting activities at this area. Apart from this site, some strategic features (fords, confluence, and communication) are in visual contact with all other sites (from Závodie settlement it was not possible to see more than the valley of the local stream named Hldočín). At the Závodie site, there are also local springs close to or within the settlement (Fig. 9: h). The most distant from the nearest water sources is Krivé Hony settlement, however, groundwater in relatively shallow depth and water which may have emerged from the subsoil is accessible on the site.

In terms of relative elevation, only Ostražica and Hldočín settlements are situated higher (a relative elevation of up to 300 m, the rest of settlements are elevated up to 150 m). From these two sites, all the

[11] P. Čaplovič assumed that it could have been a burial ground associated with an unknown settlement in the center of Zemianska Dedina village (*Čaplovič 1987*, 155). However, it is possible that it was a burial ground belonging to the settlement area of Ostražica, as no other burial ground was found here by the B. Lofajová Danielová meticulous research.

Table 4. Overview of selected attributes of archaeological sites in the Ostražica area from phase Ha C2–Lt C1 (numbering corresponds to Fig. 11). *ABM – archaeobotanical material; AZOO – archaeozoological material; BR – bronze; DA – daub; GS – grinding stone; CHS – chipped stone; LW – loom weigh; PS – pottery sherds; SI – sickle; WS – whetstone. Author B. Lofajová Danielová.

ID	Site	Type of site	Landscape formation	Area [ha]	Relative elevation [m]	Geological basis	Hydrological distance [m]	Visual control of strategic points			Inner building	Artifacts*
								Fort	Confluence	Communication		
1	Ostražica	foritified settlement	hilltop, hillside, artificial terrace	1.95	120	limestone	360	x	x	x	x	ABM, AZOO, BR, DA, GS, LW, PS, SI, WS
2	Hldočín	open settlement	hillside, artificial terrace	5.50	155	sandstone, slate	300	x	x	x	x	AZOO, DA, PS, LW, WS
3, 4	Skalica, Závodie	open settlement	promontory, artificial terrace	0.92	45	limestone	0	–	–	–	?	BR, GS, PS
5	Krivé Hony	open settlement	hillside, artificial terrace	1.93	207	sandstone, slate	626	x	–	x	x	AZOO, DA, CHS, PS, WS

strategic points in the landscape are visible – several fords over the Orava River, the confluence with the Ráztoka stream, and the communication along the river (Table 4). We suggest that they may have been involved in the control of the communication, the use of which at the turn of the Hallstatt and La Tène periods, is confirmed by the bronze hoard from Krásna Hôrka site. This hoard has analogies mainly in the territory of present-day Poland, and within the Carpathian Basin as well, which is confirmed by the chemical analysis of the selected objects (*Danielová 2018*). In the past, the hoard was associated with the Ostražica hillfort (*Čaplovič 1987,* 166). However, at that time, the previously destroyed settlement in the location 'quarry Vápence' (an upland, potentially fortified settlement), which was located at the place of the hoard discovery, was not known (Fig. 11: 10, 13; *Lofajová Danielová 2020,* 31–36).

Discovered open settlements concentrated on slopes with a higher inclination (to 35°) are situated on most likely artificial terraces (Fig. 12: A), which are in close distance to each other (0.5–1 hour accessibility).

The economy of the settlement complex around Ostražica

Both the plant remains and animal bones document that Ostražica was a place where agro-pastoral communities chose to live and perform various household activities from the Late Hallstatt to the Middle La Tène period. Although the assemblage of plant remains from the Late Hallstatt to the Middle La Tène period is rather limited, its absolute dating and data patterning might be seen as indicators of variation or changes in culinary and/or cultivation traditions or use of the space within the settlement. This is captured by the density (or absence/presence) of finds and the change of the crop spectra. The variation in densities of plant macro remains in sampled deposits indicate (alongside with other archaeological evidence like presence/absence of features, types of finds, etc.) that in time the excavated areas have changed their function or the way they were used. First it is important to note, that legumes are generally underrepresented in archaeobotanical records. One of the main reasons is that they are prepared by cooking in water, unlike cereals parched or baked directly on fire and so the legumes have a smaller chance to become charred and preserved. It is exactly for this reason, that their occurrence, higher numbers, frequencies, or concentrations, should be considered and interpreted. We propose that charred seeds from all phases originated from the same activity (e.g. discard of kitchen wastes) as there is no

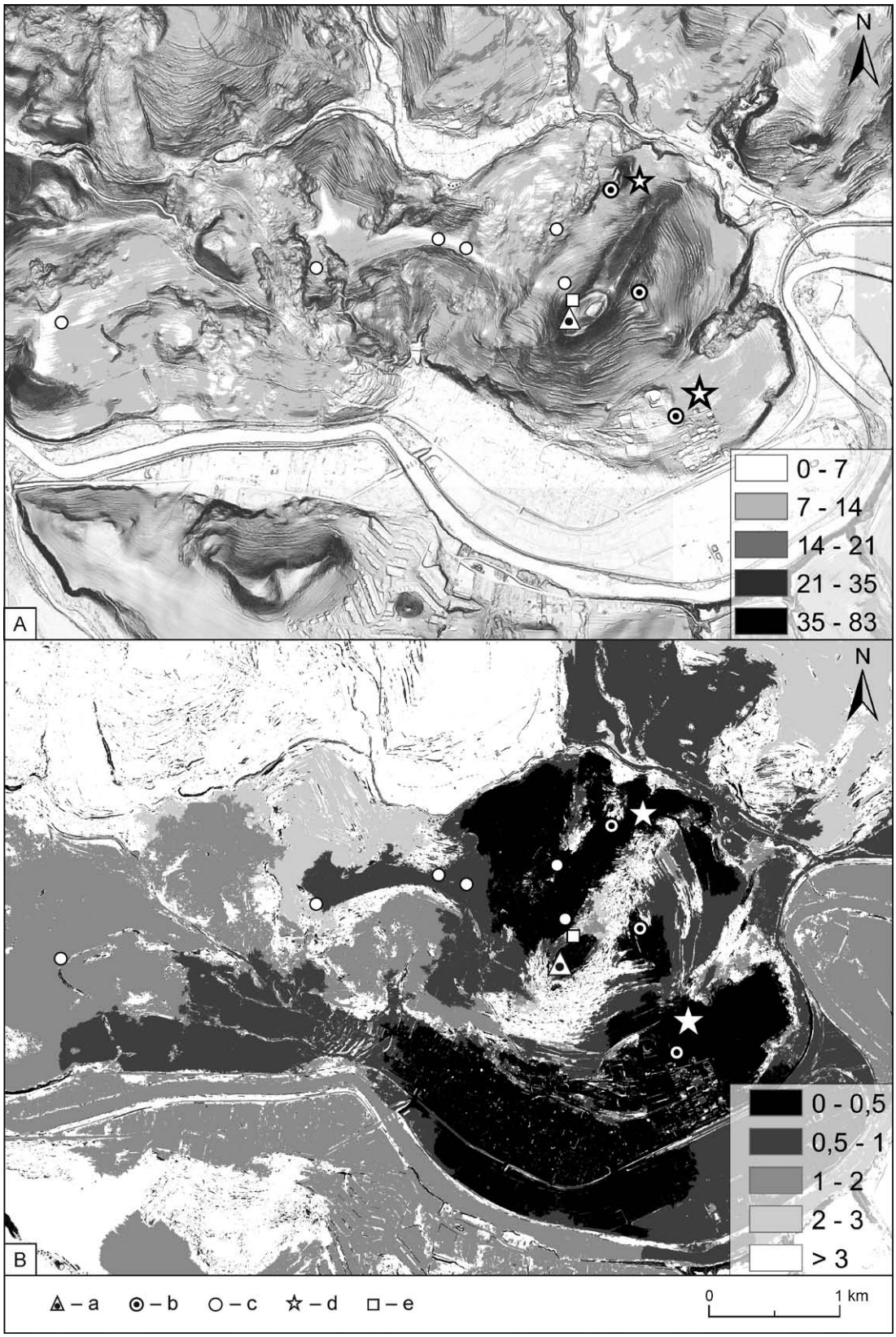

Fig. 12. Settlement complex of upland sites around Nižná, Ostražica hillfort. 1 – slope analysis (inclination in degrees); 2 – path distance analysis using Tobler's hiking function (in hours) from upland settlements. Legend: a – fortified hilltop settlement; b – open hillside settlement; c–e – stray finds: c – pottery fragments; d – pottery in local water spring; e – iron sickle. The source of the ALS Products: 'ÚGKK SR'. Author B. Lofajová Danielová.

evidence that any sample should originate from other activity (e.g. accidental burning of a store *in situ*). As such we compare them directly. Legumes, here sweet pea and Celtic bean, which are often grown as garden crops were more abundant in the Early Iron Age phase (in sample dated by AMS to Hallstatt period) but later receded and were substituted by cereals, cultivated on larger field plots. Field and garden weeds recorded at Ostražica have almost exclusively relatively heavy seeds that survive the first stages of crop processing, and can be found in unsieved or only coarsely sieved stored seed crops. This suggests that first stages of crop processing (threshing and winnowing) might took place elsewhere – either away from the site or in the area which was not excavated and sampled. Whether these hypotheses are valid have to be validated by further research. As the majority of weeds are not soil pH specific, we cannot say whether the fields or garden plots where the crops grew were situated close to the site on the calcareous soils or on acidic soils found further afield. Two tentatively determined species – *Bromus arvensis* and *Melilotus albus* – are species of basic soils, while *Vicia hirsuta* grows on slightly acidic soils. Although there are distinct artificial terraces on the hilltop and slopes of Ostražica hill, most of them are the result of farming activities of the last two centuries. The so-called 'terrace farming' was typical for Orava since the Late Middle Ages, and considerably altered the landscape. It is therefore difficult to recognize remnants of prehistoric field systems in the landscape. Equally problematic are the detector surveys of the long-used topsoil, which covers most of Ostražica, except some presently forested areas. An iron sickle was found on a narrow artificial terrace on the northern slope below the fortification (Fig. 12: e; Pl. IV: 1), which probably documents agricultural activities in this area. A flat area to the west of Ostražica with the lowest slope inclination up to 7° (Fig. 11: 9, 12; 12: A) where prehistoric sherds were ploughed out in the past may hypothetically have been used as a field in the Iron Age. This is the only one flat area in the upland surrounding the Ostražica hill (Fig. 12: A), close to settlements accessible to 0.5 max. 1 hour of walking (Fig. 12: B). This location has been laid a fallow already for many years.

Archaeozoology document that sheep/goats and cattle were kept and consumed at the site and probably grazed around the Ostražica hill (see above). On both the northern and western slopes of Ostražica, there are plenty of suitable areas for pastures (and less suitable for fields). In addition, local sources of water can be directly found in the meadows, and may have been used for watering the herds, as they are still used for these purposes today. The herding activities in the Iron Age could be documented by isolated pottery finds without context (no evidence of occupation layer), for example, at the local water source at the Závodie and Krivé Hony sites (Fig. 12: d), or the more distant Rúbanka or Lazy locations (Fig. 11: 6; 12: c). According to the site catchment theory the maximum measured time estimated for the effort used to attain grass for flocks varies from ca. 1 hour to 2 hours (*Lönnqvist et al. 2009*). All mentioned stray finds are within 2 hours radius, therefore could be taken as evidence of pastoral or other activities (hunting area, visual control of strategic points and others). The wild game (wild boar, roe deer) hunted in the surrounding mixed forests also had a role in the diet. The forest near Ostražica was also important source of timber wood used for constructions of fortifications, terraces, and dwellings, and for fuel. This is documented by several fragments of daub with imprints of logs and charred timbers (not analysed) found *in situ* at the hilltop settlement. The areas of the microregion that were repeatedly assessed by prospection as being negative for habitation activities – for example at Lučivný vrch, Klinková, or other locations north of Ostražica – may also have been forested and exploited as a source of raw materials and occasional gathered/hunted wild foods. The imprints of smaller diameter poles imprinted in the daub indicate possible management of some selected trees by coppicing, pollarding or shredding. As fragments of wattle-and-daub construction originate exclusively from Hldočín and Krivé Hony sites (Fig. 11: 2, 5), situated near the river, we speculate that willows that grow along the water streams were managed by coppicing. That the Orava River itself was also used as a source of sustenance is documented by presence of fish bones and European beaver. The river valley is also located at a close distance to the settlements within a maximum of 1 hour (Fig. 12: B). As mentioned above, research in these areas is difficult due to long-term river deposits and floods, archaeological sites can be buried very deep.

Another important raw material that was extracted from the surroundings of the Ostražica hillfort was sandstone, which was used for the reinforcement of terraces (it is documented in the entire intra muros area), and also for the construction of the frontal wall of the rampart. It should be mentioned that the stone wall was made of sandstone blocks that were more or less constant in size and shape. The blocks are of quadratic shape, mostly 20 to 30 cm long, 6 to 10 cm wide, and 5 to 6 cm thick. As the bedrock of Ostražica hill is limestone (Table 4), all the sandstone has been brought to the site. The nearest possible sources are located on the south-eastern slopes of Ostražica in the area of the settlements of Hldočín and Krivé Hony (Table 4). The inhabitants of the settlements may have been directly involved

in the extraction and processing of the sandstones. Alternatively, sandstone could have been quarried at the area west of Ostražica, i.e. at Rúbanka or Lučivný vrch hills. In all these areas there are terrain relics visible also on LIDAR images that could be associated with stone breaking or quarrying. This hypothesis has not yet been confirmed by petrographic analysis.

Apart from sporadic bronze fragments (e.g. a bronze bead), there are no finds on the Ostražica hillfort that could be attributed to the social 'elite'. The rampart fortification that distinguishes the hilltop settlement from the unfortified hillside settlements, was only constructed in the developed PPS period. Provided the fortified and unfortified sites are contemporaneous until the Early La Tène period, in phase Ha C2/Ha D1–Lt B1/Lt B2 (c. 250 years) the hilltop was unfortified, possibly with only a surrounding palisade. Thus, the hilltop settlement was not significantly different from the hillside settlements, apart from the use of the dominant position with good visibility, and the possible palisade. However, the first phase of settlements is a long period (Late Hallstatt to the beginning of the Middle La Tène period), which we are unable to divide more precisely through the current state of knowledge (especially in the hillside settlements where radiocarbon dating is not yet available). At the moment we presume food self-sufficiency of all of the presented settlements – including the Ostražica hilltop; based on the presented archaeobotanical, archaeozoological, and archaeological finds (agricultural tools and artificial terraces). The surrounding upland landscape provided suitable conditions for cattle or sheep/goat breeding, and perhaps also agriculture (the sufficiency of space, water sources, and flat plots for arable lands). However, we cannot exclude settlement or agro-pastoral activities in the lowlands as well.

A possible oscillation of people between open settlements (an alternation of settlement locations) during shorter periods cannot be excluded due to the long-studied interval (ca. 350 years). Such a practice is assumed in the Hallstatt period, e.g. in the area of Thuringia (approx. 100–150 annual intervals of alternation of upland and lowland locations). Upland sites are also considered to be food self-sufficient there. Also, an agro-pastoral way of life prevailed at this location, with a dominance of cattle breeding, similar to the results from Ostražica. According to the authors, livestock herding was easier in the mountainous landscape – it offered more possibilities for moving and protecting the herd (*Köhler 1995*, 163, 164).

THE SETTLEMENT COMPLEX AROUND PODBIEL, BIELA SKALA

At a distance of only 3 km to the south-west, there is a similar settlement complex from the Iron Age in the area of Biela skala in Podbiel. At the transition of the Hallstatt and La Tène period (Ha D–Lt A/Lt B1), four sites coexisted in this area – three settlements, and one burial ground (Fig. 13). However, unlike Ostražica, continuity up to Lt C1 has not yet been proven. Based on the finds from the top of Biela skala (Fig. 13: 3), there is a possibility that, except for the burial ground, the settlements could have continued until the Middle La Tène period. Subsequently, only the La Tène phase of the Púchov culture is well documented (*Lofajová Danielová 2022*, 22). The fifth site – a settlement in the location 'Plató nad Pohrebiskom' (Fig. 13: 2) was dated to the 'Púchov Culture' (*Točík 1980*, 213) – from which the material is absent, and therefore earlier dating is also possible. Recent excavation in the Biela skala area was carried out but only in the settlements of Biel and Za Pivovarom (Fig. 13: 1, 2; *Lofajová Danielová 2022*). Both sites were heavily disturbed by ploughing during the last century. The stratigraphic situations were in most cases unsuitable for sampling.

Archaeobotany

The aim of the archaeobotanical sampling at Podbiel, Biel, and Podbiel, Za Pivovarom sites, was the same as above – to gain material suitable for radiocarbon dating and to obtain data on cultivated and gathered plant foods. Only four contexts in Biel, dated by accompanying materials widely and tentatively as PPS? (Lt B1–Lt C1), and three in Za Pivovarom, dated generally to the Iron Age (probably Ha C2–Lt C1), seemed to be undisturbed and were sampled for archaeobotany (Table 5).

At Biel one sample (#1) originates from a cultural layer (SJ 107) situated directly over the bedrock, two samples (#2, 3) represent a fill of a ditch (SJ 105) and the last sample (#4) which contained only wood charcoal and no seeds come from a 'burned' culture layer (SJ 106). The samples yielded only 10 fragments of seeds and exclusively of crop plants. Even if the recovered taxa – oat (*Avena* sp.) and broomcorn millet (*Panicum miliaceum*) – occur in the region in the Iron Age, their combination (together with absence of finds of glume wheats) is more characteristic for younger (medieval and postmedieval) period. The remaining finds could

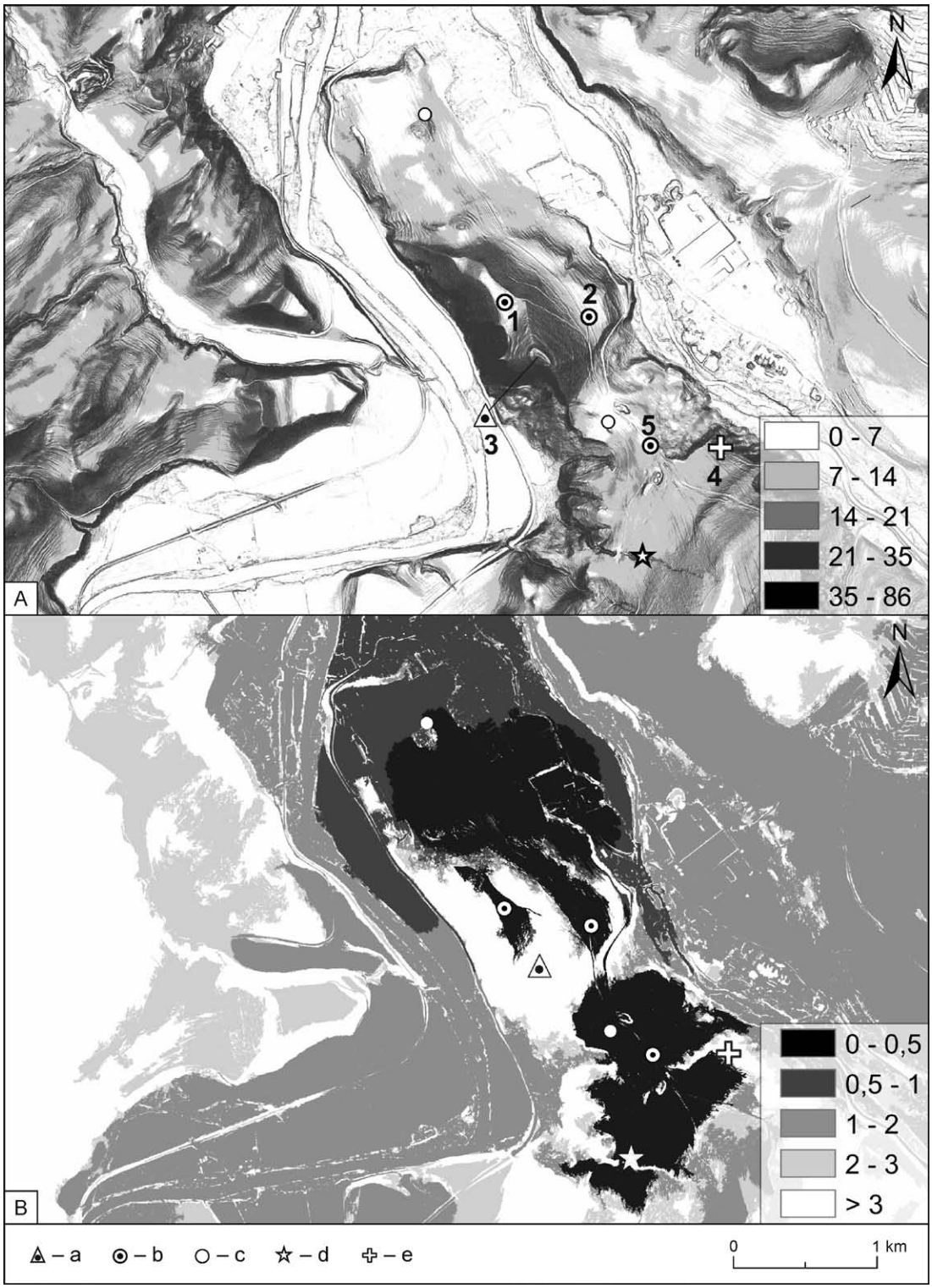

Fig. 13. Settlement complex of upland sites around Podbiel, Biela skala hillfort. A – slope analysis (inclination in degrees; 1 – Biel; 2 – Za Pivovarom; 3 – top of Biel/Biela skala; 4 – Za Bielym; 5 – plató above burial ground); B – path distance analysis using Tobler's hiking function (in hours) from settlements. Legend: a – fortified hilltop settlement; b – open upland settlement; c, d – stray finds (c – pottery fragments; d – pottery in local water spring); e – burial ground. The source of the ALS Products: 'ÚGKK SR'. Author B. Lofajová Danielová.

Table 5. Podbiel, Biel and Za Pivovarom. Plant macroremians grouped according to dating and/or context. Numbers represent NIPS values. Author M. Hajnalová.

Podbiel site area	Biel			Za Pivovarom
Dating	Lt B1–Lt C1?			Ha C2–Lt C1?
Sample No.	1	2, 3	4	1, 2, 3
Volume (l)	6	11	2	3.4
Crops				
Panicum miliaceum	1	2	–	–
Avena sp.	3	–	–	–
Triticum/Hordeum	1	–	–	–
Leg. sat.	–	2	–	–
Wood charcoal fragments	239	161	48	308
Uncharred seeds	0	5	0	2
Density of charred seeds	0.8	0.5	0	0

only be identified to broad categories of cereal grains (Cerealia) and cultivated legumes (Leg. sat.). All three samples from Za Pivovarom represent fill of two postholes – No. 1 (#1) and No. 3 (#2, 3). They contained only small fragments of wood charcoal and were void of finds of seeds. Before any interpretation of recovered plant remains is drawn, it is necessary to ascertain their Iron Age origin by their direct radiocarbon dating.

The economy of the settlement complex at Biela skala

The low representation of seeds of crops and field weeds in Biel and their absence in Za Pivovarom is most probably a consequence of the disturbance of the original cultural layer by ploughing and its subsequent erosion, and of the small number of samples (taken only in places where recent destruction was not expected).

Table 6. Overview of selected attributes of archaeological sites in the Biela skala area from Ha C2–Lt B (numbering corresponds to Fig. 13). *ABM – archaeobotanical material; AZOO – archaeozoological material; BR – bronze; DA – daub; GS – grinding stone; PS – pottery sherds; SI – sickle; WS – whetstone.

ID	Site	Type of site	Landscape formation	Area [ha]	Relative elevation [m]	Geological basis	Hydrological distance [m]	Visual control of strategic points			Inner building	Artifacts*
								Fort	Confluence	Communication		
1	Biel	fortified settlement?	promontory	1.65	150	limestone	527	x	x	x	x	ABM, AZOO, BR, DA, PS, WS
2	Za Pivovarom	open settlement	hillside, artificial terrace	1.60	70	limestone	320	–	–	x	x	DA?, PS
3	Vrchol Bielej skaly	foritified settlement	hilltop, artificial terrace	0.11	207	limestone	400	x	x	x	x	ABM, DA, GS, PS
4	Za Bielym	burial ground	hillside	0.20	44	rubble	600	–	–	x	x	BR, PS
5	Plató nad pohrebiskom	open settlement?	sedlo	?	67	rubble	164	x	–	x	?	PS

However, numerous grains of barley (*Hordeum vulgare*), and emmer (*Triticum diococum*), together with seeds of sweet pea and Celtic bean were recovered in the past from a burnt layer of crops (*Hajnalová E. 1993*, 117). This find interpreted as 'the burned storage of crops' that 'laid originally on straw bedding' was found on a small summit plateau (11 m^2) fortified with a sandstone stone wall (*Čaplovič 1987*, 148, 149; *Hajnalová E. 1993*, 117) resembling the fortification wall at Ostražica. New AMS data on charred seeds of pulses (*Pisum sativum*) from layer of crops excavated in 1965 (*Čaplovič 1987*, 149) date this layer to 2395 ± 24 (DeA-46557), with a high probability to 541–400 cal BC (98%), to Late Hallstatt to Early La Tène period. A graphite situla-shaped vessel with combing from the period of the PC (*Čaplovič 1968*, 177, 178) was found there, alongside artefacts that could date to the PPS (*Lofajová Danielová 2022*, 22). We assume that 'normal' or habitation/residential activities could not take place within such a small, fortified area, but that this enclosed place was an integral part of the settlement situated on the nearby promontory of the Biel hill (Fig. 13: 1; 14). The layouts of postholes and numerous fragments of daub with impressions

of both wattle and timber constructions found at Biel promontory settlement indicate the presence of several buildings of different (or combined) construction (*Čaplovič 1987,* 147; *Lofajová Danielová 2022*). The residential function is also evident by artefacts – polishing stones, grinding stones, whetstones, etc. In addition, the inner layout of the Biel settlement is confirmed by magnetometric prospection (*Felcanová/Felcan/Lieskovský 2021*, 113–117). We presume that similar to Ostražica, the Biel settlement was also surrounded by a palisade, yet to be archaeologically verified.

In contrast to Nižná, in Podbiel upland settlements are situated only on flatter areas with low inclination (7°–14°; Fig. 13: 2). Except for the hilltop settlement of Biela skala, all the other upland settlements are easily accessible. They are situated in a hilly area with a relative elevation of maximum 150 m above the surrounding terrain. The bedrock of the settlements consists mainly of limestone (Table 6). All the strategic points were only visible from the settlements of Biel and the top plateau of Biela skala – the fords, the confluence of the Orava River with the stream Studený potok, and the Orava River itself – the main regional waterway. Only part of the Studený potok stream was visible from the settlement Za Pivovarom. The calcareous soils that developed on carbonate geological substrates at the settlements of Biel and Za Pivovarom were suitable for farming, as the rendzina is more permeable than the heavy clay soils situated on the sandstones, usually prevailing in the area. As in the very recent history, they yielded cereal and pulse crops already in Iron Age as is recorded through archaeobotany. In the Biela skala area, the plain upland or lowland positions to the north of the Biel settlement could serve as pastures or fields (like today). This area is the flattest and the quickest accessible (0.5 to 1 hour) from the settlements Biel and Za Pivovarom (Fig. 13: 2).

THE MICROREGION OF 'CENTRAL ORAVA'

A detailed multi-year surface survey in 'Central Orava' has also enabled the identification of sites where no finds have been found, and where permanent settlement is not assumed (Fig. 14: c). Due to this, we can determine the approximate area of the settlement complexes of Nižná, Ostražica, and Podbiel, Biela skala, where everyday settlement and economic activities took place. On the other hand, we can also presume sporadic human activities in these places – for example, the hunting or collection of raw materials. We have not found sites in any of the studied complexes in 'Central Orava' that could be used as places of refuge (characteristic for Ha D–Lt A/Lt B1 period in Northern Slovakia; see *Pieta/Barta/Benediková 2021*), although prospection has been carried out at almost all the high-elevated positions (most extensively in the area of Nižná). The situation can be interpreted mainly in two ways: there was no need to build places of refuge in the 'Central Orava' microregion, as this area was beyond real physical danger and a potential enemy. This could be confirmed by the fact that no weapons, nor direct evidence of a 'catastrophic horizon' from this period come from Nižná or Podbiel. The situation is different in Lower Orava, where at the fortified hilltop settlement of Tupá skala in Vyšný Kubín (*Čaplovič 1964*; *1987,* 197), or in Istebné, Hrádok, arrowheads and burnt layers (with human remains) have also been found in the strata of destruction (*Čaplovič 1957*; *1987,* 136). The other, less likely interpretation is that the refuge places are situated deeper in mountains that have not been researched yet (e.g. Javorový vrch in Tvrdošín).

The natural border that separates the presented settlement complexes is the Orava River, as each complex is located on the opposite bank (Fig. 14). A similar situation is registered in Lower Orava, where two settlement complexes in Sedliacka Dubová (Ohrádza and Háj) are also separated by the Orava River (*Lofajová Danielová/Furman 2022*). There are no finds from the area to the north-east of Biela skala, where the first author prospected almost all of the upland positions (Fig. 14: c, f). This area is situated more than 2–3 hours of walking from both settlement complexes (Fig. 12; 13), hypothetically this could have been a kind of respected boundary, which spatially and visually separated individual communities of settlement complexes around Ostražica, and Biela skala. The estimated area of the settlement complex, including the residential area(s) (defined by archaeological excavation and prospection as an extent of settlement; Fig. 14: a) and nearby hypothetic agro-pastoral hinterland (defined on the basis of the stray finds without context and pottery found in local water springs in the locations accessible by walking in max. 1 hour; Fig. 14: d), is about 200 ha. When other activity areas (sensu *Neustupný 1986*) like hunting grounds or more distance pastures and sources accessible within 1 to 2 hours of walking are included – the extent of the 'settlement area' would increase, and cover about 300 ha including the lowland positions (Fig. 14: e, h). At the turn of the Hallstatt and La Tène periods,

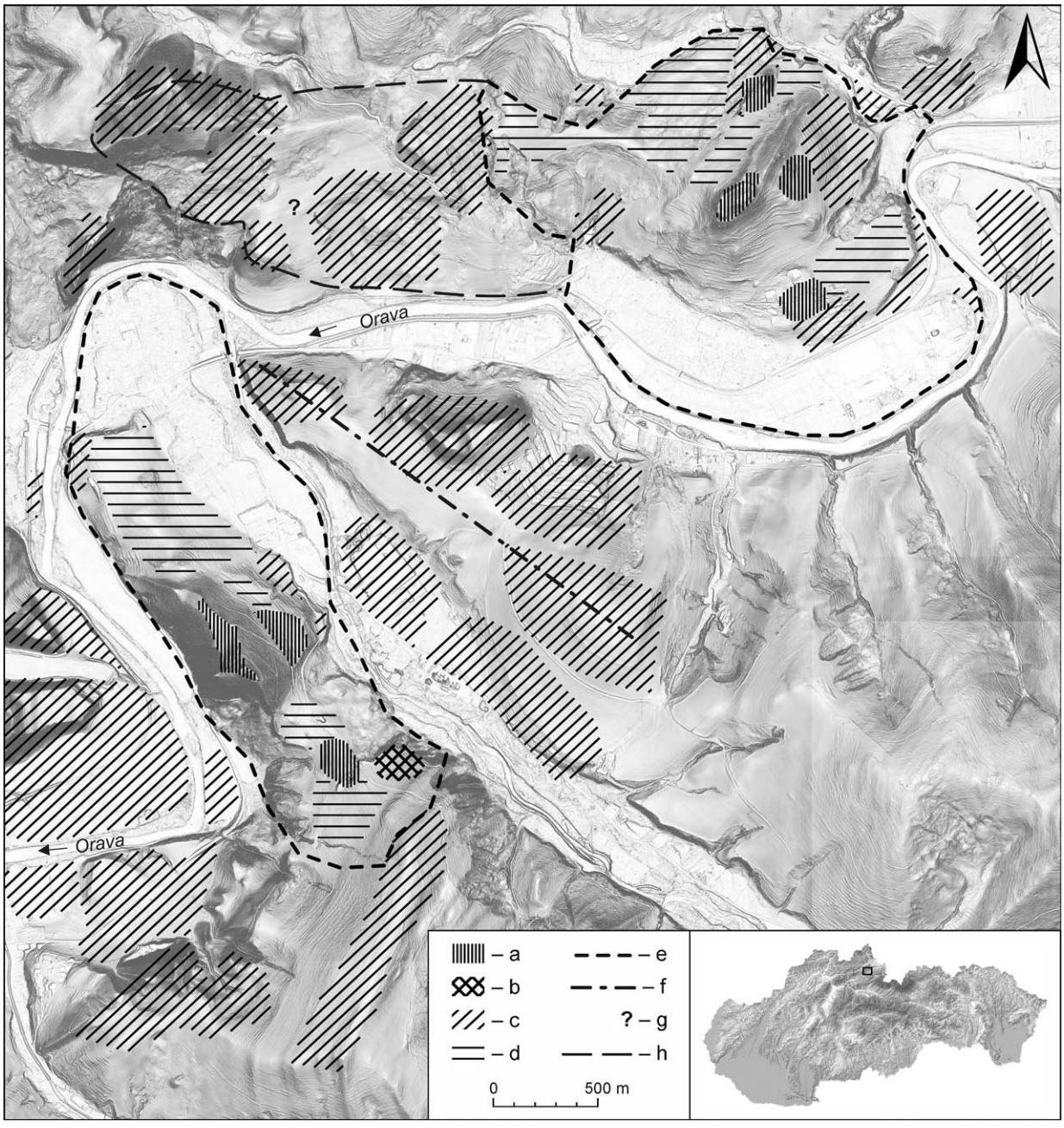

Fig. 14. Microregion 'Central Orava' and the interpretation of areas of activities in settlement complexes in Nižná (northern) and Podbiel (southern). a – residential area (extent of settlements according to recent archaeological excavation and prospection); b – burial ground area; c – researched area with no archaeological finds (unused/source of raw material/hunting area/border); d – presumed hypothetical agro-pastoral hinterland (stray finds); e – presumed 'settlement area' of everyday activities (accessible in max. 1 hour by walking, archaeological sites and finds); f – potential upland border between settlement complexes; g – site Nižná, Lazy (pottery finds); h – presumed settlement area with larger agro-pastoral hinterland (accessible in max. 2 hours by walking). The source of the ALS Products: 'ÚGKK SR'. Author B. Lofajová Danielová.

there were most likely two coexisting settlement complexes of several upland settlements centred around a fortified hilltop settlement on a dominant 'rock' (Ostražica, Biela skala). Individual settlement complexes probably functioned independently and continuously in the Ha C2–Lt C1 phase. Based on the almost identical settlement strategy, and archaeological material, these complexes are probably related cultural units that inhabited the 'Central Orava' microregion. In the Late Hallstatt period, similar settlement complexes were also found in Lower Orava (e.g. the abovementioned Sedliacká Dubová, Ohrádza, or Ostrá and Tupá skala in Vyšný Kubín).

We suppose that the presented settlement complexes functioned mainly at the level of local communities. The fortified hilltop settlements at Ostražica and Biela skala could have served to demonstrate their identity, as is already assumed in the Late Bronze Age (*Blair Gibson/Geselowitz 1988*, 26; *Furmánek 2015*, 266, 267), because they were clearly visible – situated on limestone cliffs, which are few in the country, but dominant for a person who moves in the lowlands included travellers and traders. Using P. Ramsl's terminology of social organisation for the Early to Middle La Tène period, we could describe the settlement complexes in the 'Central Orava' microregion as 'local groups', which he identifies as people in daily contact, and in a reduced social context. They are organised in smaller units such as farmsteads or their groups, and bury their dead in local burial grounds (*Ramsl 2020*, 18, 19) as in Podbiel case (Fig. 14: b). These units could be grouped into regional groups, and larger collectives ('tribes'), which is a generally accepted phenomenon in the Hallstatt and the Early La Tène periods (*Fernández-Götz/Krausse 2013*, 484; *Johnson/Earle 2000*; *Moore 2011*). At the turn of the Hallstatt and La Tène periods, the territory of Northwestern Slovakia shows elements of unified material culture, and especially of regional exchange/contact (specific pottery and bronze objects of the OLC are widespread in Liptov, Orava, Spiš, and upper Považie regions). There are also already elements of interregional relations at the end of the Hallstatt period (*Benediková 2007*, 82; *2017*), and in the Early La Tène period (*Pieta/Barta/Benediková 2021*, fig. 6). Based on the culturally mixed bronze hoard from Krásna Hôrka near Ostražica (the origin of bronze artefacts in the territory of Greater Poland, and also in the Carpathian Basin; *Danielová 2018*), 'Central Orava' was surely part of the Transcarpathian communication networks. All the hilltop settlements in Orava region had significant strategic points in visual control (fords, confluences, and main waterway communication – Orava River) and they were in mutual visual contact. To what extent the sites themselves could participate in the exchange is presently unclear. M. Novák, who researched upland sites in the Hallstatt period in Moravia and Silesia, also identifies similar 'complexes' in Late Hallstatt period as in Orava region. Based on their distribution, he assumes that they were not the centres/residences of the elites, they are mainly found above roads which are interpreted as an amber or salt roads. He interprets high-altitude sites primarily as places of control and support points of communication routes (also as supra-community areas) providing protection to traders, and storing goods. He does not exclude the function of a regional assembly place, or a seasonal cult area (*Novák 2023*, 317–319). The studied 'Central Orava' region is also located on the side branch of the presumed amber road (*Novák 2023*, fig. 117). We can agree that 'Central Orava' upland settlements are probably related to a trade route – perhaps not the amber road (lack of amber artefacts), but another transcarpathian communication. Whether they served for cult or assembly purposes, we cannot say. First of all, we interpret the fortified hilltop settlements in the studied period from the Late Hallstatt to the beginning of the Middle La Tène periods as ordinary and regular settlements within settlement units ('complexes'). As mentioned above, the presented upland sites used an agro-pastoral way of life, with cattle, and sheep/goat breeding being important. The upland settlement was therefore relatively wise and not so uncomfortable choice to agro-pastoral economic strategy of societies.

The presence of a 'chieftain/elite' in 'Central Orava' has not yet been archaeologically documented. However, the presence of the elite at upland sites should not be excluded. In the area of Northwestern Slovakia, parts of horse harnesses (mainly strap dividers), which are considered to be a manifestation of the 'equestrian elite' of the Hallstatt period *(Benediková 2017*, 347–350; *Kmeťová/Stegmann-Rajtár 2015*; *Metzner-Nebelsick 2002*, 489–492) are found in addition to graves, especially at hilltop sites (*Lofajová Danielová 2024*). The graves at the burial ground in Podbiel used relatively uniform burial equipment (*Čaplovič 1968*). The stratification of society in Lower Orava region is confirmed by some graves from Dolný Kubín II in the Ha D stage (*Benediková 2007*, 348). At the nearby hilltop site Tupá skala in Vyšný Kubín, in addition to the rampart fortification, a well-organised inner space (which we did not detect in the 'Central Orava') was uncovered by archaeological excavation. These are lines of buildings with stone foundations used as dwellings, or craft workshops. Void areas laid between the lines of the buildings were interpreted as pathways or streets (*Čaplovič 1987*, fig. 57). A recent geophysical survey of the fortified area confirmed the assumption that the settlement had a planned, and well-organised pattern and filled almost the entire area (*Felcanová/Felcan/Lieskovský 2021*, 123–131). In the Late Hallstatt and Early La Tène periods, large fortified settlements with pre-planned organised spaces that include complicated building structures are well known also in Western Europe (*Fernández-Götz/Krausse 2013*). In contrast to Tupá skala, there are numerous imports from the more distant regions of Europe. The archaeological material from Tupá skala essentially corresponds to the regionally specific artefacts (pottery and bronze objects) of the territory of present-day Northwestern Slovakia.

CONCLUSION

The research at the sites of Ostražica in Nižná and Biela skala in Podbiel revealed basic information about the chronology and function of these upland sites. Nižná, Ostražica referred to in the literature as a 'Hallstatt hillfort' (*Čaplovič 1987*) did not have rampart fortification during the Hallstatt period – if protected at all, than possibly by a simple palisade. At the Ostražica hilltop settlement, we assume continuity at least from Ha C2 or Ha D1 to Lt C1 – based on radiocarbon data and the relative chronology of the pottery. At Biela skala, we assume similar situation. Settlement during the following La Tène phase of the PC was confirmed at both hilltop settlements (continuity is also very likely), while new surface surveys at Ostražica also confirmed its previously unknown Roman phase of the PC. However, apart from the fortification, the open hillside settlements around the Ostražica hill were occupied only in the first phase and then perhaps abandoned (we can assume lowland settlements). Eight new sites were found in the Ostražica area, of which three (or four) are settlements (Hldočín, Krivé Hony, and Skalica/Závodie) contemporary with a hilltop/hillfort in the Late Hallstatt to the beginning of the Middle La Tène periods.

The archaeobotanical and archaeozoological analysis carried out by the co-authors document agro-pastoral subsistence as the leading economy not only for the open settlements, but also for the Ostražica hilltop site (and for its both unfortified and fortified phases). The positions of fields in the flat parts of the surrounding reliefs is (at present) only hypothesised. However, the proposed extent and position of grazing grounds in the surroundings of both hilltop settlements is based on the distribution of the pottery sherds found without context and on the presence of (still active) water springs in the distance accessible within 1 hour walking distance from the settlement (Fig. 14: d). We assume that the upland settlements (including the fortified ones) could be self-sufficient in procurement of food supplies and did not have to rely on supplies from settlements in the lowlands. However, we cannot rule out the existence of settlements lying in lower locations and agro-pastoral hinterland in lowland at nearby and easily accessible flat lands as evidenced by newly discovered lowland settlement in Tvrdošín, Krásna Hôrka. Moreover, the evidences for the flat land settlements and agro-pastoral hinterland may be buried under the thick layers of river alluvium at the first river terrace, as the area was regularly flooded until the regulation of the Orava River and the construction of the Orava water reservoir.

Based on the culturally mixed content of the bronze hoard from Krásna Hôrka (the origin of bronze objects in the territory of Greater Poland, and also in the Carpathian Basin), 'Central Orava' region was surely part of the Transcarpathian communication networks. All the hilltop settlements had significant strategic points in visual contact (fords, confluences, and communications). To what extent the sites themselves could participate in the exchange is presently unclear. The settlements located on the slopes had only limited view to strategic points and could monitor only a small part of the valleys of the local streams. Apparently, these were mostly habitation areas of the agro-pastoral communities that occasionally performed other activities (like presumed bronze casting at the Závodie site). Some might have been involved in the processing of local sandstone (e.g. Hldočín and Krivé Hony settlements), which was used for the construction of fortifications, and for the strengthening of the artificial terraces at the Ostražica hillfort.

Based on the present data, in the 'Central Orava' microregion, from the Late Hallstatt to the Middle La Tène periods, there were two separate settlement complexes, which probably functioned at the level of local communities (Fig. 14: a). These were culturally related units, territorially separated by the river, and perhaps by the low mountain ridge west of Prasatín, where no archaeological finds were detected during several-years repeated field prospection (Fig. 14: f). The assumed area of the residential and mixed agro-pastoral activities of both settlement complexes covered an area of approx. 200 ha (area accessible in 1 hour walking distance). If areas of other activities (like hunting grounds or mineral resources) are included, the extent of the hinterland (or settlement area) will reach up to 300 ha and would cover nearby areas with only sporadic or no archaeological finds accessible within 1 to 2 hours by walking (e.g. Nižná, Lazy, in the case of Ostražica; Fig. 14: g, h). The results of presented 'Central Orava' microregional study help to understand the lives of human societies inhabiting the mountain and/or marginal zones of the Iron Age Central Europe.

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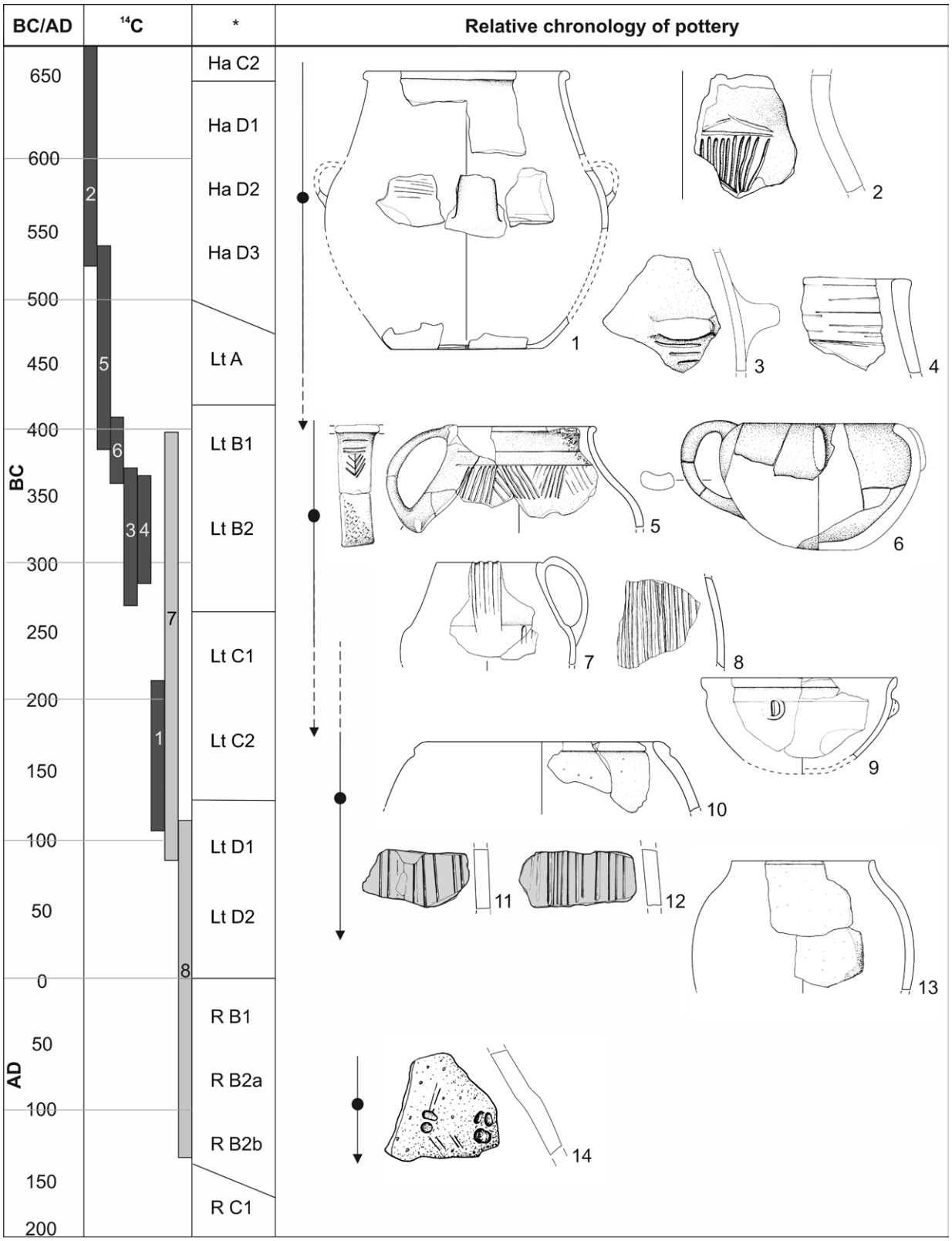
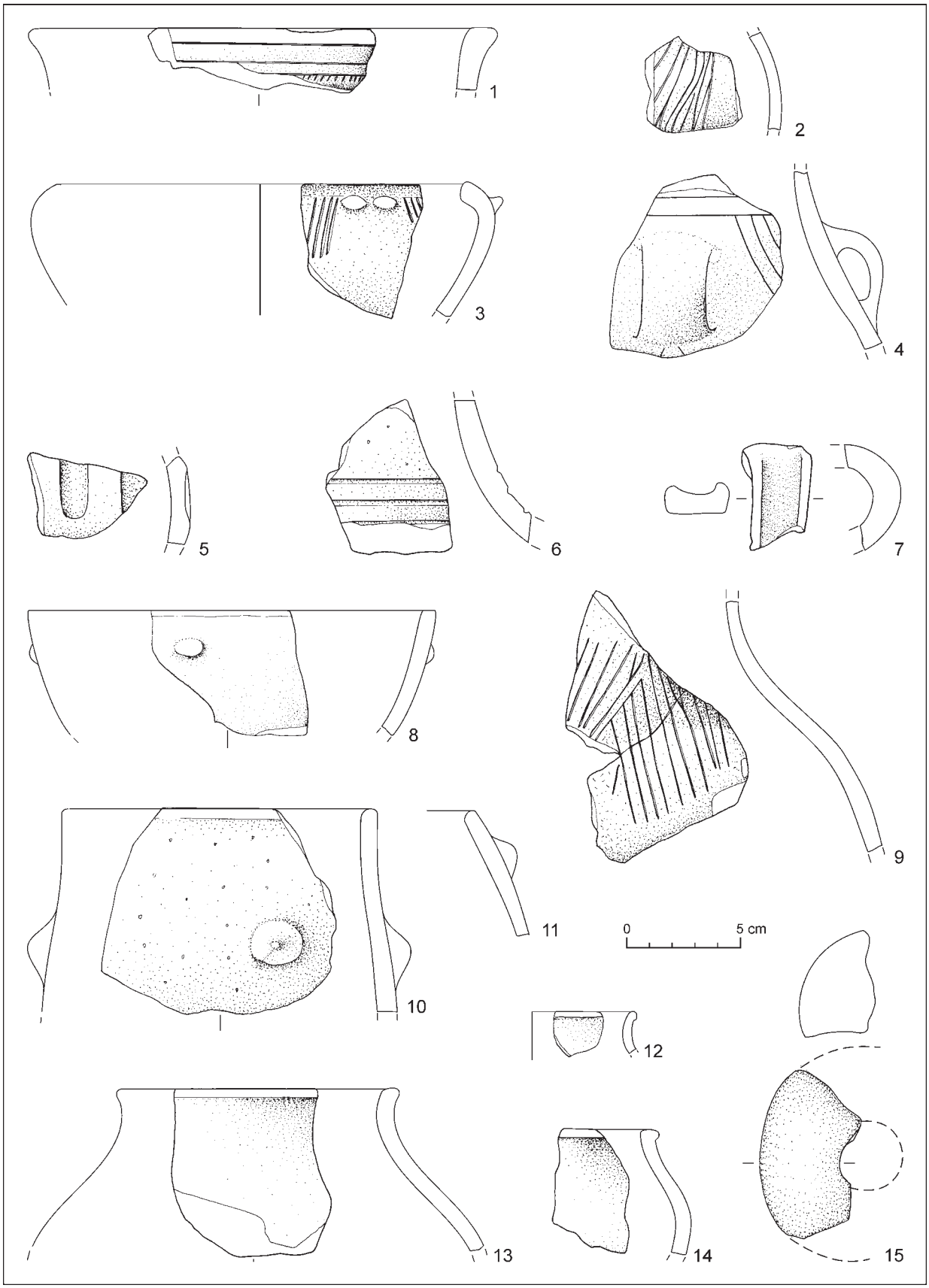
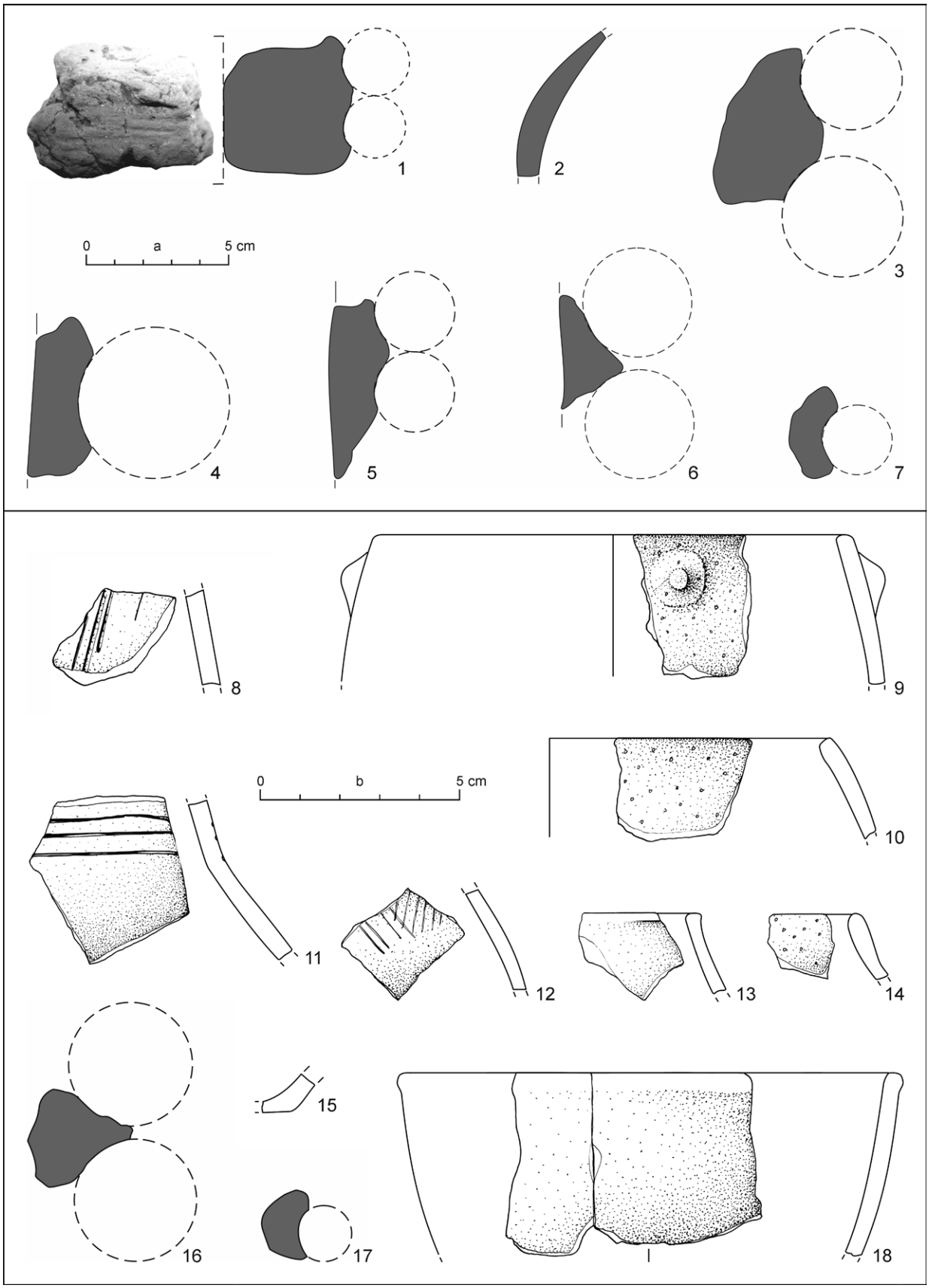


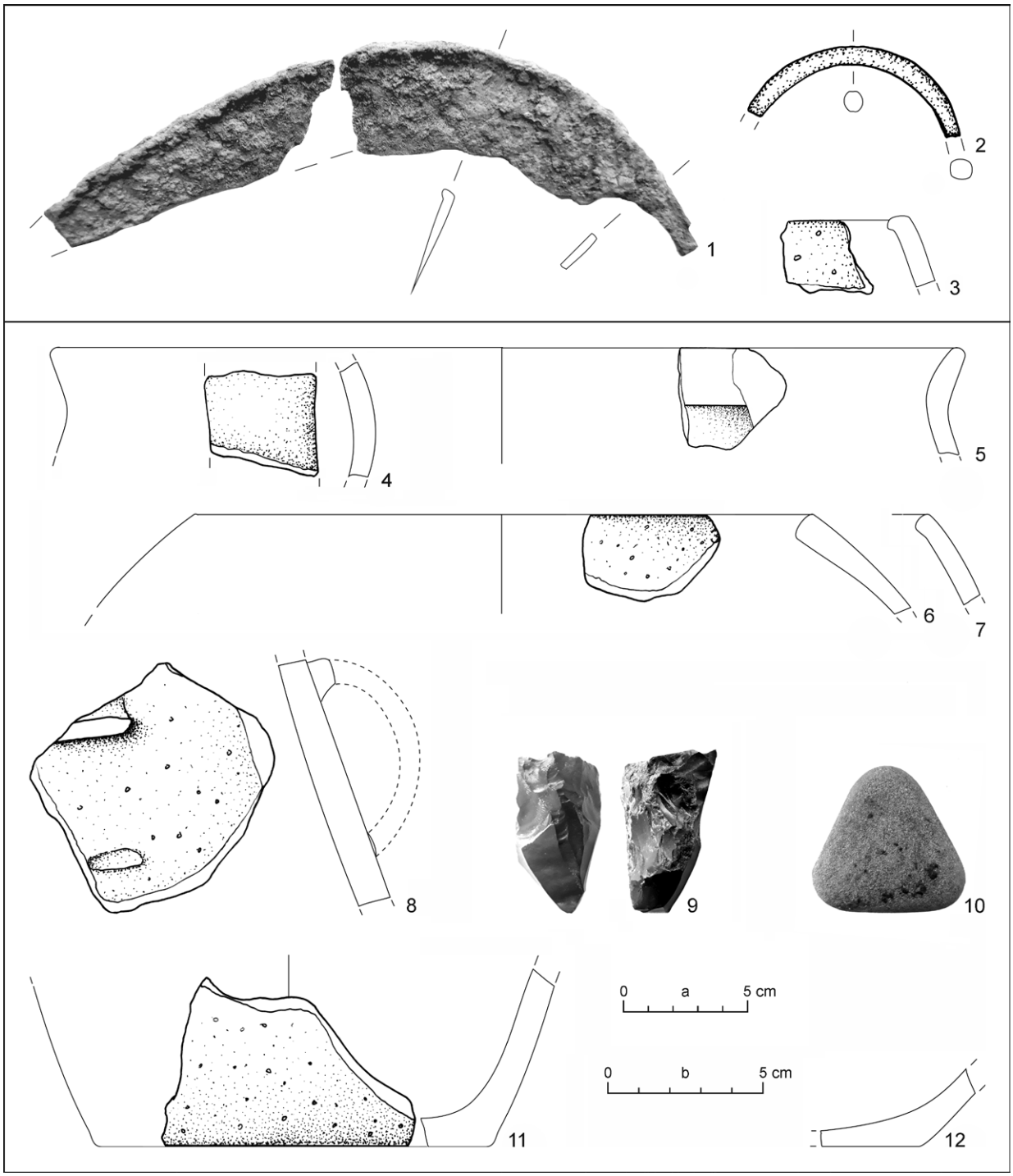
Pl. I. Nižná, Ostražica. Proposed chronology of the hilltop settlement. Overview of absolute data (darker lines – crops/animal bones; lighter lines – wood; numbering of samples corresponds to Table 1) and relative chronology of the selected pottery fragments (* – relative chronology by *Brandt 2001*; *Salač 2008*; *Trachsel 2004*). Different scale. Author B. Lofajová Danielová.



Pl. II. Nižná, Hldočín 2020. Selected pottery. Drawing B. Lofajová Danielová.



Pl. III. Nižná, Hldočín. 1–7 – daub fragments (excavation 2020); 8–18 – pottery and daub fragments (prospection 2022). Scale: a – 1–7; b – 8–18. Drawing B. Lofajová Danielová.



Pl. IV. Nižná, northern slopes of Ostražica, Závodie (1–3) and Krivé Hony (4–12). Selected archaeological artefacts. 1 – iron; 2 – bronze; 3–8, 11, 12 – ceramic; 9 – radiolarite; 10 – stone. Scale: a – 1–8, 11, 12; b – 9, 10. Photo and drawing B. Lofajová Danielová.

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Mikroregión „stredná Orava“ v dobe halštatskej až strednej dobe laténskej

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Súhrn

Výskumy B. Lofajovej Danielovej na lokalitách Ostražica a Biela skala v Podbieli poskytli zásadné informácie o chronológii a charaktere výšinných lokalít. Počas viacročného výskumu so začiatkom v roku 2018 bolo na Ostražici okrem iného zistené, že valové opevnenie s kamennou plentou je až z obdobia predpúchovského horizontu, najskôr z prelomu stupňov LTB1 a LTB2 (*Lofajová Danielová a i. 2021*), klesá juhovýchodným strmým svahom a neuzatvára vrcholovú akropolu (obr. 1–3), ako sa domnievali autori v minulosti (*Čaplovič 1987*, 149–155, obr. 73; *Pieta 2008*, 119). Archaický archeologický materiál (obr. 4: 1) sa vyskytuje v sekundárnej polohe aj v objektoch (napríklad objekt 1/18), ktoré sú datované s najväčšou pravdepodobnosťou až do stupňa LTC (obr. 4: 1–7; tabela 1). Na základe rádiouhlíkových dát získaných z ekofaktov z rôznych kontextov a na základe keramického materiálu môžeme predpokladať kontinuitu osídlenia na vrcholovom sídlisku Ostražica od HC2 alebo HD1 do LTC1 (obr. 5; 6; tab. I). Túto fázu však nie sme zatiaľ schopní archeologicky precíznejšie rozdeliť. V prípade Bielej skaly je potvrdená kontinuita od stupňa HC do počiatku stupňa LTB1, predpokladáme však podobnú situáciu ako na Ostražici (*Lofajová Danielová 2022*). Na obidvoch vrcholových lokalitách bolo potvrdené osídlenie aj v laténskej fáze púchovskej kultúry (kontinuita je vysoko pravdepodobná),

pričom na Ostražici nové povrchové prieskumy pravdepodobne dokumentujú tiež jej rímsku fázu, ktorá nebola doteraz známa (tab. I: 14).

V okolí Ostražice bolo zistených osem nových polôh, z toho tri/štyri interpretujeme ako sídliská (Hldočín, Krivé Hony, Skalica/Závodie; obr. 8–11; tab. II–IV), ktoré boli súčasné so sídliskom na vrchole pravdepodobne len v prvej fáze (neskorá doba halštatská až počiatok strednej doby laténskej) – z týchto polôh absentuje akýkoľvek archeologický materiál z obdobia púchovskej kultúry, či už laténskej, alebo z rímskej fázy.

Archeobotanická analýza M. Hajnalovej poskytla sortiment pestovaných rastlín známy aj z iných súvekých lokalít na severe Slovenska. Hoci je súbor skromný, absolútne datovanie samotných zvyškov rastlín umožnilo hodnotiť súbor diachronicky a zaznamenať tak, že stravovacie a/alebo pestovateľské tradície sa od neskorej doby halštatskej po strednú dobu laténsku pravdepodobne zmenili. Dokladá to zmena druhovej skladby pestovaných plodín a hustota nálezov v uloženinách. Strukoviny (hrach a bôb konský), ktoré sa často pestujú ako záhradné plodiny, boli početnejšie práve v staršej dobe železnej. Neskôr ustúpili a nahradili ich obilniny pestované na políčkach väčších rozmerov. Úplná absencia nálezov vo vzorkách z neskorej doby laténskej naznačuje, že aktivity, ktoré by sa dali spájať s existenciou a chodom domácností, sa v skúmanom priestore zredukovali, prípadne vymizli a nahradili ich aktivity iného charakteru. Tieto zistenia však môžu vyplývať aj z malého rozsahu skúmanej plochy, a tým aj z nízkeho počtu analyzovaných vzoriek.

Súbor zvieracích kostí analyzovaných K. Šimunkovou dokladá v celom úseku doby železnej najmä chov hovädzieho dobytka a menších prežúvavcov (ovce a kozy), a v malej miere aj prasaťa, podobne ako na území Liptova (*Benediková et al. 2020*; *Bielichová 2019*). Lov divej zveri indikujú kosti jeleňa, srnca, diviaka a zajaca a zároveň potvrdzujú v krajine prítomnosť lesov aj bezlesných trávnatých porastov. Na využitie blízkeho vodného toku Oravy poukazujú aj pozostatky rýb a bobra európskeho (tabela 3).

Na základe environmentálnych dát predpokladáme, že hlavnou subsistenčnou stratégiou všetkých miestnych komunít bolo v sledovanom období „zmiešané" poľnohospodárstvo – t. j. pestovanie rastlín a chov zvierat. V zázemí obidvoch vrcholových výšinných lokalít (Biela skala a Ostražica) sa nachádza dostatok vhodných plôch ako pre polia (plošiny a svahy s nižším sklonom), tak trávnaté pastviny (aj strmšie svahy). V areáli Ostražice môže ísť o polohy, kde boli povrchovým prieskumom nájdené črepy bez kontextu (absencia kultúrnej vrstvy) – západne a severovýchodne od vrcholu, a kde sa na miestach (aj dnes aktívnych) prameňov našli črepy (obr. 11). V areáli Bielej skaly by pre agropastorálne aktivity mohli slúžiť mierne svahy na sever od lokality (obr. 13). Domnievame sa, že výšinné sídliská (vrátane opevnených vrcholových polôh) boli potravinovo sebestačné a neboli závislé od poľnohospodárskeho zázemia v (riečnom) údolí. Využitie údolných polôh však nemožno vylúčiť na základe novoobjaveného nížinného sídliska v Tvrdošíne-Krásnej Hôrke. Identifikácia sídel či využívaných plôch v údolí je problematická vzhľadom na prítomnosť hrubých riečnych nánosov (s mocnosťou miestami viac ako 2 m), ktoré sa v minulosti pravidelne a dlhodobo tvorili až do regulácie toku rieky Oravy a do vybudovania Oravskej priehrady. Archeologické situácie preto môžu byť pochované hlboko, podobne ako na dolnej Orave v oblasti Dolného Kubína alebo Sedliackej Dubovej, kde sa osídlenie z doby železnej našlo pod riečnymi nánosmi v hĺbke viac ako 1,5 m.

Kultúrne heterogénny depot z Krásnej Hôrky (pôvod bronzových predmetov z územia dnešného Veľkopoľska aj z Karpatskej kotliny) ukazuje, že Orava nepochybne bola súčasťou transkarpatskej komunikačnej siete. Všetky vrcholové polohy sídliskových komplexov mali vo vizuálnej kontrole významné brody cez rieku a jej sútoky (tabela 4; 6). Z aktuálneho stavu poznatkov je však nejasné, do akej miery sa na výmene tovaru mohli podieľať obyvatelia žijúci v sídliskových komplexoch okolo Ostražice a Bielej skaly. Sídliská situované na svahoch mali viditeľnosť strategických prvkov obmedzenú. Napríklad zo sídlisk Závodie v Nižnej a Za Pivovarom v Podbieli boli viditeľné len lokálne potoky. Zrejme sa v nich odohrávali najmä bežné sídelné, zriedkavo aj ďalšie (špecifické) aktivity – napríklad v polohe Závodie mohlo ísť o kovolejárstvo (bronzový zliatok; obr. 9: a). V Hldočíne a Krivých Honoch predpokladáme tiež spracovanie/lámanie miestneho pieskovca pre potreby výstavby opevnenia a spevňovania terás na Ostražici (obr. 2: b; 3: b), kde tvorí podložie vápenec.

V mikroregióne „stredná Orava" koexistovali v období neskorej doby halštatskej až strednej doby laténskej dva samostatné sídliskové komplexy, ktoré fungovali zrejme na úrovni lokálnych komunít (obr. 14). Nepochybne ide o kultúrne príbuzné jednotky, ktoré boli vizuálne oddelené nielen riekou, ale pravdepodobne aj nižším hrebeňom západne od Prasatína, na ktorom neboli ani po opakovanej a viacročnej terénnej prospekcii B. Lofajovej Danielovej zistené žiadne archeologické nálezy (obr. 14: c, f). Vrátane predpokladaného poľnohospodárskeho zázemia a areálu najbližších zdrojov dostupných do jednej hodiny chôdze (obr. 12: B; 13: B) mohli mať sídliskové komplexy rozlohu cca 200 ha (obr. 14: e). Pri zahrnutí ďalších potenciálnych areálov aktivít, napríklad vzdialenejších pasienkov alebo iných areálov (lovu, zberu plodín, získavania surovín), ktoré sa mohli nachádzať na blízko situovaných plochách prevažne bez archeologických nálezov vo vzdialenosti do dvoch hodín chôdze (napríklad Nižná, Lazy; obr. 12: B; 14: g), by v prípade Ostražice išlo o sídliskový areál s rozlohou do 300 ha (obr. 14: h).

Obr. 1. Nižná, polohy Ostražica a Hldočín. Skúmané sondy a opevnenie. Legenda: a – sondy 2018; b – sondy 2019; c – sondy 2020; d – palisáda; e – valové opevnenie. Zdroj dát: ZBGIS (www.geoportal.sk). Autor B. Lofajová Danielová.

Obr. 2. Nižná, Ostražica. Sonda 9/19. A – pôdorys na úrovni deštrukcie valu; B – JV profil. Legenda: a – štrk; b – pieskovec; c – vápenec; d – riečne okruhliaky; e – poloha odobratých archeobotanických vzoriek; SJ – stratigrafická jednotka; K – kontext. Autor B. Lofajová Danielová.

Obr. 3. Nižná, Ostražica. Sonda 10/19. A – pôdorys na úrovni deštrukcie valu; B – JV profil. Legenda: a – štrk; b – pieskovec; c – vápenec; d – riečne okruhliaky; e – poloha odobratých archeobotanických vzoriek; SJ – stratigrafická jednotka; F – objekt; K – kontext. Autor B. Lofajová Danielová.

Obr. 4. Nižná, Ostražica. Objekty 1/18, 3/18 a 6/18 (sonda 5/18). A – pôdorys; B – JZ profil; 1–7 – výber keramiky z objektu 1/18 a 3/18. Legenda: a – pieskovec; b – zuhoľnatené drevo; c – vápenec; d – poloha odobratých archeobotanických vzoriek; SJ – stratigrafická jednotka; F – objekt; K – kontext. Mierka: a – 1; b – 2–7. Foto a kresby B. Lofajová Danielová.

Obr. 5. Nižná, Ostražica. Nižná, Ostražica. Objekt 4/18 (sonda 8/18). A – pôdorys objektu 4/18 na úrovni podložia; B – J profil sondy 4/18; 1–5 – výber keramiky. Legenda: a – pieskovec; b – keramika; c – vápenec; d – poloha odobratých archeobotanických vzoriek; SJ – stratigrafická jednotka; F – objekt; K – kontext. Mierka: a – 1, 2, 4, 5; b – 3. Foto a kresby B. Lofajová Danielová.

Obr. 6. Nižná, Ostražica. Rádiokarbonové dáta po kalibrácii. Šedá oblasť – vrstvy uložené pod konštrukciou valu. Vytvorené pomocou OxCal v4.4.4, krivka IntCal 20 (*Bronk Ramsey 2021*; *Reimer et al. 2020*). Dostupné na: https://c14.arch.ox.ac.uk/oxcal.html.

Obr. 7. Nižná, Ostražica. Zuhoľnatené zvyšky rastlín. A – zastúpenie hlavných typov rastlinných makrozvyškov (bez uhlíkov); B – zastúpenie určených druhov obilnín. Čísla na ľavej osi predstavujú hodnoty NISP. Legenda: a – buriny; b – strukoviny; c – obilniny; d – proso; e – ovos; f – jačmeň; g – plevnaté pšenice. Autor M. Hajnalová.

Obr. 8. Nižná, Hldočín, výskum v roku 2020. A – sonda 2/20, JV profil; B – sonda 2/20, SZ profil; C – sonda A/20, SZ profil; D – sonda 4/20, SV profil; E – sonda 3/20, SZ profil. Legenda: a – štrk; b – pieskovec; c – vápenec; SJ – stratigrafická jednotka; F – objekt. Foto a kresby B. Lofajová Danielová.

Obr. 9. Nižná, polohy Skalica/Závodie a Hldočín. Prieskum okolia Ostražice v roku 2022. Relevantné archeologické nálezy. Legenda: a – bronz; b – keramika; c – železo; d – mazanica; e – trecí kameň; f – pieskovec; g – zisťovacia sonda; h – zdroj vody (prameň); i – vyznačenie miesta archeologického výskumu v roku 2020. Data source: ZBGIS (http://www.geoportal.sk/). Autor B. Lofajová Danielová.

Obr. 10. Nižná, Krivé Hony. A – poloha skúmaného rodinného domu v roku 2020 (1) a nálezov keramiky zistených povrchovou prospekciou v roku 2018 (2); B – sonda skúmaná v roku 2020 na podklade katastrálnej mapy. Legenda: a – sonda; b – archeologický object/kultúrna vrstva. Zdroj dát: ZBGIS (http://www.geoportal.sk/). Autor B. Lofajová Danielová.

Obr. 11. Lokality a interpretácia nálezov v okolí vrchu Ostražica. a – opevnené sídlisko; b – pravdepodobne opevnené sídlisko; c – neopevnené (otvorené sídlisko); d – náhodné nálezy?; e – depot. 1 – Ostražica; 2 – Hldočín; 3, 7, 9, 11 – Závodie; 4 – Skalica; 5 – Krivé Hony; 6 – Rúbanka; 10, 13 – Vápence; 12 – Tvrdošín (číslovanie zodpovedá číslovaniu v tabele 4). Zdroj produktov LLS: ÚGKK SR. Autor B. Lofajová Danielová.

Obr. 12. Sídliskový komplex výšinných lokalít v okolí hradiska Nižná, Ostražica. A – analýza sklonu terénu („slope analysis" v °); B – analýza vzdialenosti z výšinných sídlisk („path distance analysis") pomocou funkcie „Tobler's hiking" (v hodinách). Legenda: a – opevnené výšinné sídlisko; b – otvorené výšinné sídlisko na svahu; c–e – náhodné nálezy: c – fragmenty keramiky; d – keramika nájdená v lokálnych zdrojoch vody; e – železný kosák. Zdroj produktov LLS: ÚGKK SR. Autor B. Lofajová Danielová.

Obr. 13. Sídliskový komplex výšinných lokalít v okolí hradiska Podbiel, Biela skala. A – analýza sklonu terénu („slope analysis" v °; 1 – Biel; 2 – Za Pivovarom; 3 – vrchol Bieleho/Bielej skaly; 4 – Za Bielym; 5 – plató nad pohrebiskom); B – analýza vzdialenosti z výšinných sídlisk („path distance analysis") pomocou funkcie „Tobler's hiking" (v hodinách). Legenda: a – opevnené sídlisko na vrchole; b – otvorené sídlisko na svahu; c, d – náhodné nálezy (c – keramika; d – keramika nájdená v lokálnych zdrojoch vody); e – pohrebisko. Zdroj produktov LLS: ÚGKK SR. Autor B. Lofajová Danielová.

Obr. 14. Mikroregión „stredná Orava" a interpretácia areálov aktivít v sídliskových komplexoch v Nižnej (severne) a v Podbieli (južne). a – rezidenčný areál (rozsah sídlisk zistený archeologickým výskumom a prospekciou); b – pohrebný areál; c – skúmané územie bez archeologických nálezov (nevyužívané/zdroje surovín/lovný revír/hranica); d – hypotetické agro-pastorálne zázemie (sporadické nálezy); e – predpokladaný sídliskový areál každodenných aktivít (vo vzdialenosti do 1 hodiny chôdze, archeologické lokality a nálezy); f – potenciálna hranica vo výšinnej polohe medzi sídliskovými komplexmi; g – lokalita Nižná, Lazy (nálezy keramiky); h – predpokladaný sídliskový areál s väčším agro-pastorálnym zázemím (vo vzdialenosti do 2 hodín chôdze). Zdroj produktov LLS: ÚGKK SR. Autor B. Lofajová Danielová.

Tabela 1. Nižná, Ostražica. Rádiokarbonové dáta, analyzoval M. Krąpiec (Laboratorium Datowań Bezwzględnych, Kraków). Kaliboravné pomocou OxCal v4.4.4., krivka IntCal 20 (*Bronk Ramsey 2021*; *Reimer et al. 2020*). Dostupné na: https://c14.arch.ox.ac.uk/oxcal.html.

Tabela 2. Nižná, Ostražica. Rastlinné makrozvyšky zoskupené podľa datovania. Čísla predstavujú hodnoty NISP. Podčiarknuté sú vzorky z nálezmi priamo datovanými AMS. Autor N. Hajnalová.

Tabela 3. Nižná, Ostražica. Kvantitatívne zastúpenie druhov zvierat na hradisku Ostražica. Autor K. Šimunková.

Tabela 4. Prehľad vybraných atribútov archeologických lokalít v okolí Ostražice vo fáze HC2–LTC1 (číslovanie korešponduje s číslovaním na obr. 11). *ABM – archeobotanický materiál; AZOO – archeozoologický materiál; BR – bronz; DA – mazanica; GS – trecí kameň; CHS – štiepaná industria; LW – tkáčske závažie; PS – keramika; SI – kosák; WS – brúsik. Autor B. Lofajová Danielová.

Tabela 5. Podbiel, Biel and Za Pivovarom. Rastlinné makrozvyšky zoskupené podľa datovania a/alebo kontextu. Čísla predstavujú hodnoty NISP. Autor M. Hajnalová.

Tabela 6. Prehľad vybraných atribútov archeologických lokalít v okolí Bielej skaly vo fáze HC2–LTB (číslovanie korešponduje s číslovaním na obr. 13). *ABM – archeobotanický materiál; AZOO – archeozoologický materiál; BR – bronz; DA – mazanica; GS – trecí kameň; PS – keramika; WS – brúsik.

Tab. I. Nižná, Ostražica. Chronológia lokality. Prehľad absolútnych dát (tmavšie pásy – obilniny/zvieracie kosti; svetlejšie pásy – drevo; číslovanie zodpovedá číslovaniu v tabele 1) a relatívna chronológia vybraných keramických nálezov (* – relatívna chronológia podľa *Brandt 2001*; *Salač 2008*; *Trachsel 2004*). Rôzne mierky. Autor B. Lofajová Danielová.
Tab. II. Nižná, Hldočín 2020. Vybrané keramické nálezy. Kresba B. Lofajová Danielová.
Tab. III. Nižná, Hldočín. 1–7 – fragmenty mazanice (výskum 2020); 8–18 – keramika a mazanica (prospekcia 2022). Mierka: a – 1–7; b – 8–18. Kresba B. Lofajová Danielová.
Tab. IV. Nižná, severné svahy Ostražice, Závodie (1–3) a Krivé Hony (4–12). Vybrané archeologické nálezy. 1 – železo; 2 – bronz; 3–8, 11, 12 – keramika; 9 – rádiolarit; 10 – kameň. Mierka: a – 1–8, 11, 12; b – 9, 10. Foto a kresby B. Lofajová Danielová.

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