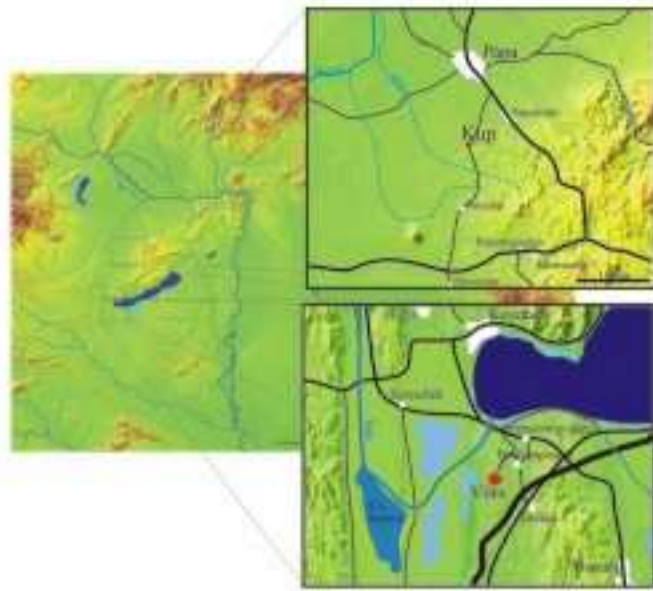


# Daub: between pottery and sediment

Kovács Tímea<sup>(1,2)</sup> – Szakmány György<sup>(2)</sup> – T. Biró Katalin<sup>(3)</sup> – Tóth Mária<sup>(4)</sup>

- (1) Department of Geology, University of Oviedo, C/Jesus Arias de Velasco S/N, 33005 Oviedo, Spain
- (2) Department of Petrology and Geochemistry, Eötvös Loránd University, Pázmány Péter sétány 1/C., H-1117 Budapest, Hungary
- (3) Hungarian National Museum, Múzeum krt. 14-16., H-1088 Budapest, Hungary
- (4) Department of Mineralogy, Petrology and Organic Geochemistry, Institute of Geochemical Research, Hungarian Academy of Sciences, Budaörsi út 45., H-1112



## introduction

The poster presents the summary of a complex archaeometrical investigation of Neolithic daub fragments from two archaeological sites (Vörs and Kup, in Transdanubia, Hungary, see map on the left).

The main target of this research was to collect information about the building technology of the wattle-and-daub houses, tracing possible differences between the building traditions of different cultures and localities and to investigate the possible raw materials and to make a preliminary comparison of daub to other, intentionally burnt earthenware (ceramics).

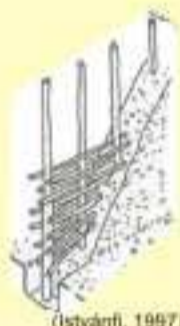
## archaeological background

samples	collected by	collected in	cultural horizon
Vörs	K.T. Biró Zs. Virág	1999-2000	Early Neolithic Starčevo Late Neolithic/Early Copper Age Lengyel
Kup	K. T. Biró J. Regénye	2000-2003	Late Neolithic/Early Copper Age Lengyel

The represented cultures used similar domestic architecture with plastered wattle walls.



Structure of the wall:  
 - wooden frame composed of larger posts and smaller branches and twigs  
 - clay with vegetal or chaff tempering inside and outside  
 - possible decoration of incising and/or painting  
 (Patel, 2004; Kalicz & Raczky, 1987)



## methodology

- binocular microscopy
- polarizing microscopy
- scanning electron microscopy with energy dispersive spectrometer
- X-ray powder diffraction
- X-ray fluorescence analysis
- neutron activation analysis

## samples

Approximately 500 samples were collected and investigated from the two sites.

After the macroscopic description a classification was made based on the:

- morphological features
- porosity
- average grain size

40 representative samples were selected for further analysis from each type. A few examples of the daub types are presented on the photos.



non-plastic components	Vörs	Kup
Monocrystalline quartz (v%)	66,4	55,2
Polycrystalline quartz (v%)	7,7	14,0
Mica (v%)	10,4	6,5
Feldspar (v%)	4,0	6,4
Rock fragment (v%)	3,6	12,5
Opaque minerals + organic material (v%)	8,0	5,3
Accessories (v%)	traces	traces

## mineralogical composition and textures

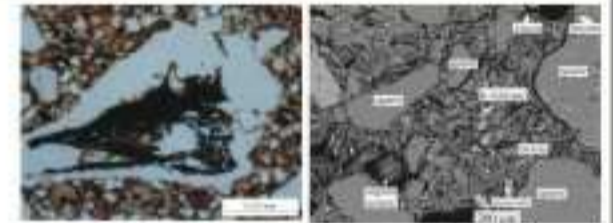


The differences in texture depends on the NPC/matrix ratio and the grain size. Fragments of burnt plasters or ceramics are present.

The matrix consists of 10-20 μm size grains of the same minerals as the non-plastic components and various amount of disperse carbonate.

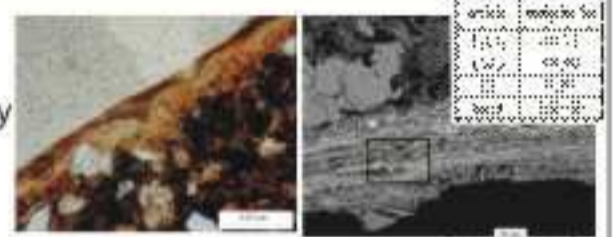
## organic material

We can find the remains of artificially added tempering organic material, as carbonized plant residual or irregular shaped nodules.



## painting

A painting layer can be observed on many surfaces. It's chemical composition is similar to apatite, which suggests bone-grist as raw material.

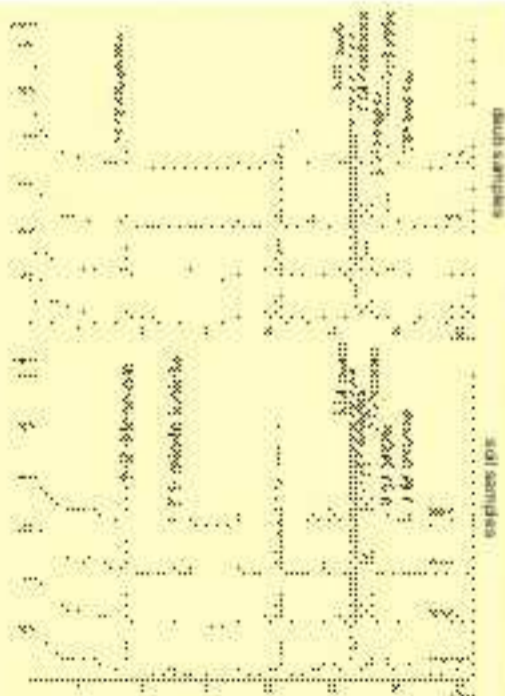


## mineralogical composition

The mineralogical and granulometric features of the daub samples and the corresponding soil samples are the same with one exception:

the clay minerals, which are present in the soil, are missing from the daub!!!

!!! - ne ordibálj



## comparison with local soils

by means of binocular microscope and XRD

## comparison with local ceramics

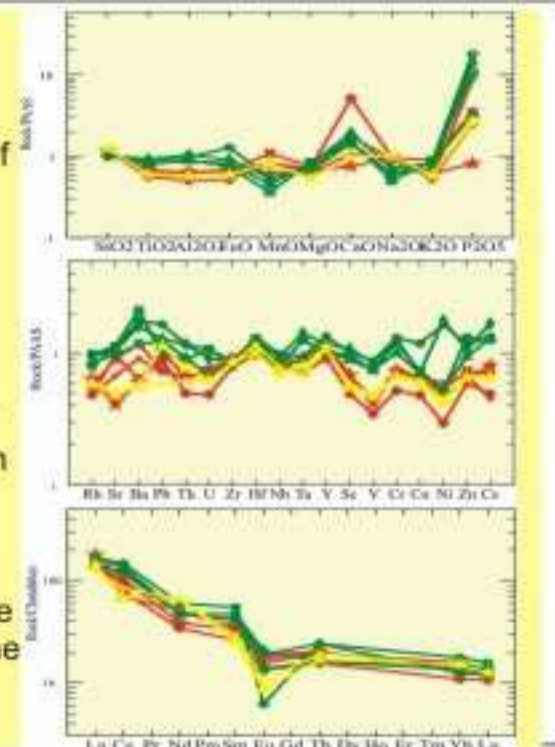
only at the Vörs site by means of geochemical analysis

## chemical composition

The chemical composition of the daub and the samples are very similar, while that of the ceramic samples is significantly different.

Higher variations in Ca may be due to the same variation of the raw material.

Higher variation in P may depend on the amount of the added organic material or the later burial conditions etc.



## conclusions

- there are no significant differences between the daub of the two sites and cultures
- vegetal (and animal?) organic material was added to the raw material
- the carbonate content of the raw material had no importance
- the clay mineral content of the raw material was removed
- bone grist was used as painting material
- the fire, which preserved the daub, probably wasn't intensive as there are no significant traces of burning

- the raw material of the daub at the Vörs site probably was the local soil, while the raw material of the ceramics was different, but more analysis is necessary

## references

- Istvánfi
- Kalicz & Raczky
- Patel
- Starnini & Szakmány
- Huston & Terry ????
- Sun & McDonough ????
- Taylor & McLennan ????

HIV: így nincs értelme. Ki kell írni, legalább rövidítve

## acknowledgements

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