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## The Gravettian lithic industry at Krems-Wachtberg (Austria)

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### ABSTRACT

In the course of extensive excavations at the Upper Palaeolithic open-air site of Krems-Wachtberg, a large assemblage as well as extraordinarily well preserved archaeological features have been recovered since 2005. After the completion of the field work, a preliminary overview of the lithic industry can be provided. Artefact-morphological studies allow for the dating of the main cultural layer to the older Gravettian, with specific typological elements indicating an attribution to the Pavlovian stage. Detailed raw material analyses applying stereo-microscopic investigation for all lithic artefacts and geochemical analysis for selected raw material groups revealed a predominantly local raw material economy. Accordingly, the lithic *chaîne opératoire* is present at the site for most of the identified raw materials. Spatial analyses of selected raw material units in combination with initial refitting-results reflect site formation processes but also indicate specific activity areas within the cultural layer.

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### 1. Introduction

The open air site of Krems-Wachtberg is located in the loess area of the Lower Austrian Danube region (Fig. 1). The site gained international attention because of the extraordinarily well preserved archaeological features, including several infant burials and a multi-phased hearth (Einwögerer et al., 2006, 2008; Händel et al., 2009a; Einwögerer, 2010; Simon et al., 2014). These and additional features are part of the archaeological horizon (AH) 4 which is clearly discernible within the 8 m thick loess sequence due to its rich cultural remains. In contrast, the other archaeological horizons of the site only represent spatially restricted find concentrations characterized by low find numbers and non-diagnostic artefacts (Händel et al., 2014, 44).

The archaeological layer AH 4 consists of two main stratigraphic units, AH 4.4 and AH 4.11 (Fig. 2). Nearly the entire find material from Krems-Wachtberg derived from these two subunits of AH 4. The archaeological horizon AH 4.4 represents an occupation layer from which only the lower part, including all archaeological features, is preserved *in-situ*. The upper parts of AH 4.4 are eroded and – together with additional material which has been re-deposited down the slope – constitute the overlaying stratum AH 4.11. Our current model of site formation was discussed and published in detail by Händel et al. (2009b, 2014). The available radiocarbon data

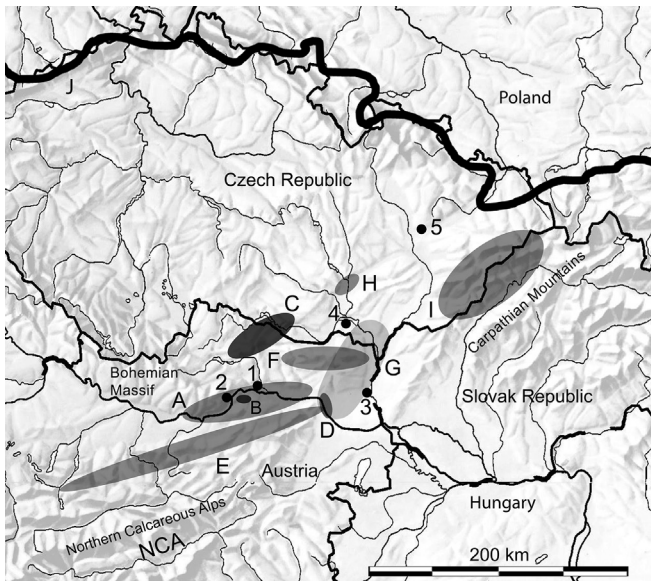
support this stratigraphic interpretation (Einwögerer et al., 2009). After the removal of one outlier AH 4.4 yielded consistent <sup>14</sup>C ages between 31,898 ± 179 and 31,331 ± 341 <sup>14</sup>C calBP (Simon et al., 2014, Table 1). The radiocarbon dates for AH 4.11 scatter over a larger time span between 32,726 ± 379 and 31,561 ± 251 <sup>14</sup>C calBP, which can be explained by periglacial processes re-depositing older material from unknown stratigraphic positions on top of AH 4.4.

In contrast to AH 4.11, which occurs throughout the entire excavated area of ~160 m<sup>2</sup>, the *in-situ* layer AH 4.4 is only preserved at ~45 m<sup>2</sup>. A hearth measuring approximately 1.5 m in diameter is situated at the centre of the *in-situ* area (Händel et al., 2014, Fig. 9.). Alternating layers of burnt loess, stone plates and different infilling episodes demonstrate that Hearth 1 represents a multi-phase fire place. Three large and almost vertical pits are stratigraphically linked to Hearth 1 and can be associated with distinct utilization stages. More than 20 smaller pits are located in the surrounding area. Some of those pits may be the result of bioturbation and/or periglacial processes; however, most of them seem to be of anthropogenic origin. A significantly smaller second fireplace (Hearth 2) was located 3 m northwest of Hearth 1, already at the fringe of AH 4.4.

The burials on the other hand were found at the southern periphery of the living horizon AH 4.4. The pit of Burial 1 was linked to a flat depression and covered by a mammoth shoulder blade and a tusk fragment. At the base of the almost vertical burial pit the skeletons of two neonates were imbedded into a distinct layer of red ochre. Approximately 1.5 m north of the double burial, a 3–4

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**Fig. 1.** Map of the Middle Danube region indicating relevant source areas and the location of important Gravettian sites: A Danube gravels, B Dunkelsteinerwald, C Waldviertel/Znojmo area, D St. Veit Klippen Belt, E Flysch Zone, F Northern Lower Austrian gravels, G Vienna Basin, H Southern Moravian cherts, I Pieniny Klippen Belt, J Maximum extension of Pleistocene glaciation (erratic flint); 1 Krems-Wachtberg, 2 Aggsbach and Willendorf II, 3 Grub/Kranawetberg, 4 Dolní Věstonice, Pavlov and Milovice, 5 Předmostí (Graph: Austrian Academy of Sciences).

months old infant was buried within a sharply delimited layer of red ochre (Burial 2).

## 2. Inventory

The lithic assemblage of Krems-Wachtberg was excavated between 2005 and 2014 in the course of 11 field campaigns and consists of 39,574 chipped stone artefacts (Table 1). This number comprises all artefacts individually recorded during the excavation measuring  $\geq 10$  mm, artefacts secondarily sorted from wet sieving and compound finds with  $\geq 10$  mm in size and additional smaller modified tools.

Almost the entire lithic assemblage of Krems-Wachtberg derived from the Gravettian-stage layer AH 4, with the majority

**Table 1**

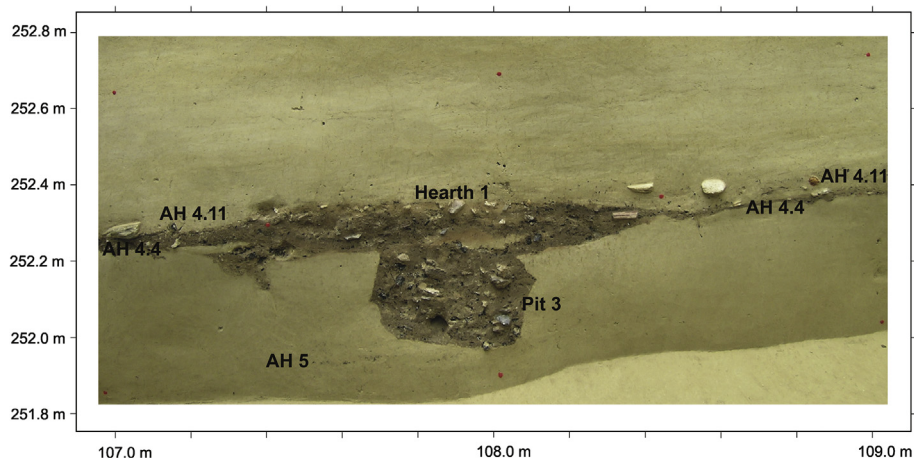
Krems-Wachtberg 2005–2014: Percentage, sum and layer assignment of individually recorded lithics  $\geq 10$  mm in size and additional smaller modified pieces from sieving.

AH	n	%
Not yet allocated	164	0.4
3	13	0.0
4	858	2.2
4.01	6	0.0
4.02	4	0.0
4.1	670	1.7
<b>4.11</b>	<b>29,605</b>	<b>74.8</b>
4.111	48	0.1
4.112	51	0.1
4.3	26	0.1
<b>4.4</b>	<b>8023</b>	<b>20.3</b>
40.1	3	0.0
40.2	17	0.0
40.4	48	0.1
44	5	0.0
5	3	0.0
7	1	0.0
Unstratified	29	0.1
	<b>39,574</b>	<b>100</b>

Bold type highlight the two most important archaeological layers AH 4.11 and AH 4.4 to facilitate a comparison.

of the archaeological finds originating from the two most important subunits AH 4.11 (29,605 lithics) and AH 4.4 (8023 lithics). During the ongoing field work AH 4 was further subdivided: The layers AH 4.01, 4.02 and 4.1 subsume a scattered zone of anthropogenic influences on top of AH 4.11. AH 4.111 and AH 4.112 indicate specific zones within AH 4.11, and the layers AH 40.1–40.4 represent thin horizons in the south of the excavated area with stratigraphic connections to AH 4.11. AH 44 represents a distinct feature of intensely fire influenced sediment and burnt find material, indicative of a re-deposited fireplace.

There exist only few lithic artefacts from the archaeological horizon 3, a spatially restricted find zone approximately 20 cm above AH 4, which most likely consists of biogenically re-deposited material as indicated by extensive crotonas linked with this archaeological horizon. Archaeological horizon AH 5, a spatially restricted find area 20–30 cm below the main layer AH 4, only produced 3 lithic artefacts. The level of AH 7 was recognised in the course of deep test trenches and only one single artefact was recovered from this layer.



**Fig. 2.** Krems-Wachtberg 2005–2006: West Profile showing the stratigraphy of AH 4 and AH 5 next to hearth 1 and the connected feature pit 3 (Planimetric photo and graph: Austrian Academy of Sciences).

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