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First insights into the use of lithic artefacts from the Mesolithic site of Liège "Place Saint- Lambert" (unit 3.2, SDT sector) (BE)

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1. Introduction

The site of the "Place Saint-Lambert" in Liège is located on the outer edge of the alluvial plain of the Meuse, at the foot of the northern slope of the valley, in the axis of the outlet of the Légia and the Pierreuse valley that drain this slope (Fig. 1). Since 1907, it has been the subject of several excavation campaigns that have documented a succession of occupations from the Mesolithic, Neolithic, Protohistoric and Historic periods.

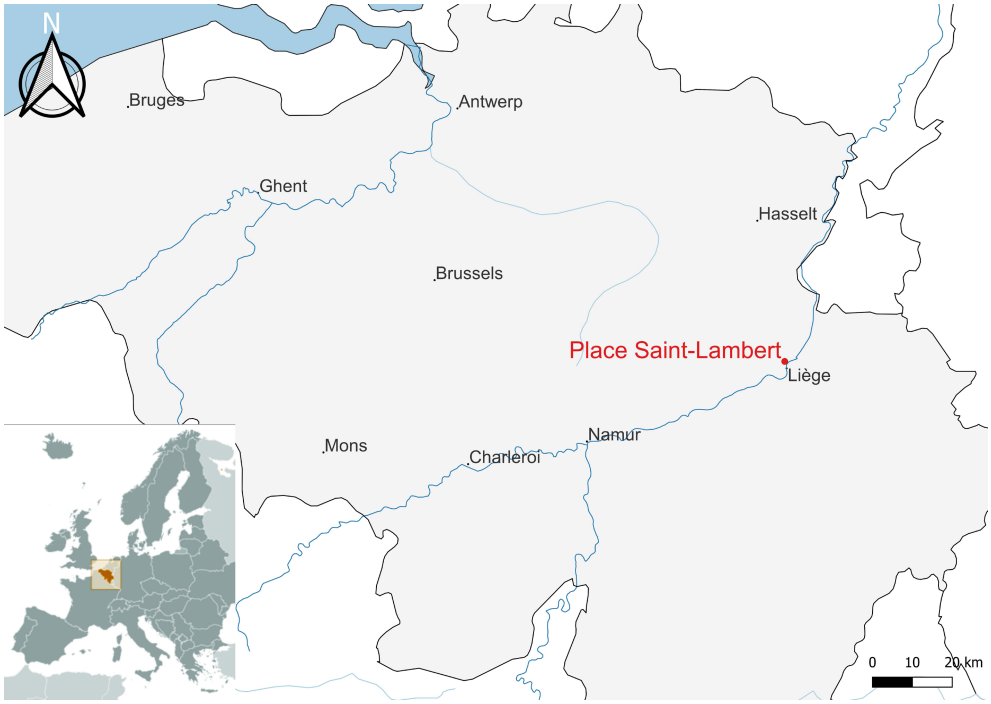


Fig. 1 – Location of the site Liège, "Place Saint-Lambert" in Belgium.

Between 1990 and 1995, salvage excavations conducted prior to an urban development project of the square made it possible to investigate the SDT sector located in the north of the site, covering nearly 200 m² (Léotard *et al.*, 1995) (Fig. 2). In this area, traces of prehistoric occupation were spread over the entire surface, with the upper level (Unit 6.2) containing several hundreds of artefacts belonging to the Middle/Late Neolithic and even the Protohistoric period. In the western part, this stratum was in contact with a Mesolithic occupation level (Unit 3.3), at the base of which the salvage excavations were halted. In the eastern part of the site, the Neolithic level presented itself sub-horizontally but the Mesolithic layer sloped downward following the slope of a paleochannel whose base could not be reached (Fig. 3). The Mesolithic artefacts in Unit 3.3 were strongly patinated and therefore not suitable for the analyses presented in this contribution.

In 1990 and 2000, an interdisciplinary research campaign was undertaken at the edge of this sector with the aim of making up for the deficiencies inherent in the salvage context of the previous excavation campaign (van der Sloot *et al.*, 2000). In parallel with the stratigraphic, palynological and anthracological studies of a sedimentary profile that constitutes the northern limit of the excavated area, three archaeological test pits – S1, S2 & S3 – located along the profile were the object of programmed excavations (Fig. 2 & 3).

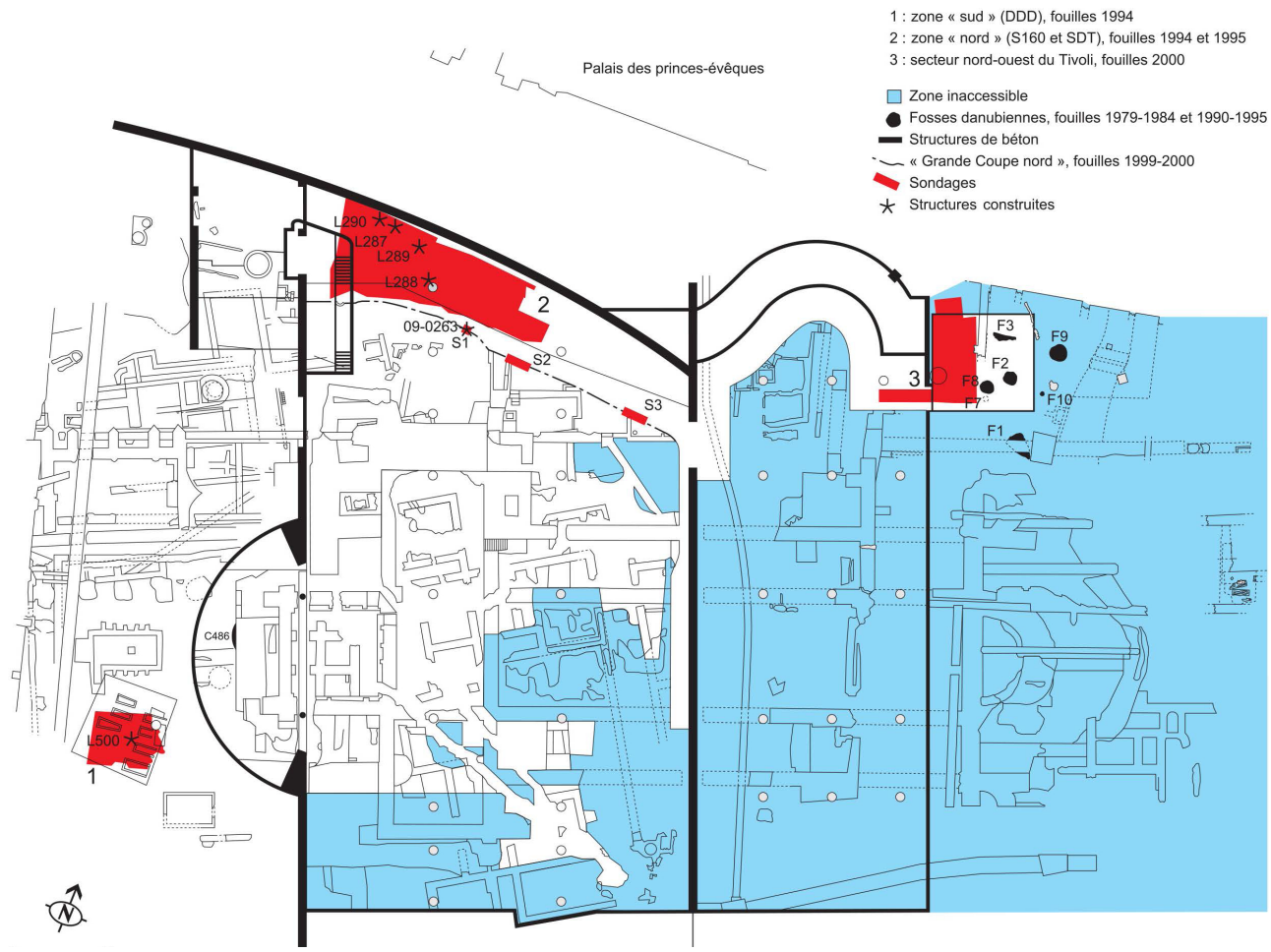


Fig. 2 – "Place Saint-Lambert" site (Liège). Map of the remains and location of the main excavation sectors for the prehistoric periods (DAO: Emmanuel van der Sloot, In Situ).

This intervention led to the establishment of a complex and precise stratigraphic framework for the prehistoric occupations and allowed to shed light on their paleoenvironmental contexts (van der Sloot *et al.*, 2003) (Fig. 4). Thus, the compact ochre-brown clayey silt with numerous bioturbations at its base (Unit 3.3) is interpreted as soil that developed in an alluvial plain.

In addition, the excavation of the S2 testpit (surface area: 3 m²) located on the western slope of the channel, partially explored in the 1990s, has made it possible to apprehend a relatively homogeneous layer of grey-beige silt (unit 3.2) that almost completely fills this paleochannel (Fig. 3). This unit, underlying Unit 3.3, suggests that sedimentation took place in the alluvial plain. Given the geomorphological context of the site, it is more likely to be an overbank deposit from the Legia rather than the Meuse (Haesaerts, unpublished report).

The lithic series contained in Unit 3.2 consists of approximately 350 pieces of unweathered flint, several of which are the subject of this paper. These artefacts are attributed to an

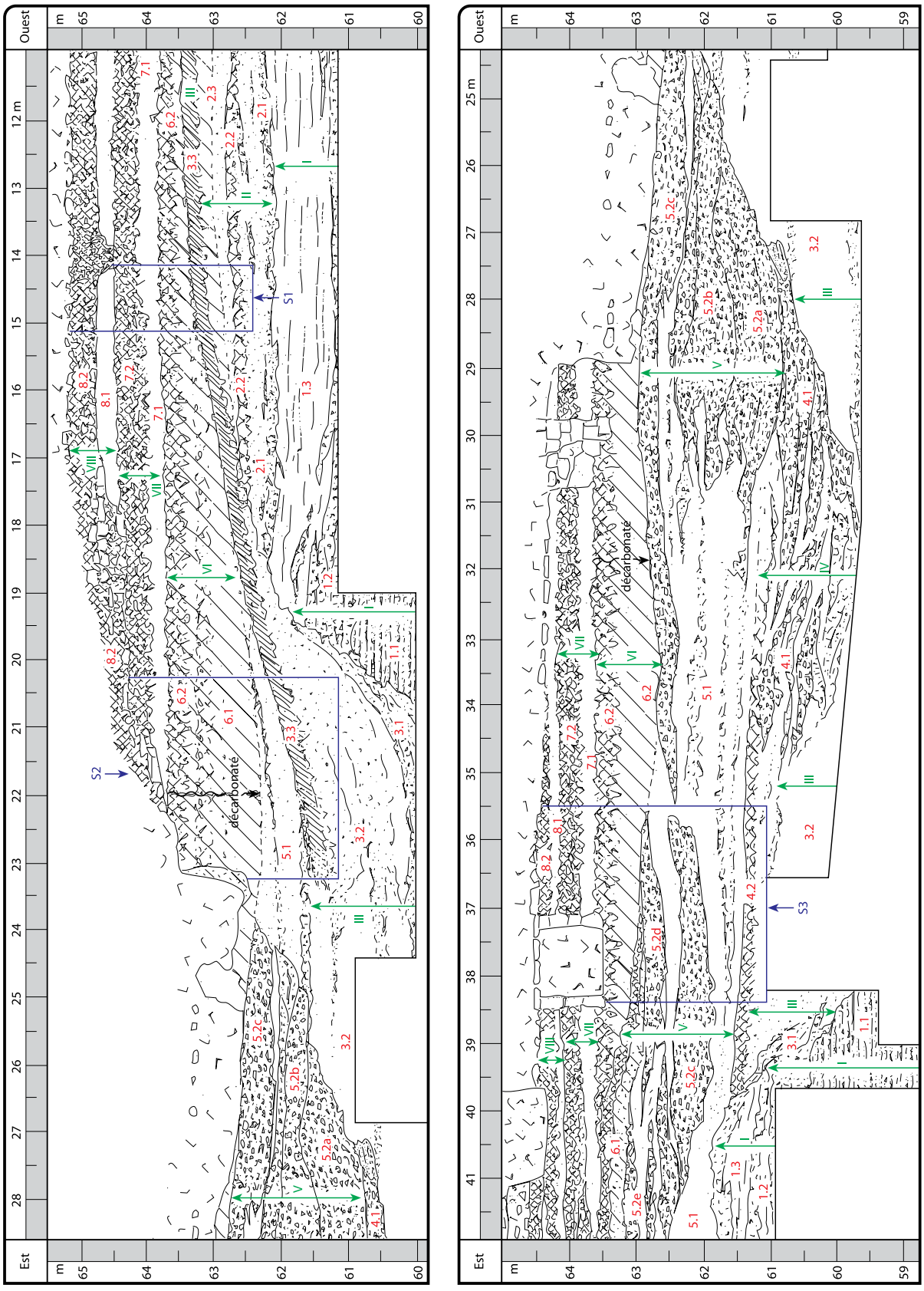


Fig. 3 – "Place Saint-Lambert" site (Liège). Stratigraphic survey of the "Grande Coupe Nord" (from Haesaerts, in van der Sloot *et al.*, 2003) (DAO: Emmanuel van der Sloot, In Situ).

indeterminate Mesolithic phase given the lack of sufficient chronoculturally relevant pieces and the absence of ^{14}C dates. There is, for example, only one microlith – a small, unfinished scalene triangle – within the lithic series (van der Sloot *et al.*, 2003). However, if one accepts the dating evidence, a ^{14}C date on a horse phalanx (OxA-8996: 7970 ± 80 BP) found in the overlying Unit 3.3 provides a minimum age for the incision and sealing of

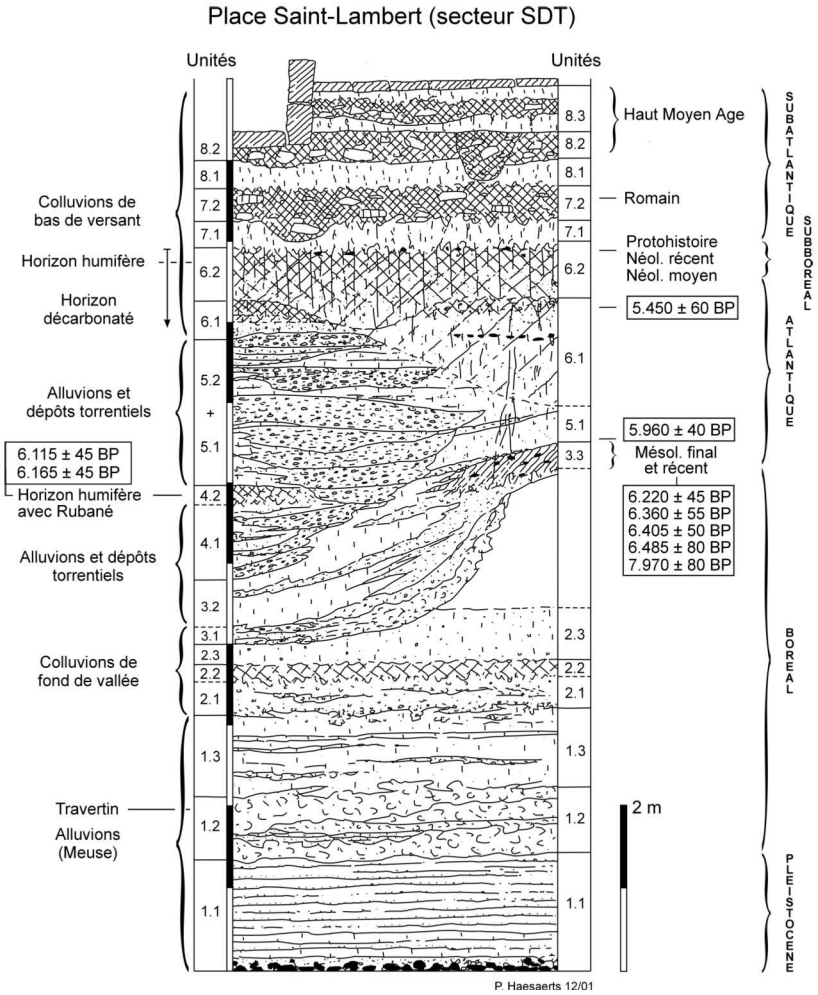


Fig. 4 – "Place Saint-Lambert" site (Liège). Lithostratigraphic scheme of the SDT sector (from Haesaerts, in van der Sloot *et al.*, 2003).

the channel, which would place both events during the Boreal (Haesaerts, unpublished report) (Fig. 4).

Taking into account the extent of the distribution of the artefacts within Unit 3.2 (overal thickness of about 1 m with a denser concentration in the upper third), as well as the position of this deposit in the topography of the SDT sector, it is plausible that these Mesolithic artefacts are in secondary position.

Lithic tools were selected from this unit (3.2) of the SDT sector to assess the potential of the assemblage for microwear and residue analysis. The assemblage is highly affected by post depositional surface modifications (PDSM), mostly post excavation treatment, such as pencil marks. The selection of the studied sample was based on the typological profile of lithic assemblage in the unit.

2. Sampling

The selected artefacts turned out to be suitable for functional analysis. There were 64 specimens sampled (Tab. 1) and 28 were selected for high-power analysis. From this, 17 used zones (UZs) were interpreted on 15 tools. It has to be noted that nine tools were not analysed for use traces because they were found to have a high amount of residue on their surfaces. These tools first will be analysed with different residue analysis methods and residues will be extracted, thus the tools can be cleaned and analysed for wear traces. Therefore, even though these tools were part of the initial selection as their macro traces suggest that they have been used, they were not analysed in detail with the high-power approach. That approach requires thorough cleaning with soap and water and additional cleaning with alcohol or lighter fluid to remove finger grease and dirt. One tool has too extensive PSDM to interpret, and three did not display any use related traces.

Among the sample selected the for microwear study, there are mainly unretouched blanks (81.25 %) consisting mostly of blade(let) and flake fragments. Preparation and/or rejuvenation elements are also presented, but to a lesser extent.

There are 12 retouched artefacts in the sample, among which a backed bladelet, a truncated bladelet, and a notched blade. In most of the other cases, the retouch is more abrupt and discontinuous.

Typological category	*Residue*	*UZ absent*	*UZ present*	*Total*
Unretouched blanks	*6*	*33*	*13*	*52*
Blade(let)s	5	32	10	47
Flake			1	1
Preparation/rejuvenation elements	1	1	2	4
Retouched artefacts	*3*	*5*	*4*	*12*
Retouched blade(let)s	2	5	3	10
Retouched preparation/rejuvenation elements			1	1
Retouched flake	1			1
Total	*9*	*38*	*17*	*64*

Tab. 1 – Typological setting of the sample. Residue means that microwear analysis was nor possible because of the presence of residue.

3. Methodology

The selection and recording of macro traces and edge damage was done by using an Olympus SX7 stereo microscope reaching between 8-56x magnification. Micrographs were taken by an Olympus SC100 camera and processed by the Olympus Stream Basic 1.9.4 software. Polish was recorded using an Olympus BM53X reflected light microscope with magnifications ranging from 50 to 500x. Micrographs were taken with the use of a Nikon D750 DSLR camera and Best Scientific 1.9x coupler and captured with Helicon Remote software and processed with Helicon Focus software.

4. Results

4.1. Microwear traces

Activities are almost equally distributed between plant and animal material (7 and 8 UZs) (Tab. 2; Fig. 7). There are two UZs that were interpreted as "probably used". One of them could be interpreted as probably used on soft material.

Among the UZs connected to animal material there are traces of hide working (n = 4); in three cases fresh hide was interpreted as the contact material and in one case no further interpretation was possible beyond that of hide. The material was worked in a boring (n = 1) (Fig. 5: ID13) and cutting (n = 2) (Fig. 5: ID23) motion. In one case, the action could not be interpreted. The polish is in general, rough, flat, greasy and bright, the edge is rounded.

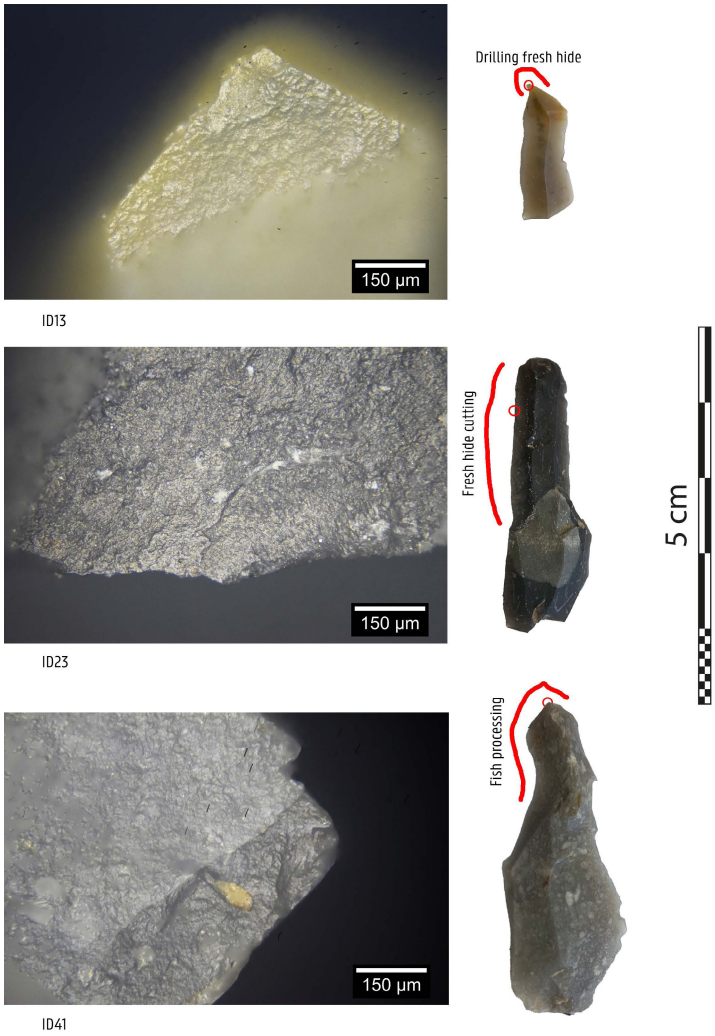
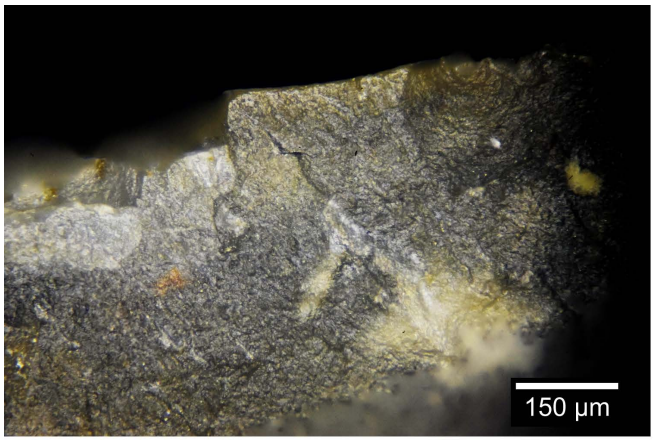


Fig. 5 – Animal related traces at Liège "Place Saint-Lambert" SDT sector Unit 3.2.

There is one UZ connected to fish processing with a longitudinal motion (Fig. 5: ID41). The polish is distributed in spots, and more concentrated around the tip of the tool. It is smooth, domed, very greasy, and bright. There is extensive edge scarring, but the scars are small.

Three UZs are interpreted as unspecified animal material; from these two are connected to soft animal material that are interpreted as hafting traces because of their position and characteristics of the traces, and one is connected to use on medium hard material.



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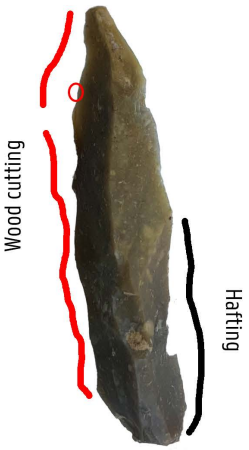

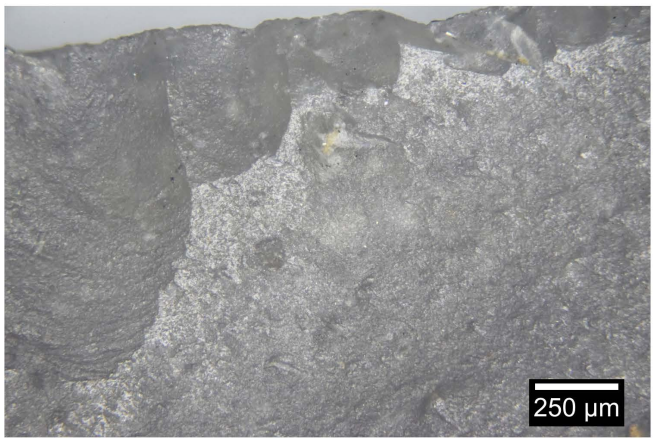

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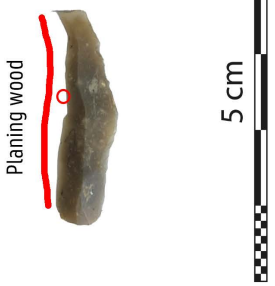

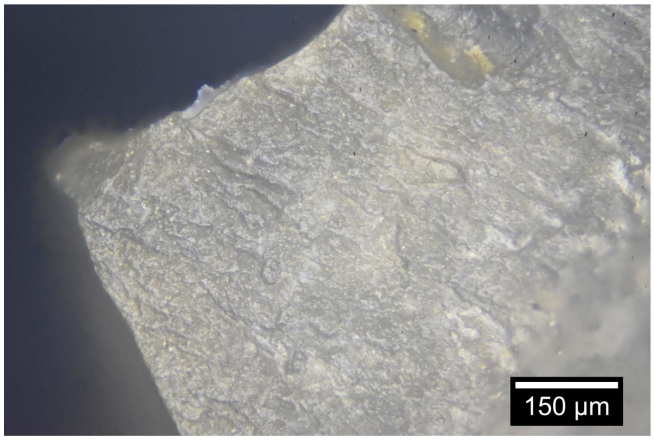

ID21

Fig. 6 – Plant related traces at Liège "Place Saint-Lambert" SDT sector Unit 3.2.

Among the plant materials, wood traces are present with 4 UZs. Two are associated with soft wood drilling (Fig. 6: ID21), one with hard wood cutting (Fig. 6: ID57), and another one with unspecified wood planing (Fig. 6: ID6). Edge scars are associated with all UZs, their frequency and size depends on the hardness of the wood and the action carried out, *i.e.* cutting hard wood and planing caused larger scars, drilling soft wood caused smaller edge scars and more rounding. The polish linked to wood is smooth, flat, matt, bright or dull, bit pitted, with clear directionality.

The tool that was used to cut medium hard plant material displays large edge scars, rounded edges and smooth, flat, matt, bright polish with comet tails.

One of UZs interpreted as a hafting trace was connected to hafting in soft plant material with adhesive mixed with a red mineral component as suggested by the smooth, flat, greasy, dull polish with smooth, flat, matt, very bright mineral polish.

There are two UZs that could not be linked to a specified material. In one case, the material has been interpreted as soft material that caused small, continuous, mostly connecting edge scars with some rounding. The other one shows some edge rounding and small edge scars, but as the ventral side is not interpretable because of extended pencil marks, further identification is not possible (Fig. 7).

4.2. Residues

As mentioned above, there are residues on some artefacts. In three cases, these are black and probably some kind of adhesive. On two tools, the residues are distributed opposite to the used edge and even connected to hafting traces. On one tool, no use related traces could be interpreted. In all other cases (n = 9), the preserved residues are white in colour. On one artefact, they are connected with use related traces. Here, the residue is distributed along the ridge that is closest to the used edge. For the other eight, it was not possible to discern the microwear traces on the lithics without cleaning, which we postponed until the preserved residues can be further analysed. On these artefacts, it could be observed that the residues are preserved along edges and, tips, or slightly further from the edge following it. The white residues are probably organic in origin, some display characteristics of animal tissue, others of collagen. However, these are very preliminary observations that have to be confirmed by comparing with reference collections and possibly paired with some biomolecular measurements.

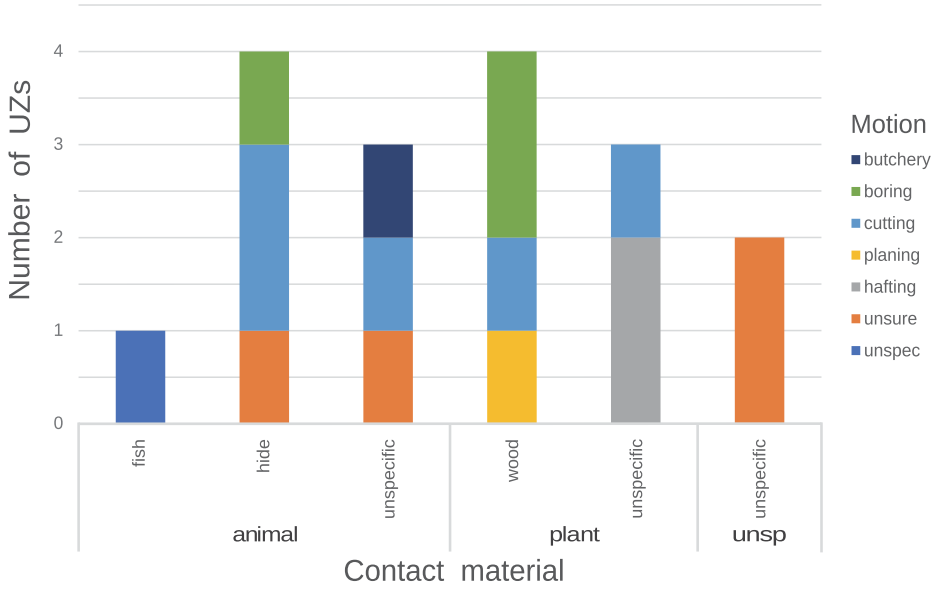

Fig. 7 – Representation of contact materials *vs* motion in the sample.

5. Discussion

5.1. Functionality

This pilot-study could demonstrate that the presence of pencil marks and metal scratches did not affect the interpretability of the artefacts from Unit 3.2 too severely. Generally, traces are well-preserved and interpretable, opening interesting perspectives for a full analysis of this small assemblage. Various tasks were carried out at the analysed locus, but for now we cannot point out any specialisation. However wood utilisation seems to have been important.

Artefacts that have been identified as retouched tools bear very few UZs (n = 4). However, unretouched blade(let) and flake blanks seem to be widely used for various actions (Tab. 2). The few larger laminar elements (n = 5) seem to be more extensively used (4 UZs on 3 artefacts). Preparation/rejuvenation elements were also used both in blank and retouched form. However, it seems that they did not prepare specific tools for specific tasks. Blank artefacts were used in a broad variety of actions (*e.g.* boring, cutting). They also hafted their tools, as was demonstrated by two artefacts presenting hafting traces. It must be emphasised here, that hafting traces are not easily preserved and not easy to detect. Therefore, the lack of hafting traces on the other artefacts does not mean that they were not hafted. It is hard to have any concluding remark on the use of tools with specific retouch as they are rare (n = 2), but one backed bladelet displays traces of wood planing.

	Unsure		*Boring*		*Cutting*				*Hafting*	*Planing*	*Unspecific*	*Total*
Typological category	*Hide*	*Soft to medium hard animal matter*	*Fresh hide*	*Soft wood*	*Fresh hide*	*Soft animal matter*	*Hard wood*	*Medium hard vegetal matter*	*Soft vegetal matter*	*Wood*	*Animal matter*	
Blade	**1**						**2**		**1**			**4**
Bladelet	**1**	**1**	**1**		**3**				**1**			**7**
Crested bladelet				**1**							**1**	**2**
Flake				**1**								**1**
Retouched bladelet		**1**								**1**		**2**
Backed bladelet										1		1
Retouched crested bladelet	**1**											**1**
Total	*3*	*2*	*1*	*2*	*3*		*2*		*2*	*1*	*1*	*17*

Tab. 2 – Summary of microwear results connected to typological categories.

5.2. Regional comparison

The obtained results are overall in agreement with outcomes from similar studies on Middle and Late Mesolithic assemblages from Belgium (Blancquaert, 1989; Crombé & Beugnier, 2013; Halbrucker & Crombé, in press; Vandendriessche, 2022; Vandendriessche

et al., 2019) in the sense that both animal and plant contact materials are recorded, and wood utilisation is present. However, the ratio of animal (hide, fish) versus plant related tasks is quite surprising in the case of "Place Saint-Lambert". They are almost equally represented, which is rather unusual on Mesolithic sites. This could be caused by the sampling, however, as it was random, we do not expect that this is the case.

The use of unretouched blanks is high, which is in agreement with other sites from the whole Mesolithic and thus seems to be a general phenomenon (*e.g.* Beugnier & Crombé, 2005; Guéret, 2013; 2017; Halbrucker & Crombé, in press; Halbrucker *et al.*, 2021; Niekus & Verbaas, 2015; Souffi *et al.*, 2015; Vandendriessche *et al.*, 2019; Verbaas & García Díaz, 2017).

An interesting difference at "Place Saint-Lambert" compared with other sites, is that all plant working traces are related to wood working, which is somewhat similar to Verrebroek Aven Ackers (Halbrucker & Crombé, in press). However, at other sites, siliceous plant working (*e.g.* reed, nettle) was important (Beugnier & Crombé, 2005; Crombé & Beugnier, 2013; Vandendriessche *et al.*, 2019).

6. Conclusion

It was shown here that the lithic assemblage from Unit 3.2 is suitable for an extensive microwear and residue analysis. Although, the presented results are still preliminary, it seems that at "Place Saint-Lambert", a wide range of activities was carried out during the Mesolithic, including hide working, fish processing, and woodworking. This might point to a long-term occupation, but because the spatial distribution of the lithics is quite unclear, this conclusion remains hypothetical. Planned ^{14}C dating of bone material associated with the flint assemblage might help us better understanding this context.

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Abstract

Liège "Place Saint Lambert" is a settlement site with multiple Mesolithic occupations. The focus of this study, unit 3.2 at the SDT sector probably belongs to the Boral, based on the dating of the overlaying unit. Lithic artefacts from the 3.2 unit are relatively fresh in nature, therefore they were selected for a pilot study to access the suitability of this area for functional analysis. Our preliminary results are very promising and suggest a good outcome for a full analysis of the unit. While functional studies have been regularly undertaken in the past two decades on Belgian Mesolithic sites, on Mesolithic sites of the Meuse valley, they are non-existent. Therefore, this study fills a gap in our knowledge of the Mesolithic in the latter region.

Keywords: Liège "Place Saint-Lambert" (BE), Mesolithic, microwear, lithics, Meuse valley.

Résumé

Liège « Place Saint-Lambert » est un site comportant de multiples occupations mésolithiques. Cette étude porte sur l'unité 3.2 du secteur SDT. Selon la datation de dépôts de recouvrement, l'unité appartient vraisemblablement au Boréal. Les artéfacts lithiques y sont relativement bien préservés ; ils ont donc été sélectionnés pour l'étude pilote afin d'évaluer la pertinence de l'unité pour des analyses fonctionnelles approfondies. Nos résultats préliminaires sont très prometteurs et suggèrent un aboutissement favorable vers l'analyse complète de l'unité. Pendant ces deux dernières décennies, les études fonctionnelles ont été conduites régulièrement sur les industries mésolithiques belges. Cependant, pour le Mésolithique de la vallée de la Meuse, de telles études sont rares voire inexistantes. Ainsi, cette étude permet de combler les lacunes dans nos connaissances du Mésolithique dans cette région.

Mots-clefs : Liège « Place Saint-Lambert » (BE), Mésolithique, tracéologie, lithique, vallée de la Meuse.

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