New research on the cultural history of the useful plant *Linum usitatissimum* L. (flax), a resource for food and textiles for 8,000 years

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Flax delivers the raw material for food, medicines and textiles and has therefore been of great importance for human culture and development for more than 8,000 years. Still today the products of flax play a role in our modern everyday life. The seeds are well-known to be healthy, they are of nutritional value and contain large amounts of short-chain ω -3 fatty acids; linen clothes have become more popular again during recent decades and linseed oil is one of the oldest commercial oils that has been used for centuries in painting and varnishing. No artificial chemical product has replaced the products of flax.

The cultural history of flax can be traced by botanical remains uncovered during archaeological excavations, such as seeds, capsule fragments, stems of flax and pollen, as well as by flax products such as fibres and textiles. Archaeological finds like flax retting structures and artefacts give evidence of textile production. Additional information on the use of flax is given by historical written sources and ancient wall paintings. But how old is the use of flax? In Fig. 1 the presence of wild, as well as domestic flax seeds and capsules, textile fragments and textile impressions in clay on aceramic and early Neolithic sites is mapped. The oldest records have been made in the area of the Fertile Crescent and date back to the 9th millennium

B.C. (Helbæk 1959; van Zeist and Bakker-Heeres 1975). Therefore we have to assume that cultivation of flax started in that region, most probably for its oil (Allaby et al. 2005).

The oldest European archaeobotanical evidence for cultivated flax derives from archaeological sites located north of the Alps and is dated to the Linearbandkeramik (Kreuz 2007). It is still not known if already at that time different landraces of flax existed. New results from measuring the seed size of uncarbonized flax seeds suggest the presence of different forms of flax for oil and for fibre exploitation since at least the 3rd millennium B.C. (Herbig 2002; Herbig and Maier 2011). These finds are now being tested for ancient DNA.

Flax cultivation and the manufacturing of its various products imply an enormous input of human labour, starting with preparing the land suitable for cultivation, planting or sowing the flax fields, weeding the fields in order to guarantee an efficient yield, harvesting, and ending with the various technical processes that have to be done to obtain fibres for textile production from the woody stems and oil from the seeds. Some of these activities have left visible archaeological features and structures, as flax retting pits that have been overlooked in many archaeological excavations until now. Only recently archaeologists have become aware of flax drying structures. New investigations suggest that flax and textile production played a yet underestimated part of domestic industry, maybe already performed by specialized craftsmen and -women and thereby formed an important economic aspect of daily life during the past millennia in many European countries (Leuzinger and Rast-Eicher 2011; Maier and Schlichtherle 2011). However, the whole process of flax production needs to be better understood: from the procurement of the seed for sowing, the cultivation methods, the harvesting and processing of the plants to the ultimate production

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Fig. 1 Presence of wild and domestic flax seeds (/capsules) and textiles (/impressions) in aceramic and early Neolithic sites. The map is credited to Sue Colledge (UCL, UK) and James Conolly (Trent

University Ontario); http://archaeologydataservice.ac.uk/archives/view/neoplants_ahrb_2005/

processes of the oil and fibres, in order to evaluate the importance of flax in the past. Only the sum of all these parts will give a whole picture and will help us to understand the relationship between ancient societies and this fascinating plant.

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