

A HUNDRED YEARS OF ARCHAEOBOTANICAL INVESTIGATION ON A ROMAN FORTRESS IN PANNONIA



Kenéz, Árpád¹; Gyulai, Ferenc²;

¹Department of Nature Conservation and Landscape Ecology. E-mail: kenezarpad@gmail.com

²Department of Agro-environmental Management. E-mail: gyulai.ferenc@kti.szie.hu

Szent István University Gödöllő, Hungary



Institute of Environmental and Landscape Management

Introduction

One of the biggest Pannonian fortress in Hungary is located on the west bay shore of Lake Balaton (Fig. 1.). The 14 hectares ranged fortress in Keszthely-Fenekpuszta was destroyed in the middle of the 5th century AD probably by the Goths. Archaeological research started here in the second part of the 19th century. Plant macroremains were found in four excavation periods. The first botanical finds came to light in the year 1904 from a rubbish layer of a roman villa built in the end of the 4th century AD. The second archaeobotanical ensemble is known from the 1970-'72 excavation's campaign. During the excavations the charcoal remains were systematically collected. The third archaeobotanical collection is known from the excavation of the year 1993. The fourth archaeobotanical research was made in 2009 within the frames of a joint German-Hungarian cooperation. The samples were taken systematically from a villa heating-system of the beginning/middle 4th century AD. Keszthely-Fenekpuszta is outstanding amongst the list of Roman age archaeobotanical sites. Never more sites in Hungary where hundred years archaeobotanical remains are available. At the same time the changing of methodology could be proofed. With the help of plant remains we could reconstruct not only the cereal- but also the fodder production, and the horticulture and viticulture during the roman occupation. During the hundred years research were found 600 thousand seeds and fruits of about 60 plant species.

Material and methods

The late roman plant remains of Keszthely-Fenekpuszta were conserved by the burning down of the fortress, but the main morphological marks are more or less identifiable. The first task was the cleaning of diaspores (seeds and fruits) from the large quantities of dirt (soil, dust, gravel and other organic remainders). This operation was made by sifting, flotation and the combination of these methods with screen series (0,5 and 1,5 mm) and flotation machinery. After that we identified the separated seeds with relevant identification literature and recent reference collection.

Results (Carpology)

Excavation 1904-05. (5th century AD.)

Features of the sampling: On chance in the course of a remark, fragment sample. „C” sign bath building (Fig. 2.).

Number of samples: 8
Number of plant remains: 14573
Number of taxons: 12

Main attributes: Dicotyl plants haven't got been detected. The most important cereals: chaffed wheats (einkorn - *Triticum monococcum*, emmer - *T. dicoccum*). The modern wheats are in smaller proportion (club wheat - *T. aestivum* ssp. *compactum*, spelt - *T. ae. ssp. spelta*, common wheat - *T. ae. ssp. vulgare*). Weeds are the rye brome, poverty brome, soft brome (*Bromus secalinus*, *B. sterilis*, *B. mollis*) and the wild oat (*Avena fatua*). As an interest information, that the rye brome today is endangered weed species in Hungary.



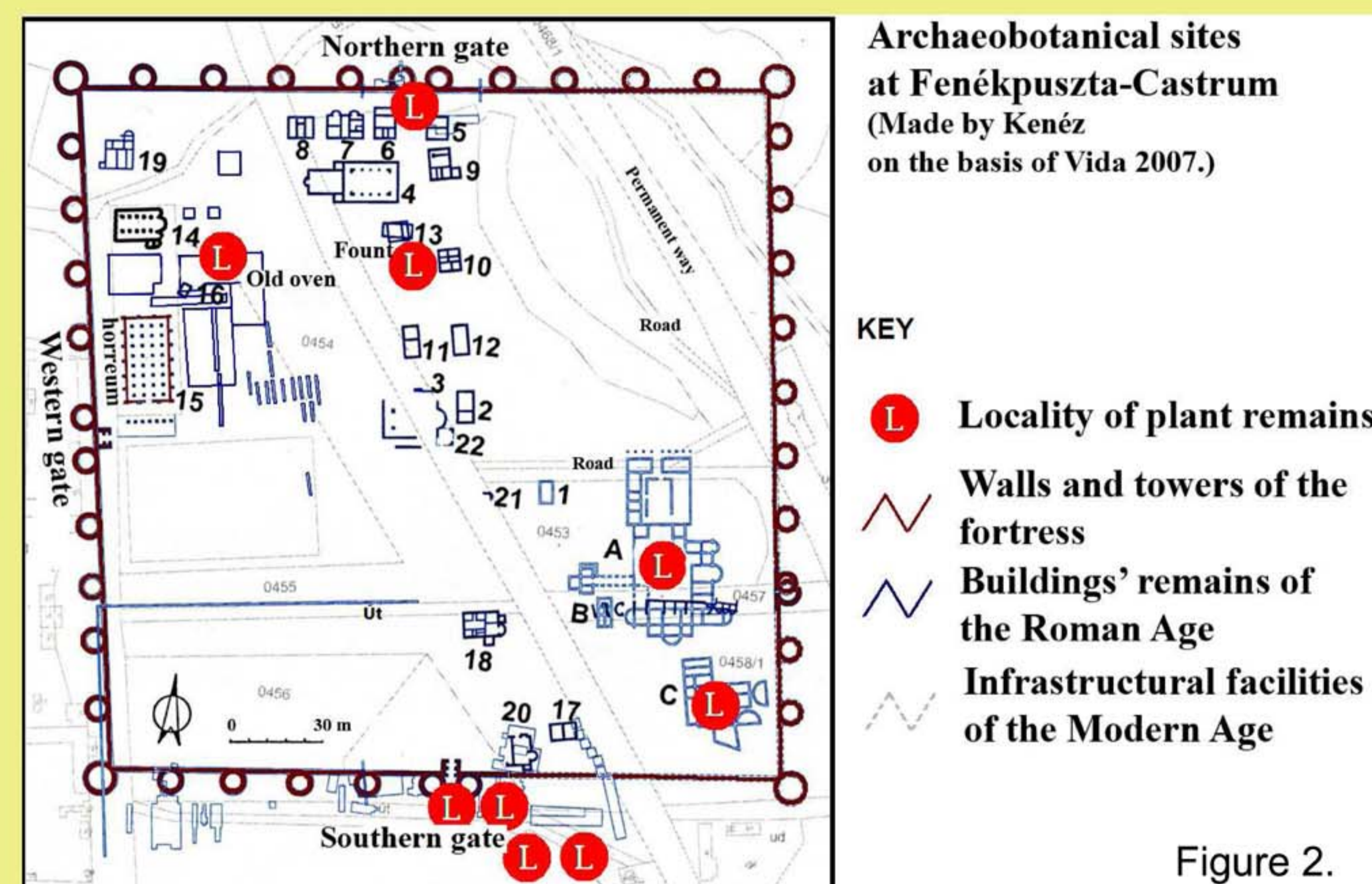
Figure 1.

Excavation 1970-72. (4-5th century AD.)

Features of the sampling: Systematically sampling with an archaeobotanical specialist. Southern gate of fortress, fount, basilica, horreum, oven.

Number of samples: 55
Number of plant remains: 542447
Number of taxons: 59

Main attributes: The most important cereal is the naked barley (*Hordeum vulgare* ssp. *nudum*). The another cultivated plants can be see on the Fig. 3. The property of the chaffed wheats much lower like the previous excavation. The millet (*Panicum millaceum*) is turn up. More species represent the leguminous plants (Fig. 4.). Two cruciferous plants can be find in the samples, which species nowadays are in Hungary very rare ; ballmustard (*Neslea paniculata*) and the bird's eye cress (*Myagrum perfoliatum*).



Archaeobotanical sites at Fenekpuszta-Castrum (Made by Kenéz on the basis of Vida 2007.)

KEY

- Locality of plant remains
- Walls and towers of the fortress
- Buildings' remains of the Roman Age
- Infrastructural facilities of the Modern Age

Figure 2.

Excavation 1993. (3-4th century AD.)

Features of the sampling: Systematically sampling. Northern gate of the fortress (Fig. 2.).

Number of samples: 1
Number of plant remains: 106
Number of taxons: 13

Main attributes: The unidentified fragments of cereals in the samples was 40%. The barley (*Hordeum vulgare*) is dominant opposite the millet and the wheat species. New weed species compared the previous excavations: field brome (*Bromus arvensis*), foxtail barley (*Hordeum murinum*), spotted ladythumb (*Polygonum persicaria*), yellow foxtail (*Setaria lutescens*).



Figure 5.: Charred remain of bread - crust (Excavation 1970-72.)

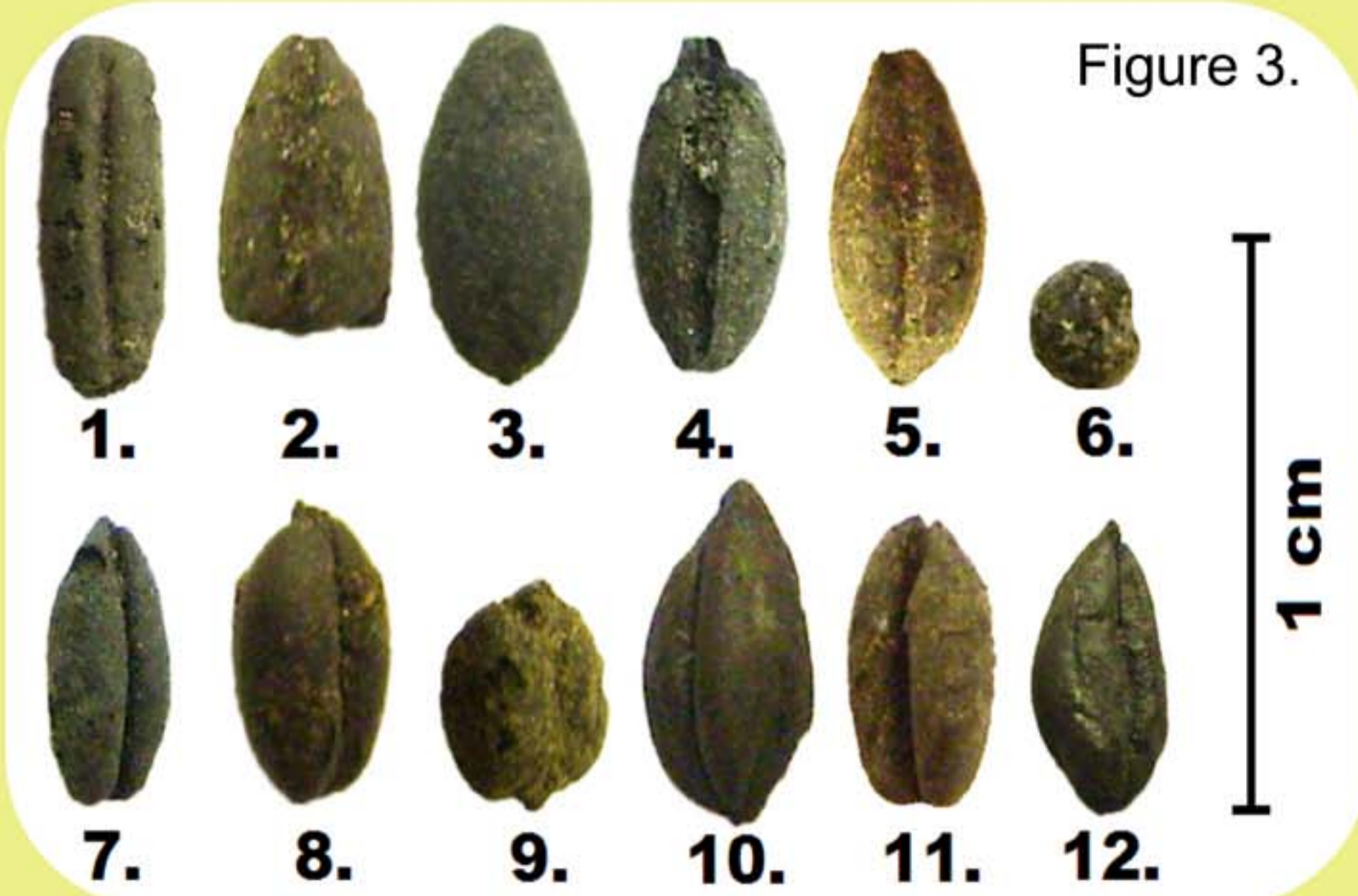


Figure 3.

Figure 3.: Charred remains of cereals (Excavation 1970-72.): 1. *Avena sativa*, 2. *Hordeum vulgare* subsp. *distichum*, 3. *H. vulgare* subsp. *distichum* var. *nudum* 4. *H. vulgare polystichum*, 5. *H. vulgare polystichum* var. *nudum*, 6. *Panicum millaceum*, 7. *Secale cereale* 8. *Triticum aestivum* subsp. *vulgare*, 9. *T. aestivum* subsp. *compactum*, 10. *T. turgidum* subsp. *dicoccum*, 11. *T. aestivum* subsp. *spelta*, 12. *T. monococcum*.

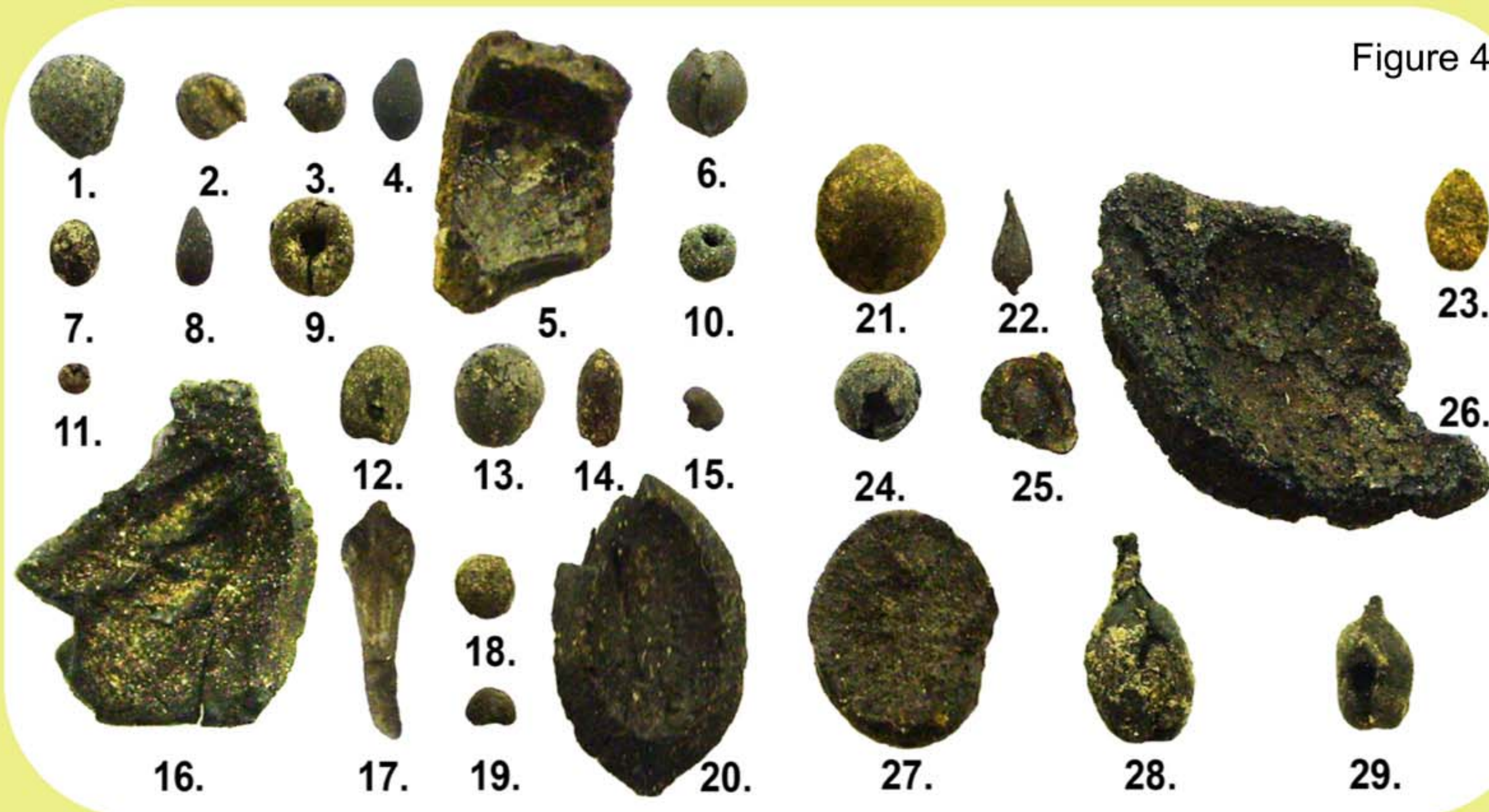


Figure 4.

Figure 4.: Charred remains of the dicotyl species (Excavation 1970-72.): 1. *Adonis spec.*, 2. *Agrostemma githago*, 3. *Chenopodium album*, 4. *Convolvulus arvensis*, 5. *Corylus avellana*, 6. *Fallopia convolvulus*, 7. *Fumaria officinalis*, 8. *Galeopsis ladanum*, 9. *Galium aparine*, 10. *Galium spurium*, 11. *Galium verum*, 12. *Lathyrus pratensis*, 13. *Lens culinaris* subsp. *macrosperma*, 14. *Melampyrum arvense*, 15. *Mellilotus officinalis*, 16. *Juglans regia*, 17. *Myagrum perfoliatum*, 18. *Neslea paniculata*, 19. *Papaver dubium*, 20. *Olea europea*, 21. *Pisum sativum*, 22. *Polygonum aviculare*, 23. *Sambucus ebulus*, 24. *Vicia angustifolia*, 25. *Vicia ervilia*, 26. *Prunus persica*, 27. *Vicia faba*, 28-29. *Vitis vinifera* subsp. *vinifera*.

Conclusions

The cereals coming from the late roman fortress explorations differ in species composition from the Pannonian set of grain remains. The large number of seeds, the carbonized, meter thick layer of cereals found in front of the southern fortification gate, in a well and ovens imply that at least one thousand tons of cereal must have been stored within the walls, mainly in the horreum before the attack and burn. A part of the grains presumably came from other provinces. This large amounts of grains were stored probably for mass catering. The most important cereals were barley, common wheat and rye. Einkorn, emmer, spelt and millet were also available. Among the poppy, pea, bitter vetch and horse-bean seeds also occurred the bigseed lentil. Some evidence of the local pome- and viticulture are available: peach, walnut, grape. Several grapevine cultivars were grown. Carbonised cereal-gruel and leavened bread pieces indicate that the inhabitants had various and nutritional foods supplemented with imported figs and olives. The number of the weed species is high. They are mostly relatively high-growing wintercrop weeds, which indicates that cereals were harvested at about two-thirds of the height of the stalks, probably using a sickle.