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Project Gallery

INHILLDAUGAR: minimally invasive fieldwork and linguistic analysis on hillforts along the Daugava river

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Combining non- and minimally invasive archaeological survey, geomorphological methods and linguistic studies enables a better understanding of the dynamic use of the Daugava waterway from the Bronze to the Viking ages. Results indicate a common origin period of many fortified settlements and also identify research questions about cultural fluctuations in the Baltic-Slavic–Scandinavian contact area.

Keywords: Baltic region, waterway trade route, Bronze Age, Viking Age, hillforts, digital modelling

Introduction

The Daugava River (Düna, Дзвіна, Западная Двина) was one of the most important gateways from the Baltic Sea to the Trans Eastern Europe waterways (Mägi 2018) from prehistory until modern times. Over this long period, a system of settlements and hillforts formed along the river, focusing on use of the waterway for transporting goods, people, ideas and communication (Schneeweiß 2017). Approximately 50 fortified settlements with varying chronology have been identified on the 350km-long Latvian section of the river valley (Figure 1) (von Carnap-Bornheim *et al.* 2008). Historical and linguistic evidence indicates that many of the Latvian hillforts were used by the Baltic and Finno-Ugric tribes until the twelfth century AD (Vasks 2015). However, the roots of such a system reach back into the Bronze Age (1100–500 BC) (Vasks 2015).

In the twenty-first century, new hillforts have been discovered based on Airborne Laser Scanning (ALS) data. Due to the wide-ranging scope of archaeology in this region or lack

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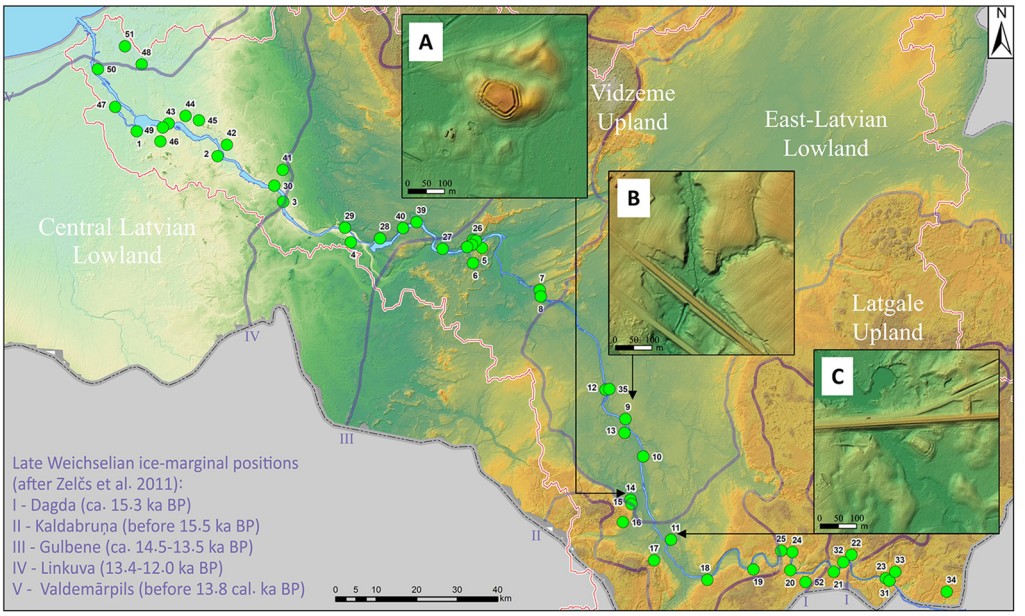

Figure 1. Map of the Daugava River valley including land relief and ice-margin position plus location of hillforts and fortified manor investigated by the INHILLDAUGAR project in 2022. Sites mentioned in the article are: 9 and B) Dzenes kalns; 11 and C) Ļūbasta; 14 and A) Zamečka; 24) Vecračina; 23) Lelindrica; 31) Indrica; 16) Melnais kalns; 8) Kaupre; 6) Sudrabkalns (figure by authors).

of archaeological survey at all, there is still a huge knowledge gap regarding the chronology, development and function of hillforts connected with the Daugava Trade Route (DTR) and organisation of settlement systems in their surroundings. Here, we present the first results of a project aiming to resolve some of these issues: Interdisciplinary Hillfort Studies at the Daugava River: Merging and Decoding Archaeological, Environmental and Linguistic Data (INHILLDAUGAR), which is based on the joint application of non- and minimally invasive field techniques with linguistic and toponomastic studies and geomorphological survey. To date, excavations have taken place in nine fortified sites.

Methods

The initial stage of the research undertaken in 2022 involved field reconnaissance of 31 selected sites (selection criteria: distance to the river; previous research; archaeological potential; palaeoenvironmental potential) and analysis of archival material, terrain models and UAV imaging (Figure 2A) to classify hillforts in terms of research potential. Using the traditional technique of digging trenches and test-pits, the hillforts and their surroundings were investigated to assess the stratigraphic situation, acquire artefacts and samples for dating using radiocarbon, dendrochronology and OSL analyses. Orthophotography was used as the primary approach to document archaeological features. This produced digitally documented cross-sections of ramparts and ditch systems that were interpreted in terms of archaeological and natural stratigraphic horizons (Figure 2).

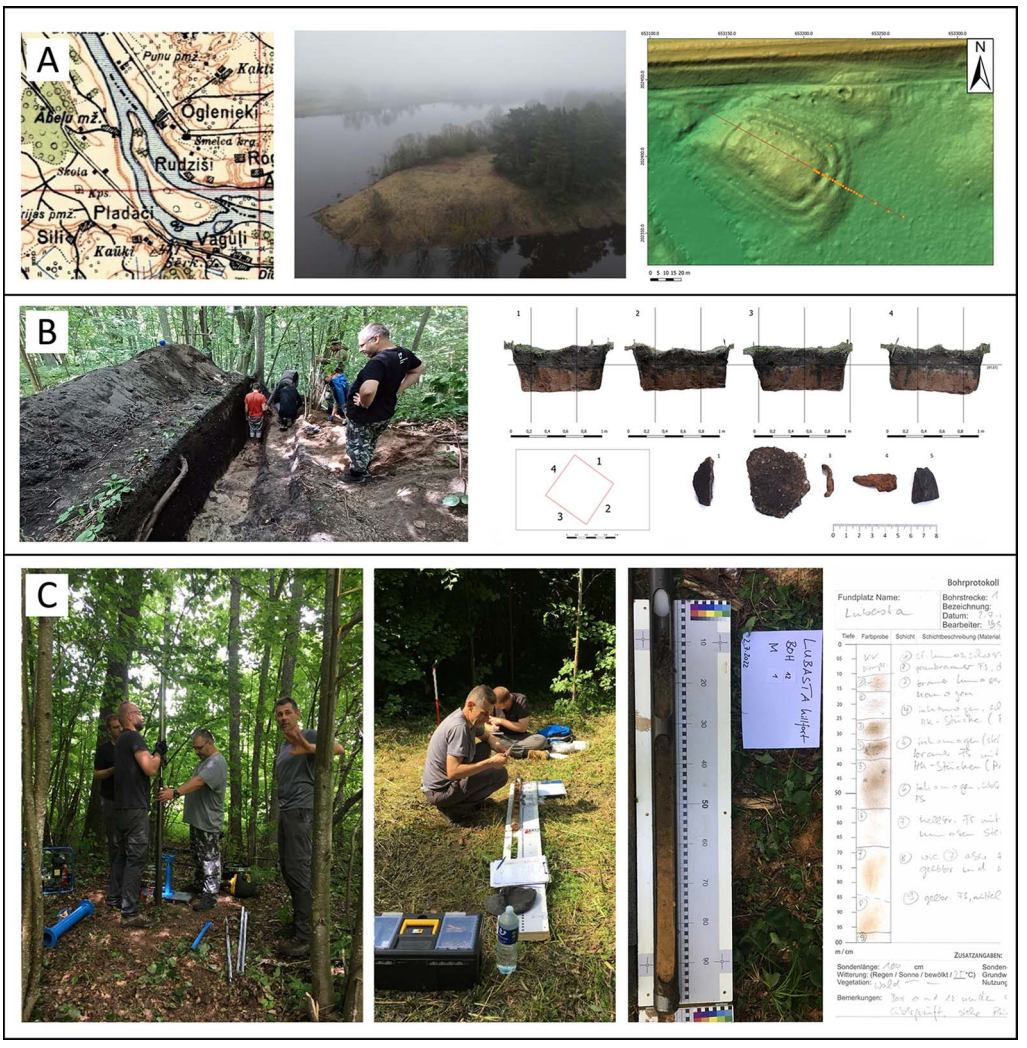

Figure 2. Selection of analyses: A) archival research (detail of Latvijas Armijas Štābs 1:75 000, Lat075_068_Jekabpils_ca1930), lidar (Kaupre), UAV (Ļubasta); B) archaeological methods: trenches and test pits (Zamečka, Dzenes kalns); C) coring using Wacker vibrohammer and hand auger (Pürckhauer), analysis, description and sampling of deposits (Dzenes kalns) (figure by authors).

Archaeological trenching was supplemented by coring of the rampart and ditch systems (Figure 2B & C) with motor-drilling equipment, along with a hand auger (Pürckhauer). The motor drill was used in combination with 1m-long metal sondes of 60mm diameter and a hydraulic extraction system, which allows for coring to a depth of 15m, including through compacted ramparts (Ibsen 2018). The layers of all individual cores were documented photographically and descriptions of the original sediment were recorded on standardised forms (Figure 2C). Organic material (mostly charcoal and sometimes charred seeds) was collected for botanical determination and radiocarbon

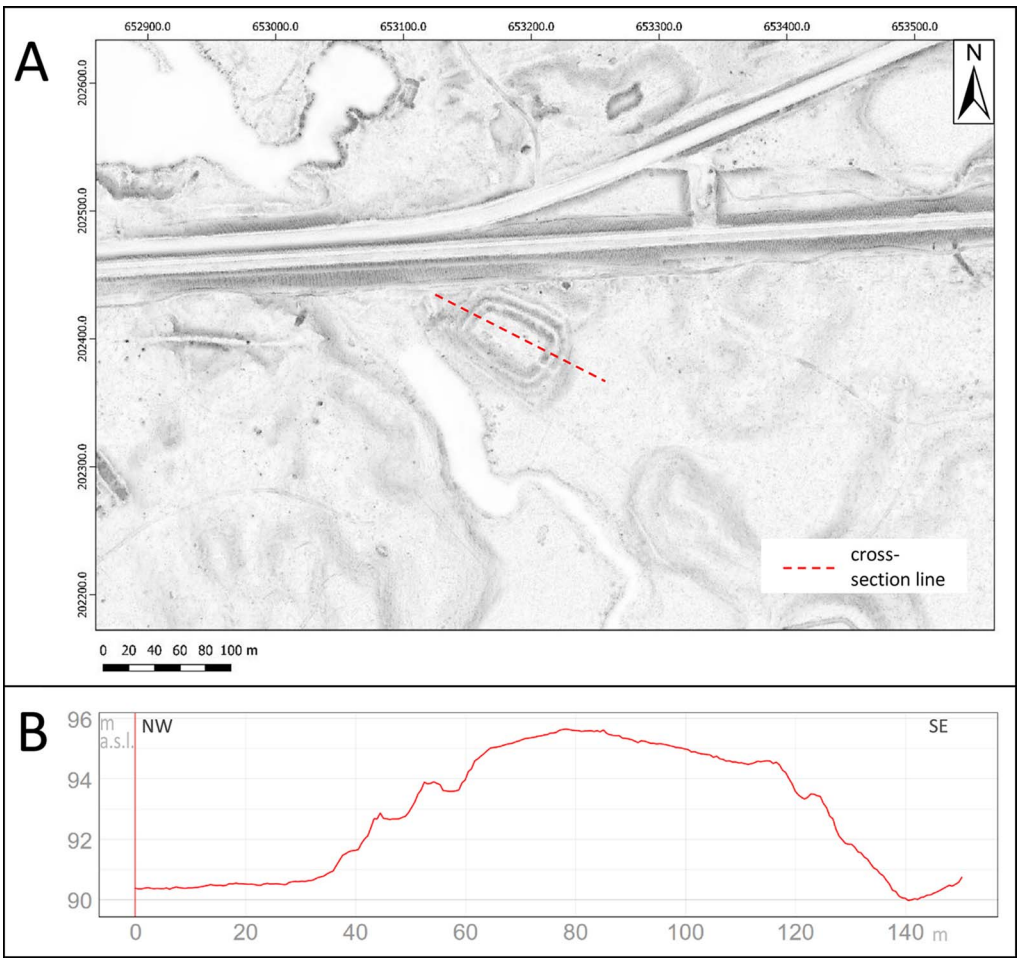

Figure 3. Selected results for the newly discovered Ļūbasta hillfort: A) Sky View Factor visualisation of ALS data (Relief Visualisation Toolbox); B) north-west/south-east elevation profile (figure by authors).

dating. This method has proved effective in the Lithuania and Kaliningrad Region (Russian Federation) and enables the identification of occupational and construction phases of the defensive earthworks (Ibsen 2018).

The geological and geomorphological context of the fortified settlements was assessed using hand augers to document biogenic sediment, to assist future multidisciplinary palaeoecological studies (Figure 2C). Supported by GIS spatial analyses, all results were projected onto archival and modern topographical maps, airborne photos, orthophotomaps, Numerical Terrain Model and ALS data.

The chronology of the documented stratigraphic units of the investigated hillforts was primarily determined through artefact typology, radiocarbon dating of organic deposits or selected plant macrofossils and dendrochronology.

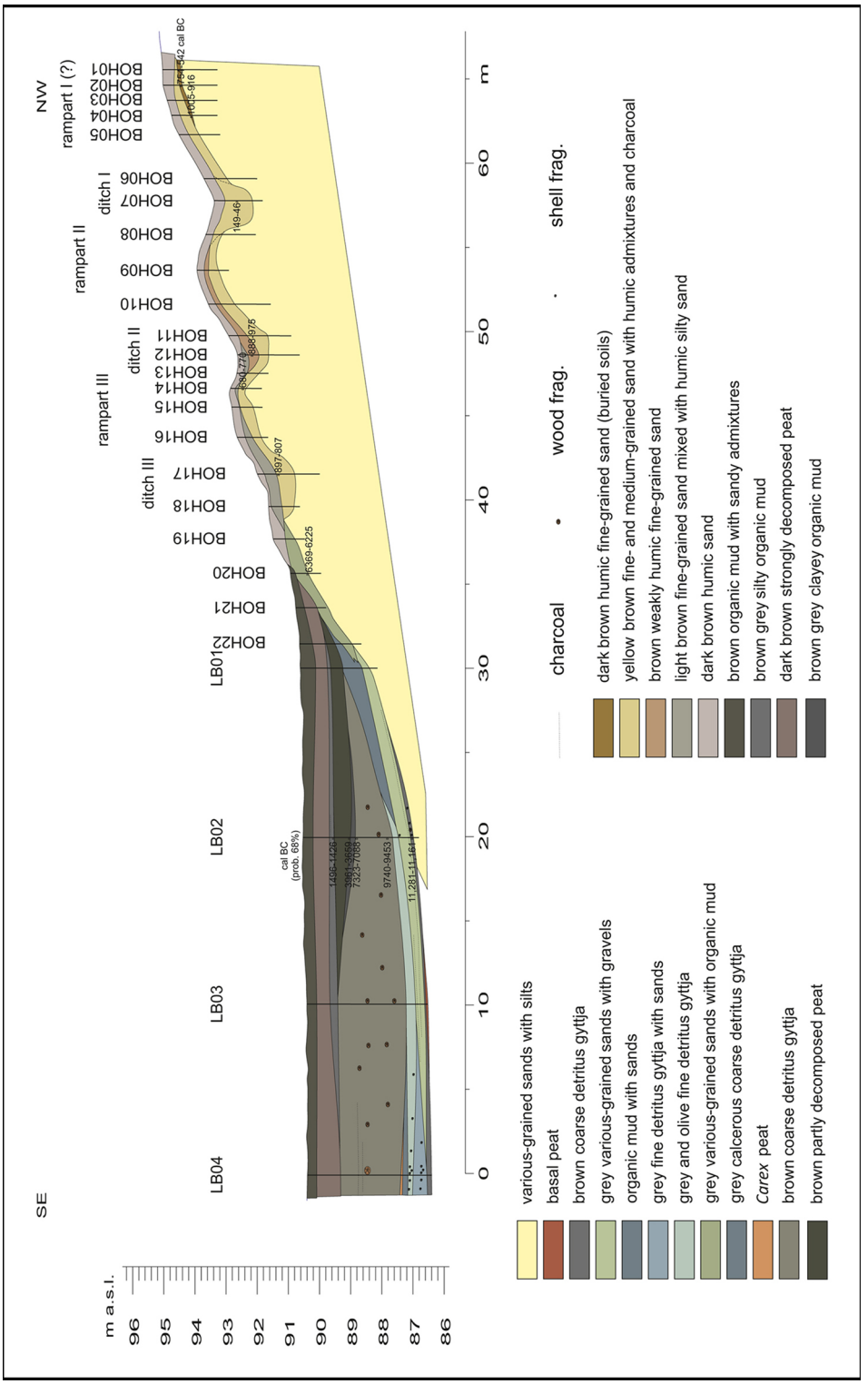

Figure 4. Ļubasta hillfort's profile reconstruction based on drillings. The results of radiocarbon dating are indicated as 2-sigma-results (95.4% probability) (figure by authors).

Results and discussion

The results indicate that the fortified settlements of the DTR were rarely on the valley floor or the fluvial or glaciofluvial terraces but were concentrated on the valley edge or on the adjacent uplands. The accessibility of these sites was hindered by deeply incised lateral small-river or denudation valleys. There is significant evidence of concentrations of defensive structures, including hillforts and later castles, in the upper Daugava ice-marginal valley (Upper Daugava spillway valley), between Pļaviņas and Aizkraukle and in the region from Lielvārde to Rīga. These areas played a crucial role in controlling the DTR in prehistoric times and the Middle Ages (Mägi 2018) due to rapids and the fast current of the river.

Regarding chronology, the Late Bronze Age origin of some of the hillforts was confirmed by various types of relative and absolute dating. For example, Ļūbasta hillfort (Figure 3), which was discovered via ALS image analysis in 2020, initially had limited evidence of an archaeological layer, with just two sherds in the topsoil of a test pit.

The typology of the pottery, however, indicates habitation during the Late Bronze to Pre-Roman Iron Age or Early Iron Age (1100 BC–AD 500). This was validated by radiocarbon samples extracted from the drilling cores that indicated rampart construction in the Late Bronze Age and the pre-Roman Iron Age. The coring also yielded two samples from the late Migration Period and Viking Age (AD 680–770 and 880–975), which may indicate a later reoccupation. The lack of distinct archaeological layers suggests that the hillfort was used as a refuge or only as a short-term habitation. The landscape around Ļūbasta was also examined. These geomorphological results demonstrate that the hillfort is adjacent to a biogenic plain consisting of thick peat-lacustrine deposits (Figure 4). The dating shows that the transformation from lake to swamp and mire took place a few hundred years before the fortification was established *c*. 1500 BC.

Conclusions

The emergence of the Daugava waterway as a corridor for trade and movement has been attributed to the Bronze Age in previous research, which is corroborated by the first results of INHILLDAUGAR. New radiocarbon dates confirm that the construction of ramparts, and likely the initial occupation of sites, occurred in this period. This is roughly parallel to the development of fortified sites in Lithuania (Vitkūnas & Zabiela 2017). However, many questions remain especially with regard to later periods. While the results of research at Ļūbasta and other sites have indicated some activity in the Viking period, it is largely ephemeral and not indicative of long-distance trade. When considered as a whole, the hillforts of the Daugava differ from what is known from the southern Baltic coast, where a significant break in the pre-Roman and Roman Iron Age is noted, and where the fortified settlements were reoccupied in the eighth century AD (Buko 2008). In the thirteenth century, development of fortified settlements resembled the southern Baltic where forts were replaced by the castles of the Teutonic Knights or, in the case of Latvia, the Livonian Brothers of the Sword. The initial results of the project show that the hillforts of the Daugava are similar to those in neighbouring regions, but also that the DTR has a dynamic and unique trajectory through time.

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