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Teaching and Research Area Neotectonics and Natural Hazards

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The Phoenician settlement of Cerro del Villar and its natural vulnerability

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INTRODUCTION

Cerro del Villar was built by Phoenicians on a small sandy island in the wide estuary of the Guadalhorce River. In the past, the site was considered to be practically destroyed and little interest in this area was shown, although it may have been important due to its location, communication routes and economic possibilities (Aubet et al. 1999). Due to the low height above mean sea level, the site has been prone to river floodings, as well as extreme wave events of the Mediterranean Sea.

METHODS

Sediment cores:
- visual descriptions (structures, colour, fragments)
- grain size analysis (laser diffraction)
- radiocarbon dating (charcoal)

GPR profiles:
- SIR 3000 instrument with 270 MHz antenna

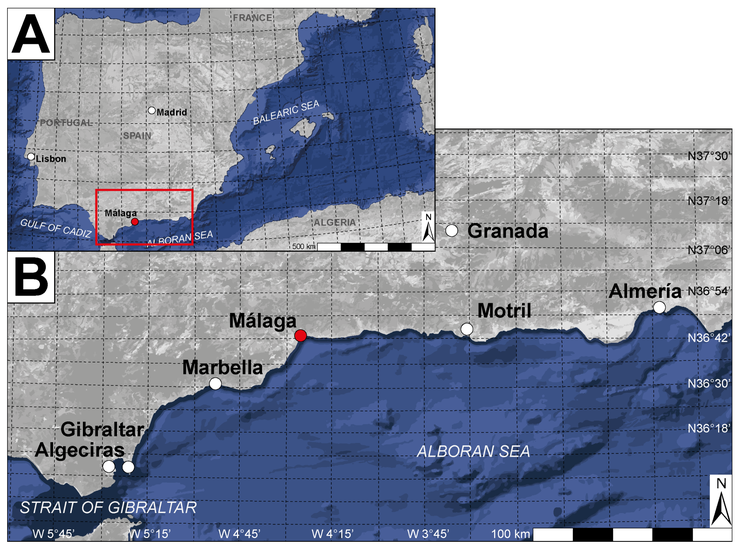


Figure 1: [A] Overview location Spain. [B] Overview location Málaga. [C] Map of Cerro del Villar archaeological and surrounding area including drilling locations MAL-CV-1 and MAL-CV-2.

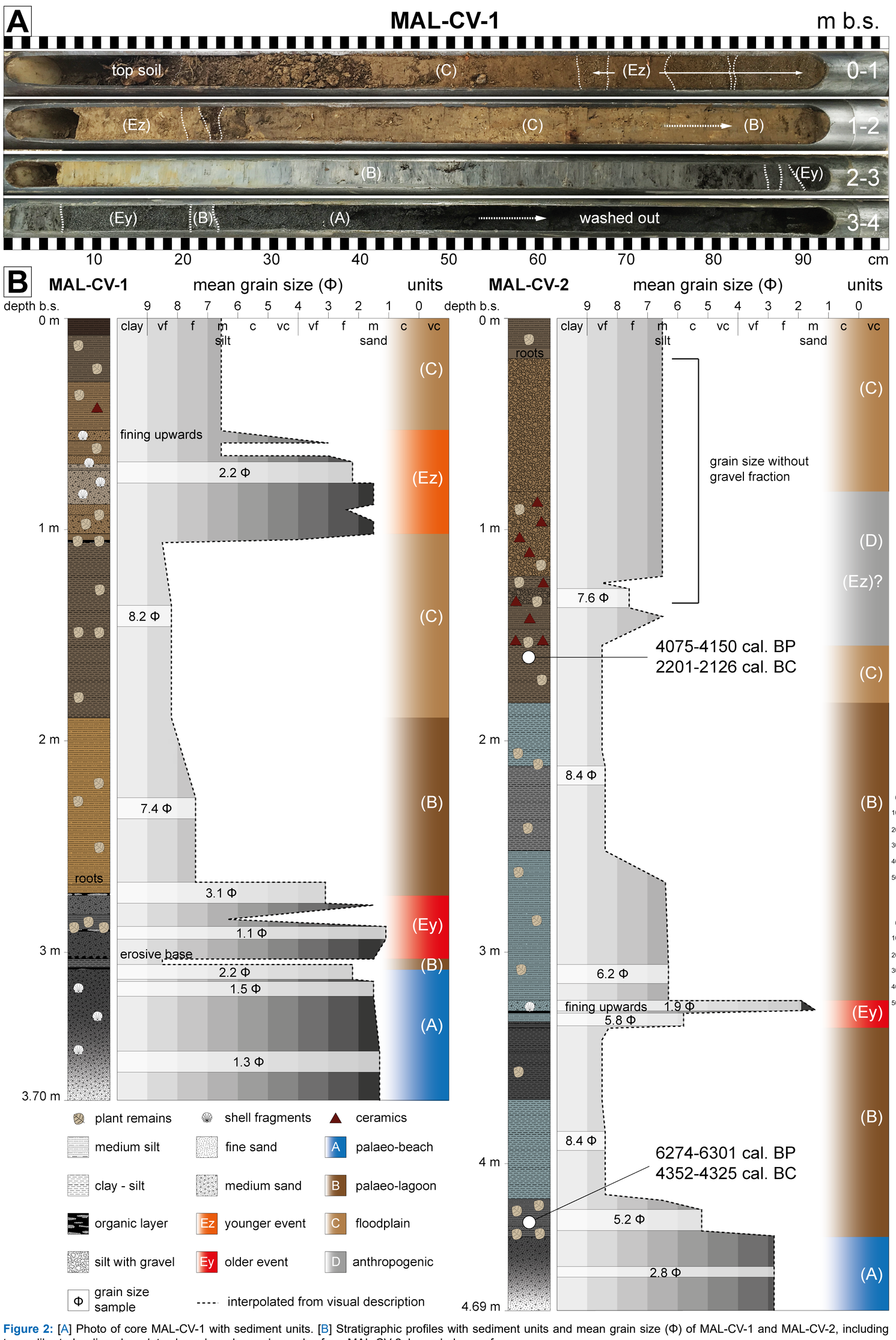


Figure 2: [A] Photo of core MAL-CV-1 with sediment units. [B] Stratigraphic profiles with sediment units and mean grain size (Φ) of MAL-CV-1 and MAL-CV-2, including two calibrated radiocarbon dates based on charcoal samples from MAL-CV-2. b.s. = below surface.

RESULTS & INTERPRETATION

Sediment units of cores CV-1 and CV-2 and GPR profiles:
Unit A - palaeo-beach: dark grey medium sand, shell fragments, washed out downcore
Unit B - palaeo-lagoon: thin dark organic rich layer at base, followed by medium dark grey silt changing upwards to a pale blue colour, occasional calcium concretions, iron and manganese staining, root fragments, *Hydrobia* gastropods and ostracods
Unit Ey - possible event layer: two (medium) dark grey fine/medium sand layers intercalated in silt, erosive basal contact, irregular upper contact, includes shell fragments
Unit C - floodplain: many large root at base, followed by light olive grey and dark yellow/brown clay and silt, root fragments, occasional glass and brick fragments, many loose gravel fragments at CV-2
Unit D (CV-2) - anthropogenic layer: diversely silzed ceramic and brick fragments incorporated in silt and gravel similar to top of unit C, anthropogenically influenced unit
Unit Ez (CV-1) - possible event layer: several sand layers intercalated in silt, includes shell fragments, sharp basal and upper contacts, may be concealed by Unit D at CV-2

Radiocarbon dates (CV-2):
4.28-4.26 m b.s.: 6284 cal. BP (6274-6301 cal. BP), transition between unit A and unit B
1.64-1.62 m b.s.: 4092 cal. BP (4075-4150 cal. BP), unit C just below unit D

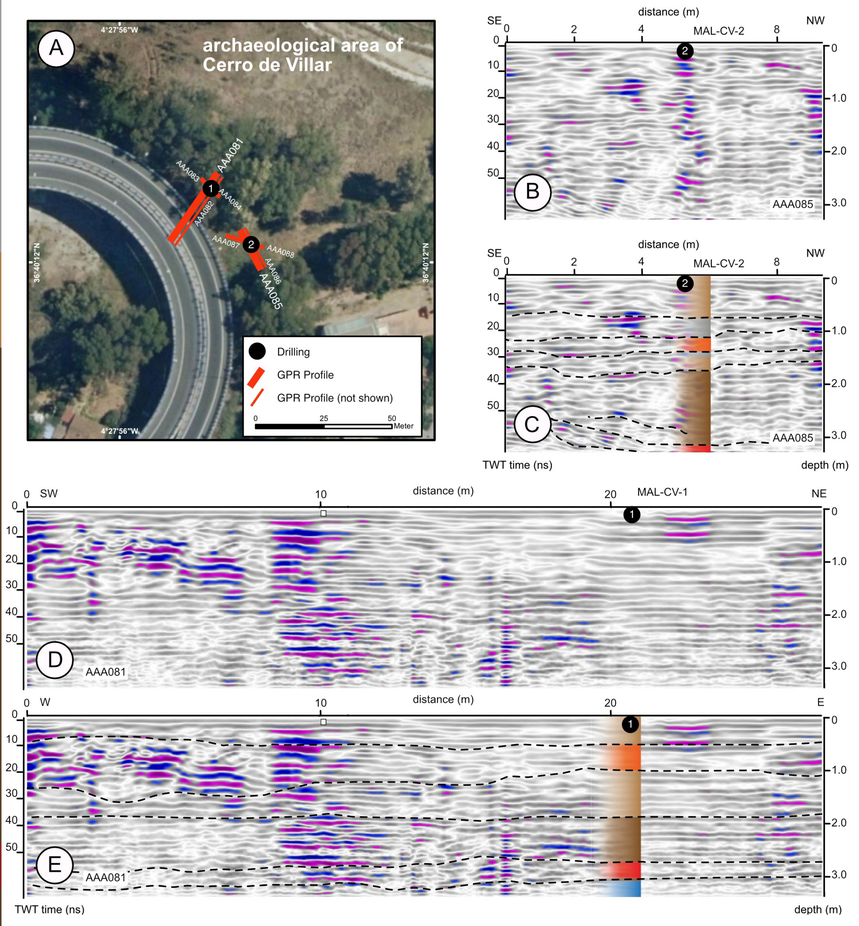


Figure 3: [A] Location of GPR profiles that were taken outside the archaeological area of Cerro del Villar. [B] GPR line AAA085 crossing the drillhole MAL-CV-2. [C] Interpretation of GPR line AAA085, including the simplified stratigraphy of MAL-CV-2, stippled lines refer to units described in **Fig. 2**. [D] GPR line AAA081 crossing the drillhole MAL-CV-1. [E] Interpretation of GPR line AAA081, including the simplified stratigraphy of MAL-CV-1, stippled lines refer to units described in **Fig. 2**.

CONCLUSION

The cores cover a stratigraphy of three different units: a basal sand unit representing a palaeo-beach, followed by a large silt and clay unit developed in a lagoon environment, and topped by another silt and clay unit representing floodplain conditions. At MAL-CV-1 two possible high-energy events (Ey and Ez) interrupt the low-energy silt and clay units. At MAL-CV-2 event unit Ey is preserved, while Ez is concealed by an anthropogenic unit rich in ceramic, brick and glass fragments. In the future, these promising first results will be extended by additional ^{14}C dates and a palynological study to better understand the climate and palaeoenvironmental evolution.

References

Aubet, M.E., Carmona, P., Curià, E., Delgado, A., Fernández Cantos, A., & Párraga, M. (1999). Cerro del Villar I. El asentamiento fenicio en la desembocadura del Guadalhorce y su interacción con el hinterland. *Monografías de la Junta de Andalucía*. ISBN: 84-8266-119-1

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