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1. Introduction

In the present preliminary report the result of the examination of plant macrofossil remains recovered from two cremation graves from the Roman period at Zuidelijke Stadsas is presented.

2. Material and methods

Four categories of botanical samples were subjected to plant macrofossil examination:

1) Seven samples (each 1 litre volume) were assessed in order to estimate their botanical value (richness and preservation condition): samples 5-19 (2x) and 5-26 (2x) from Grave 13, and samples 5-40 and 5-41 (2x) from Grave 14. All samples were washed on a series of sieves with mesh sizes of 2.0, 1.0, 0,5 and 0,25 mm, respectively. On the basis of preliminary examination, samples 5-40 and 5-41(2x) were selected for complete macrofossil analysis. Plant remains were studied under a binocular light microscope at a magnification of x6 to x50.

2) Sample 5-22 from the Grave 13 contained pot fragments, charred bone fragments and clumps of charred organic material. Selected fragments of this material were examined using a scanning electron microscope at the National Herbarium Nederland, Universiteit Leiden. The remaining sediment (ca. 2 litre) of sample 5-22 was washed (sieves with meshes 1.0 and 0,5 mm) and examined for plant remains.

3) One litre sub-samples were taken from each of the two "greppels", 22 (5-31) and 23 (5-32). These were washed and scanned for plant macro-remains. No other plant remains than a few charcoal fragments have been recorded.

4) Sample 5-28 from the Grave 13 ("crematierestendepot") with a volume of ca. 10 liters was washed over 2.0 and 1.0 mm sieves. Bone remains were submitted for physico-anthropological study, while the residuum was examined for plant remains. Two fragments of *terra sigillata* were also found.

3. Results and discussion

3.1 SEEDS AND FRUITS

The plant assemblage was dominated by legumes (peulvruchten) (pea family, Fabaceae) (see *table 1*). Most of the seeds were badly preserved, often fragmented. The majority of charred remains belonged to celtic beans (tuinboon, *Vicia faba* var. *minor*), but seeds of lentil (linze, *Lens culinaris*) and pea (erwt, *Pisum sativum*) were also present. The latter species is represented only by the seed fragments, and therefore their secure identification required the use of scanning electron microscope.

For identification, the seed parenchyma appears as densely packed, angular cells (ca. 30-40µm in diameter). The contents of the cells have become compacted during the process of charring, leaving solid structures (see *fig. 1*). This would imply that the tissue has high quantities of storage substances such as starch and protein and was originally charred in a dry condition. This type of seed parenchyma is significantly close to modern, experimentally charred tissue from *Pisum sativum* seeds, in terms of both their anatomy and preservation (see *fig. 2*).

A few badly preserved grains of barley (gerst, *Hordeum* sp.), were the only cereals present. The only other food plant in the samples was hazel (hazelnoot, *Corylus avellana*), represented by charred nutshell fragments.

3.2 PROCESSED PLANT FOOD

In the course of assessment work on samples, clumps of charred organic material were noticed in sample 5-22 (Grave 13), but also in sample 5-41 (Grave 14). Under scanning electron microscope they appear to consist of featureless, bland matrix. Within the matrix fragments of parenchyma have been observed as thick-walled, rounded cells ca. 50µm across (see *figs. 3a, b*). This parenchymatous tissue matches well with parenchyma observed in seeds of celtic bean (*Vicia faba* var. *minor*) recovered from Zuidelijke Stadsas (see *figs. 4a, b*). In this case, clumps of charred organic material probably represent remnants of plant food mush (brij) made from celtic beans.

Table 1 Charred plant remains from cremation graves.

Graf 13 Samples		**5-22**	**5-28**	**5-19**	**5-26**
Hordeum sp.	caryopsis	-	3	-	-
Lens culinaris	seed	1	2	1	-
Vicia faba var. *minor*	seed	3fr	1	4fr	6fr
Pisum sativum	seed	1fr	2fr	-	-
Corylus avellana	nut-shell	-	3fr	9fr	-
processed plant food		+	-	-	-

Graf 14 Samples		**5-40**	**5-41**
Lens culinaris	seed	2	3+24fr
Vicia faba var. *minor*	seed	12fr	30fr
processed plant food		-	+

An interesting aspect of the plant assemblage from Zuidelijke Stadsas is the presence of legumes as a major component of all the samples. The fact that charred plant remains were embedded within the lumps of sediment, bone fragments and charcoal, suggests that they were cremated together in the funeral pyre (see *fig. 6*). It may be further suggested that they represent remnants of food (possibly a ritual offering) added to the funeral pyre. This possible offering of food was composed of legume seeds, together with what is possibly a legume mush. (We should compare the plant material found in the graves with that from the settlement.)

Legumes were (and still are) an important source of human food, and together with cereals, the legumes are amongst the oldest cultivated crops. They have a high protein content (20-40 per cent), which is relatively rich in essential amino

acids (particularly lysine). As such, legume protein complements the low level of amino acids in cereal diet.

Some light on the ritual offerings during the Roman period is given by Lauwerier (1983) in his study on faunal remains from the 4th century cemetery in Nijmegen. The author suggests that food of animal origin was also placed in the graves, and it was not the refuse of a meal, "having only a symbolical meaning, but rather a good meal for the dead".

The finds of lentil in the Zuidelijke Stadsas graves are remarkable because, in the Netherlands, *Lens culinaris* has been found only in a few contexts from the Roman period, namely cremation graves near the Roman *castellum* Praetorium Agrippinae at Valkenburg (Pals *et al*. 1989), various deposits in Nijmegen (Buurman 1982, de Hingh & Kooistra 1994), and a native settlement close to the limes, De Horden near Wijk bij Duurstede (Lange 1988). *Lens culinaris* was by far the most common species found in the cremation graves at Valkenburg. Charred lentil seeds occurred there together with remains of *Vicia faba, Olea europaea* and two cereal species, *Triticum* sp. and *Hordeum* sp. In two other contexts, lentils occurred only in the very small quantities.

Lentils have been found in the Roman settlements in the German Rhineland. They occurred in samples from civilian features in Xanten and in the *castellum* Novaesium at Neuss (Knörzer 1984). In Neuss, the local cultivation of lentil was considered by the author.

In Britain (on the contrary), the presence of lentil, bitter vetch (*Vicia ervilia*) and einkorn wheat (*Triticum monococcon*) in a predominantly spelt wheat (*Triticum spelta*) deposit from the 1st century forum in London, suggests that this material has been imported from some where near the Mediterranean (Straker 1984).

In Zuidelijke Stadsas, *Hordeum* sp., *Vicia faba* var. *minor* and *Pisum sativum* were most probably the local crops. The origin of lentils, however is more difficult to determine (no threshing material has been found). In the Netherlands, *Lens culinaris* is usually interpreted as influence of the Roman world and considered to be imported from southern regions, and not cultivated locally, at least not until medieval times. However, relatively new evidence recovered from two Iron Age sites: at Maasbracht (Kooistra 1996), and at Sittard (41 charred seeds!) (Buurman & de Man 1991) show that the local cultivation of lentil, independent from the Romans influence should be considered.

4. Literature

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5. Figures

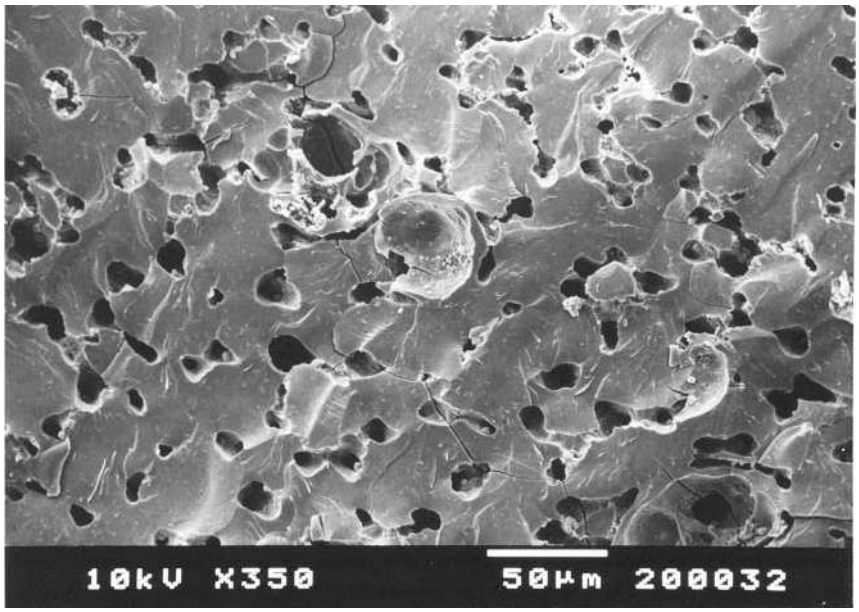


Fig. 1 Scanning electron micrograph of a charred fragment of storage parenchyma derived from pea (*Pisum sativum*) seed showing the densely packed cells (recovered from sample 5-28).

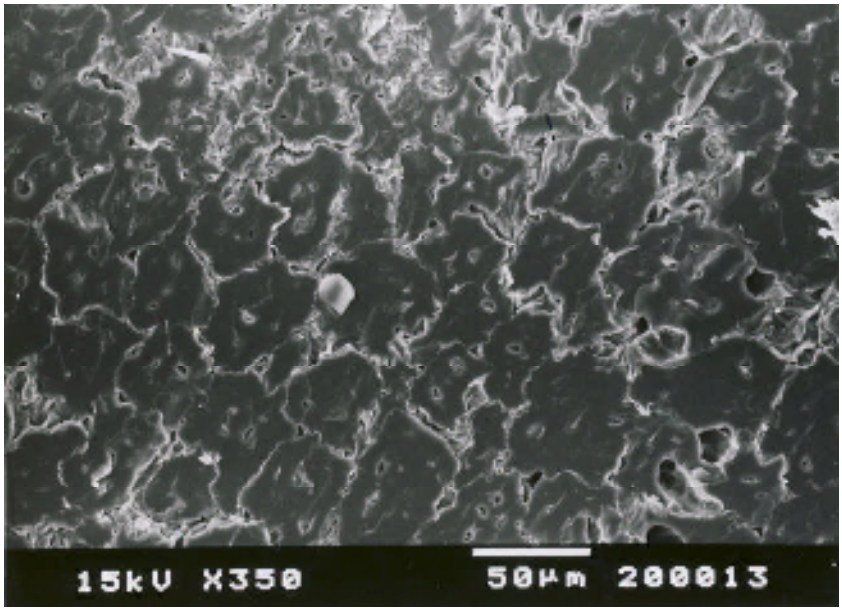
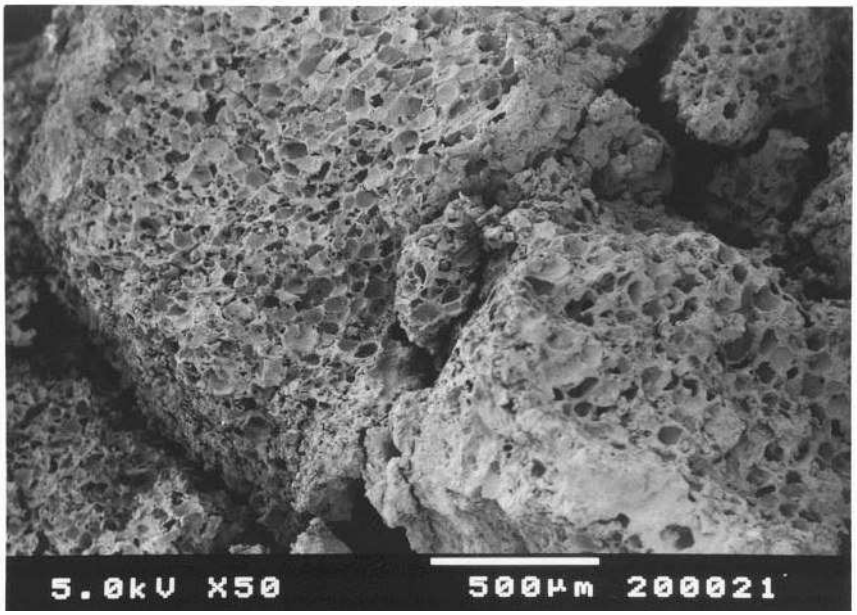


Fig. 2 Scanning electron micrograph of seed parenchyma derived from pea (*Pisum sativum*), recent, experimentally charred.



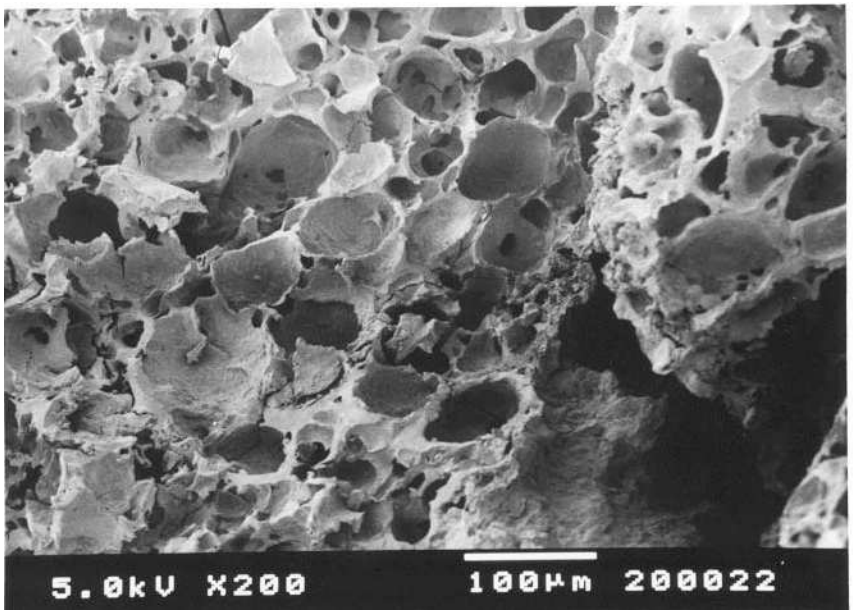
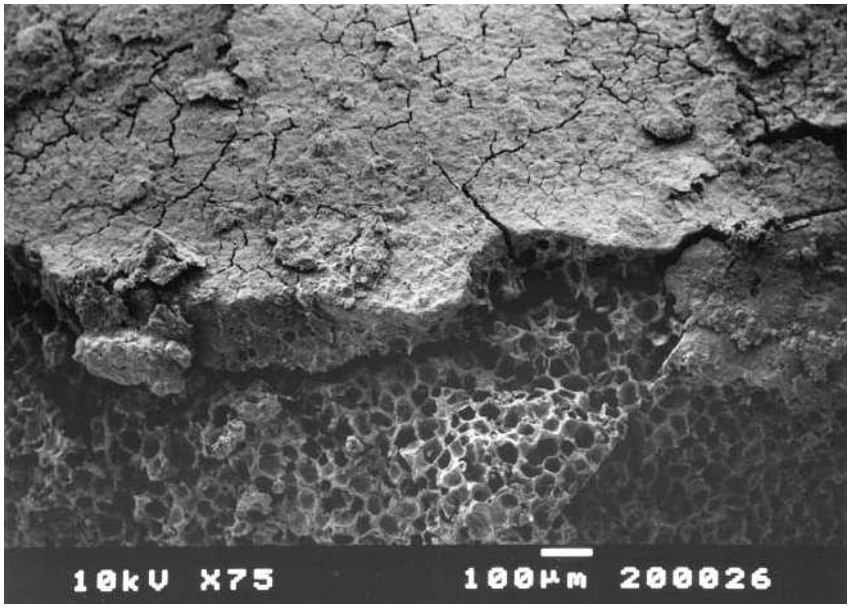


Fig. 3 a, b Scanning electron micrographs of storage parenchyma derived from the *Vicia faba* var. *minor* seed, found embedded within charred fragment of plant food mush (recovered from sample 5-41).



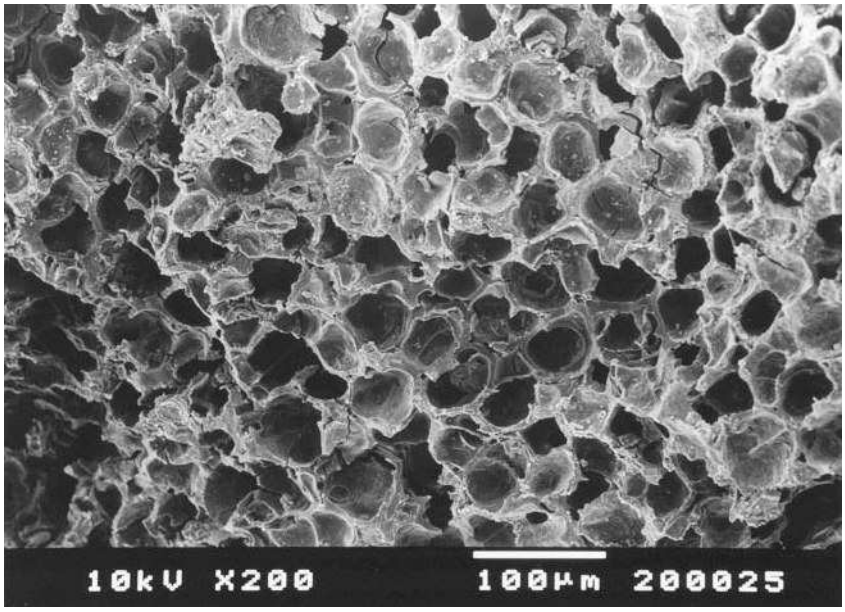


Fig. 4 a, b Scanning electron micrographs of a charred fragment of the celtic bean (*Vicia faba* var. *minor*) seed showing parenchyma as thick-walled, rounded cells (recovered from sample 5-41).

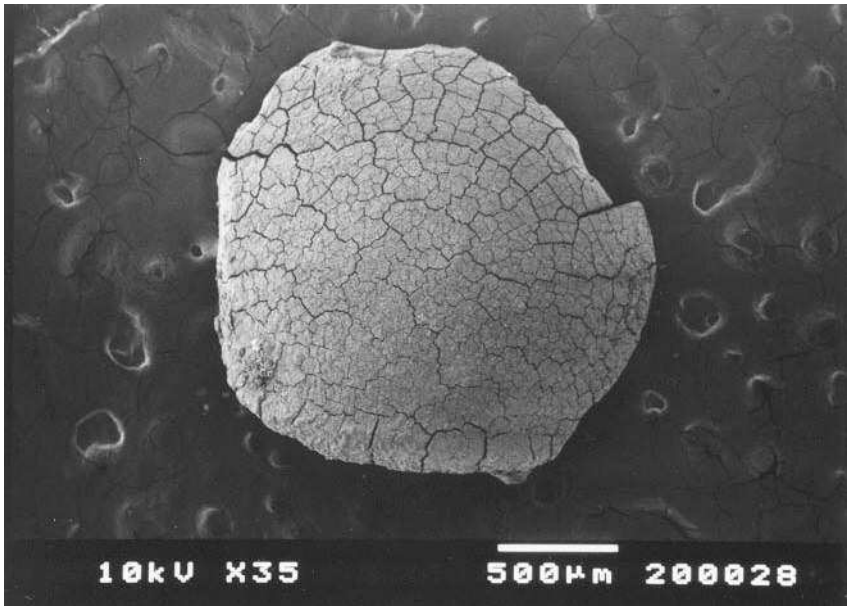


Fig. 5 Scanning electron micrograph of a charred lentil (*Lens culinaris*) seed (recovered from sample 5-41).

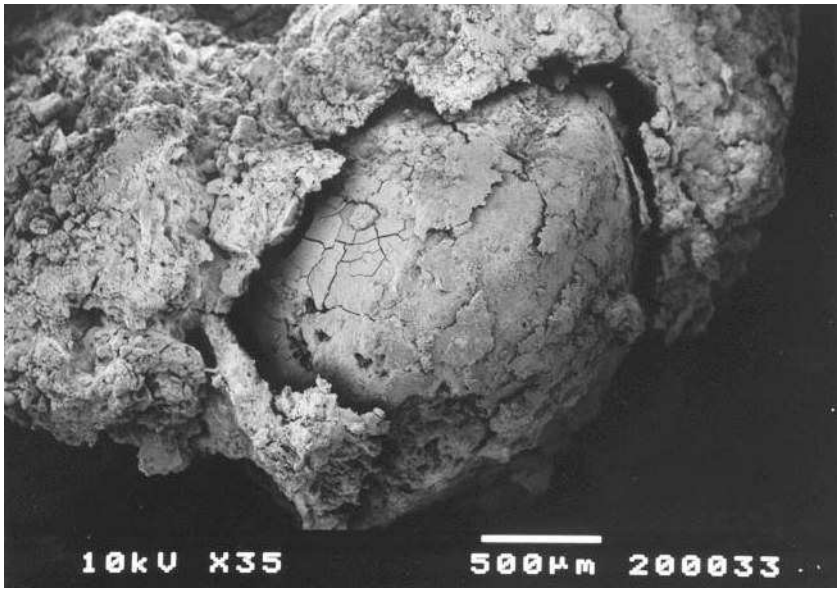


Fig. 6 Scanning electron micrograph of a charred lentil seed, found embedded within the lump of sediment, bone fragments and charcoal (recovered from sample 5-28).