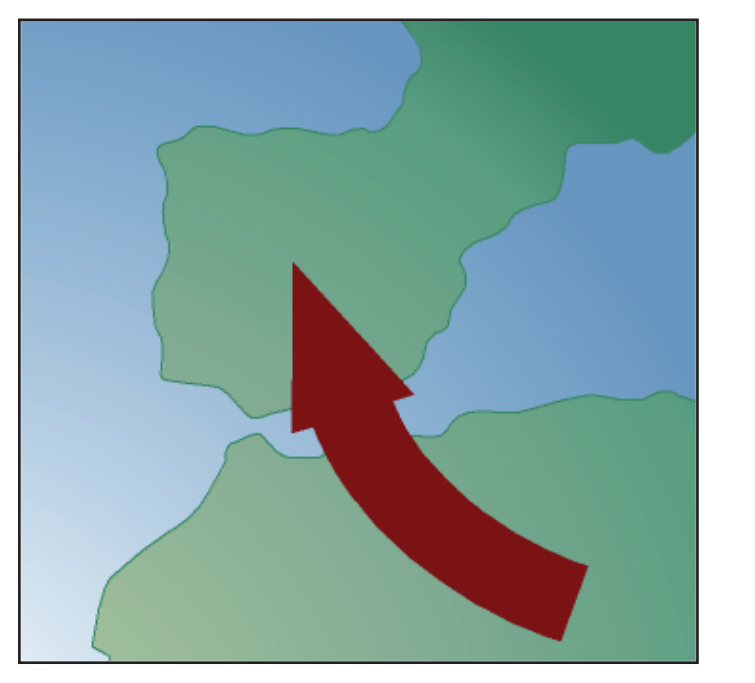


Early to middle Holocene shelter deposits in Northern Morocco – a microscopic perspective



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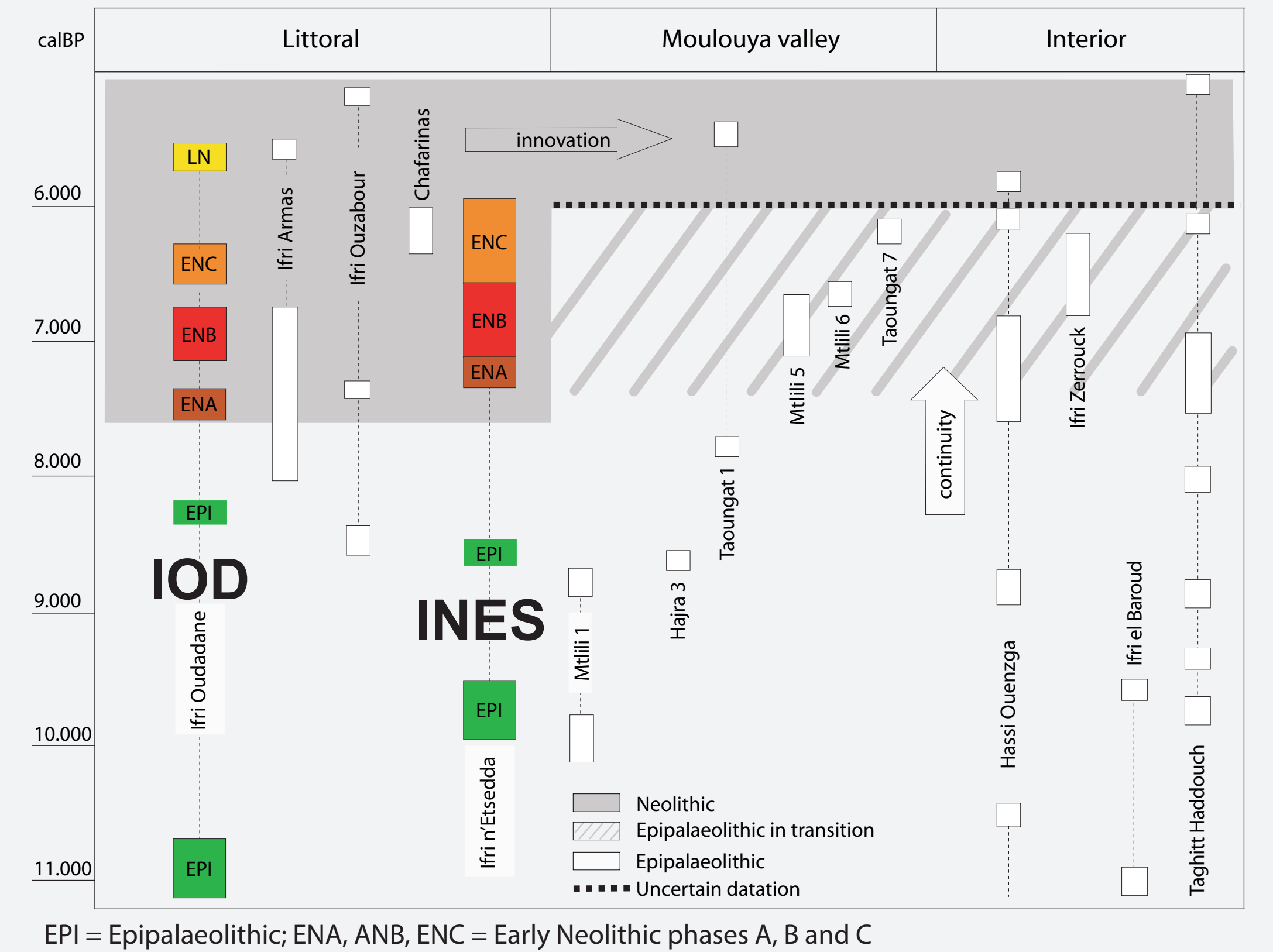
Introduction and objectives

The transition from hunter-gatherers to early food producing communities in Northwestern Africa is documented in few archaeological sites. Recently the sediment sequence of Ifri Oudadane (IOD, 45 m a.s.l.) gave insights into Late Epipalaeolithic/ Early Neolithic occupations at the Moroccan coast documenting the onset of livestock penning in the area (e.g., Linstädter and Kehl 2012). New excavations at the rock shelter of Ifri N'Etsedda (INES, 303 m a.s.l.), located at less than 10 km linear distance to the sea but separated from the coast by the Kbdana Mountain range (~600 m a.s.l.) yield information on contemporaneous occupations further inland. We here present results of micromorphological investigations on both sequences, which shed light on their mineral and organic constituents, as well as processes of sediment formation and post-depositional alteration. This information should help elucidating the usage of these rock shelters and subsistence practices during the early to middle Holocene.

Location



Chronostratigraphy



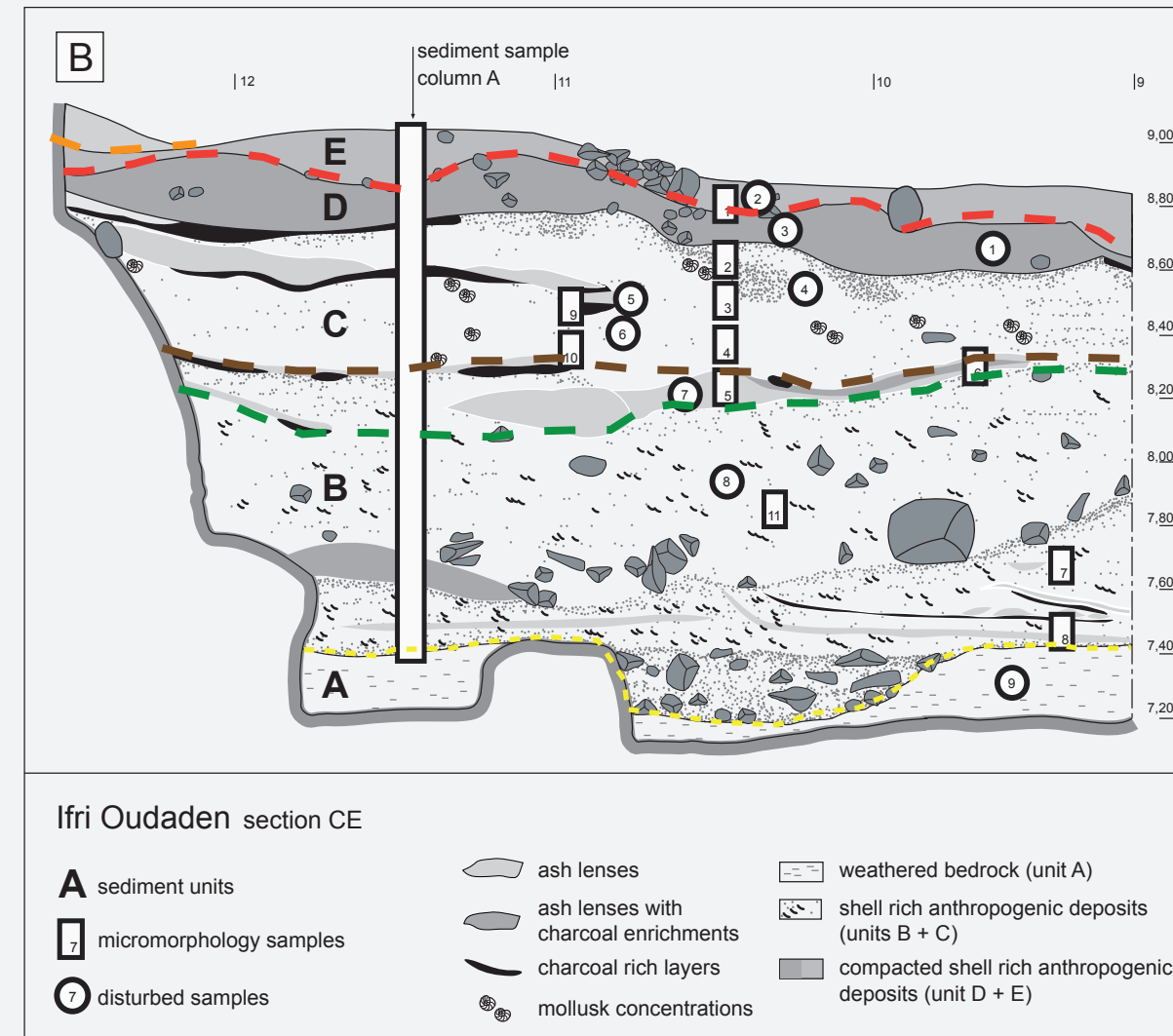
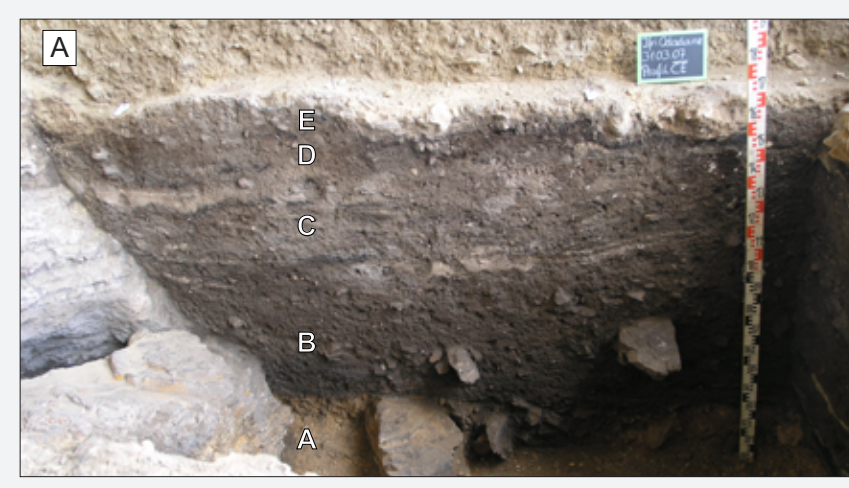
The sequence of IOD

Micromorphological features:

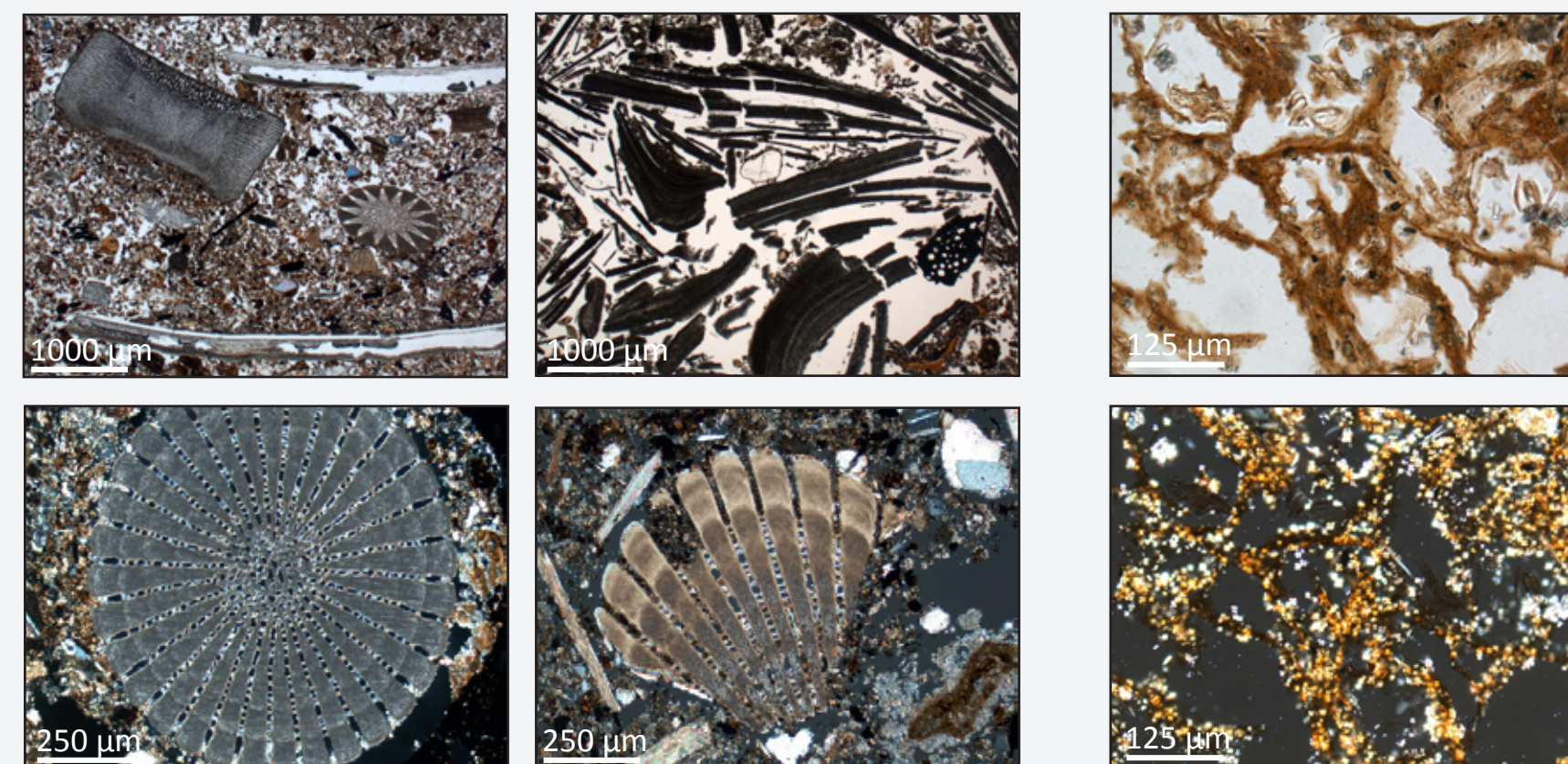
- presence of microlamination, e.g. ash or charcoal rich microlayers
- differential degrees of compaction
- abundant snail shells, partly burned and often crushed
- exo-skeletons of diatoms and bryozoa, small fish bone
- dung pellets including calcite spherulites in the Neolithic levels, very rare in the Epipalaeolithic
- pore fillings of finely grained gypsum
- lower carbonate content (CCE at 45 to 65 %) and more variable composition of mineral fines



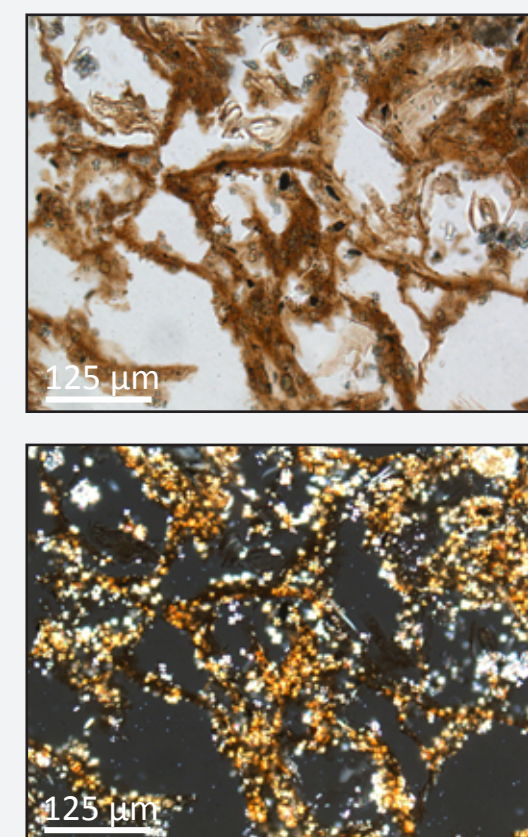
Profile CE



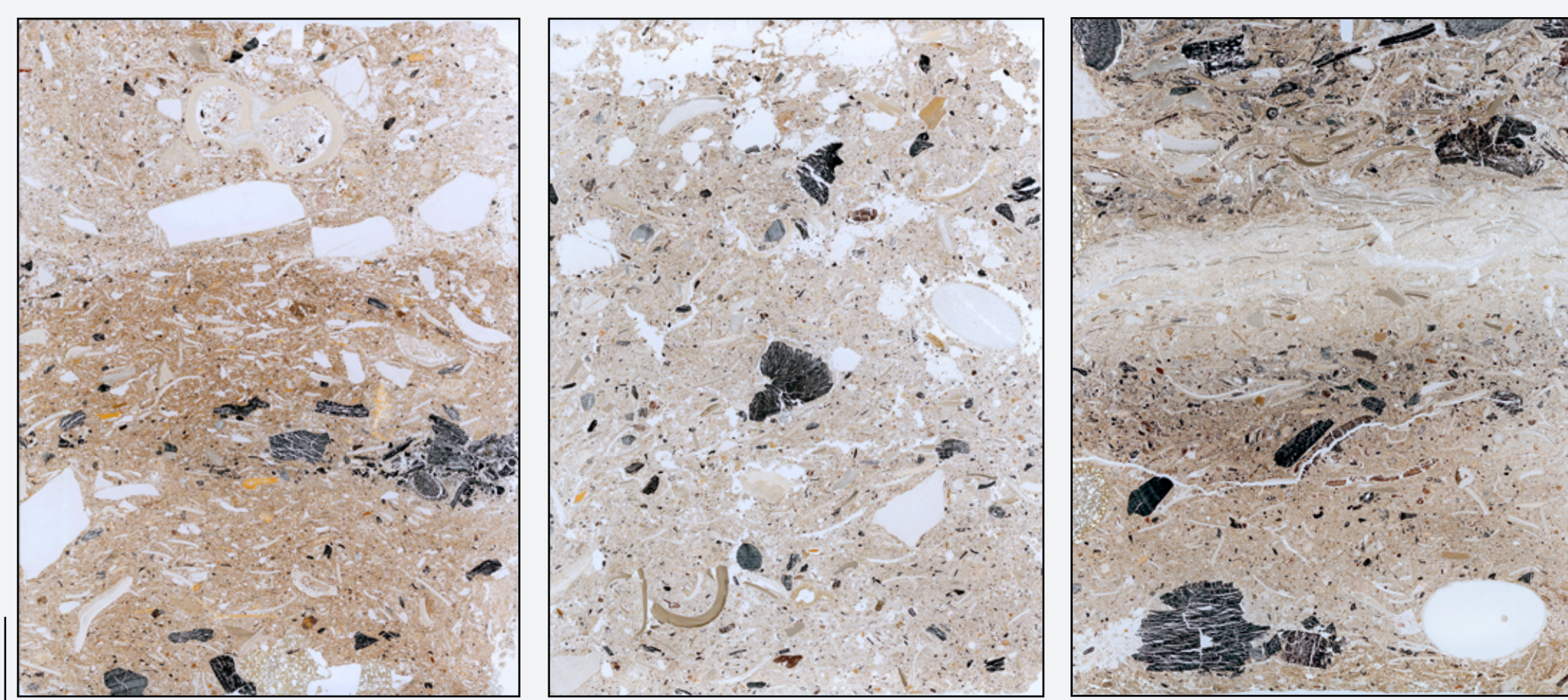
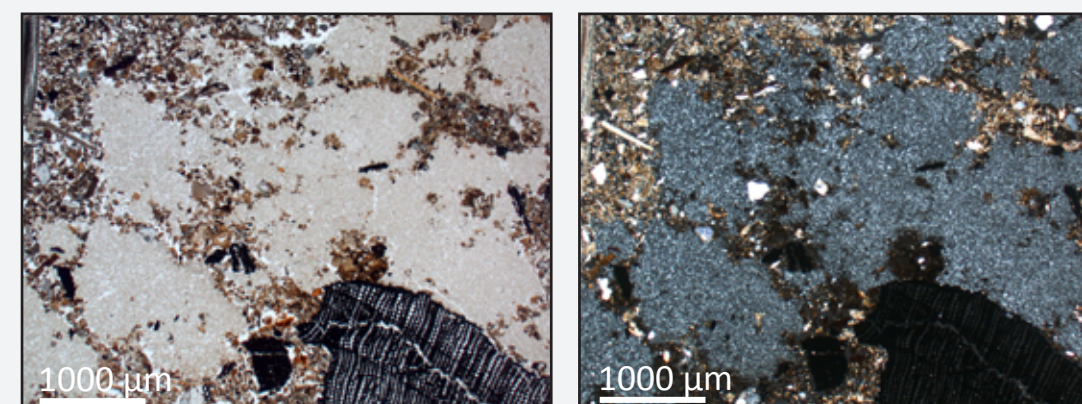
Exoskeletons of marine organisms



Dung pellets



Infillings of fine-grained gypsum



IOD 1 (ENC) IOD 4 (ENB) IOD 6 (ENA)

The sequence of INES

Micromorphological features:

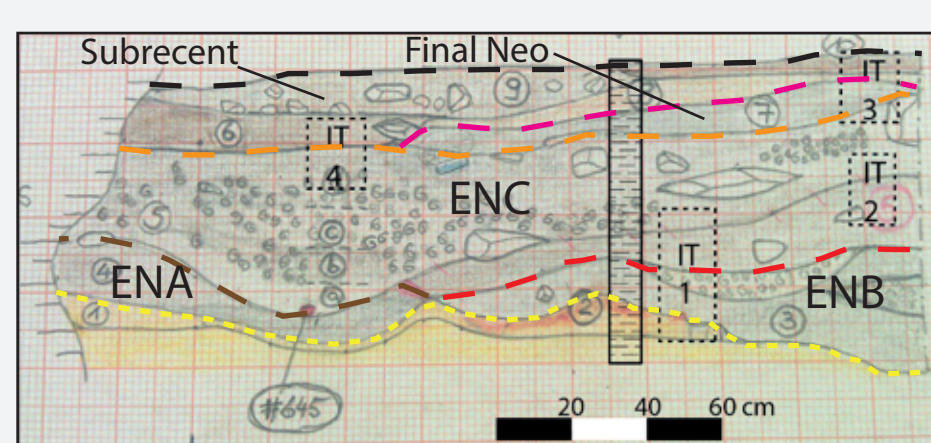
- rich in fully preserved or crushed snail shell
- no clear indication of lamination in EN layers
- ash is intermixed in the groundmass, most mineral fines are carbonaceous (CCE of 60 to 85%)
- few allochthonous materials such as soil granules
- no secondary precipitates
- dung and excrements are restricted to the sub-recent layers

The analyses of thin sections from Epipalaeolithic layers at Ifri N'Etsedda are in progress.

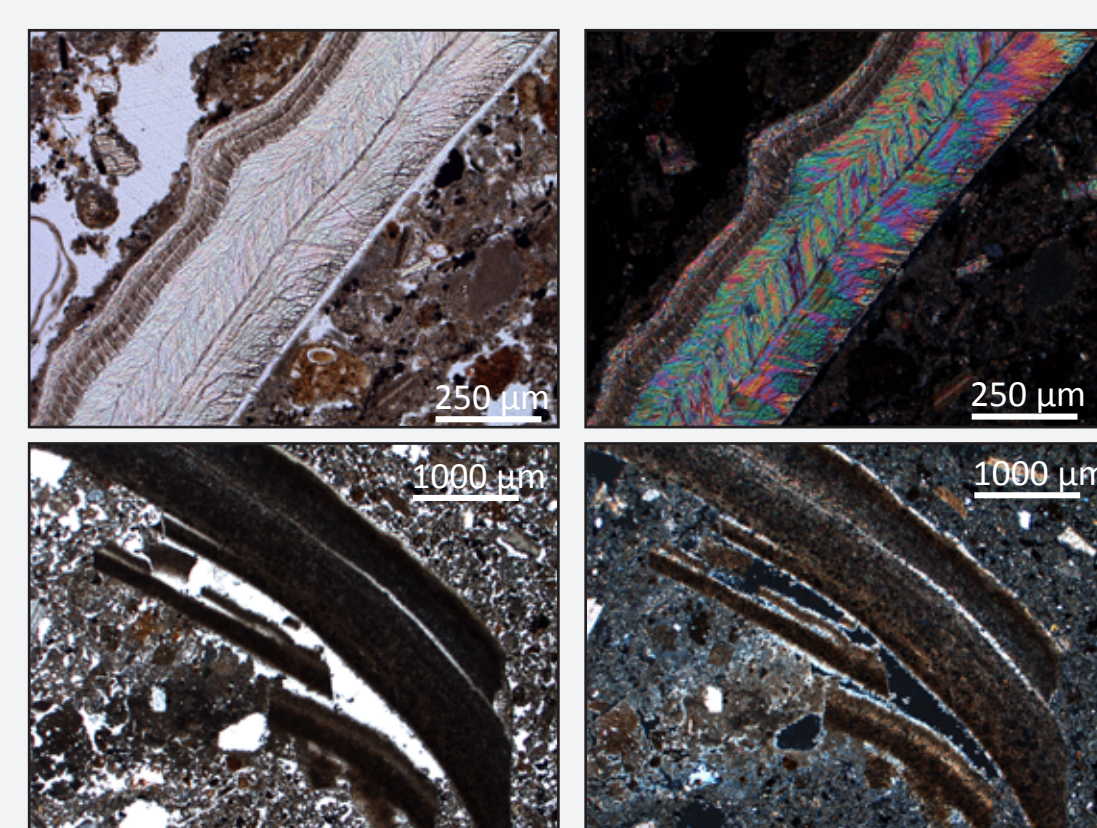
Profile AB with Neolithic layers



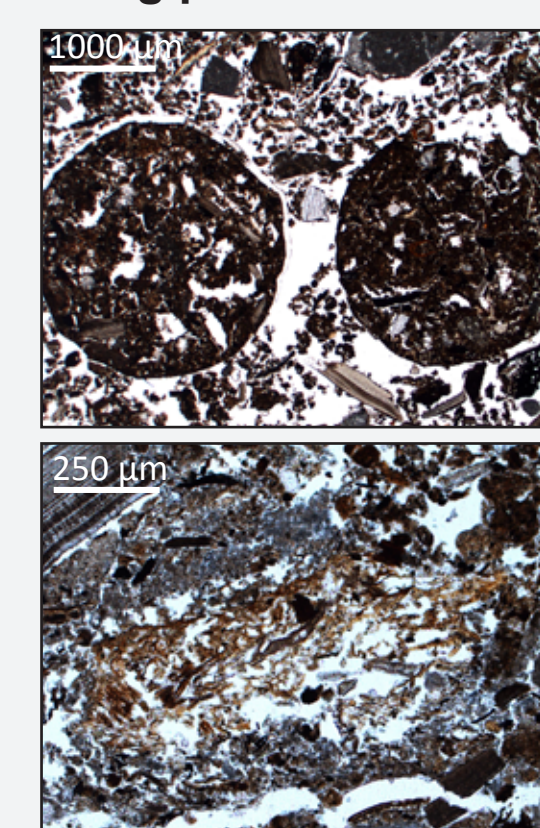
Profile IJ with Epipalaeolithic layers



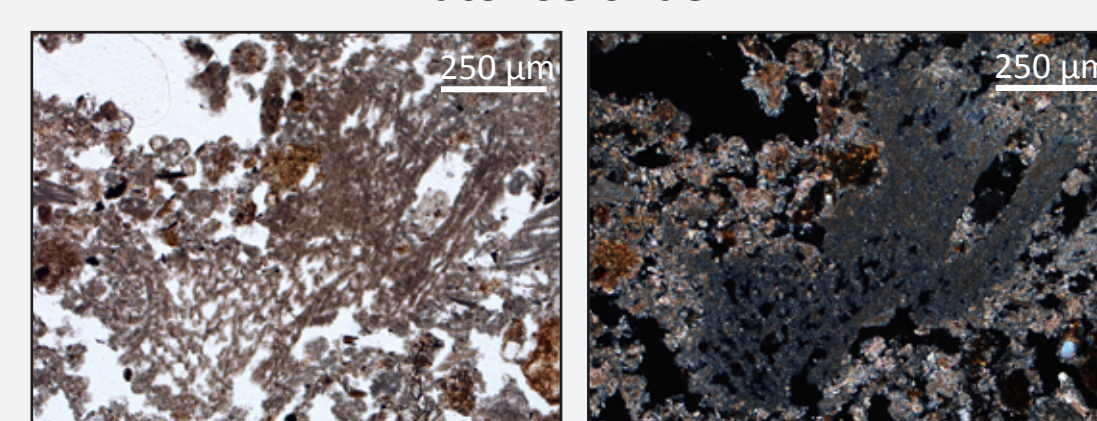
Fresh and burnt shell



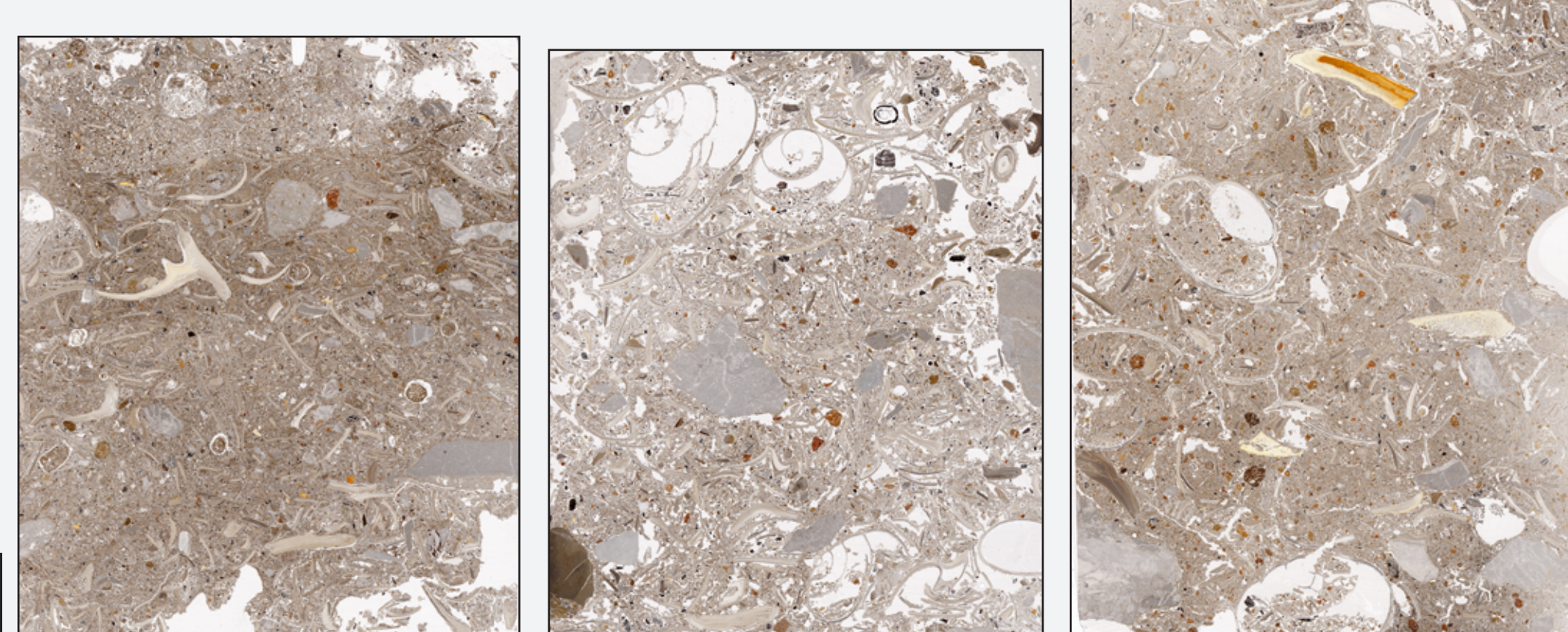
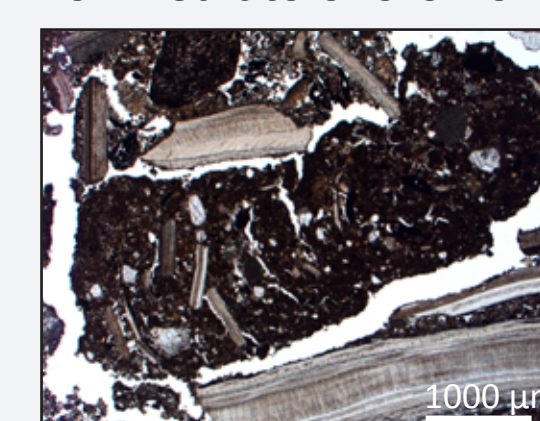
Dung pellets



Patches of ash



Vermiculate excrements



INES 3_2 (Subrecent/final Neo) INES 2_1 (ENC) INES 1_1 (ENC)

Discussion

Subsistence practices at the coast (IOD) included the consumption of sea mollusks as documented in abundant sea-shell fragments and external skeletons of diatoms and bryozoa as well as fish bone. Burnt shell probably originate from accidental heating of snails. Penning of ovicaprids is indicated by the presence of dung pellets including calcite spherulites. Small numbers of dung pellets, however, are also present in a thin section from the Epipalaeolithic deposit. It appears likely that these originate from wild ruminants such as barberry sheep, gazelle or others. Gypsum precipitates at IOD probably relate to import of sulfate by sea-spray. In the coastal environs at INES land snails were a major component of the diet. Microscopic evidence for animal husbandry in the shelter is restricted to the uppermost sub-recent layers. Excavation finds of ovicaprid bone indicate that sheep and goat were consumed at INES during the Early Neolithic as well. Remains of marine mollusks or fish are generally lacking. At both sides, the degree of compaction of the shell-rich deposits and shell preservation varies considerably, indicating differential intensities of trampling and the presence of living floors or dumping of shells in small heaps. Microlamination was observed at IOD only. It appears that wood was the most important fuel at both sides. Clear evidence for the presence of grass ash is lacking.

Conclusions

The micromorphological records of the shelters document diachronic and regional differences in subsistence strategies and land use in coastal and interior areas of Northeastern Morocco. While mollusks were important dietary components in both areas, the penning of animals could be testified for the coastal area only. Although the linear distance to the sea is less than 10 km, there is no evidence for consumption of sea food at INES. Micromorphology facilitates the identification of the type, source and nature of sedimentary components and supports the findings of palaeobotanical and faunistic analyses.

References

- Linstädter, J., M. Kehl (2012): The Holocene archaeological sequence and site formation processes at Ifri Oudadane, NE Morocco. – Journal of Archaeological Science 39, 3306-3323.
Linstädter, J.; Kehl, M. & M. Broich (in prep.): Chronostratigraphy and site formation processes at the Holocene site at Ifri n'Etsedda, NE Morocco.

Acknowledgements

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