

Recent archaeobotanical investigations into the range and abundance of crop plants in Bronze and Iron Age settlements in the Rhineland Area, North Rhine-Westphalia, western Germany

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Introduction

During the last decades numerous sites dating back to the last two millennia B.C. were studied archaeobotanically in North Rhine-Westphalia by K.H. Knörz and the Laboratory of Archaeobotany, University Cologne. New investigations within the scope of a Ph.D. enable to compare the plant spectra of more than 40 Bronze and Iron Age settlements. The majority of the analysed sites are located in one of the most fertile landscapes in western Germany, the loess region between the cities of Aachen, Cologne and Erkelenz (Fig. 1). Here, because of the lignite mining, extensive archaeological excavations have been taken place.

In Order to compare the crop husbandry regimes, four chronological groups have been differentiated: Early Bronze Age, Late Bronze Age (Urnfelder Period), Early Iron Age (Late Hallstatt and Early Latène Period) and Late Iron Age (Late Latène Period). In addition, the plant data of these sites has also been compared with assemblages of settlements from Germanic-populated areas in Westphalia right of the River Rhine, which dated in the Iron Age and the early Roman Imperial Period.

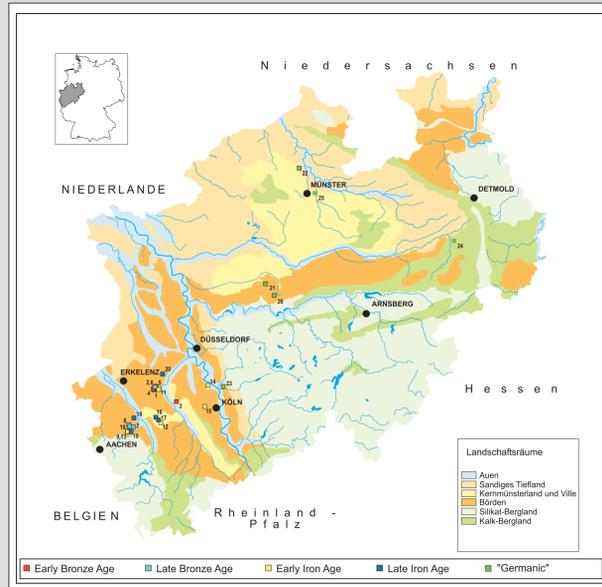


Fig. 1

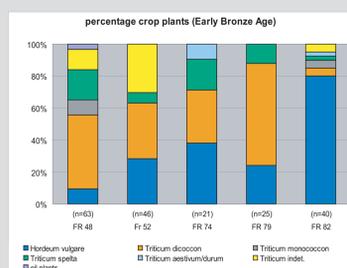
Database

In May 2010 nearly 1.200 samples and more than 120.000 charred macro remains were available for the investigation. Some settlements have been selected for this presentation (Tab. 1).

Nr.	ID	site	chronological group	sampels	macro remains
1	FR 48	Bedburg-Königshoven	Early Bronze Age	25	315
2	FR 52	Grevenbroich-Gustorf	Early Bronze Age	10	210
3	FR 74	Bergheim	Early Bronze Age	5	75
4	FR 79	Bedburg	Early Bronze Age	5	55
5	FR 82	Jüchen-Garzweiler	Early Bronze Age	5	72
6	FR 52	Grevenbroich-Gustorf	Late Bronze Age	16	92
7	WW 14	Eschweiler-Lohn	Late Bronze Age	41	3258
8	WW 73/09	Eschweiler-Laurenzberg	Late Bronze Age	1	3542
9	WW 111	Jülich-Bourheim	Late Bronze Age	11	1404
10	WW 127	Inden-Altendorf	Late Bronze Age	6	486
11	FR 3	Bedburg-Königshoven	Early Iron Age	49	1620
12	HA 512	Hambach-Niederzier	Early Iron Age	15	1031
13	WW 111	Jülich-Bourheim	Early Iron Age	28	8699
14	Blum	Köln-Blumenberg	Early Iron Age	49	1620
15	Pu-Brau	Pulheim-Brauweiler	Early Iron Age	28	2177
16	HA 382	Hambach-Niederzier	Late Iron Age	118	8609
17	HA 490	Hambach-Niederzier	Late Iron Age	18	1194
18	WW 94/376	Jülich-Bourheim	Late Iron Age	14	213
19	Esch-Lau	Eschweiler-Laurenzberg	Late Iron Age	46	9046
20	Jü-Neu	Jüchen-Neuholz	Late Iron Age	13	1204
21	Cast-Rau	Castrop-Rauholz	„Germanic“	54	90
22	Emst-Isen	Ernststetten-Isendorf	„Germanic“	40	2684
23	LEV-Schle	Leverkusen-Schleibusch	„Germanic“	31	419
24	PB-Saat	Paderborn-Saatental	„Germanic“	32	412
25	WAF-Ein	Warendorf-Einen	„Germanic“	71	2708
26	DO-Oesp	Dortmund-Oespel	„Germanic“	19	329

Tab. 1

Range and abundance in the crop plant spectra

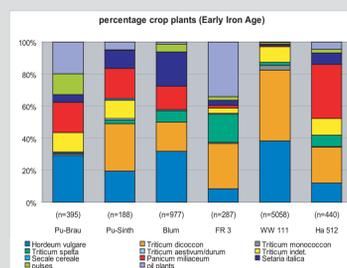


Early Bronze Age
([2200]1600–1200 B.C.)

Due to the fact that only a few sites date to the Early Bronze Age and a low density of macro remains, information on the crop plant spectrum for this period is hardly to obtain. The latter is most probably connected with a lower intensity of rural economy or in changes in the way of crop processing.

In the investigated settlements barley (*Hordeum vulgare* ssp. *vulgare*) and emmer (*Triticum dicoccon*) are dominant. Einkorn (*Triticum monococon*) and naked wheat (*Triticum aestivum/durum*) are documented as well but their importance is unclear. Spelt (*Triticum spelta*) reaches surprisingly high values up to 20 % (FR 48).

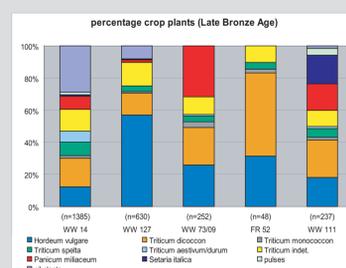
Oil plants occurred (gold of pleasure *Camelina sativa*, FR 48) but pulses couldn't be found and appear to be unimportant. Besides crop plants the remains of wild species also give no references for the husbandry regime of this period. Crop weeds are rare, whereas ruderals and grassland taxa (mostly Poaceae) are frequent. It is likely that the fields were overgrown with grass and ruderals because of insufficient tillage. Collected plants like hazelnut (*Corylus avellana*), strawberry (*Fragaria vesca*) and sloe (*Prunus spinosa*) are common.



Late Bronze Age
(1200–800 B.C.)

In the Late Bronze Age we face a larger number of archaeological sites and more charred material has been found. In all analysed settlements a higher diversity in the crop plant spectra is noticeable. Emmer and barley are the main cereals, followed by spelt and einkorn. Common millet (*Panicum miliaceum*) and foxtail millet (*Setaria italica*) gained in importance and reach values between 20 % and 30 %.

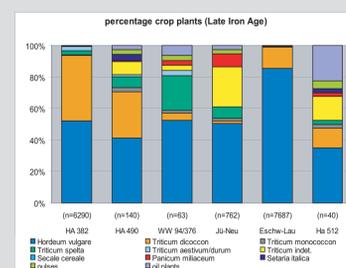
In addition the pulses lentil (*Lens culinaris*), pea (*Pisum sativum*), faba bean (*Vicia faba*) and bitter vetch (*Vicia ervilia*) have been found in several sites (e.g. WW 111). Finally oil plants like poppy (*Papaver somniferum*, the high proportion of more than 30 % in WW 14 is a matter of one harvesting event), flax (*Linum usitatissimum*) and gold of pleasure complete the crop plant spectrum. An assumed intensification of agriculture is also reflected in the wild plant data. Crop weeds are frequent, which could easily be parallelized with the occurrence of more cereal remains. Nevertheless, a high amount of grassland taxa (particularly *Poa* sp. and *Phleum* sp.) could still reflect an inadequate tillage.



Early Iron Age
(800–300 B.C.)

Because of a still increasing settlement density and more sites with rich archaeobotanical material, the Early Iron Age is well represented. Similar to the previous period, the crop plant spectra has a broad diversity. Barley and emmer are the main crops. Common millet (up to 30 % in HA 512) and foxtail millet (with 27 % in Blum) are of similar importance. The high values of foxtail millet seem to be a speciality of the Rhineland at this time. Spelt is constantly present but relatively insignificant, one exception is the site FR 3 with almost 20 %.

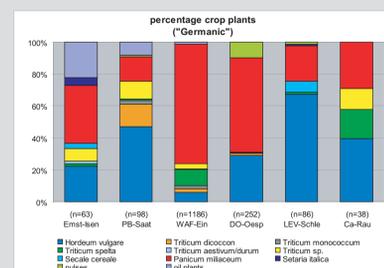
Striking features in the Early Iron Age are the high amount of pulses and oil plants. Pea, faba bean and bitter vetch are regular found, lentil reaches even values up to 8 % (FR 3). The group of oil plants is dominated by gold of pleasure (in FR 3 with more than 30 %), whereas flax and poppy were also cultivated. Plant remains of synanthropic and wild species are likely as in the Late Bronze age. There are weeds, which can be associated with cereals and other crops: summer weeds like wild-oat (*Avena fatua*), smooth crabgrass (*Digitaria ischaemum*) and scarlet pimpernel (*Anagallis arvensis*) grew frequently on fields with barley and the millets; black bindweed (*Polygonum convolvulus*) and silky bentgrass (*Apera spica-venti*) are common species under the winter cereal spelt.



Late Iron Age
(150–25 B.C.)

During the Late Iron Age we observe changes in settlement patterns: in addition to often fortified villages with central function (like HA 382) there are also smaller farmsteads (e.g. Jü-Neu). Grain cultivation is obviously the principal component of crop husbandry. In all sites the proportion of cereal remains reaches values mostly over 90 %. Barley predominates emmer and spelt. Other cereals (einkorn, naked wheat and the two millet species) weren't important. Compared to the Early Iron Age pulses and oil plants are insignificant, even though there is evidence for all four pulses, gold of pleasure and flax. Poppy couldn't be identified.

According to the high cereal values crop weeds dominate the wild plant spectra. The differentiation in summer and winter crops is comparable to the previous Early Iron Age. Interestingly, there are some species like field madder (*Sherardia arvensis*) which could be associated with developed cereal cultivation. Even if grassland taxa and some ruderals are also present, it seems that there was an intensification of tillage and weeding compared to earlier periods.



„Germanic“
(750 B.C.–14 A.D. [Iron Age] and 14 A.D. – 4th century A.D. [Roman Imperial Period])

In addition to as „Celtic“ regarded Iron Age settlements left of the River Rhine it is interesting to compare these with „Germanic“ assumed sites further east in Westphalia. The archaeobotanically investigated sites produced only a small quantity of charred plant material. Nevertheless the data is very different from the „Celtic“ spectra. The most significant difference is the importance of common millet, which has been cultivated as main crop (in WAF-Ein up to more than 60 %) besides barley. Emmer and spelt are unimportant just as einkorn, naked wheat and foxtail millet. There is evidence for all three oil plants, flax, poppy and gold of pleasure, whereas the latter is most important. Moreover lentil and pea are present in many sites, but there are no finds of faba bean and bitter vetch. The high amount of summer weeds like spotted ladysthumb (*Polygonum persicaria*), smooth crabgrass and corn spurry (*Spergula arvensis*) could be associated with millet, barley, oil plants and pulses. Weeds of winter crops are less common as remains of typical winter cereals like spelt.

“What have the Romans ever done for us?”

In the Late Iron Age the loess region west of Cologne was an intensely worked cultural landscape where a complex settlement system of central places (storage and distribution?) and farmsteads (production?) existed. With the intensification of grain production the „Celts“ prepared the ground on which the Romans build up their agricultural system after their occupation and the consolidation of productive villae rusticae could have been done quickly. Due to this, the Romans were able to install a supply system for cities, villages and military camps during the first century A.D.

So, what have the Romans ever done for us? After Caesar's „Gallic War“ imported plants from the Mediterranean World appear in this region for the first time: In site FR 2007/02 – which dated between 50 B.C. and year 0 – potential remains of dill (cf. *Anethum graveolens*) could be identified. From this time onwards the Rhineland has contacts to the roman „world trade system“ documented in an advanced horticulture with herbs and fruit trees.



Fig. 2
cf. *Anethum graveolens*
(FR 2007/02)

Results

Archaeobotanical investigations in 20 sites dating between the Early Bronze and Late Iron Age in the Rhineland as well as 6 „Germanic“ settlements in Westphalia, belonging to the Iron Age and the Roman Imperial Period, have been carried out.

For the Rhineland it became apparent, that Early Bronze Age agriculture is difficult to reconstruct because of a small database. In the Late Bronze Age and during the Early Iron Age a wide range up to a dozen plants was cultivated throughout the year. In the Late Iron Age especially the importance of barley increased. However the agriculture in the „Germanic“ populated areas right of the Rhine shows a completely different picture: in that region the cultivation of the summer crops millet and barley were popular. While the „Germanic“ rural traditions stay uniform for centuries, the agriculture on the loess regions left of the Rhine changes with the Roman occupation. During consolidation the Romans took advantage of the developed „Celtic“ agriculture and install a new supply system, which includes imported plants and horticulture.