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 BC were investigated in the region around North Rhine-Westphalia by K.H. Knoth and the Laboratory of Archaeobotany, University Cologne. New investigations within the scope of a Ph.D. enable to compare the plant remains 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 lower Rhine between the cities of Arnhem, Cologne and Euskirchen (Fig. 1). Here, because of the liguge mining, extensive archaeological excavations have been taken place.

In order to compare the plant husbandry regimes, four chronological groups have been differentiated: Early Bronze Age, Late Bronze Age (Umenfelder 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 Rhine River, which dated in the Iron Age and the early Roman Imperial Period.

Range and abundance in the crop plant spectra

Due to the fact that only a few sites data to the Early Bronze Age and a low density of macro remains, information on the crop plant spectra 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 subsp. vulgare) and emmer (Triticum dicoccon) are dominant. Einkorn (Triticum monococcum) and naked wheat (Triticum aestivum/durum) are documented as well but their importance is unclear. Spart (Triticum spelta) reaches surprisingly high values up to 50 % (FR 48).

Oil plants occurred (gold of pleasure Carthamus tinctorius), and fruit trees (Malus domestica) could not be found and appear to be unimportant. Barley is with 40 % the most important species in the Early Bronze Age (Tab. 1).

Late Bronze Age (1200–800 B.C.)

In the Late Bronze Age we face a larger number of archaeological sites and more richly 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 the spell and winter. Common millet (Panicum miliaceum) and flax (Sallaria damatica) 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 hirsuta) 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 (800–250 B.C.)

Because of an still increasing sediment density and more sites with rich archaeological 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 529) and flax (with 27 % in Blum) are of similar importance. The high proportion of millet still seem to be a specialty of the Rhinevald at this time. Spell is constantly present but relatively insignificant, one exception is the site FR 3 with almost 20 %.

Striking features in the Early Iron Age are 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) grow frequently on fields with barley and the millets, hawkweed (Hieracium spp.) and black bindweed (Convolvulus arvensis) and other weeds of winter cereal spelt. Nevertheless, the data is very assumed sites further east in Westphalia.

“Germanic” settlements (750 B.C.–4 A.D. Iron Age) and 4th century A.D. (Roman Imperial Period) in addition to as “Celtic” regarded Iron Age settlements left of the Rhine River 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” sites. The most significant difference is the importance of common millet, which has been cultivated as main crop (in WAF) up to more than 60 % (by weight). Emmer and spell are unimportant just as wild oat and flax.

There is evidence for all three oil plants, flax, poppy and gold of pleasure, whereas the latter is the most important. Moreover lentil and pea are present in many sites, but there are no finds of faba bean and wild vetch.

The high amount of summer weeds like spotted knapweed (Pacominum penetrans), 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.

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).

In the Late Iron Age we observe changes in settlement patterns: in addition to often fortified villages with central function (like HA 382) there are open settlements with large farming areas (e.g. Zo Neus). Gran culture 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 (wheat, 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 associated with developed cereal culture. Even if grassland taxa and sump ruderals are also present, it seems that there was an intensification of tillage and weedng compared to earlier periods.

Results

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

For the Rhinevald it became apparent, that Early Bronze Age agriculture is difficult to reconstruct because of small data sets. 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. The cultivation of 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 region left of the Rhine changes with the Roman occupation. During the consolidation the Romans took advantage of the developed “Celtic” agriculture and install a new supply system, which includes imported plants and horticulture.

What have the Romans ever done for us?

In the Late Iron Age the loess west of Cologne was an intensely worked cultural landscape where a complex settlement system of villages (storage and distribution?) and farms (production?) existed. With the intensification of grain production the “Celtic” prepared the ground on which the Romans build up their agricultural system after their occupation and the consolidation of productive villae rusticae (cultural landscapes) could be done already. 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 is overgrown with grass and ruderals because weeds are rare, whereas ruderals and species also give no references for the Camellia sativa values up to 20 % (FR 48).

In the investigated settlements barley and emmer were the main cereals, followed by the spell and winter. Common millet (Panicum miliaceum) and flax (Sallaria damatica) gained in importance and reach values between 20 % and 30 %.

The abundance of crop plants in Bronze and Iron Age 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 529) and flax (with 27 % in Blum) are of similar importance. The high proportion of millet still seem to be a specialty of the Rhinevald at this time. Spell is constantly present but relatively insignificant, one exception is the site FR 3 with almost 20 %.

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