

## Abhandlung

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# In a narcotic trance, or stimulants in Germanic communities of the Roman period

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**Zusammenfassung:** Im Mittelpunkt des Beitrages stehen löffelförmige Beschläge an den Enden einiger Gürtel germanischer Krieger. Im Beitrag wird der These gefolgt, dass diese als Stimulanzien für kriegerische Ereignisse wie Schlachten gedient haben könnten. Die Autoren haben 241 solcher Objekte zusammengetragen und diese typologisiert. Es stellte sich heraus, dass alle diese Artefakte zusammen mit Elementen der Kriegsausrüstung gefunden wurden. Die Autoren versuchten einerseits, für die lokale Bevölkerung jener Zeit erreichbare pflanzliche Rohmaterial zu identifizieren, die als Stimulanzien gedient haben können. Für diese Stimulanzien wurden Wirksamkeiten bestimmt sowie mögliche Verfügbarkeiten definiert. Der Beitrag gelangt zum Schluss, dass der Gebrauch von Stimulanzien weitaus größer gewesen sein könnte, als dies bisher angenommen wurde. Verwiesen wird auf Funde militärischer Opferplätze und Votivstätten in Südsandinavien (vor allem Illerup), die zeigen, dass die Menge an Utensilien zur Unterstützung der körperlichen Leistungsfähigkeit sogar deren Verbreitung belegen kann. Die Autoren nehmen ferner an, einen bislang noch unbekannten Wirtschaftszweig entdeckt zu haben, der während der kriegerischen Auseinandersetzungen der römischen Zeit bedeutsam war.

**Schlüsselworte:** Stimulanzien, Germanien, Germanische Kriege, Rauschmittelspender

**Abstrakt:** Autorzy doszli do wniosku, że zakończone łyżeczką okucia końców pasa mogły służyć jako dozowniki środków pobudzających wojowników germańskich do

walki. Zestawili 241 takich przedmiotów dzieląc je typologicznie. Okazało się, że wszystkie znajdowane były wraz z elementami rynsztunku wojennego. Podjęli próbę wskazania osiągalnych surowców roślinnych wpływających na pobudzenie organizmu i określili ich skuteczność. Wskazali też zakresy dostępności poszczególnych z nich. W konkluzji doszli do wniosku, że zastosowanie środków stymulujących np. agresywność, mogło być daleko większe niż przypuszczano. Odwołali się do znalezisk z militarnych ofiarnych miejsc wotywnych w południowej Skandynawii (głównie Illerup), które pokazują, że ilość przyborów do dozowania środków wspomagających efektywność organizmu może świadczyć wręcz o ich powszechności. Autorzy sądzą też, że odkryli nieznaną gałąź gospodarki działającej na potrzeby konfliktów wojennych prowadzonych w okresie rzymskim.

**Słowa kluczowe:** środki pobudzające, Germania, wojny germańskie, dozowniki środków odurzających

**Abstract:** The authors concluded that the spoon-ended fittings of the ends of the belt may have served as dispensers of stimulants for Germanic warriors to fight Germanic warriors into battle. They collated 241 such objects, dividing them typologically. It turned out that all of them were found together with elements of war equipment. They attempted to identify achievable plant raw materials affecting the stimulating the body and determined their effectiveness. They also indicated the ranges of their availability. In conclusion, they concluded that the use of agitation stimulants may have been far greater than had been assumed. They referred to finds from military sacrificial sites votive sites in southern Scandinavia (mainly Illerup), which show that the amount of dispensing utensils to aid body efficiency may even attest to their prevalence. The authors also believe that they have discovered an unknown branch of the economy operating for the war conflicts waged during the Roman period.

**Keywords:** stimulants, Germania, Germanic wars, narcotic dispensers

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## Introductory remarks

Alcohol and stimulants have accompanied man for millennia<sup>1</sup>. They are also inextricably linked with the concept of ‘war’. An abundance of scientific and popular literature provides the most varied assessments of the role that stimulants played in the mobilisation of soldiers in combat and in alleviating the stress of having to face an enemy; or simply in offsetting fear<sup>2</sup>. There are harrowing documents describing the Red Army’s policy of alcoholising soldiers during World War II operations. They are particularly expressive in the memoirs of former soldiers of this formation<sup>3</sup>. Suffice it to mention that during the Soviet-Finnish War alone, each Red Army soldier received a daily ration of 100 grams of alcohol – it was supposed to kill not only the feeling of cold and fear but also the sense of hunger in an ill-equipped and badly commanded army.

One could risk the thesis that the presence of stimulants in a soldier’s environment, was in some sense a resultant of their presence in social life. Except that in everyday life their function and role may have been to fulfil other needs: a stimulant for entertainment, an antidote to everyday problems or even a necessary medicine.

Reaching back into history, into antiquity, we can again conclude that nothing has changed in this respect. In pre-historic times, the European flora offered a large variety of plant and fungal species with psychoactive properties, such as the opium poppy (*Papaver somniferum* L.), cannabis (*Cannabis* sp.), ephedra (*Ephedra* sp.), some members of the Solanaceae family, e. g. belladonna or deadly nightshade (*Atropa belladonna* L.), henbane (*Hyoscyamus niger* L.), mandragora (*Mandragora officinarum* L.); and also ergot (spores of the fungus *Claviceps purpurea* (Fr.) Tul.) and hallucinogenic fungi such as the liberty cap (*Psilocybe semilanceata* (Fr.) P. Kumm.) or even the fly agaric (*Amanita muscaria* (L.) Lam.)<sup>4</sup>.

The history of Mediterranean civilisations is, after all, marked not only by the consumption of wine. “The ancient Greeks ate and drank opium, but the custom went nowhere beyond ancient Rome, whose users also kept this custom to themselves”<sup>5</sup>. The sentence quoted above even suggests unequivocally that stimulants other than alcohol in antiquity were reserved for the world of Mediterranean civilisation. The barbarians living outside its borders were expected to content themselves with consuming alcoholic beverages.

We therefore asked ourselves whether the consumption of stimulants in the barbarian world of the Roman period was indeed absent. For while ancient sources inform us about the widespread drinking of various alcoholic beverages, which is also confirmed by archaeological finds<sup>6</sup>, they are silent about the consumption of other stimulants. There are, however, discoveries from the eastern part of the continent which show that drug stimulants were not alien to them. The discovery in the village of Klin-Yar in the Caucasus – a richly furnished tomb of a woman from the second half of the fifth century BCE, accompanied by a lump of opium – is interpreted directly as that of a shamaness in a narcotic trance<sup>7</sup>. We realise that this is a parantel distant from the Germanic world, but one that provides an important pretext for searching for references of interest – all the more so as contacts between Germanic cultures and the world of steppe (nomadic) cultures have a long history<sup>8</sup>.

## The problem

The question we posed – whether barbarian communities of the Roman period in the area of Central European *Barbaricum* took stimulants – has a despire, in the absence of natural relic finds in the context of artefacts from this period to answer it directly. We therefore decided to look for indirect clues. The pretext for the selection of objects that could have served the purpose of dosing stimulants was the few recorded small spoons, whose form and size excluded, for example, the function of a cosmetic utensil or a medical instrument. Such a silver spoon, 67 mm long with a bowl diameter of 17 mm, was found in a grave from the B2 phase of the Roman period in Bredal, Jutland (municipality of Vejle, Denmark)<sup>9</sup>. In contrast, a small spoon made of antler was found in a war sacrifice site at Illerup (phase C1b of the Roman period), also in Jutland. It measured 53 mm in length, with a bowl 18 × 15 mm in diameter (Fig. 1a)<sup>10</sup>. The same function was probably performed by a specimen found in the same deposit made of iron, 57 mm long, with a bowl 19 mm in diameter<sup>11</sup>. A spoon with a 144 mm long shaft and a regularly rounded bowl 29 mm in diameter (with engraved letters P C – Fig. 1b), identified as a cochlear, was also found in the grave of a Germanic ‘king’ in

1 Macioti 2006; Molenda 2016, 218–219.

2 Janicki 2012; Kamiński 2017; Ohler 2018.

3 Nikulin 2013.

4 Rudgley 1993; Merlin 2003; Guerra-Doce 2014.

5 de Berge 2009, 108.

6 Rodzińska-Nowak 2018.

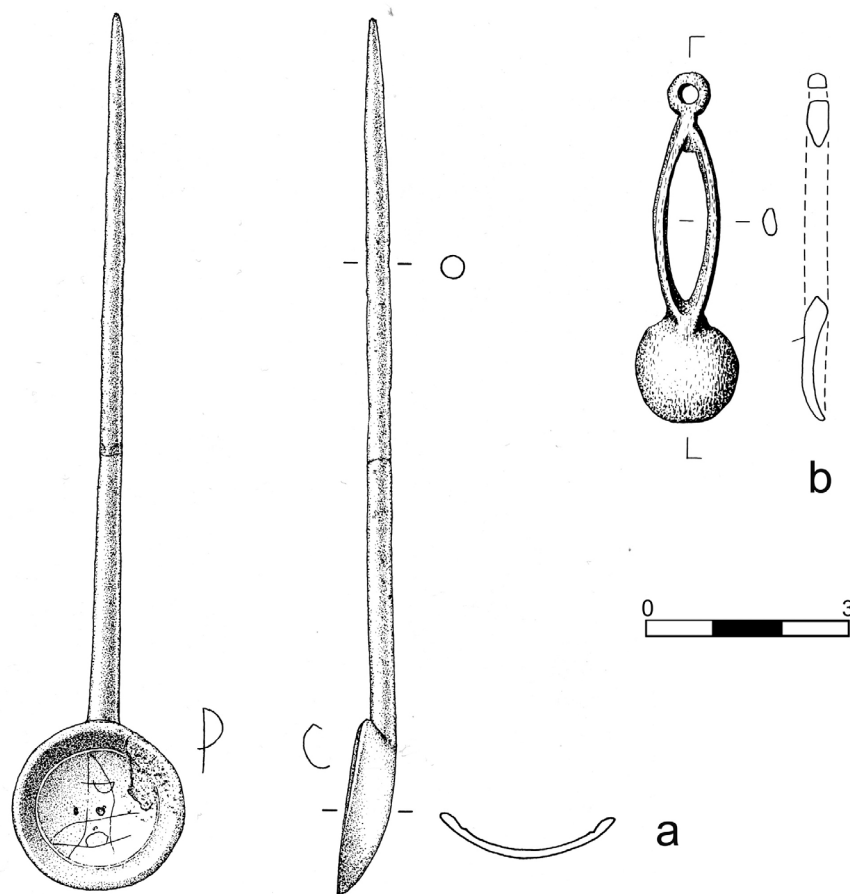
7 Kazanski/Mastykova 2003, 121.

8 Kokowski 2001; 2003; 2004.

9 Kaldal Mikkelsen 1989, 177 fig. 26a.

10 Ilkjær 1993b, plate 110 XHH.

11 Ilkjær 1993b, plate 110 KAA.



**Fig. 1:** Small spoons from Mušov  
(a – after Künzl/Künzl 2002) & Illerup  
(b – after Ilkjær 1993b).

Mušov, Moravia (phase B2/C1 of the Roman period)<sup>12</sup>. The indicated objects could have been used in an excellent way to dose stimulants. We think that the object found in a Sarmatian burial from the fourth century BC in Dunaharaszti (Hungary) should be interpreted in a similar way – it was only 37 mm long, but the bowl measured 15 mm in diameter. It was probably worn around the neck or attached to the waist, as evidenced by a hole in the upper part of the shaft through which a cord or thong could have been threaded<sup>13</sup>.

We have associated the above-mentioned artefacts with another category of objects from the Roman period, namely certain metal fittings accompanying the construction of a leather belt. The appearance of the belt itself and the elements that ensured its functionality are an important element of archaeological analysis, allowing chronological and chorological findings to be made<sup>14</sup>. This is because they are subject to a typological classification whose purpose is to trace changes in the appearance of belts over time.

In this way, they have become one of the most important dating devices for assessing the age of finds occurring in the context of the metal elements associated with the belt.

Commonly used for this purpose is the buckle typology by Renata Madyda-Legutko<sup>15</sup>, which is generally applicable to finds from the whole of Central European Barbaricum. In many cases regional typologies have been constructed, as was the case for the military votive find from Illerup, Denmark<sup>16</sup>. Recently, R. Madyda-Legutko also presented a summary of the knowledge of metal elements attached to a belt, serving not only to strengthen it, decorate it, but also allowing for the attachment or hanging on it of elements not related to its fastening: bags with utensils, chairs, knives, etc.<sup>17</sup>.

Among the metal components that make up the construction of a belt, metal ends of a thong attached to its opposite end, threaded through the buckle, appear relatively frequently, in addition to the common buckle. These vary in shape, usually elongated to facilitate quick manoeuvring

<sup>12</sup> Künzl/Künzl 2002, 589–590 fig. G 4.

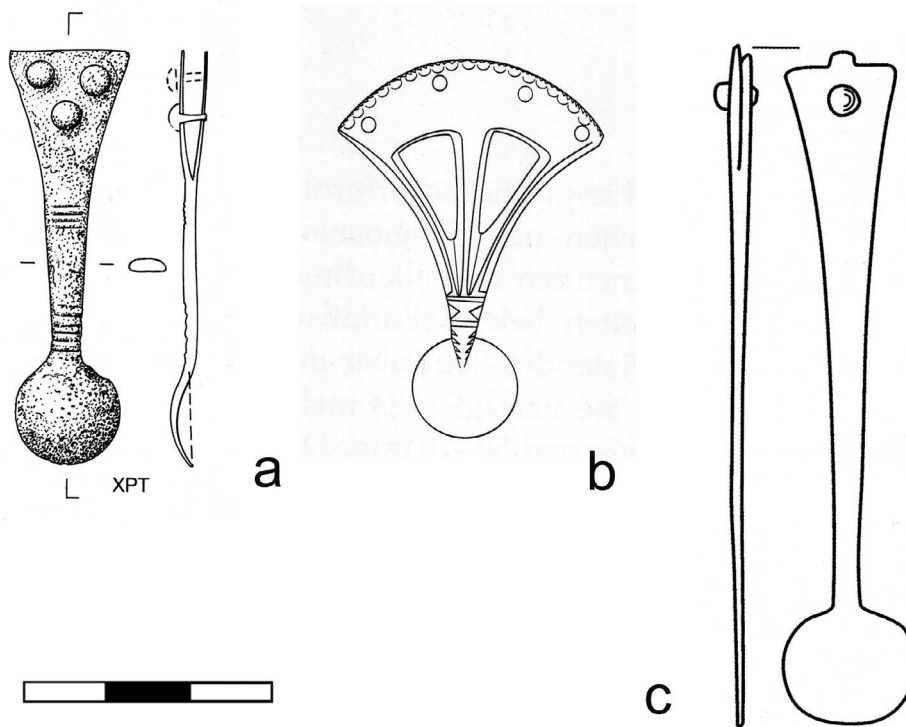
<sup>13</sup> Párducz 1950, 157 plate 85:10. It also functions in the literature as a belt-end fitting.

<sup>14</sup> e. g.: Rau 2010a, 210–361; Madyda-Legutko 2016.

<sup>15</sup> Ibid.

<sup>16</sup> Ilkjær 1993a 125–203; 1993b.

<sup>17</sup> Madyda-Legutko 2016.



**Fig. 2:** Belt-end fittings which end in a small spoon, and flat disc: a – type A1 (Illerup – after Ilkjær 1993b), b – type A2 (Nydam – after Rau 2010b); c – type B (Zadowice – after Madyda-Legutko 2011).

when fastening. Some are richly profiled, but simple forms also occur. Apparently, the shapes of the fittings attached to a thong belt were subject to the same fashion rules as the associated buckles. A considerable amount of attention has therefore been devoted to them when constructing typological classifications, and the ones by Kurt Raddatz<sup>18</sup> and R. Madyda-Legutko<sup>19</sup> are considered basic; but equally important are the findings dedicated to their specific forms<sup>20</sup>.

We would like to draw attention to a specific type of such metal belt ends, namely those crowned by a cup. This is usually between 10 and 20 mm in diameter (Table 1). Together with the stem, at the forked end of which the belt thong was attached, it forms a small spoon. In our opinion, it may have been used to dispense stimulants (Fig. 2) – just like the aforementioned spoons, which are not elements directly related to the construction of the belt. There are two basic designs of such spoons being the ends of the belt. Generally, the older specimens have a slender shaft, in the shape of a strongly elongated triangle on top of which is the spoon of interest (type A1 – Fig. 2a). They were attached to a relatively narrow thong by a single rivet. Younger specimens had a triangular-shaped shaft with a wide base and

were usually fixed with three rivets, suggesting a correspondingly wide thong of the belt itself (type A2 – Fig. 2b)<sup>21</sup>. We were also interested in fittings that were not crowned by a spoon, but by a circular disc, similar in diameter to those described above (type B – Fig. 2c), which may also have served to dose stimulants.

## Archaeological analysis

The belt element that drew our attention is defined in the typology of K. Raddatz is defined as type J.III. This author also recognised the two variations we have indicated, defined by him as types J.III.1 and J.III.2<sup>22</sup>. In the typology of R. Madyda-Legutko type J.III.1 was designated as type 8<sup>23</sup>. On the other hand, the specimens ending in a shield in Raddatz are shown as type J.I, and in Madyda-Legutko as type 4 within group III.

The objects of interest have been catalogued many times in the past. In addition to the lists of finds accompanying the leading typological studies indicated above, they were collated by, for example: Claus von Carnap-Bornheim<sup>24</sup>,

<sup>18</sup> Raddatz 1957.

<sup>19</sup> Madyda-Legutko 2011.

<sup>20</sup> e. g. Rau 2010a, 225–230; Iversen 2010, 114–116.

<sup>21</sup> Rau 2010a, 225–230.

<sup>22</sup> Raddatz 1957, 89 fig. 2; 99–101.

<sup>23</sup> Madyda-Legutko 2011, 66–69.

<sup>24</sup> von Carnap-Bornheim 2002.

**Tab. 1:** Characteristic of metal ends of belt type A. MVF – military votive find; BK – Bogaczewo culture; LK – Luboszyce culture; PK – Przeworsk culture; LRP – Late Roman Period

| No. | Location                 | Area/<br>Culture | Number<br>of | Object |        |   | Size [mm]   | Type |    | Material |    | Dating   |
|-----|--------------------------|------------------|--------------|--------|--------|---|-------------|------|----|----------|----|----------|
|     |                          |                  |              | MVF    | Grave  | ? |             | A1   | A2 | Cu       | Fe |          |
| 1   | Agdaorp                  | S                | 1            |        | X      |   | no data     |      | X  | ?        |    | LRP      |
| 2   | Babięta                  | PL/BK            | 1            |        | 305    |   | 66/14       | X    |    | ?        |    | C1?      |
| 3   | Barmann                  | N                | 1            |        | X      |   | no data     |      | X  | ?        |    | LRP?     |
| 4   | Baunegård                | DK               | 1            |        | 11     |   | 99/27       |      | X  | X        |    | C2       |
| 5   | Bodarp                   | S                | 1            |        | X      |   | 60/15 × 21  |      | X  | ?        |    | C2       |
| 6   | Bredal                   | DK               | ?            |        | X      |   | 37/ 0       | X    |    |          | X  | B2       |
| 7   | Brzezcie                 | PL/PK            | 1            |        | 130    |   | 54/11       | X    |    |          | X  | B2/C1    |
| 8   | Chorula                  | PL/PK            | 1            |        | 51     |   | 71/15       | X    |    |          | X  | B2/C1    |
| 9   | Chrystalnoe<br>(Wieckau) | RUS              | 2            |        | 8      |   | no data     | X    | X  | ?        | ?  | B2–C1    |
| 10  | Dalby                    | S                | 1            |        | X      |   | no data     | X    |    | ?        |    | C3       |
| 11  | Domanowice               | PL/PK            | 1            |        | 1      |   | 55/11       | X    |    |          | X  | B2/C1    |
| 12  | Dynna                    | N                | 1            |        | X      |   | no data     |      | X  | ?        |    | C2       |
| 13  | Ejsbøl                   | DK               | 11           | 1      |        |   | 42/13,5     |      | X  | X        |    | C2b      |
|     |                          |                  |              | 2      |        |   | 60/22,5     |      | X  | X        |    |          |
|     |                          |                  |              | 3      |        |   | 60/19,5     |      | X  | X        |    |          |
|     |                          |                  |              | 4      |        |   | 67,5/24     |      | X  | X        |    |          |
|     |                          |                  |              | 5      |        |   | 69/19,5     |      | X  | X        |    |          |
|     |                          |                  |              | 6      |        |   | 66/24       |      | X  | X        |    |          |
|     |                          |                  |              | 7      |        |   | 48/16,5     |      | X  | X        |    |          |
|     |                          |                  |              | 8      |        |   | 51/21       |      | X  | X        |    |          |
|     |                          |                  |              | 9      |        |   | 66/24       |      | X  | X        |    |          |
|     |                          |                  |              | 10     |        |   | 66/21       |      | X  | X        |    |          |
|     |                          |                  |              | 11     |        |   | -45         |      | X  | X        |    |          |
| 14  | Fohrde                   | D                | 2            |        | 1. 104 |   | 40/10       | X    |    |          | X  | B2       |
|     |                          |                  |              |        | 2. 251 |   | 55/ca 15    | X    |    |          | X  | B2       |
| 15  | Foss                     | N                | 1            |        | X      |   | no data     |      | X  |          | ?  | C3       |
| 16  | Gårdby Kirchspiel        | S                | 1            |        |        | X | no data     |      | X  | ?        |    | LRP      |
| 17  | Geşiki                   | PL/BK            | 1            |        | 35     |   | 103/13 x 11 | X    |    |          | X  | C2       |
| 18  | Grabice                  | PL/LK            | 1            |        | 118    |   | 60/17       | X    |    |          | X  | C1       |
| 19  | Griebieten               | RUS              | 1            |        | 155    |   | no data     | X    |    | ?        | ?  | B2/C1–C1 |
| 20  | Grimmhellern             | N                | 1            |        |        | X | no data     |      | ?  | ?        |    | LRP      |
| 21  | Håland                   | N                | 1            |        |        | X | no data     |      | ?  | ?        |    | LRP      |
| 22  | Hassle-Bösarp            | S                | 1            | X      |        |   | 44/18       |      | X  | ?        |    | C2b      |
| 23  | Havor                    | S                | 1            |        | 95     |   | no data     |      | X  | ?        |    | C1b–C2   |
| 24  | Horns                    | S                | 1            |        |        | X | no data     |      | X  | ?        |    | LRP      |

| No. | Location | Area/<br>Culture | Number<br>of | Object   |       |   | Size [mm]   | Type |    | Material |    | Dating |
|-----|----------|------------------|--------------|----------|-------|---|-------------|------|----|----------|----|--------|
|     |          |                  |              | MVF      | Grave | ? |             | A1   | A2 | Cu       | Fe |        |
| 25  | Illerup  | DK               | 60           | 1. VZQ   |       |   | 55/13,5     | X    |    | X        |    | C1b    |
|     |          |                  |              | 2. XHK   |       |   | -55,4/12,9  | X    |    | X        |    |        |
|     |          |                  |              | 3. XHS   |       |   | 52,5/11,2   | X    |    | X        |    |        |
|     |          |                  |              | 4. XPT   |       |   | 58, 33/15,6 | X    |    | X        |    |        |
|     |          |                  |              | 5. VRH   |       |   | 52/13       | X    |    | X        |    |        |
|     |          |                  |              | 6. GPG   |       |   | 50,8/10,7   | X    |    | X        |    |        |
|     |          |                  |              | 7. HFH   |       |   | 72,1/13,3   | X    |    | X        |    |        |
|     |          |                  |              | 8. MMD   |       |   | 53,7/11,4   | X    |    | X        |    |        |
|     |          |                  |              | 9. YNG   |       |   | 37,8/10     | X    |    | X        |    |        |
|     |          |                  |              | 10. SZZ  |       |   | 50,3/16     | X    |    | X        |    |        |
|     |          |                  |              | 11. AARC |       |   | 45/Ø 11,5   | X    |    | X        |    |        |
|     |          |                  |              | 12. LLS  |       |   | 57/10,8     | X    |    |          | X  |        |
|     |          |                  |              | 13. LSO  |       |   | 71,5/17,4   | X    |    |          | X  |        |
|     |          |                  |              | 14. LST  |       |   | 67,8/13,4   | X    |    |          | X  |        |
|     |          |                  |              | 15. MDL  |       |   | 60,7/13,2   | X    |    |          | X  |        |
|     |          |                  |              | 16. RSG  |       |   | 95,8/18,2   | X    |    |          | X  |        |
|     |          |                  |              | 17. SAP  |       |   | 87,1/15     | X    |    |          | X  |        |
|     |          |                  |              | 18. SCE  |       |   | 53,1/15,6   | X    |    |          | X  |        |
|     |          |                  |              | 19. RFD  |       |   | -70,3/15,1  | X    |    |          | X  |        |
|     |          |                  |              | 20. RGS  |       |   | 73/13       | X    |    |          | X  |        |
|     |          |                  |              | 21. RUU  |       |   | 46,8/15     | X    |    |          | X  |        |
|     |          |                  |              | 22. RVT  |       |   | 54,3/10     | X    |    |          | X  |        |
|     |          |                  |              | 23. VYM  |       |   | -45,9/14,3  | X    |    |          | X  |        |
|     |          |                  |              | 24. VYW  |       |   | 43,3/13,3   | X    |    |          | X  |        |
|     |          |                  |              | 25. XHZ  |       |   | 68,3/17,8   | X    |    |          | X  |        |
|     |          |                  |              | 26. XPL  |       |   | 57,4/13,3   | X    |    |          | X  |        |
|     |          |                  |              | 27. XSQ  |       |   | -47,4/11,9  | X    |    |          | X  |        |
|     |          |                  |              | 28. XSY  |       |   | 54,8/12     | X    |    |          | X  |        |
|     |          |                  |              | 29. SRP  |       |   | 66,3/15,6   | X    |    |          | X  |        |
|     |          |                  |              | 30. GZN  |       |   | 61/13,9     | X    |    |          | X  |        |
|     |          |                  |              | 31. HAQ  |       |   | 55/13,5     | X    |    |          | X  |        |
|     |          |                  |              | 32. HCD  |       |   | 99,8/15,8   | X    |    |          | X  |        |
|     |          |                  |              | 33. HCE  |       |   | 47/14,6     | X    |    |          | X  |        |
|     |          |                  |              | 34. UIB  |       |   | -40,7/11,7  | X    |    |          | X  |        |
|     |          |                  |              | 35. YFL  |       |   | 48,6/11     | X    |    |          | X  |        |
|     |          |                  |              | 36. YNK  |       |   | 72,1/11,2   | X    |    |          | X  |        |
|     |          |                  |              | 37. MWH  |       |   | 60,4/13     | X    |    |          | X  |        |

| No. | Location         | Area/<br>Culture | Number<br>of | Object      |        |   | Size [mm]  | Type |    | Material |    | Dating    |
|-----|------------------|------------------|--------------|-------------|--------|---|------------|------|----|----------|----|-----------|
|     |                  |                  |              | MVF         | Grave  | ? |            | A1   | A2 | Cu       | Fe |           |
|     |                  |                  |              | 38. MXM     |        |   | -44,8/11,2 | X    |    |          | X  |           |
|     |                  |                  |              | 39. ERG     |        |   | 61,0/14    | X    |    |          | X  |           |
|     |                  |                  |              | 40. ERZ     |        |   | 57,9/13,1  | X    |    |          | X  |           |
|     |                  |                  |              | 41. ETI     |        |   | -59/13,3   | X    |    |          | X  |           |
|     |                  |                  |              | 42. IZO     |        |   | -48,8/9,5  | X    |    |          | X  |           |
|     |                  |                  |              | 43. KAK     |        |   | 65,5/15,0  | X    |    |          | X  |           |
|     |                  |                  |              | 44. AANK    |        |   | 57,5/14,9  | X    |    |          | X  |           |
|     |                  |                  |              | 45. AAOX    |        |   | 60,3/11,8  | X    |    |          | X  |           |
|     |                  |                  |              | 46. IPK     |        |   | 55/9,6     | X    |    | X        |    |           |
|     |                  |                  |              | 47. POB     |        |   | 56,1/11,5  | X    |    | X        |    |           |
|     |                  |                  |              | 48. KBH     |        |   | 59,7/9,1   | X    |    | X        |    |           |
|     |                  |                  |              | 49. AV      |        |   | 60,8/18,7  | X    |    | X        |    |           |
|     |                  |                  |              | 50. ZPV     |        |   | 63,5/19,7  | X    |    |          | X  |           |
|     |                  |                  |              | 51. ENF     |        |   | 52,1/12    | X    |    |          | X  |           |
|     |                  |                  |              | 52. AAHC    |        |   | 63,3/14,1  | X    |    |          | X  |           |
|     |                  |                  |              | 53. AASP    |        |   | 62, 1/12,7 | X    |    |          | X  |           |
|     |                  |                  |              | 54. AATC    |        |   | -45,9/14,2 | X    |    |          | X  |           |
|     |                  |                  |              | 55. ABEL    |        |   | 86,1/14,8  | X    |    |          | X  |           |
|     |                  |                  |              | 56. ABFG    |        |   | 50,7/14,9  | X    |    |          | X  |           |
|     |                  |                  |              | 57. XHH     |        |   | 53/18 × 15 | X    |    |          |    |           |
|     |                  |                  |              | 58. KAA     |        |   | 57/19      | X    |    |          | X  |           |
| 26  | Jelling          | DK               | 1            |             | X      |   | no data    | X    |    |          | X  | B2        |
| 27  | Katajamäki       | FIN              | 1            |             |        | X | 54/24–21   | X    |    | X        |    | B2/C1–C1  |
| 28  | Kemnitz          | D                | 2            |             | 1. 40  |   | 71/?       | X    |    |          | X  | B2        |
|     |                  |                  |              |             | 2. 236 |   | 62/15      | X    |    |          | X  |           |
| 29  | Kijewo           | PL/PK            | 1            |             | 9      |   | 50/10      | X    |    |          | X  | B2b–B2/C1 |
| 30  | Kragehul         | DK               | 2            | 1. MDCCXIIa |        |   | 65/16      | X    |    | X        |    | C2b       |
|     |                  |                  |              | 2. C 2270b  |        |   | 45/11      | X    |    | X        |    |           |
| 31  | Lindau/Sorge     | D                | 1            |             | 100    |   | 71/15      | X    |    |          | X  | B2/C1–C1  |
| 32  | Lundergårdem     | DK               | 1            |             | X      |   | no data    |      | X  | ?        |    | LRP       |
| 33  | Mikulov          | CZ               | 1            |             | 2      |   | 69/10      | X    |    | ?        |    | B2/C1     |
| 34  | Møistad          | N                | 1            |             | X      |   | no data    | X    |    |          | ?  | C1b       |
| 35  | Mokra            | PL/PK            | 1            |             | 56     |   | 78/22 × 18 | X    |    |          | X  | C1a       |
| 36  | Netta            | PL/BK            | 1            |             | 85     |   | 88/17      | X    |    |          | X  | B2/C1     |
| 37  | Nordre Besseberg | N                | 1            |             | H.2    |   | no data    |      | ?  | ?        |    | LRP       |
| 38  | “Norwegen”       | N                | 1            |             |        | X | 69/24      |      | X  | ?        |    | LRP       |

| No. | Location      | Area/<br>Culture | Number<br>of | Object   |       |   | Size [mm]  | Type |    | Material |    | Dating    |
|-----|---------------|------------------|--------------|----------|-------|---|------------|------|----|----------|----|-----------|
|     |               |                  |              | MVF      | Grave | ? |            | A1   | A2 | Cu       | Fe |           |
| 39  | Nydam         | DK               | 15           | 1. 166   |       |   | 36/12      | X    |    |          | X  | C2a       |
|     |               |                  |              | 2. 167   |       |   | 73/11      | X    |    |          | X  |           |
|     |               |                  |              | 3. 168   |       |   | 75/11      | X    |    |          | X  |           |
|     |               |                  |              | 4. 169   |       |   | 80/21      | X    |    |          | X  |           |
|     |               |                  |              | 5. 170   |       |   | 85/18      | X    |    |          | X  |           |
|     |               |                  |              | 6. 171   |       |   | 82/24      | X    |    |          | X  |           |
|     |               |                  |              | 7. 172   |       |   | 70/16,5    | X    |    | X        |    |           |
|     |               |                  |              | 8. 173   |       |   | 96/33      | X    |    |          | X  |           |
|     |               |                  |              | 9. 174   |       |   | 65/21      | X    |    |          | X  |           |
|     |               |                  |              | 10. 175  |       |   | 85/15      | X    |    |          | X  |           |
|     |               |                  |              | 11. 176  |       |   | 78/22      | X    |    |          | X  |           |
|     |               |                  |              | 12. 177  |       |   | 72/27      |      | X  | X        |    | C2b       |
|     |               |                  |              | 13. 3044 |       |   | 60/15      |      | X  | X        |    |           |
|     |               |                  |              | 14. 8693 |       |   | 60/18      |      | X  | X        |    |           |
|     |               |                  |              | 15. 3791 |       |   | 51/15      |      | X  | X        |    |           |
| 40  | Öland         | S                | 1            |          |       | X | no data    |      | X  | ?        |    | LRP       |
| 41  | Petsarfve     | S                | 1            |          | X     |   | no data    |      | X  | ?        |    | LRP       |
| 42  | Rønsberg      | N                | 1            |          | X     |   | no data    |      | X  | ?        |    | C2        |
| 43  | Rosenlund     | S                | 1            |          | X     |   | no data    | X    |    |          | ?  | B2        |
| 44  | Rumma         | S                | 1            |          | X     |   | 115/40     | X    | X  | ?        |    | C2        |
| 45  | Sadzarzewice  | PL/LK            | 3            | 1. 25–32 |       |   | 78/14 × 12 | X    |    |          | X  | B2/C1–C1  |
|     |               |                  |              | 2. 67    |       |   | 62/12      | X    |    |          | X  |           |
| 46  | Ščerbinka     | RUS              | 1            |          |       | X | 97/17 × 14 | X    |    |          | X  | no data   |
| 47  | Schonen       | S                | 1            |          |       | X | no data    |      | X  | ?        |    | B2–C1a    |
| 48  | Simris        | S                | 1            |          | 10    |   | 120/34     | X    | X  |          |    | C2        |
| 49  | Skedemosse    | S                | 7            | 1        |       |   | 70/25      |      | X  | X        |    | C2        |
|     |               |                  |              | 2        |       |   | 78/24      |      | X  | X        |    |           |
|     |               |                  |              | 3        |       |   | 80/24      |      | X  | X        |    |           |
|     |               |                  |              | 4        |       |   | 63/27 × 24 |      | X  | X        |    |           |
|     |               |                  |              | 5        |       |   | 54/22 × 19 |      | X  | X        |    |           |
|     |               |                  |              | 6        |       |   | 90/26      |      | X  | X        |    |           |
|     |               |                  |              | 7        |       |   | 22/19      |      | X  | X        |    |           |
| 50  | Stadheim      | N                | 1            |          | X     |   | no data    |      | X  | X        |    | C2–C3     |
| 51  | Störlinge     | S                | 1            |          | X     |   | no data    |      | X  |          | ?  | C2        |
| 52  | Strzebnów     | PL/PK            | 1            |          |       | X | 42/ca 10   | X    |    |          | X  | B2/C1–C1a |
| 53  | Suderbarup    | D                | 1            |          | 667   |   | no data    |      | X  | X        |    | C3        |
| 54  | Szelków Stary | PL/PK            | 1            |          | 198   |   | 63/13 × 17 | X    |    |          | X  | B2/C1–C1a |

| No.   | Location       | Area/<br>Culture | Number<br>of | Object |              |    | Size [mm]     | Type |    | Material |    | Dating    |
|-------|----------------|------------------|--------------|--------|--------------|----|---------------|------|----|----------|----|-----------|
|       |                |                  |              | MVF    | Grave        | ?  |               | A1   | A2 | Cu       | Fe |           |
| 55    | Szurpiły       | PL/BK            | 1            |        | XV/A3        |    | 102/21        | X    |    |          | X  | B2/C1–C1a |
| 56    | Tarnów         | PL/PK            | 3            |        | 1. 52a /1938 |    | 66/12?        | X    |    |          | X  | B2/C1     |
|       |                |                  |              |        | 2. 1/ 1925   |    | 72/11         | X    |    | X        |    |           |
|       |                |                  |              |        | 3. 10/1925   |    | ca 30/ca 11   | X    |    | X        |    |           |
| 57    | Thorsberg      | D                | 3            | 2.     |              |    | 65/ 20 × 17   | X    |    | X        |    | C1b       |
|       |                |                  |              | 3.     |              |    | 52/20         |      | X  | X        |    |           |
|       |                |                  |              | 4.     |              |    | 60/16         | X    |    | X        |    |           |
| 58    | Tibble         | S                | 1            |        |              | X  | no data       | X    | X  |          |    | C3–D1     |
| 59    | Třebusice      | CZ               | 2            |        | 573          |    | no data       | X    |    |          | X  | B2/C1–C1  |
| 60    | Tveitante      | N                | 1            |        | H. 20        |    | no data       |      | X  | X        |    | C2        |
| 61    | Uddvide        | S                | 1            |        |              | X  | no data       |      | X  | ?        |    | LRP       |
| 62    | Uskela         | FIN              | 1            |        |              | X  | no data       |      | X  | ?        |    | LRP?      |
| 63    | Uzornoje       | RUS              | 1            |        | d            |    | no data       | X    |    |          |    | B2/C1–C1a |
| 64    | Vimose         | DK               | 2            | 1.25   |              |    | ca 30 /10     | X    |    | X        |    | C1a       |
| 65    | Vøien          | N                | 1            |        | X            |    | 72/24         |      | X  | ?        |    | C2        |
| 66    | Wymysłowo      | PL/PK            | 2            |        | 203          |    | 76/16         | X    |    |          |    | B2b       |
|       |                |                  |              |        |              |    | 100/15        | X    |    |          |    |           |
| 67    | Zadowice       | PL/PK            | 3            |        |              | X  | no data       | X    |    |          | X  | B2/C1–C1  |
| 68    | Zapowiednia    | PL/PK            | 1            |        | 2            |    | ca 68/12 × 13 | X    |    |          | X  | C1a       |
| 69    | Zgierz-Rudunki | PL/PK            | 1            |        | 3/1984       |    | 76/ca 15      | X    |    |          | X  | B2/C1     |
| Total |                |                  | 173          | 100    | 62           | 14 |               | 114  | 59 |          |    |           |

Rasmus Birch Iversen<sup>25</sup>, Andreas Rau<sup>26</sup>, Jørgen Ilkjær<sup>27</sup>; and the most up-to-date map of the range of occurrence of our type B was created by Jan Schuster<sup>28</sup>.

We have combined these lists, supplementing them with finds not included in them. We have thus established a list of discoveries in 116 localities amounting to 241 finds (list 1). The discoveries were made in a variety of contexts: there were 102 finds from eight marsh finds; 117 from 109 graves; while in 20 cases (for 21 finds) it was not possible to establish a context. There is, however, a high probability that the majority of these are grave finds. There is also an apparent rule that they accompany belts worn by men.

These are not impressive numbers. Nor has it been possible to gather complete information about all those on our list: dimensions, the raw material from which they were made and even their exact dating. However, it is important to realise that the number of finds of the type we are interested in in individual discoveries is influenced by the circumstances in which they found their way into the ground or into the aquatic environment. One may venture the thesis that there may have been an equivalent number of them in the find of the military votive deposit at Thorsberg (northern Germany) as in the similar one from Illerup. However, in the former case, the trophies collected from the battlefield ended up in a natural environment, in which iron creations were subject to rapid decomposition – only those made of non-ferrous metals survived<sup>29</sup>. In Illerup it was the

<sup>25</sup> Iversen 2010, 191.

<sup>26</sup> Rau 2010b, 14–16.

<sup>27</sup> Ilkjær 1993b, 415–416.

<sup>28</sup> Schuster 2018, 73 fig. 41.

<sup>29</sup> Lau 2014, 2.

other way around. Sediments deposited at the bottom of the tank actually preserved the iron<sup>30</sup>.

The analysis of the artefacts we collated yielded interesting results.

## Type A

We have summarised the type A finds known to us in Table I, in which we have separated the type A1 (slender) and A2 (stocky) specimens, and indicated the raw materials from which they were made. We have included dating where possible. In three cases there is an intermediate form between types A1 and A2 – we have indicated this in both boxes.

The way belts with A-type fittings were worn in the grips indicates that the thongs to which they were attached were about 50 cm long. This is how much they ‘hung’ from the belt line – specifically from the buckle through which they passed. This means that they could easily have been lifted to face height (Fig. 3). A model example is the find from skeletal grave number 10 in Simris (Sweden), where a buckled belt with the remains of a thong makes it possible to determine the exact position of all the associated fittings. The distance from the buckle of the fitting of interest with the crowning spoon is almost 50 cm<sup>31</sup>.

The manner in which the belt elements were deposited in the water deposits (here we refer to the discoveries at Nydam) also allows us to establish that they dangled quite freely from the buckle, on thongs between 25 and 42 cm long<sup>32</sup> (Fig. 3). This therefore allowed the spoon at the end of the ferrule to be manoeuvred freely – according to us – when scooping the stimulant and ingesting it. It also had a universal function, as it also made it easier to pass the end of the belt through the frame of the buckle.

The information collated in the Table 1 makes it possible to conclude that, of the 173 type A representatives, 100 were found in the contexts of war sacrificial sites, i. e. directly associated with warriors. There were 62 such finds in male graves, usually accompanied by elements of weaponry. This allows the thesis to be put forward that this utensil was a common part of a warrior’s armour, and from here it is close to concluding that pharmacological stimulation of warriors in the face of stress and exertion was the order of the day. It would seem that the almost double prevalence of older finds (type A1) over type A2 may indicate the extinc-



**Fig. 3:** Germanic warrior taking stimulants imagined by Stanislaw (Stanislaw) Kontry, especially for the *Prähistorische Zeitschrift*.

tion of the use of such stimulants in late antiquity. However, it should be borne in mind that the votive deposits became smaller and smaller, which may indicate, for example, a small scale of conflict – smaller groups fighting each other.

The scale of the actual use of such objects can be attempted to be reconstructed on the basis of data on a votive military find from the Illerup marsh. J. Ilkjær estimated that about 40 per cent of this deposit had been excavated. About 150 belts were excavated, almost half of which had spoons attached to the ends of the thongs. This archaeologist also suggested that if the site had been investigated in its entirety, 300 or perhaps even 400 belts should have been excavated from it<sup>33</sup>. This means that we could expect about 150 to 200 beltspoons, i. e. half of the barbarian army defeated near Illerup would have used stimulants. If, however, we were to accept J. Ilkjær’s other estimate that the entire invading army should have numbered about 1,000 warriors – not all of whom fell, after all<sup>34</sup> – we would get the closest thing to the truth in terms of the popularity of stimulants around the 200-something year after Chr.

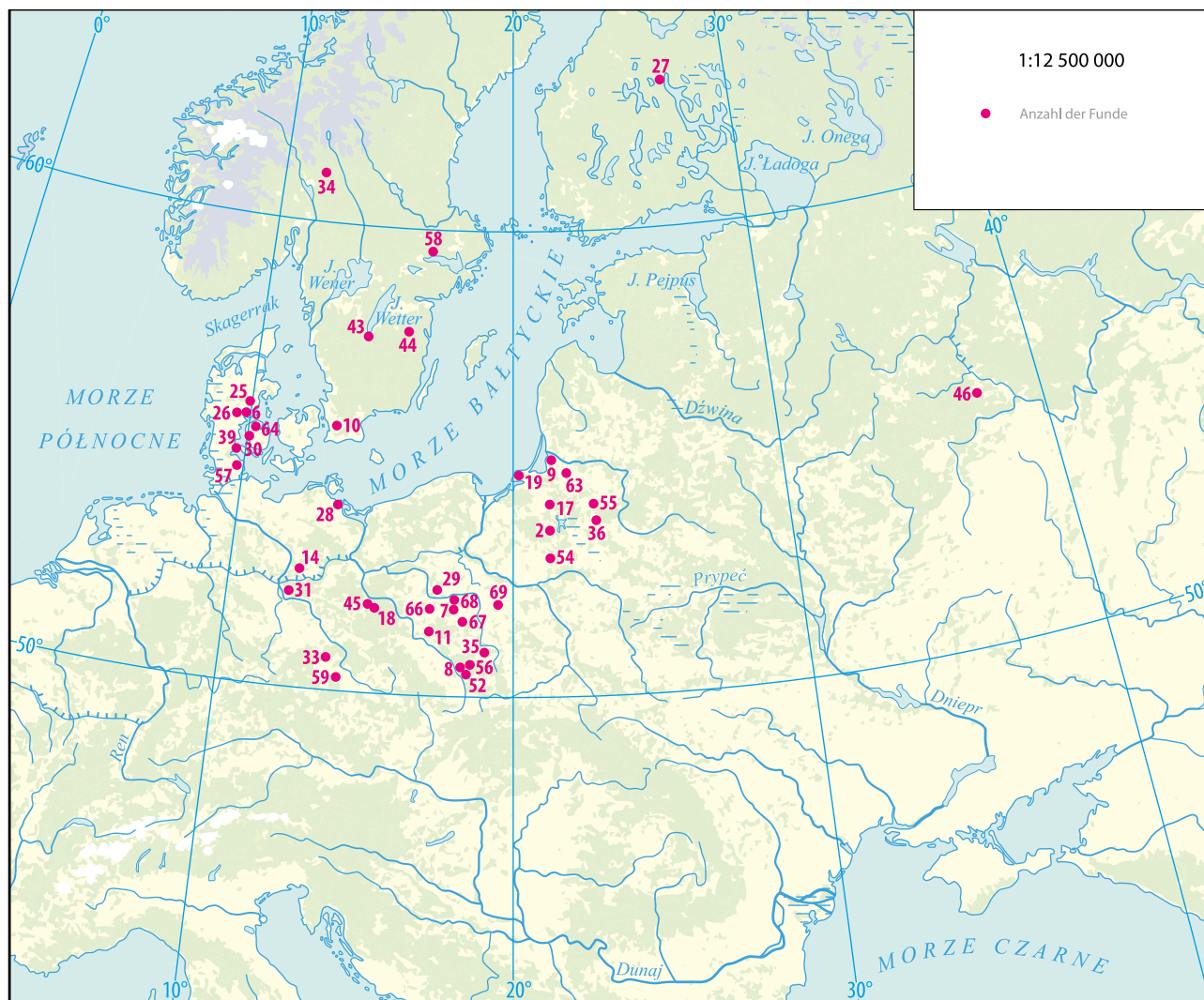
<sup>30</sup> Ilkjær 2002, 23–25.

<sup>31</sup> Stjernquist 1955, 10 fig. 3; plate III.

<sup>32</sup> Rau 2010a, 212 fig. 79 – at the top; 215 fig. 81 – at the top; 217 fig. 83 – at the top.

<sup>33</sup> Ilkjær 2002, 136–137.

<sup>34</sup> *Ibid.* 137.



**Map 1:** Distribution of metal ends of belt type A1. The numbers on the map correspond to the numbers in table 1

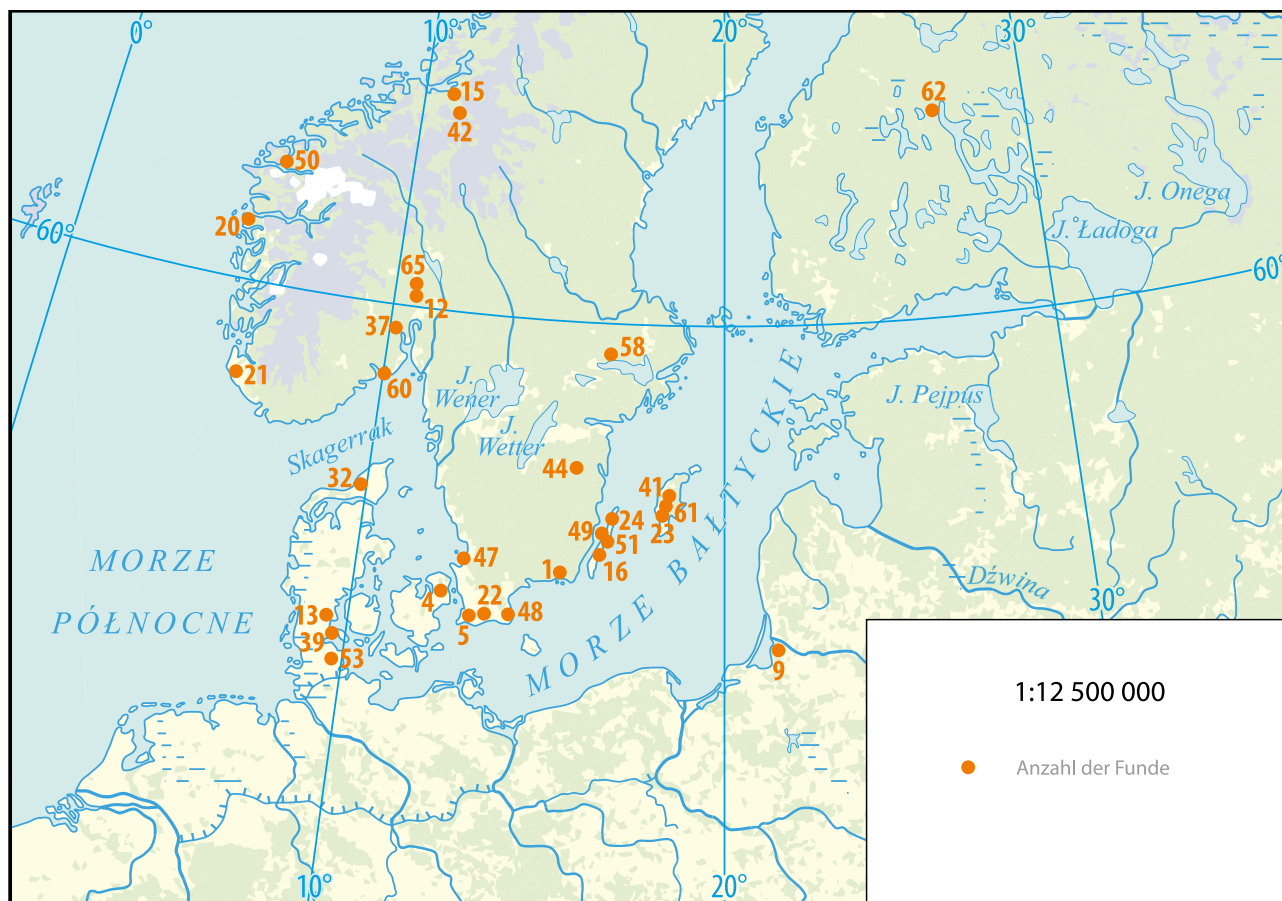
But an even more interesting estimate comes from the knowledge of almost 400 shields that were drowned in a former lake near Illerup – in a fragment examined by archaeologists<sup>35</sup>. This means that only one in three warriors wore a belt with metal fittings. Whether, then, there were proponents of stimulants among those deprived of this accessory is a purely academic and even speculative question. Nevertheless, it is in Illerup that we have the aforementioned spoon made of antler, so it cannot be ruled out that they were also made of wood ... or the stimulant was simply scooped with the fingers.

By contrast, it is interesting to note that type A1 fittings were known virtually throughout European Barbaricum (Map 1). A2-type fittings were only adopted in Scandinavia

(Map 2). However, drawing far-reaching conclusions from this fact is risky.

Equally interesting is the question of the raw materials used to make the different types. Despite the many gaps in information in this regard, we can risk the thesis that type A2 was made, with one doubtful exception relating to the Foss find – from copper alloys. Type A1, on the other hand, was predominantly made of iron (Table 1). It should be clearly emphasised that copper alloy specimens were more frequently recorded in the northern areas of Barbaricum. This is generally consistent with J. Schuster's findings, admittedly in relation to type B, that Scandinavians and Baltic coastal residents were more likely to use copper alloy wares; than those inland, who preferred iron.

<sup>35</sup> Ilkjær 2001.



**Map 2:** Distribution of metal ends of belt type A2. The numbers on the map correspond to the numbers in table 1

## Type B

In our study, we have concentrated on belt end fittings, the end of which has the obvious form of a small spoon. It should be remembered, however, that there are also belt-end fittings which end not in a small spoon, but in a round, flat disc of a similar (type B) or slightly larger diameter as the type A teaspoons we are interested in. R. Madyda-Legutko separated these fittings as type 4 within group III, and collated discoveries from 45 localities<sup>36</sup>. We have collated information on 61 such finds in Table 2. The absolute majority of these were found on the continent. At the same time, the small number of these finds, compared to type A, in our opinion does not indicate the extent of use. It merely reflects the state of our knowledge implied by funerary customs and different cultural conditions on the continent (Map 3). The small number of these may have two reasons. Firstly, we have no votive sacrificial sites here in which the

spoils collected from the battlefield were deposited. The few, such as the deposit from Lake Żarnowieckie<sup>37</sup>, or from Lake Wólka (Wolka-See) in Masuria<sup>38</sup> have provided so few items that even statistically they do not reflect the value of Scandinavian deposits. Secondly, we do not know the rules that accompanied the customs of depositing objects in the grave. The people of the Cambrian culture, generally Goths, did not put armaments in their graves<sup>39</sup>; they also avoided putting objects made of iron<sup>40</sup>. This may be the reason for the small number of objects of interest in the area they occupied. The people of the Przeworsk culture buried their dead warriors with armaments, which in turn explains the greater number of finds in the territory they occupied. It is also interesting to note that the vast majority of finds of this type were made of iron. Those made of other metals are limited to a pair of silver gilt fittings

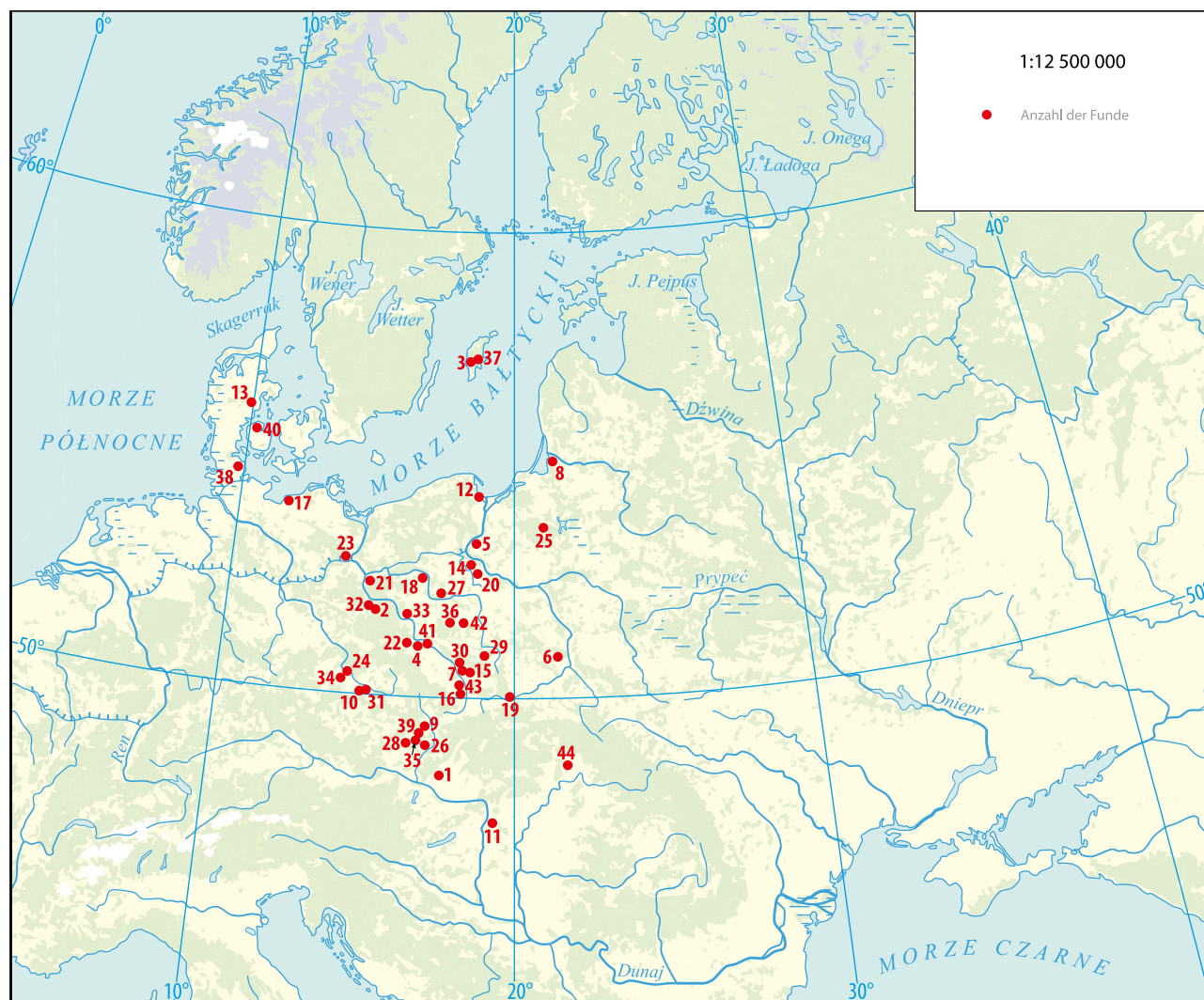
<sup>37</sup> Kontny 2008.

<sup>38</sup> Raddatz 1993.

<sup>39</sup> Kokowski 1994; Kontny 2019, 69–113.

<sup>40</sup> Gładysz 1997; Woińska 2018, 5–6 table I.

<sup>36</sup> Madyda-Legutko 2011, 137–139, 232–235 plate XII: 6–10 – XV: 1–6.



**Map 3:** Distribution of metal ends of belt type B. The numbers on the map correspond to the numbers in table 2

from a 'royal' tomb from Mušov; two copper alloy finds discovered in Gothic cemeteries in Gdańsk-Oliwa and Kowalewko; a tomb from Dunaharaszti; probably Körchow; and two finds from swamp sacrificial sites in Vimose and Thorsberg (Table 2).

## Stimulants

The question that needs to be asked, then, is what stimulants were available to the Germanic communities of interest. Several natural sources of biologically active substances can be identified, which affect the human body in very different ways. In our opinion, the plants or fungi we have listed below could, with a high degree of probability, have been of interest to the Germans of the Roman period. These

include plants such as the poppy, hops, hemp, species of the *Solanaceae* family (henbane and belladonna) and selected fungi from the genera *Amanita*, *Clitocybe*, *Claviceps* or *Psilocybe*. We will therefore analyse their ranges of occurrence (availability), as well as their levels of expected effectiveness in stimulating the organism (Table 3).

### Opium poppy (*Papaver somniferum* L., family *Papaveraceae*, poppy)

Nowadays it is a cultivated plant, sometimes wild, which is the raw material for the kidney-shaped seeds contained in the pouch-shaped fruit. A characteristic feature of this plant is the presence of secretory tissues in the form of branched, multicellular milky tubes that collect their products inside

**Tab. 2:** Characteristic of metal ends of belt type B. MVF – military votive find; BK – Bogaczewo culture; LK – Luboszyce culture; PK – Przeworsk culture; WK – Wielbark culture

| No. | Location              | Area/<br>Culture | Number<br>of | Object   |       |   | Size [mm]   | Material |    |    | Dating    |
|-----|-----------------------|------------------|--------------|----------|-------|---|-------------|----------|----|----|-----------|
|     |                       |                  |              | MVF      | Grave | ? |             | Ag/Au    | Cu | Fe |           |
| 1   | Abrahám               | SLK              | 1            |          | 189   |   | 89/18       |          |    | X  | B2        |
| 2   | Biecz                 | PL/LK            | 1            |          | 8     |   | 58/13 × 11  |          |    | X  | B2–C1     |
| 3   | Bjärs                 | S                | 1            |          | 35    |   | 66/14 × 16  |          |    | ?  | RP        |
| 4   | Brodno                | PL/PK            | 1            |          | X     |   | 54/12       |          |    | X? | C1b       |
| 5   | Chełmno               | PL/PK?           | 1            |          | 132   |   | 84/16       |          |    | X  | OR        |
| 6   | Chmielów Piskowy      | PL/PK            | 1            |          | 18N   |   | 60/16       |          |    | X  | C1a       |
| 7   | Chorula               | PL/PK            | 1            |          | 103   |   | 68/17       |          |    | X  | B2        |
|     |                       |                  | 1            |          | 116   |   | 80/13       |          |    | X  | C1a       |
|     |                       |                  | 1            |          | 155   |   | 60/18       |          |    | X  | C1        |
|     |                       |                  | 1            |          | 169   |   | 71/16       |          |    | X  | C1a       |
|     |                       |                  | 1            |          |       | X | 19/13       |          |    | X  | OR        |
| 8   | Chrystalnoe (Wieckau) | RUS/BK           | 2            |          | 8     |   | no data     |          |    |    | B2–C1     |
| 9   | Chválkovice           | CZ               | 1            |          | X     |   | no data     |          |    | Fe | B2        |
| 10  | Dobřichov-Pičhora     | CZ               | 1            |          | 145   |   | 67/18       |          |    | X  | B2/C1     |
| 11  | Dunaharaszti          | HU               | 1            |          | 21    |   | 37/15       |          | X  |    | 4. BC     |
| 12  | Gdańsk-Oliwa          | PL/WK            | 1            |          | 1     |   | 68/16       |          | X  |    | B2b       |
| 13  | Illerup               | DK               | 2            | 59. XHI  |       |   | 54/22 × 13  |          |    | X  | C1b       |
|     |                       |                  |              | 60. AAUG |       |   | 50/25 × 20  |          |    | X  |           |
| 14  | Inowrocław-Szymborze  | PL/PK            | 1            |          | 28    |   | 96/18       |          |    | X  | OR        |
| 15  | Kalinów               | PL/PK            | 1            |          | 9     |   | 115/20 × 14 |          |    | X  | B2–C1     |
| 16  | Kietrz                | PL/PK            | 1            |          | 630   |   | 93 × 19     |          |    | X  | B2        |
| 17  | Körchow               | D                | 1            |          | 413   |   | 52/18       |          | ?  |    | B2b       |
| 18  | Kowalewko             | PL/WK            | 1            |          | 215   |   | 46 /14      |          | X  |    | B2/C1     |
| 19  | Kryspinów             | PL/PK            | 1            |          | 10    |   | 80/14       |          |    | X  | B2b       |
| 20  | Lachmirowice          | PL/PK            | 1            |          | 36    |   | 65/10       |          |    | X  | B2        |
| 21  | Laski Lubuskie        | PL/LK            | 1            |          |       |   | no data     |          |    | X  | B2/C1–C1a |
| 22  | Legnica               | PL/PK            | 1            |          | X     |   | no data     |          |    | X  | B2/C1–C1a |
| 23  | Lunow                 | D                | 2            |          | 1. 3  |   | 94/20       |          |    | X  | C1        |
|     |                       |                  |              |          | 2. 5  |   | no data     |          |    | X  | B2–C1     |
| 24  | Lužec                 | CZ               | 6            |          | 22b   |   | 73/15       |          |    | X  | C1        |
|     |                       |                  |              |          | a. 76 |   | 70 × 14     |          |    | X  | B2b       |
|     |                       |                  |              |          | b. 76 |   | 45 × 13     |          |    | X  | B2b       |
|     |                       |                  |              |          | 80    |   | 73 × 20     |          |    | X  | B2–C1     |
|     |                       |                  |              |          | 88    |   | 63 × 19     |          |    | X  | B2?       |
|     |                       |                  |              |          | 98    |   | 67 × 16     |          |    | X  | B2b       |

| No. | Location         | Area/<br>Culture | Number<br>of | Object |       |   | Size [mm]  | Material |    |    | Dating |
|-----|------------------|------------------|--------------|--------|-------|---|------------|----------|----|----|--------|
|     |                  |                  |              | MVF    | Grave | ? |            | Ag/Au    | Cu | Fe |        |
| 25  | Miętkie          | PL/BK            | 1            |        | 122   |   | 81/16      |          |    | X  | B2/C1  |
| 26  | Mikulčice        | CZ               | 1            |        |       | X | 35/10      |          |    | X  | B2?    |
| 27  | Młodzikowo       | PL/PK            | 2            |        |       | 1 | 48/10      |          |    | X  | RP     |
|     |                  |                  |              |        |       | 2 | 58/16      |          |    | X  | RP     |
| 28  | Mušov            | CZ               | 2            |        | 1     |   | 103/20     | X        |    |    | B2b    |
|     |                  |                  |              |        | 2     |   | 103/20     |          |    |    |        |
| 29  | Opatów           | PL/PK            | 1            |        | 854   |   | 74/15      |          |    | X  | C1a    |
| 30  | Opole Groszowice | PL/PK            | 1            |        |       | X | 65/12 × 14 |          |    | X  | OR     |
| 31  | Pňov             | CZ               | 1            |        | 47    |   | 94/14      |          |    | X  | B2–C1  |
| 32  | Sadzarszewice    | PL/LK            | 1            |        | 3. 24 |   | 78/15      |          |    | X  | C2     |
| 33  | Serby            | PL/PK            | 1            |        | 2     |   | no data    |          |    | X  | B2b    |
| 34  | Stehelčevs       | CZ               | 2            |        |       | 1 | 60/18      |          |    | X  | RP     |
|     |                  |                  |              |        |       | 2 | 65/18      |          |    | X  | RP     |
| 35  | Šitbořice        | CZ               | 1            |        | 2     |   | 92/15      |          |    | X  | B2b    |
| 36  | Sulmierzyce      | PL/PK            | 1            |        |       | X | 78/17      |          |    | X  | RP     |
| 37  | Tänglings        | S                | 1            |        | 18    |   | 72/12      |          |    | ?  | C1     |
| 38  | Thorsberg        | D                | 1            |        | 463   |   | 40/8       |          | X  |    | C1b    |
| 39  | Velatice         | CZ               | 1            |        |       | 1 | 64/15      |          |    | X  | B2b    |
| 40  | Vimose           | DK               | 1            | 2.     | 26    |   | ca 24/6    |          | X  |    | C1a    |
| 41  | Wrocław-Popowice | PL/PK            | 1            |        | X     |   | c. 100/14  |          |    | X  | B2b    |
| 42  | Zadowice         | PL/PK            | 3            |        | X     |   | 93/18 × 13 |          |    | X  | B2–C1  |
|     |                  |                  |              |        | 226   |   | 55/18      |          |    | X  |        |
| 43  | Zakrzów          | PL/PK            | 1            |        | 18    |   | 81/19      |          |    | X  | B2–C1  |
| 44  | Zemplín          | SK               | 1            |        | 3     |   | 68/10      |          |    | X  | B2     |

the cells. In *P. somniferum* this is the opium, a concentrated milky sap/latex extracted after incision of the immature seed sacs/capsules<sup>41</sup>. Archaeological evidence suggests that the poppy probably appeared somewhere between the western Mediterranean and Asia and Asia Minor. It was earliest cultivated in Sumerian Mesopotamia (late 3<sup>rd</sup> century BC) both as food and as a medicinal raw material<sup>42</sup>. The earliest written reference to the medicinal use of the poppy is an Assyrian herbal text dating from around 3000 BC<sup>43</sup>. It was also used by the ancient Egyptians for its medicinal and narcotic effects<sup>44</sup>. The physical properties of the milky juice/

latex (it sets in the air) preclude taking opium by drinking it directly, so it was used for inhalation<sup>45</sup>. It is the ancient Greeks who are credited with developing the technique of extracting the alkaloid-rich milk juice to obtain opium, while the spread of this knowledge came as a result of the expansion of the Arab empire<sup>46</sup>. By around 1000 BC, the cultivation of poppies for medicinal as well as food purposes was widespread throughout Europe and Asia<sup>47</sup>. Ancient representations of the poppy in works of art include depictions of it with symbols of spiritual and religious power and ritual<sup>48</sup>, and writings from various ancient cultures indicate

<sup>41</sup> Ożarowski 1983; Podbielkowski 1992.

<sup>42</sup> Gabra 1956; Schultes/Hofman 1979; Beyer/Drummer/Maurer, 2009.

<sup>43</sup> Grey-Wilson 1993; Rudgley 1995; Lack 2016; Petrovska 2012.

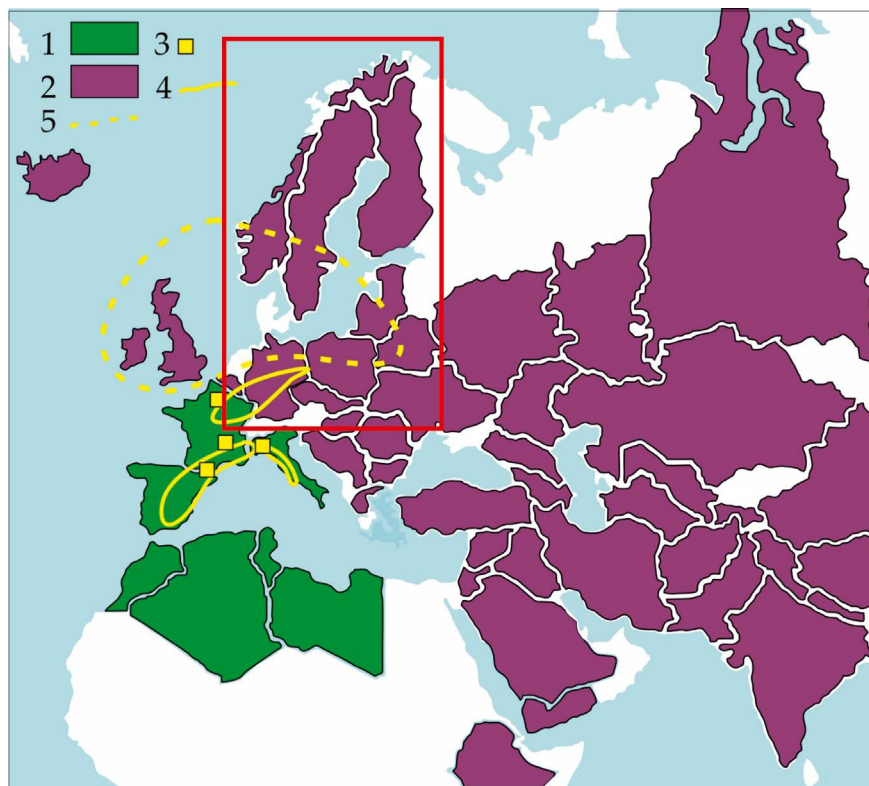
<sup>44</sup> Grey-Wilson 1993.

<sup>45</sup> Rudgley 1995.

<sup>46</sup> Chouvy 2009; Grey-Wilson 1993.

<sup>47</sup> Canton-Alvarez 2019; Grey-Wilson 1993.

<sup>48</sup> Julyan/Dirksen 2011; Lack 2016.



**Map 4:** Distribution of opium poppy, *Papaver somniferum* L. 1 – primary, natural range; 2 – secondary range, including introduction of the species according to <https://powo.science.kew.org/taxon/>, modified; 3 – selected historical sites of poppy seeds; 4 – earliest sites where poppy seeds were found 5300 BC; 5 – second stage of the spread of useful plants including poppy seeds c. 4000 BC, according to Salavert *et al.* 2018, modified. The red outline marks the area of our interest.

that the benefits as well as the dangers of poppy use were well known<sup>49</sup>.

It is assumed that the poppy of Troy, in its wild state unknown, was originally cultivated in the Mediterranean basin from the mid-sixth millennium BC, and its range expanded with settlement and cultivation (Map 4)<sup>50</sup>. In the same region, SW Europe (Portugal, Spain, France, Italy, Greece) and North Africa its presumed wild ancestor, the *Papaver somniferum* subsp. or ssp. *setigerum* bristle poppy, occurred<sup>51</sup>. This plant is closely related and sometimes treated as a subspecies of the opium poppy (*P. somniferum*). It actually produces a very small amount of morphine alkaloids. However, *P. somniferum* is diploid ( $n=11$ ) and *P. setigerum* is tetraploid ( $n=22$ ) with twice the number of chromosomes. Thus, it cannot be considered a wild ancestor of the opium poppy.

So far, however, the most frequent recordings of *P. somniferum* outside the Mediterranean area, come from sites of the Shoemaker pottery culture (ca 3100/2900 – ca 2300/1800 BC), it followed a dispersal pattern from south to north (Map 4)<sup>52</sup>. The opium poppy occurs in the Alpine region at

the beginning of the fifth millennium BC<sup>53</sup>. This distribution raises questions about the diffusion process and the status of the plant.

Opium contains a mixture of about 40 alkaloids in amounts up to 25%. The most important of these are morphine and codeine (phenanthrene derivatives) and papaverine and narcotine (benzylisoquinoline derivatives). The pharmacological action of opium is the sum of the action of the individual alkaloids, mainly morphine, codeine and papaverine – therefore opium is a potent but narcotic analgesic, diastolic and antitussive<sup>54</sup>. We believe that the properties of the poppy may have been known to and used by the Germans.

### Hemp family (*Cannabaceae*)

The hemp family (*Cannabaceae*) is a source of valuable and long-used raw materials. It is represented in the flora of the area of interest by two species: hops, *Humulus lupulus* L., and hemp seed, *Cannabis sativa* L.

<sup>49</sup> Beyer/Drummer/Maurer 2009; Lack 2016.

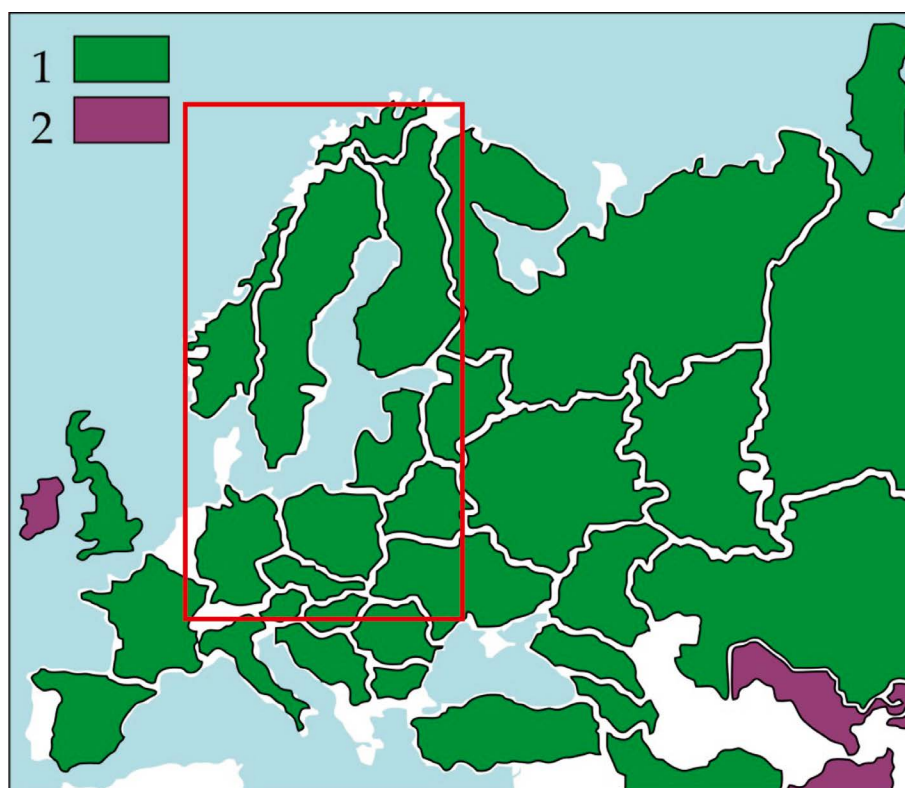
<sup>50</sup> Chouvy 2009.

<sup>51</sup> Hammer/Fritsch 1979; Schultze-Motel 1979.

<sup>52</sup> Bakels 1996; Salavert 2011.

<sup>53</sup> Martin 2015.

<sup>54</sup> Barceloux 2008.



**Map 5:** Distribution of hops, *Humulus lupulus* L. 1 – primary, natural range; 2 – secondary range, including introduction of the species according to <https://powo.science.kew.org/taxon/>, modified. The red outline marks the area of our interest.

## Hops (*Humulus*)

The origin of hops is uncertain, but the presence of three species in the genus *Humulus* (*H. lupulus*, *H. yunnanensis* and *H. japonicus*) suggests that hops originated in China, from where they spread westward into Europe and North America<sup>55</sup>. Hops is a dioecious climber with 3–5 lobed leaves. The raw material is provided by the female flowers, gathered in spike-shaped cone-like inflorescences, which become fruiting bodies when ripe. They are covered with glandular hairs that secrete lupulin/lupulone containing up to 6% essential oil (the main constituents are humulone, xanthohumol, myrcene) and resins and waxes, up to 50% and 25% respectively<sup>56</sup>. In its natural range, the species is widely distributed in Europe, northern and eastern Russia, Transcaucasia, the European part of Turkey and Morocco (Map 5). Hop pollen has been discovered at archaeological sites dating back to 3000 BC, and it is also known that hops have been used as a foodstuff since ancient Egyptian times<sup>57</sup>.

In Roman times, hops gained importance due to its use in the treatment of liver disease, digestive disorders and as a blood purifier. When the Romans occupied Britain,

they began to treat hops as a raw material for obtaining infusions and, by adding it to the fermentation of cereals, it became a key ingredient in the preparation of beer<sup>58</sup>. The latter beverage was thought to have been common among the Germans, made mainly from barley (*Hordeum vulgare*), common wheat (*Triticum aestivum*), common millet (*Panicum miliaceum*) and oats (*Avena sativa*). There is no indication that hops were added to beer in the times of interest<sup>59</sup>. No less, as a common plant, it may have been known for all the qualities mentioned above.

## Hemp (*Cannabis* L.)

This genus botanically includes a single species *Cannabis sativa* L., which groups several subspecies or varieties, including *C. sativa* ssp. *sativa*, *C. sativa* ssp. *indica*, *C. sativa* ssp. *ruderalis* and *C. sativa* ssp. *afghanica*<sup>60</sup>. The morphological similarity of plant remains and pollen poses many difficulties in interpreting the archaeological remains of this species<sup>61</sup>. *C. sativa* L. is an annual, dioecious plant reaching

<sup>55</sup> Zanolli/Zavatti 2008.

<sup>56</sup> Podbielkowski 1983; Ożarowski 1983.

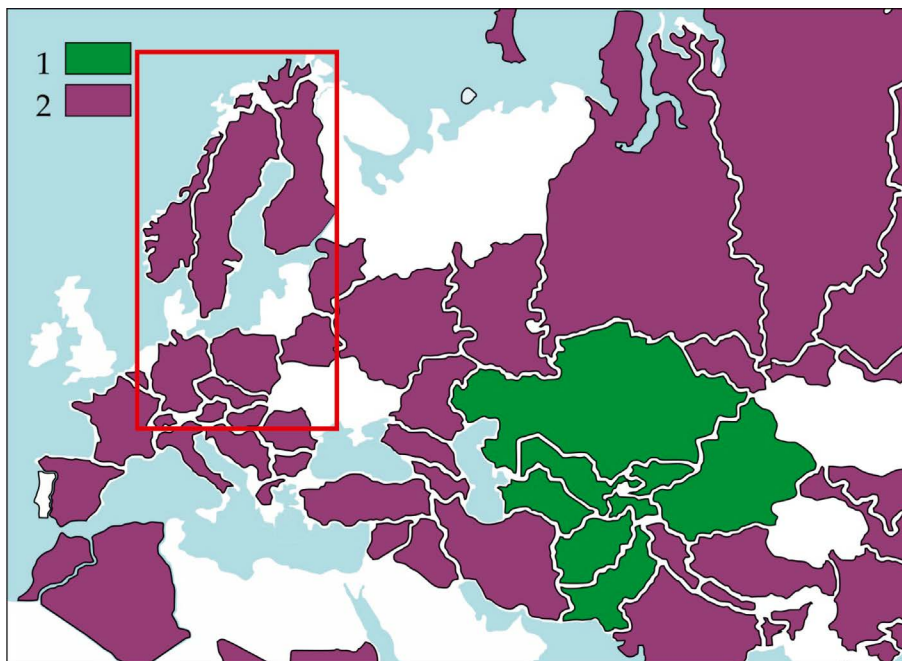
<sup>57</sup> Moir 2000.

<sup>58</sup> Nelson 2005; Zanolli/Zavatti 2008.

<sup>59</sup> Rodzińska-Nowak 2018, in particular the page 582.

<sup>60</sup> McPartland 2018; McPartland/Small 2020.

<sup>61</sup> Samorini 2019.



**Map 6:** Distribution of hemp seed, *Cannabis sativa* L. 1 – primary range, natural; 2 – secondary range, including introduction of the species according to <https://powo.science.kew.org/taxon/>, modified. The red outline marks the area of our interest.

1.5–1.8 m in height with characteristic 3–7 incisive, palmate leaves, the ovule is an angular nut<sup>62</sup>. A species native to central Asia (Map 6). *C. sativa* L. is one of the plants that have been used by mankind since ancient times, and many historians have reported that it was a useful plant used in various ways, such as as a source of fibre and oil obtained from the nuts (they contain 25–40% oil). *Cannabis sativa* ssp. *indica* Lam is particularly rich in biologically active compounds. The raw material rich in oleoresins is the apical parts of the female inflorescences bearing glands, from which hashish and its derivatives are produced. In addition, many ethnobotanical studies have highlighted the therapeutic use of cannabis in the treatment of chronic pain, depression and inflammation<sup>63</sup>. In Eastern Europe, the practice of cannabis smoking has played a significant role in burials since at least the third millennium B. C. In many barrows, ceramic vessels that were traditionally interpreted as incense sticks have been found deposited there among grave goods<sup>64</sup>. Charred hemp seeds have been identified in some of these, such as at Gurbanești, near Bucharest, Romania, and in an Early Bronze Age tomb from the northern Caucasus<sup>65</sup>. The pottery was decorated with imprints of cords made from twisted hemp fibres, indicating the importance of the plant<sup>66</sup>. Remains suggestive of a

narcotic infusion have been detected in some Bronze Age barrows in Russia, or in the north-west Caspian steppe in finds dating to the Catacomb culture (c. 2500–2000 BC). This interpretation is based on the abundance of hemp phytoliths, sometimes mixed with the psychotropic wormwood (*Artemisia campestris* L.), in some vessels deposited in barrows<sup>67</sup>. Given these properties, we cannot omit this plant from our considerations.

### Representatives of Solanaceae (nightshades) family

Another group of plants traditionally (and still) used as drugs with hallucinogenic effects throughout the world are representatives of the nightshades family, *Solanaceae*<sup>68</sup>. Certainly species such as as thorn apple, (*Datura stramonium* L.), henbane (*Hyoscyamus niger* L.) and belladonna (*Atropa belladonna* L.) should be mentioned here.

**Thorn apple or devil's trumpet (*Datura stramonium* L.)** is an annual species with a spindle-shaped root, an erect stem growing to 100 cm, large leaves (up to 20 cm) and tubular, single flowers. The fruit is an egg-shaped, spiny pouch containing dark, flat seeds. A widespread plant today, with a range extending from Europe to the Caucasus, Asia, Africa and the Americas. It occurs in ruderal habitats and

<sup>62</sup> Podbielkowski 1983.

<sup>63</sup> Clarke/Merlin 2016.

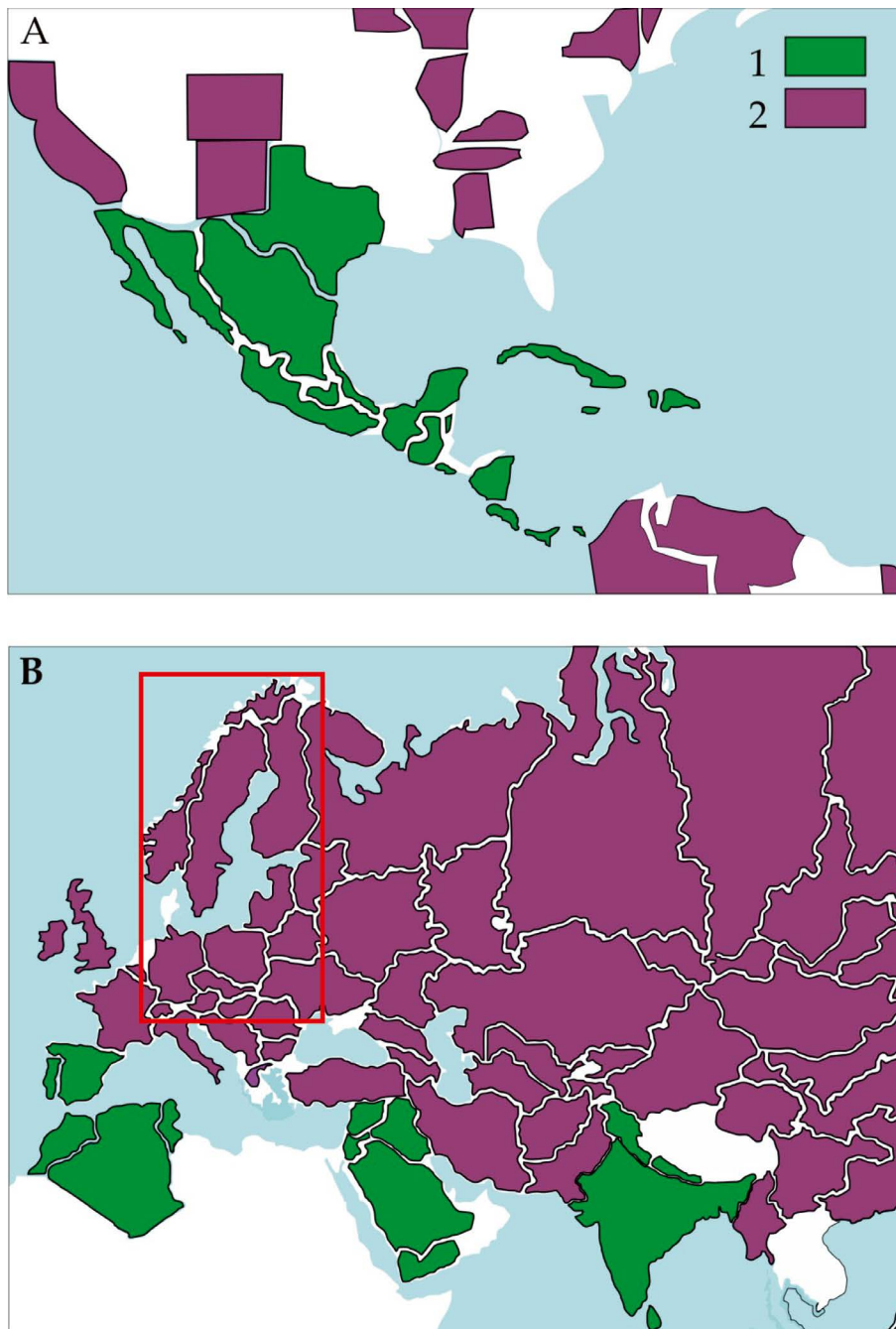
<sup>64</sup> Guerra Doce 2015.

<sup>65</sup> Ecsedy 1979.

<sup>66</sup> Sherratt 1987.

<sup>67</sup> Shishlina *et al.* 2007.

<sup>68</sup> Ott 1993; Ożarowski 1983.



**Map 7:** Distribution of the thorn apple or devil's trumpet *Datura stramonium* L. A – map of occurrence in the New World after Symon/Hegi (1991); B – map incorporating the disjunctive distribution theory of the species according to Satin/Avery (1959); 1 – primary range, natural; 2 – secondary range, including introduction of the species according to <https://powo.science.kew.org/taxon/>, modified. The red outline marks the area of our interest.

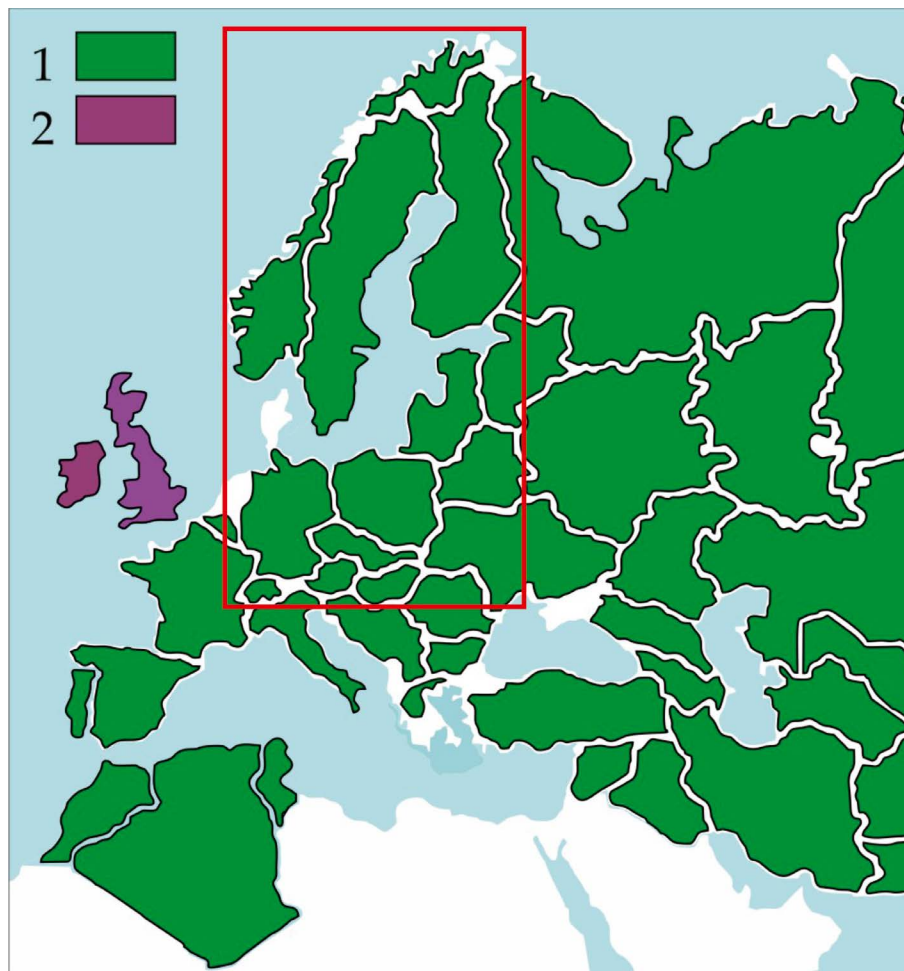
is quite common. The origin is not fully documented; in Poland, for example, it has the status of an alien established species that appeared in the flora in the mid-15<sup>th</sup> century from North America<sup>69</sup>. Other sources cite South and Central Asia as the homeland of devil's trumpet. The first more widely known view based on taxonomy and evolution in the work of Symon and Hagi<sup>70</sup>, explicitly rejects the pre-Co-

lumbian occurrence of representatives of this genus in the Old World. An alternative to this is the disjunction of *Datura* and its occurrence in both America and Asia<sup>71</sup>. This has a historical and cultural basis that is well documented. Evidence of the occurrence of representatives of this genus in Central Asia and the Iberian Peninsula dates to between the 4<sup>th</sup> and 12<sup>th</sup> centuries BC (Map 7). Among these are: numerous descriptions in Arabic and Sanskrit of the morphologi-

<sup>69</sup> Tokarska-Guzik *et al.* 2012.

<sup>70</sup> Symon/Hagi 1991.

<sup>71</sup> Satina/Avery 1959.



**Map 8:** Distribution of henbane, *Hyoscyamus niger* L. 1 – primary range, natural; 2 – secondary range, including introduction of the species according to <https://powo.science.kew.org/taxon/>, modified. The red outline marks the area of our interest.

cal structure (habit and size, leaf shape, flower colour and structure, spiky fruit) and consistent descriptions of the effects on the human body depending on the dose used: intoxicating, sedative and ultimately fatal<sup>72</sup>.

The thorn apple was associated with European witchcraft in medieval and early modern times<sup>73</sup>. Archaeobotanical remains of hallucinogenic ‘nightshade’ plants (including *D. stramonium*, often thought to have originated in the New World) have been recorded in prehistoric Europe<sup>74</sup> and there is direct evidence for their use as drugs. These include: the detection of the alkaloid hyoscyamine and traces suggestive of barley beer in a beaker from a burial cave at Calvari d’Amposta, Tarragona, Spain, dating to the third millennium BC, has been interpreted as a ‘hallucinogenic beer’ that was consumed during funerary ceremonies<sup>75</sup>. Similar remains were found in a vessel deposited in a Vaccean

tomb, from the second century BC, in the Las Ruedas cemetery, Valladolid, corresponding to an adult male<sup>76</sup>.

Despite the tenuous basis of reference for the presence of this plant in the territories inhabited by the Germans in the first centuries after Christ, we cannot exclude the possibility that the properties of sapwood were known to them.

**Henbane (*Hyoscyamus niger* L.)** is an annual or biennial plant, native to ruderal and nitrophilous habitats, occurring to lower montane elevations in Europe, Asia, India and northern Africa (Map 8). It reaches a height of up to 90 cm and the characteristic features of this species are the dirty yellow flowers with purple veins and the fruit in the form of a multi-seeded pouch. The herbal raw material is the leaves. As a medicinal plant, loosestrife was known in ancient times – in Egypt, Babylon, India, Persia, Arabia, Greece and Rome. The prevalence of this plant in the landscape inhabited by the Germans suggests that they were aware of its properties.

<sup>72</sup> Geeta/Gharaibeh 2007.

<sup>73</sup> Harner 1973.

<sup>74</sup> Guerra Doce 2006.

<sup>75</sup> Fábregas 2001.

<sup>76</sup> Sanz/Velasco 2003.



**Map 9:** Distributions of wolfsbane, belladonna, or deadly nightshade *Atropa belladonna* L. 1 – primary range, natural; 2 – secondary range, including introduction of the species according to <https://powo.science.kew.org/taxon/>, modified. The red outline marks the area of our interest.

**The belladonna or deadly nightshade (*Atropa belladonna* L.)** is a plant whose Latin name *Atropa* derives from the name of one of the three Greek goddesses of destiny. Atropos was the one who cut the thread of life. Nettle is a perennial plant found wild in European forests, its range is related to that of the fir tree. It is mainly found in northern Africa, in Asia up to the Caucasus and in Iran (Map 9). In Poland, it is under partial low protection and listed on the Polish Red List in the NT category (near threatened species). It grows up to 2 m and has large, egg-shaped or elliptical leaves, bell-shaped flowers (up to 5 cm long) and a fruit in the form of a dark, shiny berry. The bioactive active substances are found in the leaves and root of belladonna. *A. belladonna* has already been written about by Theophrastus and Dioscorides. The use of the deadly fruits of the belladonna or deadly nightshade as a poison was known in ancient Rome, as evidenced by the rumour that the Roman empress Livia Drusilla used the juice of the berries of *A. belladonna* to assassinate her husband, Emperor Augustus<sup>77</sup>.

In this case, the plant should at least have been known to Germanic communities on the continent. The Scandinavian inhabitants may have had indirect access to it.

All the plants listed contain tropane alkaloids, which are a group of derivatives formed from the condensation of a pyrrolidine ring and piperidine. These include hyoscyne, atropine, scopolamine and beladonine, which differ mainly in their potency and toxicity<sup>78</sup>. They are usually found in mixtures, e. g. the roots and leaves of deadly nightshade (*A. belladonna* L.) contain 0.3 to 1.4 % of tropane alkaloids, which are a mixture of hyoscyne and its racemic derivative atropine, as well as scopolamine, beladonine and others. The main substances are hyoscyamine and atropine, which is usually formed during the drying of parts of the plant<sup>79</sup>. These tropane alkaloids are parasympatholytics, i. e. substances that paralyse the parasympathetic nervous system. Their action manifests itself in several directions, the most important being the inhibition of sweat, mucus and gastric

<sup>77</sup> Emsley 2008.

<sup>78</sup> Fatur/Kreft 2020.

<sup>79</sup> Vezikov/Simpson 2023.

juice secretion, as well as dilation of the pupil of the eye. By stimulating the vagus nerve endings, they cause an acceleration of heart rate and a reduction in intestinal smooth muscle tone. In higher doses, they act on the central nervous system and cause psychomotor agitation at first and then fatigue, accelerated breathing, disorientation, anxiety and even realistic visual and auditory hallucinations<sup>80</sup>.

## Fungi (mushrooms)

Fungi, mainly the macrofungal (Basidiomycota and Ascomycota) or fungal spores, are also a source of biologically active substances that have a strong effect on the human body.

Of particular interest is ergot (*Secale cornutum*), the spore form of the fungus *Claviceps purpurea* (FR.) Tull. which attacks around 400 species of plants in the panicle family (*Poaceae*), causing a disease known as ergot of cereals and grasses. The ergot fungus, *Claviceps purpurea* (Fr.) Tul. is widely distributed in temperate climates. It has the status of a lower fungus parasitic on many wild grasses, e. g. ryegrass (*Lolium* L.), barley (*Hordeum* L.), which, through selection, became crops and became the staple diet: rye (*Secale* L.), wheat (*Triticum* L.), rice (*Oryza* L.), maize (*Zea* L.), millet (*Panicum* L.) and oats (*Avena* L.). The spores of the fungus *C. purpurea* are sclerotia (so-called ergot). The harvesting and cultivation of cereals, from about 10 000 BC onwards, was undoubtedly accompanied by contact with their fungal parasites including ergot<sup>81</sup>. Much direct evidence of the presence of ergot in historic communities has been collected. These include traces of fatty acids, determined by modern profiling methods, in pottery found in Sardinia, Calabria and Sicily dating respectively to the Late Neolithic (3970–3340 BC), Middle and Late Hellenistic periods 1950–1100 BC.<sup>82</sup> Other direct historical evidence for the use of ergot comes from Spain (site of Mas Castellar, Girona – dated ca. 300 BC), where traces of it were found in a vessel along with the remains of beer and yeast, as well as in a tartar in the jaw of a 25-year-old man, providing evidence of their chewing<sup>83</sup>. A similar example is the ‘Grauballe Man’, an Iron Age body found in a bog in Denmark, dating to around 400–200 BC. Analysis of his intestines revealed the presence of numerous ergot spores. This fungus with hallucinogenic properties should be better understood as a contamination of rye, which was one of the ingredients of this man’s last

meal<sup>84</sup>. The presence of the ergot fungus and its spores has also been found at archaeological sites in central and northern Europe, e. g. in and around Cracow in Poland and in Lubomia in Silesia dated to c. 3430 BC and 600–900 AC, respectively<sup>85</sup>. Other traces come from Germany (500 AC) and Denmark and Sweden (500–900 AC). The traces mentioned are the remains of useful plants mainly barley, rye and wheat containing fragments of ergot<sup>86</sup>. The ergot contains a mixture of about 30 indole alkaloids, derivatives of lysergic acid, in amounts up to 0.8%. These compounds are extremely active and exhibit toxic and/or psychoactive properties, and many of them have important medicinal properties. The main ergot alkaloids certainly include simple acid amides – e. g. ergometrine and peptide alkaloids such as ergotamine and ergotoxin<sup>87</sup>. In the past, the admixture of ergot sclerotia in cereal grains and further in the flour used for consumption was the cause of hallucinations, muscle contractures, leading, due to ischaemia, to tissue necrosis (especially in the limbs). Ergot poisoning, or ergotism, was formerly referred to as “St Anthony’s fire” or “sacred fire” and led repeatedly to mass hallucinations and deaths<sup>88</sup>. The biologically active substances of ergot cause vasoconstriction by acting on the muscles of the blood vessels, and repeated consecutive doses of ergot eventually damage the vascular endothelium. Continued damage results in reduced blood flow and eventually leads to end-stage limb necrosis. In addition, the consumption of ergot stimulates the central nervous system which causes very different mental states (due to strong dopaminergic and serotonergic effects) manifesting very often as agitation<sup>89</sup>. It seems to us that ergot, processed appropriately, was the most likely emotional booster of Germanic warriors.

Consider also the fruiting bodies of fungi that could certainly be found in forests, meadows or fields. Here, mention should be made of the various species of agarics (*Amanita*), clitocybe means sloping head (*Clitocybe*), sap-suckers (*Inocybe*), coots (*Psilocybe*) or pigeon mushrooms (*Russula*). They contain numerous alkaloids that affect the human body, such as muscarine, muscimol, psilocybin, ibotenic acid<sup>90</sup>. Muscarin is an organic chemical compound, a poisonous alkaloid of many fungi, including *Amanita muscaria* (0.1–0.3%), *Russula lateritia*, *Inocybe geophylla* or *Clitocybe candicans*. Muscarine is a parasymphathicomi-

<sup>80</sup> Barceloux 2008.

<sup>81</sup> Aronson 1989; Samorini 2019.

<sup>82</sup> Lucejko *et al.* 2018.

<sup>83</sup> Samorini 2019.

<sup>84</sup> Stødtkilde-Jørgensen *et al.* 2008.

<sup>85</sup> Gluza, 1984; Szydłowski/Wasylikowa 1973.

<sup>86</sup> Helbaek 1950; 1957; 1958; 1966.

<sup>87</sup> Schiff 2006.

<sup>88</sup> Alm/Elvevag 2012.

<sup>89</sup> Pitt/Miller 2017; Barceloux 2008.

<sup>90</sup> Stebelska 2013; Pitt/Miller 2017.

metic substance that acts as early as 15–30 minutes after ingestion. Poisoning can manifest as nausea and vomiting, drooling, lacrimation, blurred vision and difficulty breathing, lasting about 2 hours. The lethal dose for an adult is 0.3–0.5 g. The mushrooms mentioned also contain ibotenic acid (an alkaloid with toxic and intoxicating effects) and muscimol (a psychoactive alkaloid), which are responsible for the psychoactive activity of *A. muscaria* by stimulating the parasympathetic system<sup>91</sup>. The fruiting bodies of this mushroom are very distinctive which must surely have aroused human interest.

## Conclusions

The examples of plants and fungi we have presented, known for their content of natural substances that show a wide variety of activities in relation to the human body, are an attempt to show potential natural sources that could have been used in a variety of ritual activities. Since the earliest history of man, plants have been an important component of food and have been used for a great variety of life activities. Initially, only wild plants were used, and then various cultivated plant species gradually appeared. Among the oldest cultivated plants in Europe (as far back as the Neolithic), cereals (wheat – *Triticum diccocon* Schrank, *T. monococcum* L., barley – *Hordeum vulgare* L.), legumes (broad beans – *Vicia faba* L., pea – *Pisum sativum* L.), fibre and oil crops, including flax (*Linum usitatissimum* L.) and hemp (*Cannabis sativa* L.), or spice crops (e. g. dill – *Anethum graveolens* L. and caraway – *Carum carvi* L.)<sup>92</sup>.

Despite the development of agriculture, wild plants continued to be collected and used, mainly as food, medicines and ritual preparations. Was knowledge of them widely available? As far as their use as medicines and ritual preparations is concerned, it was certainly necessary to know where to find these plants, when to collect them, how to prepare them to bring out their activity and, of course, how to store them. We think that, as with modern medicine, this knowledge was not widely available, but there were certainly people in each community who had this knowledge and used it. The best way to prepare and store plant material and mushroom fruiting bodies is by drying, which makes it possible to preserve the biological activity of the active substances they contain. Drying also made it possible to transport plant material over fairly long distances, which could encourage trade and exchange. Dried plant or mushroom

material then made it possible to prepare various preparations, which retained their biological activity and could be used as stimulants or narcotics.

Perhaps it was the knowledge of the toxic properties of some mushrooms, especially ‘cap’ mushrooms, that caused the Germanic people to be cautious about introducing them into their menus. Indeed, no ancient or ethnographic sources confirm the consumption of mushrooms by the Germans<sup>93</sup>. In contrast, ergot, common among cereals (both wild and cultivated), may have been the most readily available mushroom for making stimulants of adequate potency. Its form (a dark grey, purple or black cylindrical structure 1.5 cm long and 0.5 cm wide) may have made it easy to collect, store and dose at a specific time.

It also seems obvious that such knowledge implied the ability to prepare preparations with the expected efficacy. Apart from the question of their ingestion dissolved in liquids, mainly in alcohol (most of the biologically active substances of the plant and fungal species we have mentioned dissolve partially or completely in alcohol), they were probably also able to be prepared in powdered form for ingestion through the respiratory tract. It should be considered whether the small *pyxis*-style wooden containers found in the rich Gothic grave of the Wielbark culture in Łędeczek, Złotów district, were not used to store such substances<sup>94</sup>. Their ingestion/dosing may have been facilitated by simple utensils in the form of a spoon, which accompanied the construction of the belt. Of course, the doses of the substances depended on the organism taking them. Nevertheless, the size of the belt-spoons in the A1 and A2 fittings, and the discs in the B fittings, determined the safest amount of stimulant necessary to stimulate the body to increased exertion or to relieve stress. Exceeding these doses (Table 3) could have had tragic consequences for the user. Another part of this knowledge was knowing the convenient moment to take the substances, as their effects changed with the length of time they were present in the human body. Today, we know perhaps far more precisely which chemical compounds are responsible for the action of particular plants and fungi that affect the human body, and we know how and when to dose them to achieve the desired effect. For people who observed the effects of different plants or fungi on their bodies in the

<sup>91</sup> Barceloux 2008; Stebelska 2013.

<sup>92</sup> for more information, see Moskal-del Hoyo 2021.

<sup>93</sup> There is no relevant reference for this in the literature, but we obtained this opinion from Prof. Judyta Rodzińska-Nowak (Jagiellonian University), a specialist in ancient dietary knowledge – for which we thank her warmly. Admittedly, Heinz Grünert mentions mushrooms in his study of gathering among the Germans, but only once, in a single word, without comment (Grünert 1976, 453).

<sup>94</sup> Biborski/Kaczanowski 2001, 71; 73 fig. 3–5; Kokowski 2023.

Tab. 3: Pharmacological characteristics of basic plants with intoxicating properties: effects and consequences of use on the body.

| Organism<br>(Latin name)         | Pharmacological<br>material                                    | Main active<br>substances                                                                                                                           | Route<br>of administration                                                                                                        | Clinical response (selected symptoms)                               |                                                                                | References                                                                                                                                                                           |
|----------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  |                                                                |                                                                                                                                                     |                                                                                                                                   | early                                                               | late                                                                           |                                                                                                                                                                                      |
| <i>Papaver<br/>somniferum</i> L. | immature seed<br>bags, immature<br>seeds, poppy<br>seeds/opium | morphine<br>codeine<br>papaverine                                                                                                                   | oral, sublingually,<br>inhalation,<br>dissolved in alcohol,<br>slightly dissolved in<br>water                                     | the analgesic effect,<br>euphoria, relaxation,<br>mild trance state | mild depression,<br>muscle pain, loss of<br>appetite, anxiety,<br>irritability | Ożarowski 1983;<br>Morphine (and Heroin), 2006;<br>Farmakopea Polska XII, 2020<br>III;<br><a href="https://pubchem.ncbi.nlm.nih.gov/">https://pubchem.ncbi.nlm.nih.gov/</a>          |
| <i>Atropa<br/>belladonna</i> L.  | leaves (0.3–1.2%),<br>roots (0.4–1.4%),<br>seeds, berries      | L-hyoscyamine<br>(to 98% of the total<br>alkaloid content),<br>atropine,<br>scopolamine                                                             | oral (powder),<br>rectal (tincture),<br>dissolved in alcohol,<br>slightly dissolved in<br>water                                   | dilated pupils, blurred<br>vision, hallucinations                   | sensitivity to light,<br>delirium, blurred<br>visions                          | Ożarowski 1983;<br>Barceloux 2008; Farmakopea<br>Polska XII, 2020 III;<br>Vezikov/Simpson 2023;<br><a href="https://pubchem.ncbi.nlm.nih.gov/">https://pubchem.ncbi.nlm.nih.gov/</a> |
| <i>Datura<br/>stramonium</i> L.  | mainly seeds also<br>leaves and flowers                        | L-hyoscyamine,<br>scopolamine<br>(~0.02 mg/seed)<br>atropine<br>(0.1 mg/seed)                                                                       | oral (powder, tincture),<br>smoking of stramonium<br>cigarettes,<br>for solubility see <i>A.<br/>belladonna</i> L.                | see <i>A. belladonna</i> L.                                         | see <i>A. belladonna</i> L.                                                    | Ożarowski 1983; Farmakopea<br>Polska XII, 2020 III;<br>Barceloux 2008;<br>Vezikov/Simpson 2023                                                                                       |
| <i>Hyoscyamus<br/>niger</i> L.   | leaves, seeds,<br>roots                                        | L-hyoscyamine<br>(0.02–0.18%)<br>scopolamine (to 30% in<br>a mixture of alkaloids),<br>atropine (little)                                            | oral (powder, dry<br>extract),<br>variable proportions of<br>active substances,<br>for solubility see <i>A.<br/>belladonna</i> L. | see <i>A. belladonna</i> L.                                         | see <i>A. belladonna</i> L.                                                    | Ożarowski 1983;<br>Barceloux 2008; Farmakopea<br>Polska XII, 2020 III;<br>Vezikov/Simpson 2023                                                                                       |
| <i>Humulus lupulus</i> L.        | hops<br>(female flowers)                                       | etheric oils – 1.5%<br>(main compounds –<br>myrcene, humulene,<br>xanthohumol, linalool)                                                            | oral, tincture, extracts;<br>dissolved in warm water<br>and ethanol                                                               | sleepiness                                                          | dermatitis                                                                     | Ożarowski 1983;<br>Carbone/Gervasi 2022;<br><a href="https://pubchem.ncbi.nlm.nih.gov/">https://pubchem.ncbi.nlm.nih.gov/</a>                                                        |
| <i>Cannabis sativa</i> L.        | female flowers &<br>inflorescence                              | cannabinoids (at least<br>133 e. g. tetrahydrocan-<br>nabinol, cannabidiol)<br>and terpenoids (about<br>120 e. g. myrcene,<br>alfa-pinen, linalool) | oral, inhalation,<br>very low soluble in<br>water and soluble in<br>ethanol                                                       | sedative, painkiller                                                | irritability, anxiety,<br>stress                                               | Hourfane et al. 2023;<br><a href="https://pubchem.ncbi.nlm.nih.gov/">https://pubchem.ncbi.nlm.nih.gov/</a>                                                                           |

Tab. 3 (continued)

| Organism<br>(Latin name)                                                                                                            | Pharmacological<br>material                                              | Main active<br>substances                                                                                                | Route<br>of administration                                                            | Clinical response (selected symptoms)                                                |                                                                                      |                                                                | References                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                     |                                                                          |                                                                                                                          |                                                                                       | early                                                                                | late                                                                                 | side effects                                                   |                                                                                                                      |
| <i>Claviceps purpurea</i><br>(Fr.) Tul.                                                                                             | ergot sclerotium<br>(on cereals such<br>as barley, oats,<br>rice, wheat) | indole alkaloids (about<br>80 compounds, e. g.<br>ergotamine, ergo-<br>metrine, ergotamine<br>group,<br>D-lysergic acid) | oral,<br>slightly soluble in water<br>and ethanol                                     | auditory and visual<br>hallucinations,<br>a state of euphoria,                       | convulsions, tissue<br>necrosis, muscle<br>spasms                                    | nausea, vomiting,<br>lethargy, gangrene                        | Barceloux 2008;<br>Schiff 2006;<br><a href="https://pubchem.ncbi.nlm.nih.gov/">https://pubchem.ncbi.nlm.nih.gov/</a> |
| <i>Amanita</i> spp.<br>(e. g. <i>A. muscaria</i> ,<br><i>A. pantherina</i> )                                                        | fruit bodies                                                             | muscimol,<br>ibotenic acid,<br>pantherine                                                                                | oral, compounds very<br>soluble in water and<br>slightly soluble in<br>ethanol        | after 0.5–2 hours<br>hallucinations, eupho-<br>ria, agitation,<br>movement disorders | blurred vision, disorien-<br>tation, convulsions,<br>dreams,<br>sleepiness           | nausea, vomiting<br>(rare), headache, loss<br>of consciousness | Barceloux 2008;<br><a href="https://pubchem.ncbi.nlm.nih.gov/">https://pubchem.ncbi.nlm.nih.gov/</a>                 |
| <i>Clitocybe</i> spp.<br>(e. g. <i>C. candicans</i> );<br><i>Inocybe</i> spp.<br>(e. g. <i>I. geophylla</i> , <i>I. dulcamara</i> ) | fruit bodies                                                             | muscarine                                                                                                                | oral,<br>dissolved in water and<br>in ethanol                                         | after 15–30 minutes –<br>narrowing pupils,<br>diaphoresis                            | after approx. 1 hour –<br>salivation, lacrima-<br>tion, blurred visions,<br>wheezing | nausea, vomiting,<br>watery diarrhea                           | Barceloux 2008;<br><a href="https://pubchem.ncbi.nlm.nih.gov/">https://pubchem.ncbi.nlm.nih.gov/</a>                 |
| <i>Psilocybe</i> spp.<br>(e. g. <i>P. baeocystis</i> ,<br><i>P. cubensis</i> )                                                      | fruit bodies                                                             | psilocybine                                                                                                              | oral, compounds dis-<br>solved in boiling water<br>and slightly soluble in<br>ethanol | after 0.5–3 hours –<br>euphoria, hallucinations                                      | disorientation, weak-<br>ness, sleepiness                                            | headache                                                       | Barceloux 2008;<br><a href="https://pubchem.ncbi.nlm.nih.gov/">https://pubchem.ncbi.nlm.nih.gov/</a>                 |

“Morphine (and Heroin)”. Drugs and Human Performance Fact Sheets. U. S. National Traffic Safety Administration. Archived from the original on 3 October 2006. Access 1 August, 2023. <https://web.archive.org/web/20061003085645/http://www.nhtsa.dot.gov/people/injury/research/job185drugs/morphine.htm>  
Farmakopea Polska XIII. 2020. Tom III.

past, this knowledge was certainly more mysterious; and thus could be used in various ritual activities.

A side effect of our analysis is to point out the existence of a hitherto underestimated branch of collecting – which has usually been written about in great generalities<sup>95</sup>, related to the search, collection and processing of plants with psychotropic properties. Judging by our assessment of the degree of demand for stimulants in the Germanic armies of European Barbaricum, this must have been an important industry. The market for these drugs was defined by the number of warriors involved in conflicts. It had to create not only a constant demand, but also a requirement for an adequate quality of product, which after all influenced the effectiveness of the confrontation with the enemy. The high level of agriculture of the Roman period in European Barbaricum, which also provided surplus produce, implied the need for the ability to store and process it at an equally high level<sup>96</sup>. It is likely that this knowledge was also applied to the collection and storage of wild plants; including those used as medicines and ritual preparations.

In our deliberations, we have concentrated on one category of probable narcotic feeder, linked beyond doubt to the armour/guttering of a Germanic warrior of the Roman period. However, we cannot pass by the theses of Katarzyna Czarnecka, who was interested in the small metal containers accompanying the burials of women. The evocative German name ‘Amulettendose’, which functions in the literature, indicates that amulets were stored in them. This researcher concluded that they had a universal function – it cannot be ruled out that cosmetics or even agents “for cultic purposes” were stored in them<sup>97</sup> – i. e. most likely also intoxicants. This means that the use of the substances we have identified was broader than the military contexts of the objects helping to dispense them would indicate.

In our work, we have attempted to combine knowledge of archaeological discoveries with knowledge of the abundance of biologically active substances ubiquitous in many plants and fungal species and their origins and distribution. It seems that the awareness of the effects of various types of natural preparations on the human body entailed knowledge of their occurrence, methods of application and the desire to consciously use this wealth for medicinal and ritual purposes.

<sup>95</sup> Grünert 1976; Wielowiejski 1981, 332.

<sup>96</sup> Kokowski 2005; 2007; 2015.

<sup>97</sup> Czarnecka 2010.

## List of belt-end fittings types J.III.1–2 – types 4, 8 according to Madyda-Legutko

List notation construction. After the consecutive number of the discovery in alphabetical order, the number of objects is given in square brackets, and after the ‘=’ sign, the sum of the finds at all the included sites. The name of the discovery site is accompanied by administrative data; country affiliation (abbreviation of the international car registration). This is followed by the circumstances of the find, the length of the object, the diameter of the spoon crowning it, the raw material from which it was made and the dating in the relative chronology system applicable to Central and Northern European Barbaricum. References to the literature are given in simple brackets.

1. **[1 = 1] Abrahám**, okr. Galanta, SK, **typ B**, grave 189: 89 mm, Ø 18 mm, Fe, B2 (Kolník 1980, 67 plate 54: 189: a; von Carnap-Bornheim 2002, 271 No. 34; Madyda-Legutko 2011, 138 No. 20; 234 plate XIV/8).
2. **[1 = 2] Agdatorp**, Nättraby sn., Blekinge, S, **typ A2 (J.III.2)**, grave. SHM 8102B – no other data, late Roman period? (Raddatz 1957, map 10; Iversen 2010, 191 No. 17).
3. **[1 = 3] Alvastra**, Östergötland, S, **typ B**, grave 96: ca 48 mm, Ø ca 15 mm, Fe, B2 (Oxenstierna 1945, 250; Oxenstierna 1958, 103, 160 fig. 60; Schuster 2018, 73 fig. 41).
4. **[1 = 4] Babięta** (Babienten), Mrągowo district, warmińsko-mazurskie voivodship (Warmia-Masuria), PL, **typ A1 (J.III.1)**, grave 305: 66 mm, Ø 14 mm, Cu?, C1? (Schmiedehelm 2011, 148, plate XLIII: 3).
5. **[3 = 7] Barmann**, Sør-Trøndelag, N, **typ A2 (J.III.2)**, grave – no other data, late Roman period? (Tilvekt Trondheim 1912, fig. 3–5; Iversen 2010, 191 No. 13).
6. **[1 = 8] Bartlikowo** (Bartlickshof), Giżycko district, warmińsko-mazurskie voivodship (Warmia-Masuria), PL, **typ 0**, grave 293 – no data, classification uncertain (Schmiedehelm 2011, 148).
7. **[1 = 9] Baunegård**, Pedersker s., Bornholm, DK, **typ A2 (J.III.2)**, grave 11: 99 mm, Ø 27 mm, Cu, C2 (Vedel 1886, 124, No. 270; Foss 1989, 137 fig. 2: 7; 138; Ilkjær 1990, fig. 190; Ilkjær 1993b, 415 list 6a; Iversen 2010, 191 No. 7; Rau 2010a, 228 fig. 88: 12).
8. **[1 = 10] Biecz**, Żary district, lubuskie voivodship (Lubusz), PL, **typ B**, grave 8: 58 mm, Ø 13 × 11 mm, Fe, Luboszyce culture, B2–C1 (Domański/Onzol 1979, 66 plate XIII: d; Domański 2002, 264, 265 plate III: 8/5; von Carnap-Bornheim 2002, 269 No. 13; Madyda-Legutko 2011, 138 No. 21).

9. [1 = 11] **Bjärs**, Gotland län, S, **typ B**, grave 35: 66 mm, Ø 14 × 16 mm, Fe?, B2–C1 (Almgren 1914, 37, plate 14: 234; Madyda-Legutko 2011, 138 No. 22; 235 plate XV/6).
10. [1 = 12] **Blekinge** (region), S, **typ 0**, find not located, no data (Almgren/Nerman, 77; Raddatz 1973, map 10).
11. [1 = 13] **Bodarp**, Bodarp sn., Skåne, S, **typ A2 (J.III.2)**, grave. SHM 8102B: 60 mm, Ø 15 × 21 mm, Cu?, C2 (Raddatz 1957, map 10; Iversen 2010, 191 No. 15; Rau 2010a, 228 fig. 88: 10).
12. [1 = 14] **Bredal**, Vejle Kommune, DK, **typ A1 (J.III.1)**, grave: 37 mm, Ø 9 mm, Fe, B2 (Kaldal Mikkelsen 1989, 161, fig. 15: d; Madyda-Legutko 2011, 149 No. 12); and a small silver spoon for hanging: 62 mm, Ø 17 mm (Kaldal Mikkelsen 1989, 177 fig. 26: a).
13. [1 = 15] **Brodno** (Breitenau), Środa Śląska district, dolnośląskie voivodship (Lower Silesia), PL, **typ B**, pit grave: 54 mm, Ø 12 mm, Fe?, Przeworsk culture, C1b (Altschlesien 1: 1926, 273 fig. 18; von Carnap-Bornheim 2002, 269 No. 14; Madyda-Legutko 2011, 137 No. 1).
14. [1 = 16] **Brzezie**, Pleszew district, wielkopolskie voivodship (Greater Poland), PL, **typ A1 (J.III.1)**, grave 130: c. 54 mm, Ø c. 11 mm, Fe?, Przeworsk culture, B2/C1 (Pudelko 1990, fig. 7: t; Madyda-Legutko 2011, 148 No. 1; 249 plate XXIX/6).
15. [1 = 17] **Chelmino**, district loco, kujawsko-pomorskie voivodship (Kuyavia-Pomerania), PL, **typ B**, grave 132: 84 mm, Ø 16 mm, Fe, culture?, Roman Periode, (Łęga 1938, 34 Plate 9:10; von Carnap-Bornheim 2002, 270 No. 16; Madyda-Legutko 2011, 138 No. 23).
16. [1 = 18] **Chmielów Piaskowy**, Ostrowiec Świętokrzyski district, świętokrzyskie voivodship, PL, **typ B**, grave 18N: 60 mm, Ø 16 mm, Fe?, Przeworsk culture, C1a (Godłowski, Wichman 1998, 22, plate XXI/18N/5; von Carnap-Bornheim 2002, 270 No. 17; Madyda-Legutko 2011, 137 No. 2; 233 plate XIII/8).
17. [6 = 24] **Chorula**, Krapkowice district, opolskie voivodship (Opole), PL, **typ A1 (J.III.1)**; 1. grave 51: 71 mm, Ø 15 mm, Fe, Przeworsk culture, B2/C1 (Szydlowski 1964a, 56, 57 fig. 49: 1; Madyda-Legutko 2011, 149 No. 2; 249 plate XXIX/9); 5 × **typ B** graves: 2. 103: 68 mm, Ø 17 mm, decorated borders, Fe, B2; 3. 116: 80 mm, Ø 13 mm, decorated borders, Fe, C1a; 4. 118: 78 mm, Ø 17 mm, spoon decorated with the sign of the cross, Fe, B2/C1; 5. 155: 60 mm, Ø 18 mm, Fe, C1; 6. 169: 71 mm, Ø 16 mm, decorated, Fe, C1a; 7. loose find: 63 mm, Ø 19 × 13 mm, Fe (Szydlowski 1964a, 91 fig. 89: 18; 92; 101, fig. 99: 13; 121 fig. 128: 2; 122; 126, 127 fig. 136: 1; 138 fig. 149: 9; Madyda-Legutko 2011, 137, No. 3, 18; 232 plate XII/7, 9; 233 plate XIII/6–7; 234 plate XIV/1).
18. [1 = 25] **Chrystalnoe** (Wieckau), raj. Zelenogorsk, RUS, **typ A i B (?)**, grave 8 – no data, B2–C1 (Raddatz 1957, footnote 598; Madyda-Legutko 2011, 149 No. 13; von Carnap-Bornheim 2002, 271 No. 33; Madyda-Legutko 2011, 138 No. 24).
19. [1 = 26] **Chvalkovice na Hané**, okr. Vyškov, CZ, **typ B**, grave: no scale, Fe, B2 (Tejral 1971, 55 fig. 13: 4; 75; Droberjar/Peška 1994, 281; 299 fig. 4: 10; von Carnap-Bornheim 2002, 268 No. 1; Madyda-Legutko 2011, 138 No. 25).
20. [3 = 29] **Czarnówko**, Lębork district, pomorskie voivodship (Pomerania), PL, **typ 0**, graves: 150, 776/10, 1277 – no data, Cu?, Wielbark culture (Schuster 2018, 73 fig. 41).
21. [1 = 30] **Dalby**, Lund Municipality, Skåne County, S, **typ Ilkjaer R.III.6**, grave – no data, Cu?, C3 (Ilkjær 1993b, 415 list 6a).
22. [1 = 31] **Dobřichov-Pičhora**, okr. Kolín, CZ, **typ B**, grave 145: 67 mm, Ø ca 18 mm, Fe, B2/C1 (Droberjar 1999, 262, 263 plate 77: 145/ 2; Madyda-Legutko 2011, 138 No. 26).
23. [1 = 32] **Domaniewice**, Trzebnica district, dolnośląskie voivodship (Lower Silesia), site 4, PL, **typ A1 (J.III.1)**, grave 1: 55 mm, Ø 11 mm, Fe, Przeworsk culture, B2/C1 (Błażejowski 1998, 181, 184 fig. 5: 4; Madyda-Legutko 2011, 149 No. 3).
24. [1 = 33] **Dunaharaszti**, Kom. Pest, H, **typ B**, grave 21: 37 mm, Ø 15 mm, Cu, Sarmatians, 4<sup>th</sup> century after Chr. (Párducz 1950, 157 plate 85: 10; Raddatz 1957, 92; Istvánovits/Kulcsár 1994, 74 fig. 2: 3; von Carnap-Bornheim 2002, 269 No. 12) – note, it is rather not a belt fitting but a separate pendant.
25. [1 = 34] **Dynna**, Gran k., Oppland, N, **typ A2 (J.III.2)**, grave: no data, C2 (Grieg 1926, fig. 52; Ilkjær 1993b, 415 list 6a; Iversen 2010, 191 No. 10; Rau 2010b, 14 No. 1).
26. [11 = 45] **Ejsbøl**, Gammel Haderslev s., Jütland, DK, military votive finding: 11 × **typ A2 (J.III.2)**, Cu: 1. – 42 mm, Ø 13,5 mm; 2. – 60 mm, Ø 22,5 mm; 3. – 60 mm, Ø 19,5 mm; 4. – 67,5 mm, Ø 24 mm; 5. – 69 mm, Ø 19,5 mm; 6. – 66 mm, Ø 24 mm; 7. – 48 mm, Ø 16,5 mm, 8. – 51 mm, Ø 21 mm; 9. – 66 mm Ø 24 mm; 10. – 66 mm, Ø 21 mm; 11. – 45 mm C2 (C2b?) (Ørsnes 1988, 47–48, plate 63: 1–11; Iversen 2010, 191 No. 3).
27. [1 = 46] **Evebø**, Evebø is a farm in Gloppen, Western N, **typ 0**, grave: no data, D1 (Ilkjær 1993b, 415 list 6a).
28. [2 = 48] **Fohrde**, Kra. Brandenburg-Land, D, 2 × **typ A1 (J.III.1)**, graves: 1. – 104: 40 mm, Ø ca 10 mm; 2. – 251: 55 mm, Ø ca 15 mm, Fe, B2 (von Müller 1962, 31, 52, plate 26: 104d; 53: 251c; Madyda-Legutko 2011, 149 No. 14).
29. [1 = 49] **Foss**, Sør-Trøndelag, N, **typ A2 (J.III.2)**, grave: no data, Fe?, C3 (Ilkjær 1990, fig. 194; Ilkjær 1993b, 415 list 6a; Iversen 2010, 191 No. 14).
30. [1 = 50] **Gårdby Kirchspiel**, Öland, S, **typ A2 (J.III.2)**, place of finding unknown, SHM 7391 – no data, late Roman period? (Raddatz 1957, map 10; Iversen 2010, 191 No. 22).

31. **[1 = 51] Gdańsk-Oliwa** (Oliva-Pelonken), Gdańsk district, pomorskie voivodship (Pomerania), PL, **typ B**, inhumed burial 1: ca 68 mm, Ø ca 16 mm, Cu, Wielbark culture, B2b (Schindler 1940, fig. 47: 1; von Carnap-Bornheim 2002, 270 No. 27; Madyda-Legutko 2011, 138 No. 27).
32. **[1 = 52] Gęsiki** (Meisterfelde), Kętrzyn district, warmińsko-mazurskie voivodship (Warmia-Masuria), PL, **typ A1 (J.III.1)**, grave 35: 103 mm, Ø ca 13 × 11 mm, Fe, Bogaczewo culture (Balt), C2? (Nowakowski 2013, 92, 197, plate 170: 3) – bei Madyda-Legutko 2011, 149 No. 15 – as grave 55.
33. **[3 = 55] Gerojskole** (Eisliethen), Zelenogradsk raj., Kaliningrad obl. RU, site. II, **typ 0**, grave 6: 3 fragments of three objects (?), Fe, in one case with bronze rivet (or iron rivet with bronze shirt); one with iron rivet, western length 4.9; 3.1; 3.4; greatest width 1.4 cm; Bogaczewo culture (Balt), B1–B2a (Chilińska-Früboes 2020, 78, plate 169: 6a).
34. **[1 = 56] Grabice**, Krosno Odrzańskie district, lubuskie voivodship (Lubusz), PL, **typ A1 (J.III.1)**, grave 118: 60 mm, Ø 17 mm, Fe, Luboszyce culture, C1 (Domański 1976, 50 plate XIX; Madyda-Legutko 2011, 149 No. 16; 250 plate XXX/3).
35. **[1 = 57] d. Grebieten**, raj. Zelenogorsk, RU, **typ A1 (J.III.1)**, grave 155: no data, B2/C1–C1? (Bitner-Wróblewska 2007, 71; Madyda-Legutko 2011, 149 No. 17).
36. **[1 = 58] Grimmhellern** av Brossvik, Gulen k., Sogn og Fjordane, N, **typ A2? (J.III.2)** no other data, late Roman period? (Tilvekt Bergen 1962–1966, 132–134 Fig. 21; Rau 2010b, 14 No. 2) – probably.
37. **[1 = 59] Håland**, Hå k., Rogaland, N, **typ A2? (J.III.2)** – no data, late Roman period? (Rau 2010b, 14 No. 3).
38. **[1 = 60] Hassle-Bösarp**, Hassle-Bösarp sn., Skåne, S, **typ A2 (J.III.2)**, marsh find: 44 mm, Ø 18 mm, Cu, C2 (C2b?) (Stjernquist 1973, fig. 6; Rau 2010a, 228 fig. 88: 1; Iversen 2010, 191 No. 5).
39. **[1 = 61] Havor**, Hablingo sn., Gotland, S, **typ A2 (J.III.2)**, grave 95: no data, Cu?, C1b–C2 (Ilkjær 1993b, 416 list 6b; Iversen 2010, 191 No. 21).
40. **[1 = 62] Horns** Kungsgård, Högby sn., Öland, S, location unknown: **typ A2 (J.III.2)** – no data, Cu?, late Roman period? (Bemmann/Hahne 1994, list 83: 16; Iversen 2010, 191 No. 18).
41. **[60 = 122] Illerup** Ådal, Skanderborg Kommune, DK, Military Votive Marsh Find, **Typ A1 (J.III.1)**: 1. – VZQ, 55 mm, Ø 13,5 mm, Cu; 2. – XHK, -55,4 mm, Ø 12,9 mm, Cu; 3. – XHS, 52,5 mm, Ø 11,2 mm, Cu; 4. – XPT, 58, 33 mm, Ø 15,6 mm, Cu; 5. – VRH, 52 mm, Ø 13 mm, Cu; 6. – GPG, 50,8 mm, Ø 10,7 mm, Cu; 7. – HFH, 72,1 mm, Ø 13,3 mm, Cu; 8. – MMD, 53,7 mm, Ø 11,4 mm, Cu; 9. – YNG, 37,8 mm, Ø 10 mm, Cu; 10. – SZZ, 50,3 mm, Ø 16 mm; 11. – AARC, 45 mm, Ø 11,5 mm, Cu; 12. – LLS, 57 mm, Ø 10,8 mm, Fe; 13. – LSO, 71,5 mm, Ø 17,4 mm, Fe; 14. – LST, 67,8 mm, Ø 13,4 mm, Fe; 15. – MDL, 60,7 mm, Ø 13,2 mm; 16. – RSG, 95,8, Ø 18,2 mm, Fe; 17. – SAP, 87,1 mm, Ø 15 mm, Fe; 18. – SCE, 53,1 mm, Ø 15,6 mm, Fe; 19. – RFD, -70,3 mm, Ø 15,1 mm, Fe; 20. – RGS, 73 mm, Ø 13 mm Fe; 21. – RUU, 46,8 mm, Ø 15 mm, Fe; 22. – RVT, 54,3 mm, Ø 10 mm, Fe; 23. – VYM, -45,9 mm, Ø 14,3 mm, Fe; 24. – VYW, 43,3 mm, Ø 13,3 mm, Fe; 25. – XHZ, 68,3 mm, Ø 17,8 mm, Fe; 26. – XPL, 57,4 mm, Ø 13,3 mm, Fe; 27. – XSQ, -47,4 mm, Ø 11,9 mm, Fe; 28. – XSY, 54,8, Ø 12 mm, Fe; 29. – SEP, 66,3 mm, Ø 15,6 mm, Fe; 30. – GZN, 61 mm, Ø 13,9 mm, Fe; 31. – HAQ, 55 mm, Ø 13,5 mm, Fe; 32. – HCD, 99,8 mm, Ø 15,8 mm, Fe; 33. – HCE, 47 mm, Ø 14,6 mm, Fe; 34. – UIB, -40,7 mm, Ø 11,7 mm, Fe; 35. – YFL, 48,6 mm, Ø 11 mm, Fe; 36. – YNK, 72,1 mm, Ø 11,2 mm, Fe; 37. – MNH, 60,4 mm, Ø 13 mm, Fe; 38. – MXM, -44,8 mm, Ø 11,2 mm, Fe; 39. – ERG, 61,0 mm; Ø 14 mm, Fe; 40. – ERZ, 57,9 mm, Ø 13,1 mm, Fe; 41. – ETI, -59 mm, Ø 13,3 mm, Fe; 42. – IZO, -48,8 mm, Ø 9,5 mm, Fe; 43. – KAK, 65,5, Ø 15,0 mm, Fe; 44. – AANK, 57,5 mm, Ø 14,9 mm, Fe; 45. – AAOX, 60,3 mm, Ø 11,8 mm, Fe; 46. – IPK, 55, Ø 9,6 mm, Cu; 47. – POB, 56,1 mm, Ø 11,5 mm, Cu; 48. – KBH, 59,7, Ø 9,1 mm, Cu; 49. – AV, 60,8 mm, Ø 18,7 mm, Cu; 50. – ZPV, 63,5 mm, Ø 19,7 mm, Fe; 51. – ENE, 52,1 mm, Ø 12 mm, Fe; 52. – AAHC, 63,3 mm, Ø 14,1 mm, Fe; 53. – AASP, 62,1, 1 mm, Ø 12,7 mm, Fe; 54. – AATC, -45,9 mm, Ø 14,2 mm, Fe; 55. – ABEL, 86,1 mm, Ø 14,8 mm, Fe; 56. – ABFG, 50,7 mm, Ø 14,9 mm, Fe., wisiorki: 57. – XHH, 53 mm, Ø 18 × 15 mm, poroże; 58. – KAA, 57 mm, Ø 19 mm, Fe; **typ B**: 59. – XHI, + 54 mm, Ø 22 × 13 mm, Fe; 60. – AAUG, ca 50 mm, Ø 25 × 20 mm, Fe, C1b (Ilkjær 1993a, 195 fig. 58; 197 fig. 59; 201–203, fig. 63; Ilkjær 1993b, plate 108–110).
42. **[1 = 123] Inowrocław-Szymborze**, Inowrocław district, kujawsko-pomorskie voivodship (Kuyavia-Pomerania), PL, **typ B**, grave 28: 96 mm, Ø 18 mm, Fe, Przeworsk culture, B2/C1 (Bednarczyk/Łaskiewicz 1990, 18 fig. 10: 7; Madyda-Legutko 2011, 137 No. 5; 233 plate XIII/3; von Carnap-Bornheim 2002, 270 No. 19).
43. **[1 = 124] Janow**, Ortsteil der Gemeinde Spantekow im Landkreis Vorpommern-Greifswald, Mecklenburg-Vorpommern, D, **typ 0**, objekt 13: no data (Schuster 2018, 73 fig. 41).
44. **[1 = 125] Jelling**, Vejle Kommune, DK, **typ A1 (J.III.1)**, grave: no data, Fe?, B2 (Ilkjær 1993a, 351, fig. 144; Ilkjær 1993b, 415 list 6a; Madyda-Legutko 2011, 149 No. 19).
45. **[1 = 126] Kalinów**, Strzelce district, opolskie voivodship (Opole), PL, **typ B**, grave 9: 115 mm, Ø 20 × 14 mm, spoon decorated with the sign of the cross; Fe, Przeworsk culture, B2–C1 (Szydłowski 1959, 164 plate 4: g;

- Madyda-Legutko 2011, 137 No. 6; 233 plate XIII/5; von Carnap-Bornheim 2002, 270 No. 20).
46. **[1 = 127] Katajamäki**, Uskela, Salo k., FIN, **typ A1 (J.III.1)**, 54 mm, Ø 24 × 21 mm, Cu, B2/C1–C1 (Kivikoski 1947, plate 21: 160).
  47. **[2 = 129] Kemnitz**, Kr. Potsdam Land, D, 2 × **typ A1 (J.III.1)**, 1. – grave 40: 71 mm, Ø?, Fe, B2 (Geisler 1974, 13, tabl. 3: 40/4); 2. – object 236: 87 mm, Ø 15 mm, Fe, B2 (Geisler 1974, 30, plate 18: 236/4; Madyda-Legutko 2011, 149 No. 20; 250 plate XXX/1).
  48. **[1 = 130] Kietrz**, Głubczyce district, opolskie voivodship (Opole), site 1, PL, **typ B**, grave 630: 93 mm, Ø 19 mm, Fe, Przeworsk culture, B2 (Gedl 1988, 141, 152 fig. 20: f; Madyda-Legutko 2011, 137 No. 7).
  49. **[1 = 131] Kijewo**, Środa Wielkopolska district, wielkopolskie voivodship (Greater Poland), site 4, PL, **typ A1 (J.III.1)**, grave 9: 50 mm, Ø ca 10 mm, Fe, Przeworsk culture, B2b–B2/C1 (Pawlak, Pawlak, Kabaciński 2008, 219, fig. 34: 3; Madyda-Legutko 2011, 149 No. 4).
  50. **[1 = 132] Körchow**, Kr. Bad Doberan, D, **typ B**, urn grave 413: 52 mm, Ø 18 mm, spoon decorated with a star, Cu?, B2b (Beltz: 1920/1921, 98 plate 13: 119; Raddatz 1957, 92; von Carnap-Bornheim 2002, 269 No. 8; Madyda-Legutko 2011, 138 No. 28; 235 plate XV/4).
  51. **[1 = 133] Kowalewko**, Oborniki district, wielkopolskie voivodship (Greater Poland), PL, **typ B**, grave 215: 46 mm, Ø 14 mm, Cu, Wielbark culture, B2/C1 (Skorupka 2001, 63, plate 65: 215/ 2; Madyda-Legutko 2011, 138 No. 29; 235 plate XV/1).
  52. **[2 = 135] Kragehul**, Flemløse s., Båg h., Odense a., Fünen, DK, Military Votive Marsh Find: **typ A2 (J.III.2)**: 1. – MDDXIIA: 65 mm, Ø 16 mm; 2. – C2270b: 45 mm, Ø 11 mm, Cu, C2 (C2b?) (Engelhardt 1867, fig. n; Raddatz 1957 map 10; Bemmman/Hahne 1994, Fundliste 83: 35; Iversen 2010, 210, 236, plate 74: C2270b; MDDXIIa).
  53. **[1 = 136] Kryspinów**, Kraków district, małopolskie voivodship (Lesser Poland), PL, **typ B**, grave 10: 80 mm, Ø 14 mm, Fe, Przeworsk culture, B2b (Godłowski 1969, 35, fig. 3: c; Godłowski 1977, 66, fig. 6: 13; von Carnap-Bornheim 2002, 270 No. 21; Madyda-Legutko 2011, 137 No. 8; 232 table XII/10).
  54. **[1 = 137] Lachmirowice**, Inowrocław district, kujawsko-pomorskie voivodship (Kuyavia-Pomerania), PL, **typ B**, grave XXXVI: 65 mm, Ø 10 mm, decorated on the circumference of the spoon, Fe, Przeworsk culture, B2 (Zielonka 1951/1952, 378 fig. 33: 18; Raddatz 1957, 90; von Carnap-Bornheim 2002, 270 No. 22; Madyda-Legutko 2011, 137 No. 9; 232 plate XII/6).
  55. **[1 = 138] Laski Lubuskie** (Lässig), Słubice district, lubuskie voivodship (Lubusz), PL, **typ B**, single find: no data, Fe, Luboszyce culture, B2/C1–C1a (Bohnsack 1940, plate 457: 10; von Carnap-Bornheim 2002, 270 No. 23; Madyda-Legutko 2011, 138 No. 30).
  56. **[1 = 139] Latzov I**, Kr., Mecklenburg-Vorpommern, Fpl. 6, D, **typ 0** – no data (Schuster 2018, 73 fig. 41).
  57. **[1 = 140] Legnica** (Liegnitz), district loco, dolnośląskie voivodship (Lower Silesia), PL, **typ B**, grave find?: no data, Fe, Przeworsk culture, B2/C1–C1a (Tackenberg 1925, 65 plate 29: 9; von Carnap-Bornheim 2002, 270 No. 25; Madyda-Legutko 2011, 137 No. 10).
  58. **[1 = 141] Lindau/Sorge**, Kr. Zerbst, D, **typ A1 (J.III.1)**, grave 100: 75 mm, Ø 15 mm, Fe, B2/C1–C1a (Voigt 1940, plate XXVII: 8; Madyda-Legutko 2011, 149 No. 3; 250 plate XXX/2) – belt reconstruction – Madyda-Legutko 2016, 94 fig. 24: 4.
  59. **[1 = 142] Lundergårdem** Jedsmark s., Hvetbo h., Hjøring a., DK, **typ A2? (J.III.2)**, grave: no data, Cu?, late Roman period?, classification uncertain (Rau 2010b, 15 No. 23).
  60. **[2 = 144] Lunow-Stolzenhagen**, Kr. Bраним, D, 2 × **typ B**, 1. – grave: 3: 94 mm, Ø 20 mm, Fe, C1; 2. – grave 5: no data (Leube 1975, 79; Madyda-Legutko 2011, 149 No. 22; Schmook/Schultze 1990, 74 fig. 3: d; von Carnap-Bornheim 2002, 269 No. 9; Madyda-Legutko 2011, 138 No. 31; 235 plate XV/3).
  61. **[6 = 150] Lužec, okr. Mělník**, CZ, 6 × **typ B**: 1. – grave 22b: 73 mm, Ø 15 mm, C1, Fe (Kytlicová 1970, 293 fig. 8, B 2; 37: 3); 2. – grave 76: 2a – 70 mm, Ø 14 mm, spoon decorated on the rim; 2b – 45 mm, Ø 13 mm, Fe, B2b (300 fig. 21: 4; 36, 10); 3. – grave 80: 73 mm, Ø 20 mm, Fe, B2–C1 (302 fig. 25: 3); 4. – grave 88: 63 mm, Ø 19 mm, spoon decorated on the rim, Fe, B2? (304 fig. 30: 4; 38, 6); 5. – grave 98: 67 mm, Ø 16 mm, B2b (306, fig. 33, B 1; von Carnap-Bornheim 2002, 268 No. 2; Madyda-Legutko 2011, 138 No. 32; 234 plate XIV/4–6).
  62. **[1 = 151] Machary** (Macharren), Mrągowo district, warmińsko-mazurskie voivodship (Warmia-Masuria), PL, **typ 0**, grave 120: no data, tentative finding (Schmiedehelm 2011, 148).
  63. **[1 = 152] Marcinkowo** (Mertinsdorf), Mrągowo district, warmińsko-mazurskie voivodship (Warmia-Masuria), PL, **typ 0**, loose find: no data, tentative finding (Schmiedehelm 2011, 148).
  64. **[1 = 153] Miętkie** (Mingfen), Szczecno district, warmińsko-mazurskie voivodship (Warmia-Masuria), PL, **typ B**, grave 122: 81 mm, Ø 16 mm, Fe, Bogaczewo culture (Balt), B2/C1 (Juga/Ots/Szymański 2003, 216, fig. 2631: 4; Nowakowski 2013, 77, 197, plate 135: 3; Madyda-Legutko 2011, 138 No. 33).
  65. **[1 = 154] Mikulčice**, okr. Hodonin, CZ, **typ B**, loose find: 35 mm, Ø 10, Fe, B2? (Droberjar 1997, 281, 282 fig. 5: 8; Madyda-Legutko 2011, 138 No. 34).

66. [1 = 155] **Mikulov**, okr. Břeclav, CZ, **typ A1 (J.III.1)**, grave 2: 69 mm, Ø 10 mm, Cu?, B2/C1 (Tejral 1999c, 147, 149 fig. 49: 2; Madyda-Legutko 2011, 149 No. 23; 250 table XXX/7).
67. [2 = 157] **Młodzikowo**, Środka Wielkopolska district, wielkopolskie voivodship (Greater Poland), PL, 2 × **typ B**, loose finds from the cemetery: 1. – 48 mm, Ø 10 mm; 2. – 58 mm, Ø 16, Fe, Przeworsk culture, B2–C1 (Dymaczewski 1958, 400 fig. 472: 24; von Carnap-Bornheim 2002, 270 No. 26; Madyda-Legutko 2011, 137 No. 11; 234 plate XIV/2).
68. [1 = 158] **Møistad**, N, **typ A1 (J.III.1)** – no data, C1b (Ilkjær 1993b, 415 list 6a).
69. [1 = 159] **Mokra**, Kłobuck district, śląskie voivodship (Silesia), PL, site 8, **typ A1 (J.III.1)**, grave 56: 78 mm, Ø 22 × 18 mm, Fe, Przeworsk culture, C1a (Biborski 1998, 64, fig. 4: 7; Madyda-Legutko 2011, 149 No. 5; 249 plate XXIX/10); belt reconstruction (Madyda-Legutko 2016, 73 fig. 7: 3).
70. [2 = 161] **Mušov**, okr. Břeclav, CZ, 2 × **typ B**, ‘king’s’ tomb: 103 mm, Ø 20 mm, Ag gold-plated, decorated with filigree and beaded wire, B2b (von Carnap-Bornheim 2002a, 241 fig. 27: 2–3; von Carnap-Bornheim 2002b, 538–540; Madyda-Legutko 2011, 138 No. 35).
71. [1 = 162] **Netta**, Augustów district, podlaskie voivodship, PL, **typ A1 (J.III.1)**, grave 85: 88 mm, Ø 17 mm, Fe, Balts culture, B2/C1 (Bitner-Wróblewska 2007, 26, plate XLI: 85/2; Madyda-Legutko 2011, 149 No. 24; 250 plate XXX/5).
72. [1 = 163] **Nordre Besseberg**, Øvre Eiker k., Buskerud, N, **typ A2? (J.III.1)**, barrow 2: no data, Cu?, belt fittings are preserved, indicating the probable presence of such a termination, late Roman period? (Rau 2010b, 14 No. 4).
73. [1 = 164] “**Norwegen**”, N, **typ A2 (J.III.2)**, without location: 69 mm, Ø 24 mm, Cu?, late Roman period? (Rau 2010a, 228 fig. 88: 6).
74. [15 = 179] **Nydam** mose, Sottrup s., Nybøl h., Søndeborg a., DK, military marshland votive find, **typ A1 (J.III.1)**: 1. – No. 166: 36 mm, Ø 12 mm; 2. – No. 167: 73 mm, Ø ca 11 mm, Fe (Bemmann/Bemmann 1998b, 30, plate 10: 167); 3. – No. 168: 75 mm, Ø ca 11 mm, Fe (plate 10: 168); 4. – No. 169: 80 mm, Ø 21 mm, Fe (plate 10: 169); 5. – No. 170: 85 mm, Ø 18 mm, Fe (plate 10: 170); 6. – No. 171: 82 mm, Ø ca 24 mm, Fe (plate 10: 171); 7. – No. 172: 70 mm, Ø 16,5 mm, Cu (plate 10: 172); 8. – No. 173: 96 mm, Ø ca 33 mm, Fe (plate 10: 173); 9. – No. 174: 65 mm; Ø ca 21 mm, Fe (plate 10: 174); 10. – No. 175: 85 mm, Ø 22 mm, Fe (plate 10: 175); 11. – No. 176: 78 mm, Ø ca 22 mm, Fe (plate 10: 176); **typ A.2 (J.III.2)**: 12. – No. 177: 72 mm, Ø 27, Cu (plate 10: 177); 13. – No. 3044: 60 mm, Ø 15 mm, Cu (Rau 2010b, plate 7: 2); 14. – No. 8693: 60 mm, Ø 18 mm, Cu (plate 10: 2); 15. – 3791: 51 mm, Ø 15 mm, Cu (plate 16: 2), C2a; C2b.
75. [1 = 180] **Öland**, S, **typ A2 (J.III.2)** – loose find: no data (Almgren/Nerman 1923, 77; Raddatz 1957, map 10).
76. [1 = 181] **Opatów**, Kłobuck district, śląskie voivodship (Silesia), site 1, PL, **typ B**, grave 854: 74 mm, Ø ca 15 mm, Fe, Przeworsk culture, C1a (Madyda-Legutko, Rodzińska-Nowak, Zagórska-Telega 2011a, 200; Madyda-Legutko, Rodzińska-Nowak, Zagórska-Telega 2011b, 306 plate CCCIV/3; Godłowski 1970d, 250, 251, fig. 1: e; von Carnap-Bornheim 2002, 270 No. 28; Madyda-Legutko 2011, 137 No. 12; 233 plate XIII/9).
77. [1 = 182] **Opole Groszowice** (Groschowitz), Opole district, opolskie voivodship (Opole), PL, **typ B**, finding from 1843: 65 mm, Ø 12 × 14 mm, Fe, Przeworsk culture, B2/C1–C1a (Jahn 1918, 87, plate 3: 8; von Carnap-Bornheim 2002, 270 No. 18; Madyda-Legutko 2011, 137 No. 4).
78. [1 = 183] **Petsarfve**, Sjonhem sn., Gotland, S, **typ A2 (J.III.2)**, SHM 4247, grave: no other data, late Roman period? (Almgren/Nerman 1923, find No. 295; Iversen 2010, 191 No. 20).
79. [1 = 184] **Pňov**, okr. Nymburk, CZ, **typ B**, grave 47: 94 mm, Ø 14 mm, Fe, B2–C1 (Hellich 1914, 199 plate 20: 13; Raddatz 1957, 93 footnote 552; Rybová 1970, 89 plate 17: 3; von Carnap-Bornheim 2002, 268 No. 4; Madyda-Legutko 2011, 138 No. 36).
80. [1 = 185] **Rønsberg**, Selbu k., Sør-Trøndelag, N, **typ A2 (J.III.2)**, grave: no data, C2 (Ilkjær 1993a, fig. 148; Ilkjær 1993b, list 6a; Iversen 2010, 191 No. 12).
81. [1 = 186] **Rosenlund**, Jönköpings län, S, **typ A1 (J.III.1)**, grave: no data, B2 (Selling 1952, 74 fig. 2: 6; Ilkjær 1993b, 415, list 6a; Madyda-Legutko 2011, 149 No. 26).
82. [1 = 187] **Rumma**, Horn sn., Östergötland, S, **typ A1/2 (J.III.½)**, grave: 115 mm, Ø 40 mm, Cu?, C2 (Oxenstierna 1958, 122, fig. 64.94.110; Ilkjær 1990 fig. 191; Ilkjær 1993b, list 6a; Iversen 2010, 191 No. 19).
83. [3 = 190] **Sadzarzewice**, Krosno Odrzańskie district, lubuskie voivodship (Lubusz), PL, 2 × **typ A1 (J.III.1)**, 1. – grave 25–32: 78 mm, Ø 14 × 12 mm, Fe (Jentsch 1895, 34 No. 20, fig. 9d), 2. – grave 67: 62 mm, Ø 12 mm, Luboszyce culture, B2/C1–C1a (Jentsch 1895, 80 No 5; Madyda-Legutko 2011, 149 No. 27); 3. – **typ B**: grave 24: no data (Jentsch 1896, 30; von Carnap-Bornheim 2002, 271 No. 29; Madyda-Legutko 2011, 138 No. 37).
84. [1 = 191] **Ščerbinka (Щербинка)**, Podol'skij gor. okrug, Moskovskaya obl., RUS, **typ A (J.III.1)**, fortified settlement: 97 mm, Ø 17 × 14 mm, Fe, Diakovo culture, B2–C1a (Gavrituchin/Voroncov 2018, 595 fig. 2: 21; 613).
85. [1 = 192] **Schonen**, S, **typ A2 (J.III.2)**, loose find: no other data, late Roman period? (Almgren/Nerman 1923, 77; Raddatz 1957, map 10).

86. [1 = 193] **Serby** (Lerchenberg), Głogów district, dolnośląskie voivodship (Lower Silesia), PL, **typ B**, grave 2: no data, Fe, Przeworsk culture, B2b (Tackenberg 1925, 24 plate 7:16; von Carnap-Bornheim 2002, 270 No. 24; Madyda-Legutko 2011, 137 No. 13).
87. [1 = 194] **Simris**, Skåne, S, **typ A** (J.III.1/2), grave 10: ca 120 mm, Ø ca 34 mm, Ag + Cu, C2 (Stjernquist 1955, 9, 10 fig. 3; Ilkjær 1993a, fig. 147; Rau 2010a, 226 fig. 87; Iversen 2010, 191 No. 16).
88. [7 = 201] **Skedemosse**, Gärdslösa sn., Öland, S, **typ A2** (J.III.2), Military Marshland Votive Find: 1. – 70 mm, Ø 25 mm; 2. – 78 mm, Ø 24 mm; 3. – 80 mm, Ø 24 mm; 4. – 63 mm, 27 × 24 mm; 5. – 54 mm, 22 × 19 mm; 6. – 90 mm, Ø 26 mm; 7. – 65 mm, 22 × 19 mm, Cu, C2 (Hagberg 1967a, plate 4; Rau 2010a, 228 fig. 88: 4, 7, 11; Iversen 2010, 191 No. 6).
89. [1 = 202] **Stadheim**, Sogn & Fjordane, N, **typ A2** (J.III.2), grave, Cu?, C2–C3 (Slomann 1959, plate VI: 2a; Ilkjær 1993a, fig. 150; Ilkjær 1993b, list 6b; Iversen 2010, 191 No. 11).
90. [2 = 204] **Stehelčeves**, okr. Kladno, CZ, 2 × **typ B**, place of cremation: 1. – 60 mm, Ø 18 mm, decorated on the border; 2. – 65 mm, Ø? mm, Fe, Roman period (Motyková 1981, 364 fig. 14: 1–2; von Carnap-Bornheim 2002, 269 No. 6; Madyda-Legutko 2011, 138 No. 38; 234 plate XIV/3).
91. [1 = 205] **Šitbořice**, okr. Břeclav, CZ, **typ B**, grave 2: 92 mm, Ø 15 mm, Fe, B2b (Tejral 1970, 187, fig. 1: 9; Tejral 1971, 77 fig. 7:7; Tejral 1999b, fig. 10: 5; Droberjar/Kazdová 1993, 104, plate 1: 2/ 8; von Carnap-Bornheim 2002, 269 No. 5; Madyda-Legutko 2011, 138 No. 39).
92. [1 = 206] **Störlinge**, Öland, komune Borgholm, Kalmar S, **typ A1** (Ilkjær R.III.3), grave: no data, C1b–C2 (Ilkjær 1993b, 415 list 6a).
93. [1 = 207] **Strzebnów** (Gogolin-Strzebnów), Krapkowice district, opolskie voivodship (Opole), PL, **typ A1** (J.III.1), loose find from a cemetery: 42 mm, Ø 10 mm, Fe, Przeworsk culture B2–C1 (Jahn 1918, 92, plate IV: 11; Madyda-Legutko 2011, 149 No. 6).
94. [2 = 209] **Süderbarup**, Kr. Schleswig-Flensburg, Schleswig, D: 2 × **typ A2** (J.III.2), 1. – grave 667: broken, Cu, C3 (Bantelmann 1988, plate 95: f; Iversen 2010, 191 No. 24); 2. – grave 934: broken, Cu, C2? (Bantelmann 1988 plate 133:c; Iversen 2010, 191 No. 25).
95. [1 = 210] **Sulmierzyce** (Sulmirschütz), Krotoszyn district, wielkopolskie voivodship (Greater Poland), PL, **typ B**, destroyed grave: 78 mm, Ø 17 mm, decorated edge, Fe, Przeworsk culture, B2/C1–C1a (Posener Arch. Mitt 2, 1887, 24 plate 8: 6 Album 20 plate 59: 4; Raddatz 1957, 90; von Carnap-Bornheim 2002, 271 No. 30; Madyda-Legutko 2011, 137 No. 14; 232 plate XII/7).
96. [1 = 211] **Szelków Stary**, Maków district, mazowieckie voivodship (Masovia), PL, **typ A1** (J.III.1 object 198: 63 mm, Ø 13 × 17 mm, Fe, Przeworsk culture, B2/C1–C1a (Prochowicz 2017, 496, 498 fig. 4: 8).
97. [1 = 212] **Szurpiły**, Suwałki district, podlaskie voivodship, PL, site II, **typ A1** (J.III.1), barrow XV, grave A3: 102 mm, Ø 21 mm, decorated spoon; Fe, Sudovian culture, B2/C1–C1a (Żurowski 1961, 59, plate XIII:8; Madyda-Legutko 2011, 149 No. 28; 250 plate XXX/6).
98. [1 = 213] **Tänglings**, Gotland län, S, **typ B**, grave 18: 72 mm, Ø 12 mm, Fe?, C1 (Almgren 1914, 54: 168 plate 14: 233; Madyda-Legutko 2011, 138 No. 40; 235 plate XV/5).
99. [3 = 216] **Tarnów**, Opole district, opolskie voivodship (Opole), PL, 3 × **typ A1** (J.III.1), 1. – grave 52a/1938: 66 mm, Ø 12? mm, Fe; 2. – grave 1/1925: 72 mm, Ø 11, Cu; 3. – grave 10/1925: ca 30 mm, Ø ca 11 mm, Cu, Przeworsk culture, B2/C1 (Godłowski/Szadkowska 1972, 12, 23, 24, 49, plate II: 15; XI: 3; XXXI: 7; Madyda-Legutko 2011, 149 No. 7; 249 plate XXIX/5, 6).
100. [4 = 220] **Thorsberg** – Süderbarup, Kr. Schleswig-Flensburg, Schleswig, D, Military Votive Marsh Find: **typ B**, 1. – 40 mm, Ø 8 mm, Cu; **typ A1** (J.III.1) 2. – 65 mm, Ø 20 × 17 mm, Cu; **typ A2** (J.III.2) 3. – 52 mm, Ø 20 mm, Cu; **typ A1** (J.III.1) 4. – 60 mm, Ø 16 mm, Cu, C1b (Raddatz 1957, plate 14: 1–3; Iversen 2010, 191 No. 4; Madyda-Legutko 2011, 138 No. 41; 149 No. 29; 235 plate XV/2).
101. [1 = 221] **Tibble**, Västerås Municipality, Västmanland County S, **typ A1/2** (J.III.½) – no data, C3b–D1 (Ilkjær 1993b, 415 list 6a; Rau 2010a, 226–227, fig. 87).
102. [2 = 223] **Třebusice**, okr. Kladno, CZ, grave 573: 1 × **typ A1** (J.III.1) – no data; grave 463: 1 × **typ B** – no data, B2/C1–C1a? (Madyda-Legutko 2011, 138 No. 42; 149 No. 30).
103. [1 = 224] **Tveitane**, Larvik k., Vestfold, N, **typ A2** (J.III.12), barrow 20: no data, Cu, C2 (Grieg 1926 fig. 53; Ilkjær 1990, fig. 191; Ilkjær 1993b, 415 list 6a; Iversen 2010, 191 No. 8).
104. [1 = 225] **Uddvide**, Grötlingbo sn., Gotland, S, **typ A2** (J.III.2), no other data, late Roman period? (Rau 2020b, 15 No. 18).
105. [1 = 226] **Uskela**, Katajamäki, FIN, **typ A2** (J.III.2), grave: no data (Kivikoski 1947, plate 21, 160; Iversen 2010, 191 No. 23).
106. [1 = 227] **Uzornoje** (d. Jäcknitz), raj. Bagrationovsk, Kaliningrad obl., RUS, **typ A1** (J.III.1), grave d: no data, B2/C1–C1 (Bitner-Wróblewska 2007, 70; Madyda-Legutko 2011, 150 No. 31).
107. [1 = 228] **Velatice**, okr. Brno-venkov, CZ, **typ B**, grave 1: 64 mm, Ø 15 mm, Fe, B2b (Tejral 1971, 77 fig. 8: 2; von Carnap-Bornheim 2002, 269 No. 7; Madyda-Legutko 2011, 139 No. 43; 234 plate XIV/7).

108. [2 = 230] **Vimose**, Odense Kommune, DK, Military Votive Marsh Find: 1. – **typ A1 (J.III.1)** – 25: ca 30 mm, Ø 10 mm?; 2. – **typ B** – 26: ca 24 mm, Ø 6 mm?, C1a (Engelhardt 1869, plate 15: 25–26; Madyda-Legutko 2011, 139 No. 44; 150 No. 32).
109. [1 = 231] **Voien**, Gran k., Oppland, N, **typ A2 (J.III.2)**, grave: 72 mm, Ø 24 mm, Cu?, C2 (Grieg 1926, fig. 49; Ilkjær 1990, fig. 191; Ilkjær 1993b, 415 list 6a; Rau 2010a, 228 fig. 88: 5; Iversen 2010, 191 No. 9).
110. [1 = 232] **Wrocław-Popowice** (Breslau-Pöpelwitz), dolnośląskie voivodship (Lower Silesia), PL, **typ B**, grave: c. 100 mm, Ø 14 mm, Fe, Przeworsk culture, B2b (Peschek 1939, 314 fig. 173; Godłowski 1970, plate 1: 35; von Carnap-Bornheim 2002, 268 No. 15; Madyda-Legutko 2011, 137 No. 15; 233 plate XIII/4).
111. [2 = 234] **Wymysłowo**, Gostyń district, wielkopolskie voivodship (Greater Poland), PL, **typ A1 (J.III.1)**, 1. – grave 203: 1 – 76 mm, Ø 16 mm; **typ B**, 2. – 100 mm, Ø 15 mm, Przeworsk culture, B2b (Jasnosh 1952, 138, fig. 188: 3–4; Madyda-Legutko 2011, 149 No. 8; 249 plate XXIX/8, 11).
112. [3 = 237] **Zadowice**, Kalisz district, wielkopolskie voivodship (Greater Poland), PL, 1. – **typ B** grave 266: ca 55 mm, Ø ca 18 mm, B2–C1 (Kaszewska 1961, 211, plate 26: 1, von Carnap-Bornheim 2002, 271 No. 31); 2. – **typ B**: 93 mm, Ø 18 × 13 mm, Przeworsk culture, Fe (Kaszewska 1975b, 161, fig. 17:h; Madyda-Legutko 2011, 137 No. 16; 233 plate XIII/1); 3. – **typ A1 (J.III.1)** – no data, Przeworsk culture (Madyda-Legutko 2011, 149 No. 9).
113. [1 = 238] **Zakrzów**, Środa Śląska district, dolnośląskie voivodship (Lower Silesia), PL, **typ B**, grave 18: 81 mm, Ø ca 19 mm, Fe, Przeworsk culture, B2–C1 (Szydlowski 1964b, 199 fig. 41:a; von Carnap-Bornheim 2002, 271 No. 32; Madyda-Legutko 2011, 137 No. 17; 233 plate XIII/2).
114. [1 = 239] **Zapowiednia**, Września district, wielkopolskie voivodship (Greater Poland), PL, stan. 5, **typ A1 (J.III.1)**, grave 2: ca 68 mm; Ø ca 12 × 13 mm, Fe, Przeworsk culture, C1a (Ciesielski 2008, 269, 270, plate VII: h; Madyda-Legutko 2011, 149 No. 10).
115. [1 = 240] **Zemplín**, okr. Trebišov, SK, **typ B** – barrow 3: 68 mm, ca Ø 10 mm, Fe, B2 (Budinský-Krička/Lamiová-Schmiedlová 1990, plate X: 7; Madyda-Legutko 2011, 139 No. 45).
116. [1 = 241] **Zgierz-Rudunki**, Zgierz district, łódzkie voivodship (Łódzkie), site 1, PL, **typ A (J.III.1)**, grave 3/1984: 76 mm, Ø ca 15 mm, Fe, Przeworsk culture, B2/C1 (Skowron 2000, 80, fig. 3: 1; Madyda-Legutko 2011, 149 No. 11).

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