


See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/36087275>


## Isopod faecal pellets as archaeological and forensic time capsules

Poster · September 2022


CITATIONS  
0


8 authors, including:

 Nicola Bellizzi  
University of Tübingen  
14 PUBLICATIONS 223 CITATIONS  
[SEE PROFILE](#)


 Christoph Algen  
University of Tübingen  
25 PUBLICATIONS 228 CITATIONS  
[SEE PROFILE](#)


Some of the authors of this publication are also working on these related projects:

 "VMM" Virtual Micromorphology Meeting [View project](#)

 Molecular age determination of forensically relevant blowfly pupae [View project](#)

READS  
27

 Christine Frensch  
University of Basel  
64 PUBLICATIONS 273 CITATIONS  
[SEE PROFILE](#)

 Jens Frensch  
Goethe-Universität Frankfurt am Main  
149 PUBLICATIONS 3,215 CITATIONS  
[SEE PROFILE](#)

# Isopod faecal pellets as archaeological and forensic time capsules

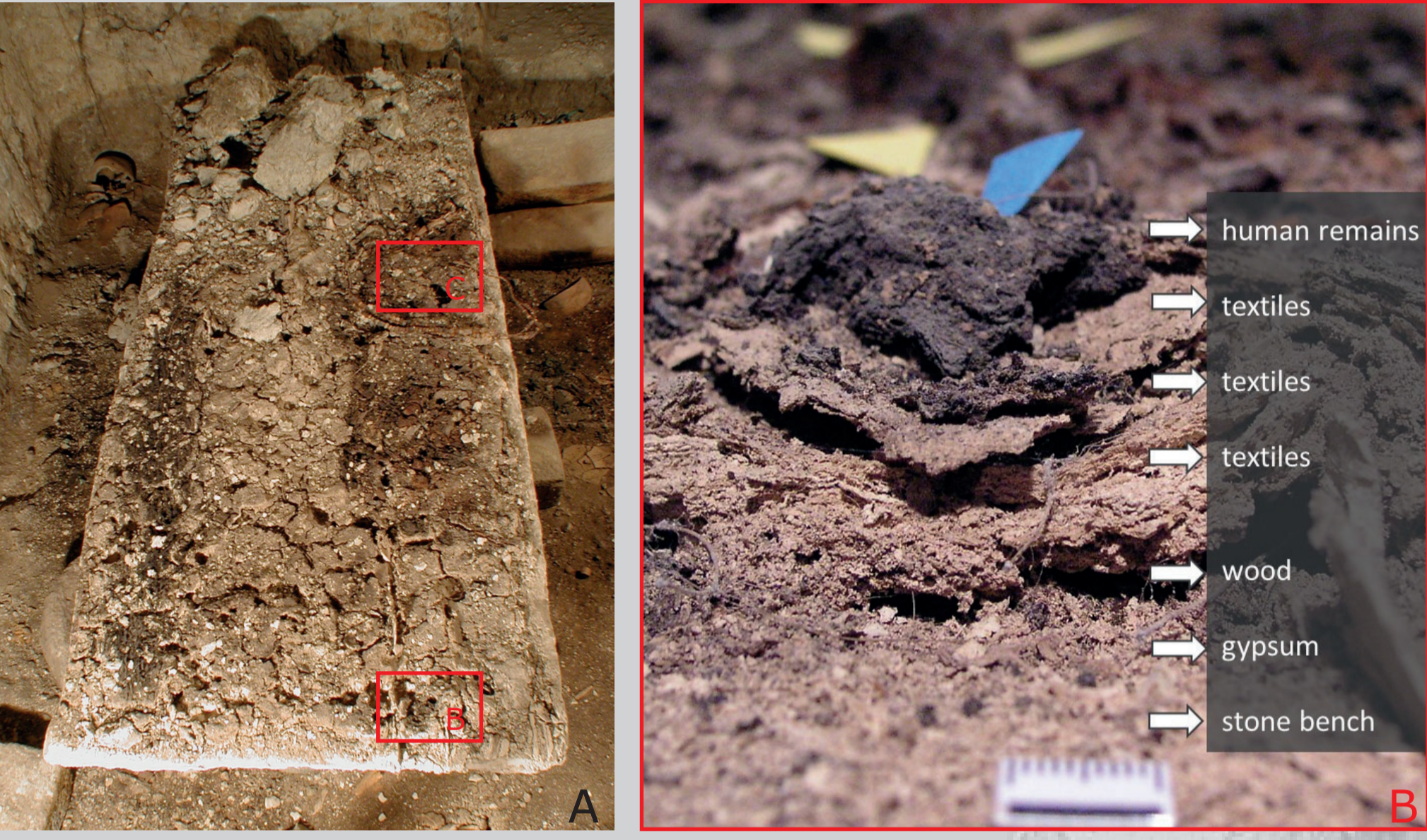
N. Reifarth<sup>1</sup>, Ch. Pümpin<sup>2</sup>, Christoph Allgaier<sup>3</sup>, Ursula Drewello<sup>4</sup>, Rainer Drewello<sup>5</sup>, Wolfgang Langer<sup>6</sup>, Peter Watzke<sup>6</sup>, Jens Amendt<sup>7</sup>

Faecal pellets of invertebrates are frequently observed as microscopic bricket-like particles in archaeological burial contexts. Microscopic and molecular analyses of these inconspicuous finds shed new light in the field of paleofaeces. They provide indirect evidence for grave goods of organic materials, such as textiles or leather, which are already completely decayed today.



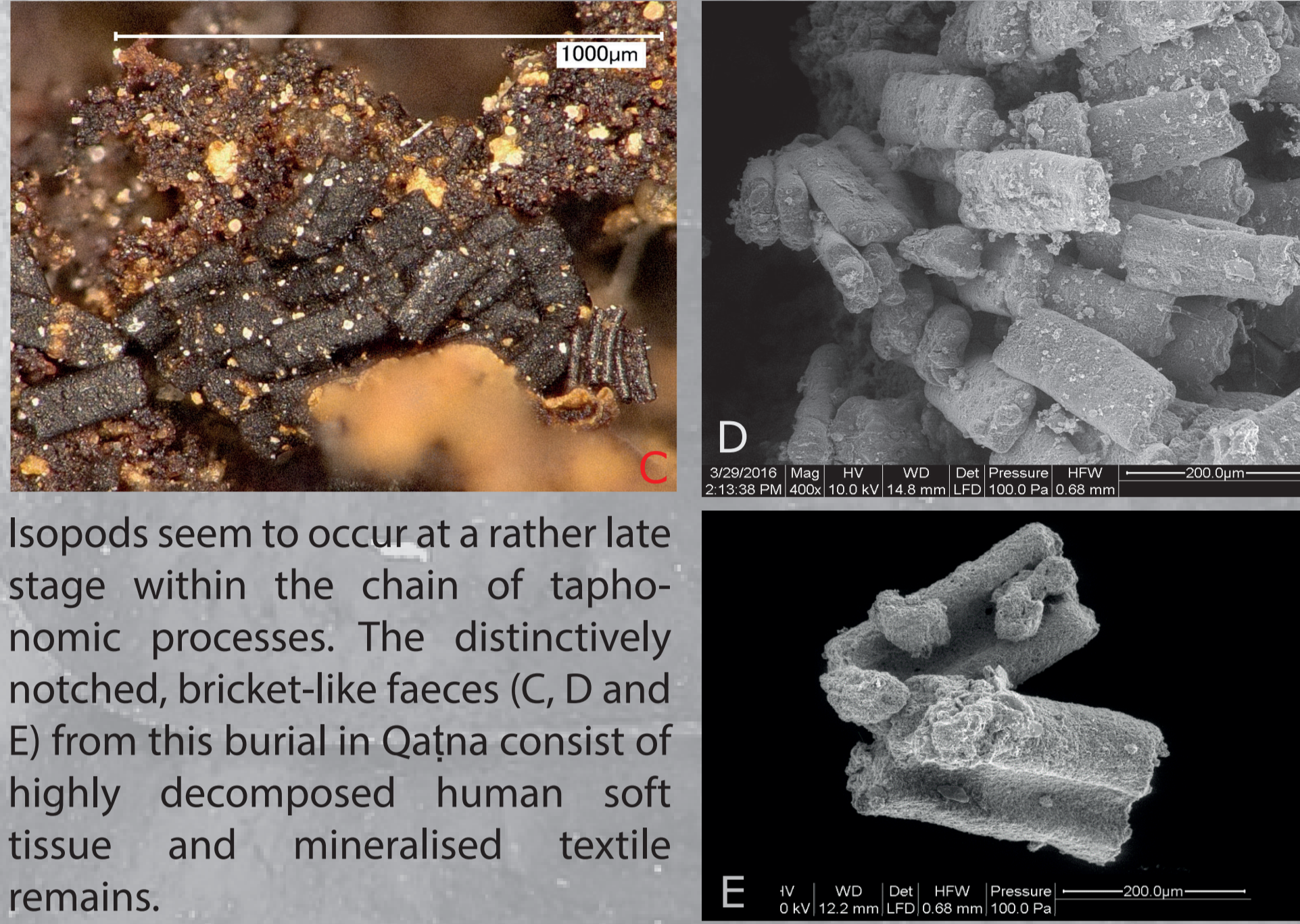
## The Big Feast

Qatna/Tell Mishrife (Syria, c. 1800 BC)



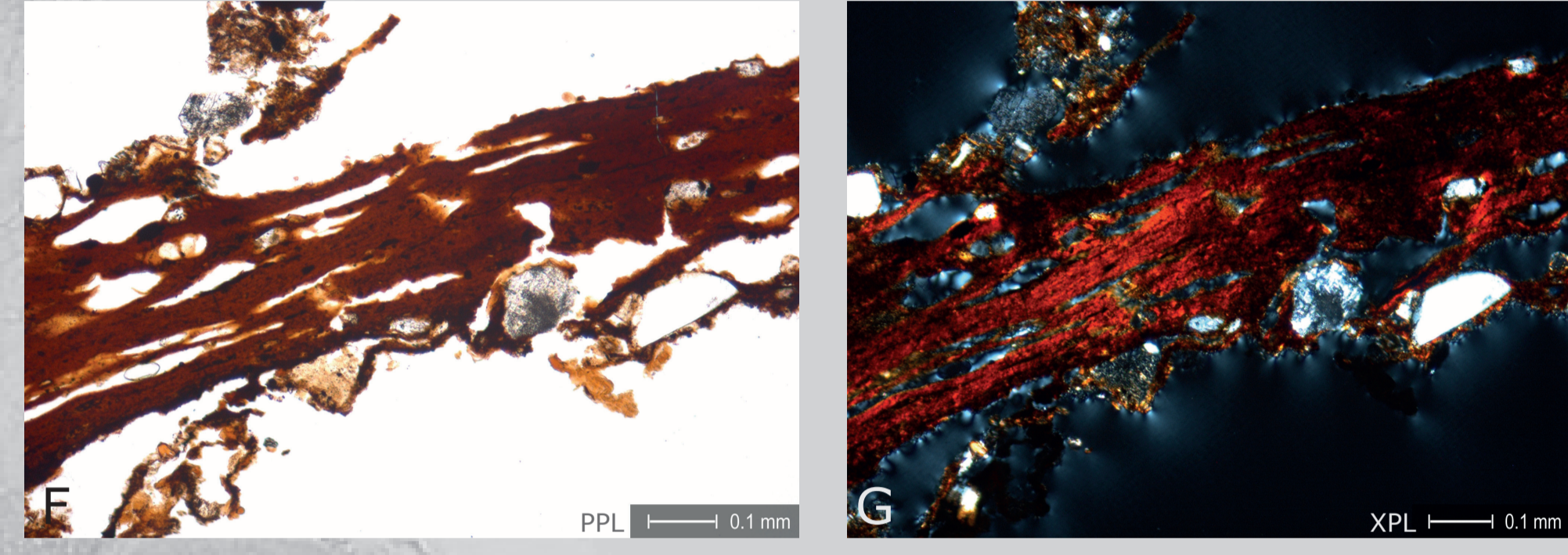
The most remarkable burial in the Royal Tomb of Qatna was recovered on a stone bench (A), embedded between deposits of a sediment-like material which turned out to be a complex bedding of more than 30 textile layers, plant materials and a wooden coffin lined with gypsum (B).

## Late Arrivals



Isopods seem to occur at a rather late stage within the chain of taphonomic processes. The distinctively notched, bricket-like faeces (C, D and E) from this burial in Qatna consist of highly decomposed human soft tissue and mineralised textile remains.

## Transformation



FT-IR spectroscopy and micromorphological analysis (F and G) of thin sections indicate complex taphonomic transformation processes of human soft tissue (B and C) as well as textiles, caused by special burial practices (heating the body, treatment of body and textiles with pigments and minerals) and post-depositional processes over the millennia in the tomb.

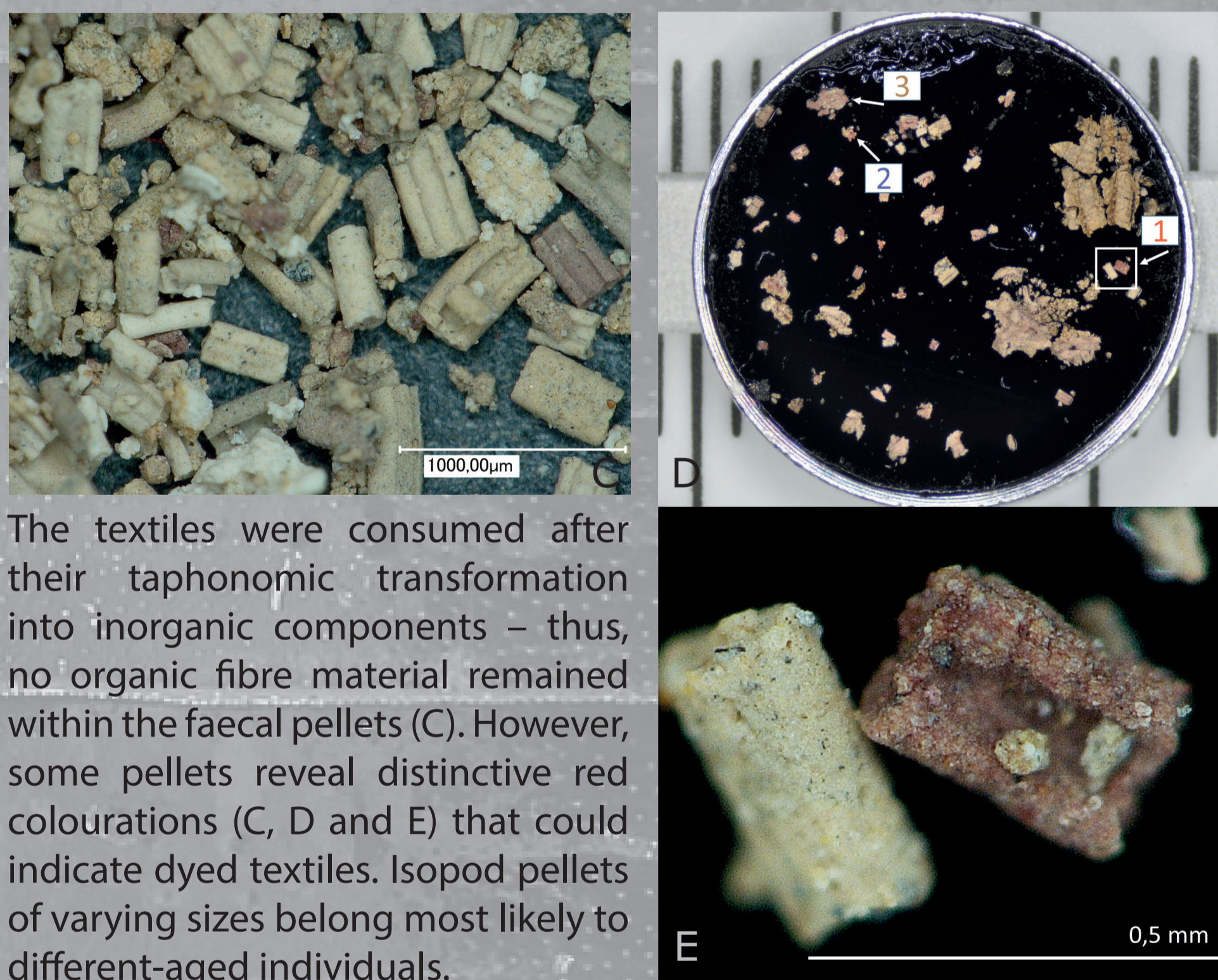
## Red Dessert

Tell Chuëra (Syria, c. 1500 BC)



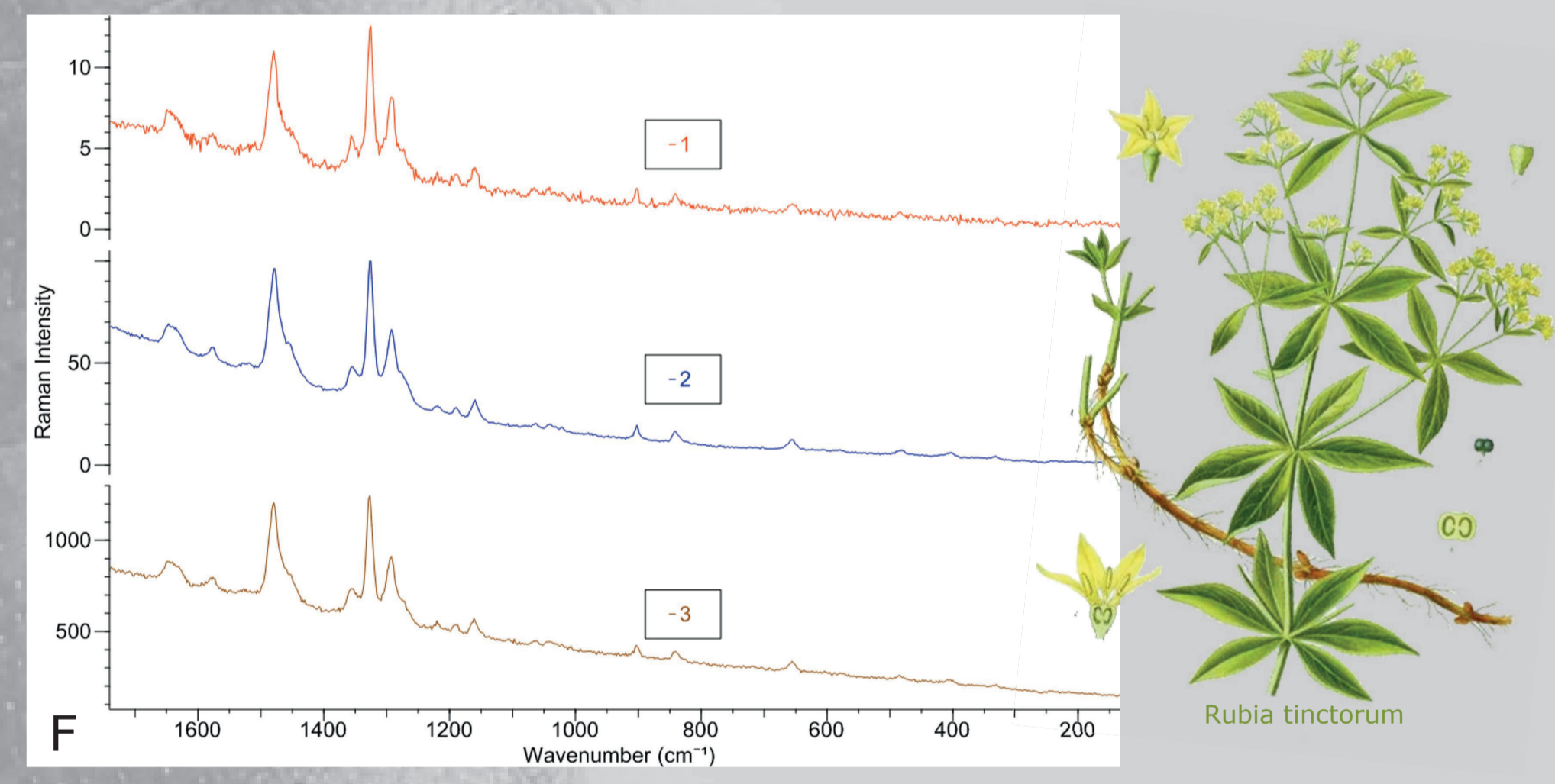
A Middle Assyrian mud brick burial (A) revealed mineralised textile structures and isopod faecal pellets (B, red arrows) between the phalanges of a female individual.

## Devoured Textiles



The textiles were consumed after their taphonomic transformation into inorganic components – thus, no organic fibre material remained within the faecal pellets (C). However, some pellets reveal distinctive red colourations (C, D and E) that could indicate dyed textiles. Isopod pellets of varying sizes belong most likely to different-aged individuals.

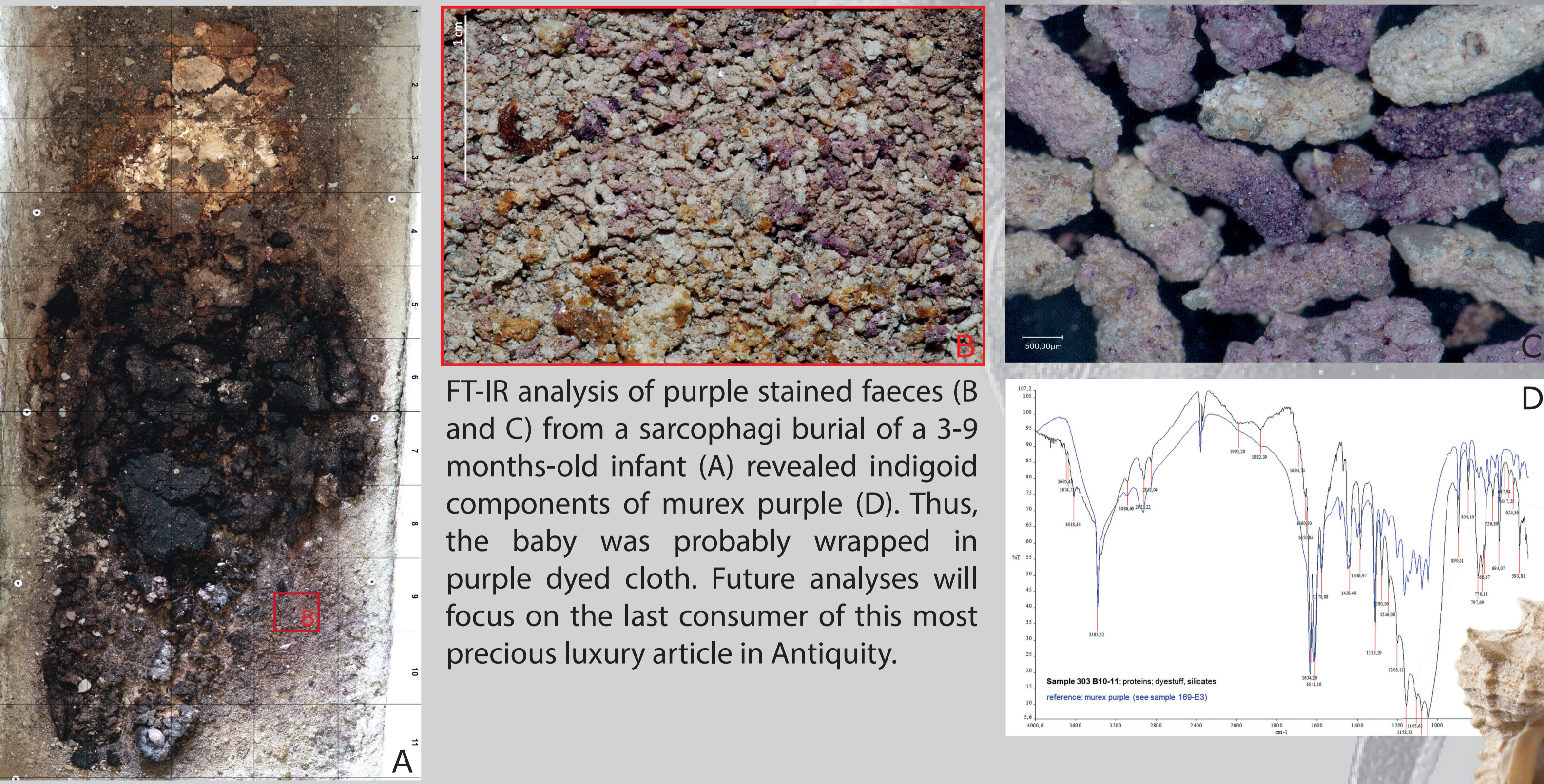
## Resilient Dyestuffs



Raman spectroscopy (F) of the red colouration (D and E; 1-3) revealed the dye component alizarin which originates from the madder root (Rubiaceae). It is known from written as well as archaeological sources that madder was one of the most important dyestuffs for textiles and leather. Nevertheless, the find from Tell Chuëra constitutes only the third evidence of this dyestuff in the Bronze Age Near East, due to the perishable nature of organic materials and the rarity of these finds in archaeological contexts.

## Perspectives – still unknown gourmets

Trier (Germany, 4th century AD)



FT-IR analysis of purple stained faeces (B and C) from a sarcophagi burial of a 3-9 months-old infant (A) revealed indigoid components of murex purple (D). Thus, the baby was probably wrapped in purple dyed cloth. Future analyses will focus on the last consumer of this most precious luxury article in Antiquity.

## Conclusion

The potential of arthropod faeces in archaeological and forensic contexts is still underestimated and has not attracted much attention so far. They can be considered as time capsules that bear unexplored sources of information. Future research would benefit from a systematic approach to multidisciplinary analyses of these finds, as well as experimental work.



Recent pellets from isopoda with digested wood fibres.