FARMING AND FORAGING ON LIMESTONE AND LOESS
Archaeobotanical records from the Late Iron Age settlement of Michelstetten (Lower Austria)

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Investigated Area
Michelstetten is located in the central Weinviertel, Lower Austria (48°35'N, 16°22'E, Fig. 1). Farming in this region dates back to the beginnings of agriculture in central Europe (Linear Pottery), favoured by the low relief of the rolling hills and the fertile soils – often chernozems – formed on the abundant loess deposits. A subcontinental climate, strong winds and low annual precipitation often chernozems – formed on the abundant loess deposits. A favoured by the low relief of the rolling hills and the fertile soils – towards the north. The closest river, the Zaya, passes the settlement low hills belonging to a series of hill ranges which connect the Alps and the Carpathians. In Michelstetten, they form a basin opening towards the north. The closest river, the Zaya, passes the settlement.

The Site
Archaeological excavations, carried out from 1994 till 1999 by the Niederösterreich Museum for Prehistory, unearthed the vast amount of 1,640 archaeological features (Fig. 3) originating from settlement activities from the Middle Neolithic till Modern Times[1-2]. Dating of the La Tène settlement phase was established by radiocarbon dating (Fig. 4) as well as pottery, glass and fila chronologies. From the supposed period of the settlement’s maximum extent in Lt C2 (c. 190-120 BC), 15 buildings were discovered. The majority were pit houses (Trebschütz 2010). In addition, post holes and ditches belonging to a rather large wall-trench building were found, probably serving as a communal building for gatherings. It was in operation until the end of the whole settlement (c. 130-100 BC), just like the pottery kilns in the southern part of the settlement (Fig. 3).

Material and Methods
Macrofossil analyses were carried out on soil samples from six pit houses in order to investigate the local farming practices and subsistence economy in general. A total of 800 if soil samples were floated, the recovered plant remains identified under the stereomicroscope. For identification of processed food remains (see results), SEM imaging was also applied. The clay floor (Loessum) found in situ in the pottery kiln was searched for plant imprints.

Results
The analyses yielded a total of 1,526 charred plant macrofossils from 74 taxa (17 cultivated and 57 wild plants).

Cereals were mainly represented by broomcorn millet and barley, while einkorn, spelt, emmer and naked wheat were found in relatively low numbers. Foxtail millet was rare, and records of rye and “new type” glume wheat were restricted to single specimens. Pulses were represented by pea and lentil, while oil seeds were – most probably due to taphonomical reasons – completely absent. Charred remains of food residues were recorded in the pit houses with the richest plant material, consisting mostly of amorphous crusts with cereal rim remains.

Among the wild plants, the group of malvaceous plants and pulli weeds was clearly dominant, followed by species from steppe- and forest-steppe-like habitats. Forest species were however much rarer, and wetland species played an insignificant role.

Sycamore maple (Acer pseudoplatanus) was represented by leaf imprints covering the whole lower side of the pottery kiln’s clay floor (Fig. 6), while imprints of thin twigs were not identifiable.

Discussion
The entire spectrum of cultivated plants fits well with the plant assemblages of other Iron Age sites in eastern Austria, such as Oberkeiserberg[3], Roselendorf[4] and Gars-Thunau[5], and also matches the records of this species had been associated with natural riverine habitats. It seems that the ruderal career of Xanthium had been facilitated by the low relief of the rolling hills and the fertile soils – towards the north. The closest river, the Zaya, passes the settlement low hills belonging to a series of hill ranges which connect the Alps and the Carpathians. In Michelstetten, they form a basin opening towards the north. The closest river, the Zaya, passes the settlement.

Of particular interest is the find of Xanthium strumarium, as it comes from a purely ruderal context: so far, most prehistoric records of this species had been associated with natural riverine habitats. It seems that the ruderal career of Xanthium has begun at an early date. From 225 BC, due to the abundance of dryland species in Michelstetten, open habitats must have played an important role in the Iron-Age landscape: Recorded species range from typical steppe representatives like Stipa poaeana to forest steppe- and shrubland species, like Nepeta nuda and Veronica tauricica, which points to a rich and varied mosaic of open and semi-open habitats. This matches the archaeoecological record of ample livestock keeping in the settlement.

Accordingly, woodland species are mostly represented by taxa growing on forest edges and in open woodland tracts, like hazel (Corylus avellana), cornelian cherry (Cornus mas), bladder cherry (Phyllis lutea), elder (Sambucus nigra) and apple/pear (Malus/Pyrus). Since these fruit-bearing, edible species were probably brought into the settlement on purpose, they might rather reflect wild plant collecting activities than vegetation patterns.

Aside from the fruits, a number of other wild plants recorded in Michelstetten might have been gathered intentionally, either for consumption or medicinal purposes.

When compared with other Iron Age sites of the region, the wild plant spectrum of Michelstetten mirrors subtle differences in local climatic conditions and may challenge the potential climatic significance of such records.

Fig. 6 Leaf imprints of sycamore maple (Acer pseudoplatanus) on the clay floor of the La Tène pottery kiln

References
