

Report

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C14 Dating of Shell from PP5-6 South

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An export permit was requested for shell samples to be dated using the C14 technique. Our goal was to determine the age of a hanging remnant shell midden and near-surface shell midden in the PP5-6 South site. The hanging remnant shell midden has been largely eroded away from PP5-6 South, and is only preserved as small remnants cemented under tufa deposits. In several locations in the cave there are tufa stalactites and other tufa cementations hanging from the roof of the cave. Many of these have at their base shell midden. We have not yet observed stone artifacts in this shell midden. Some of these hanging remnant deposits are surrounded uncomfortably by uncemented sand dune. The hanging remnant deposit shares some similarities to the LC-MSA deposits at PP13B, which preserve MIS6 occupation – a very rare occupation time in Africa. However, the shellfish are more reminiscent of LSA shell middens.

The near-surface shell midden is also largely eroded away and is now only preserved in the side chambers of the cave where it is protected under overhangs.

Determining the age of these deposits is crucial to the overall understanding of the sedimentological history of the caves. We submitted three shell samples to BetaAnalytic sampling the hanging remnant (357348 and 357349, Figures 1 and 2, respectively) and one sample from the near-surface shell midden (357352, Figure 3).

Table 1. The results of the C14 dating from BetaAnalytic.

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 344646 SAMPLE : 357348 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (shell): acid etch 2 SIGMA CALIBRATION : Cal BC 360 Cal AD 90 (Cal BP 2310 to 1860)	2130 +/- 30 BP	+3.1 o/oo	2590 +/- 30 BP
Beta - 344647 SAMPLE : 357349 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (shell): acid etch 2 SIGMA CALIBRATION : Cal BC 3470 Cal AD 740 (Cal BP 5420 to 1210)	3050 +/- 30 BP	+2.0 o/oo	3490 +/- 30 BP
Beta - 344648 SAMPLE : 357352 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (shell): acid etch 2 SIGMA CALIBRATION : Cal AD 460 to 820 (Cal BP 1490 to 1130)	1460 +/- 30 BP	+1.6 o/oo	1900 +/- 30 BP

Results

The hanging remnant shell midden (Figures 1 and 2), somewhat surprisingly, is a Later Stone Age shell midden dating between 2590 and 3490 BP. Currently there is no LSA shell midden deposit on the surface of PP5-6 South. The deposit at the surface is a sand dune that dates to about 70 ka as estimated by OSL. This strongly suggests that at one time the entire surface of PP5-6 South was covered by a mid- to late Holocene shell midden that was at least several meters thick, since the hanging remnants of this shell midden are perched this high off the current sand dune. The thin shell lens tucked up under the roof (Figure 3, sample 357352) is also an LSA shell midden, but more recent being dated at about 1900 BP.

What happened to this shell midden? It is highly unlikely that geological forces alone could have so completely eroded away a shell midden off the top of the sand dune. We suspect that this midden was likely excavated away during the historic period by people, perhaps for the purpose of the production of lime, a procedure that is documented historically.

Conclusions

The surface shell midden in PP5-6 South is NOT MSA but rather a Holocene LSA shell midden. Even the material cemented as hanging remnant is LSA. This midden is for the most part now completely missing from the site, being preserved only as cemented hanging remnant and in some rare spots tucked up under the roof of the cave. We suspect that this midden was removed in the historic period by human activity.



Figure 1. The location of sample 357348 indicated by the orange tag.

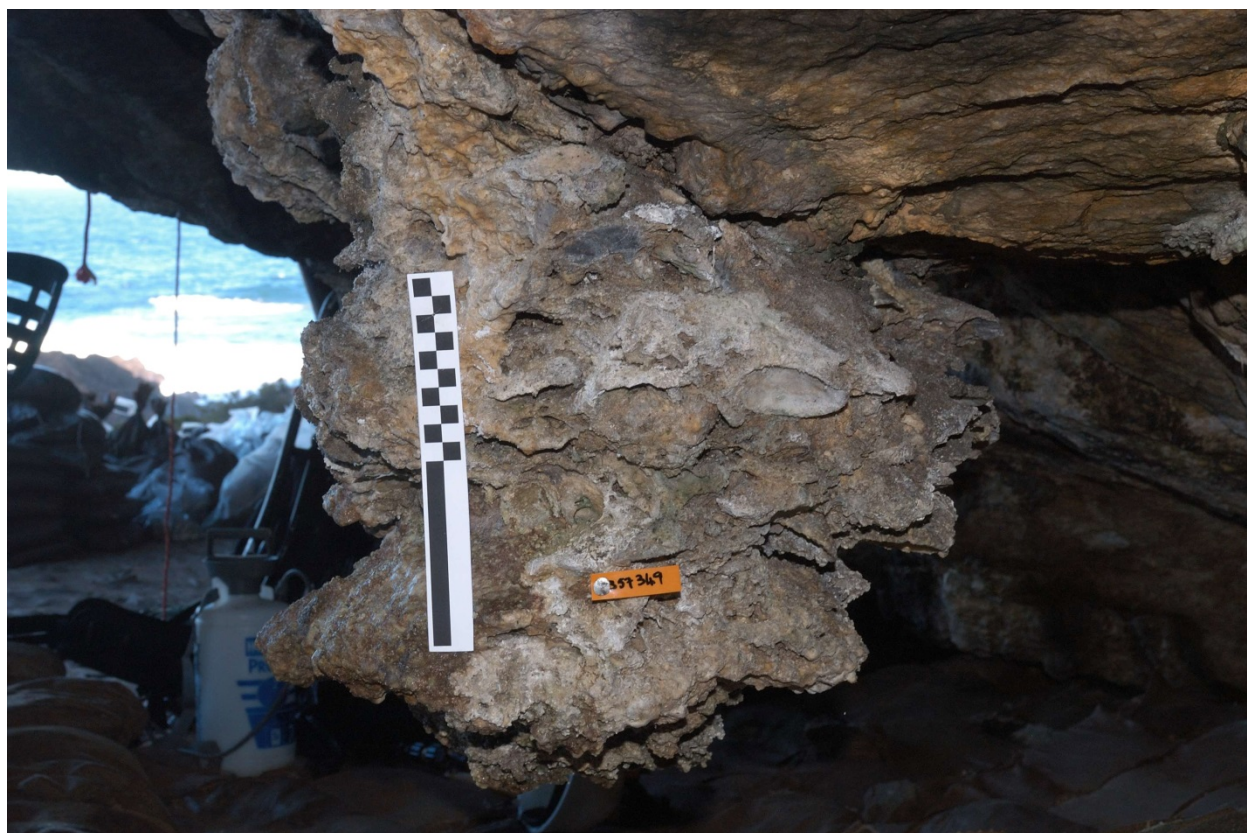


Figure 2. The location of sample 357349 indicated by the orange tag.

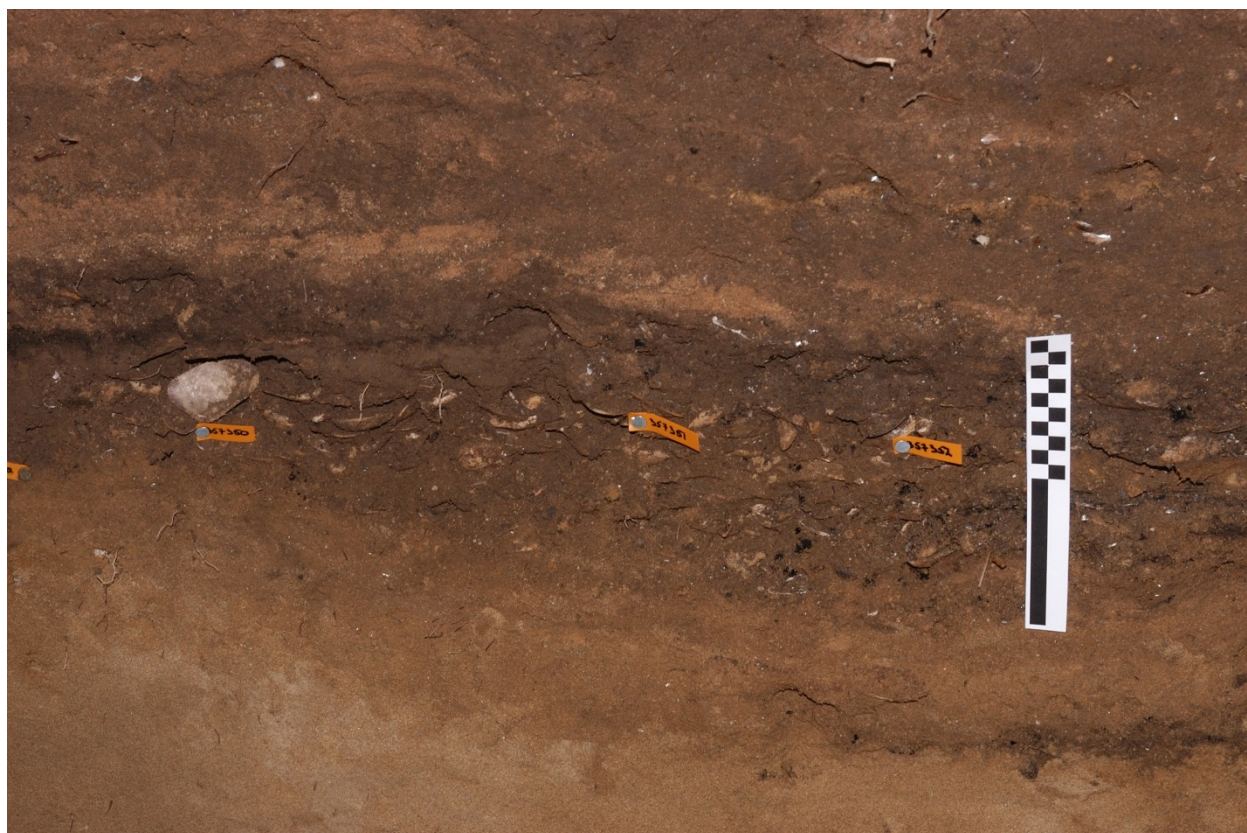


Figure 3. The location of sample 357352 indicated by the orange tag.