

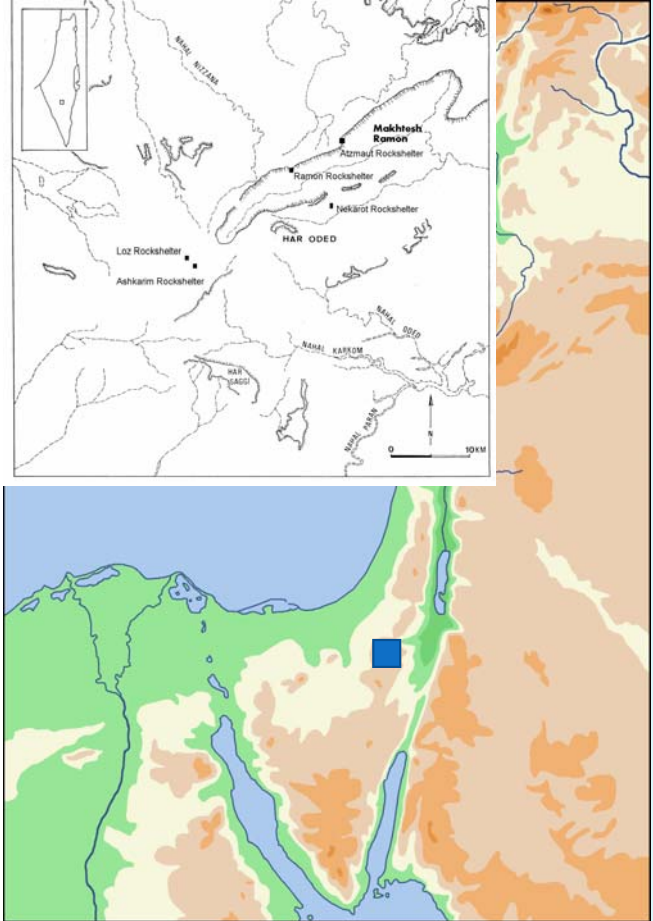
Rockshelters in the Negev: Episodes of Pastoral Exploitation and their Meaning for Understanding the Long Term Archaeology of the Desert

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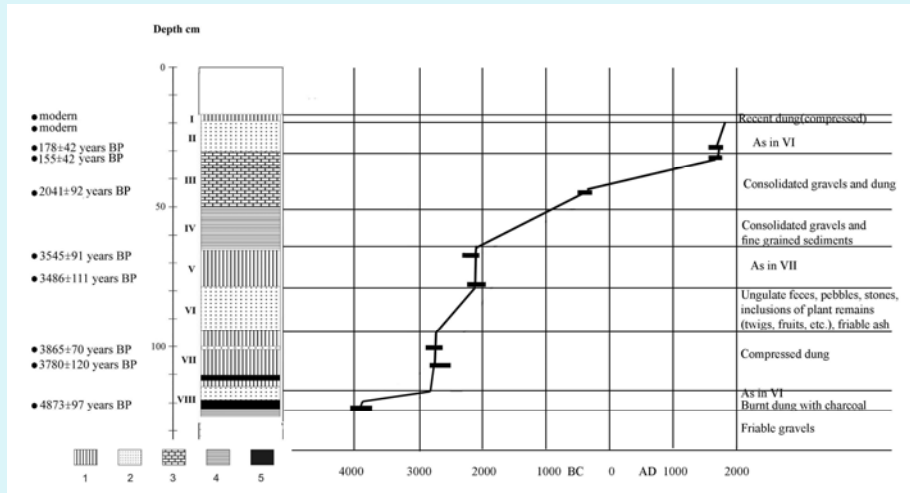
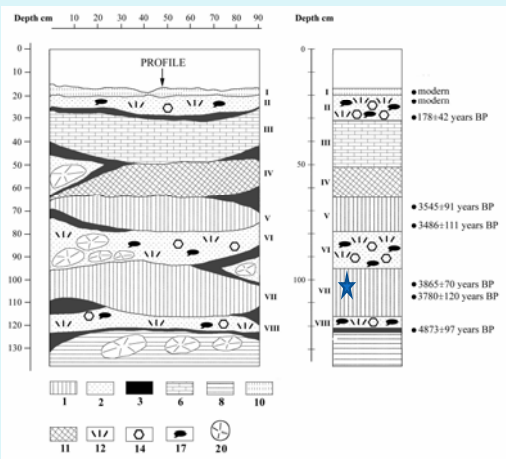
Multi-disciplinary studies of sediment accumulation in rock shelters in the Mitzpe Ramon area present a picture of intensive episodes of rock shelter exploitation, separated by long periods showing little anthropogenic activity. These studies can be cross analyzed with climatic sequences and regional archaeological data to obtain a comprehensive picture of the history of pastoralism from its beginnings in the 7th millennium Cal BC through recent times.

In particular, the earliest evidence for the penetration of domestic herd animals, goats, into the Negev Highlands, can be dated to the late 7th millennium BC. Major episodes of pastoral exploitation are the Early Bronze Age I-II, and the Early Bronze Age IV. Other periods of significant exploitation include the Late Classical Era and recent times.

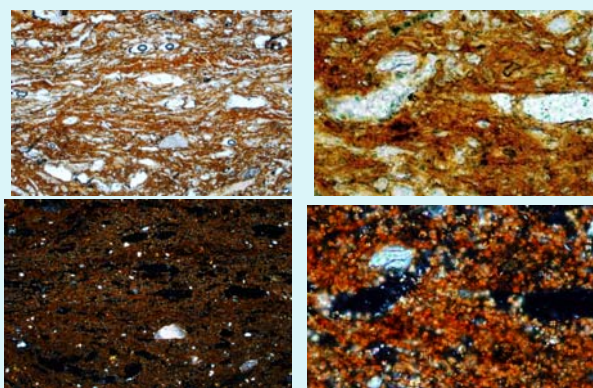
Chemical, pollen, and stable carbon analyses of sediments provide information on environment and seasonality during different phases of exploitation. Notably, there is hints of late winter/early spring presence in some periods. Environment was arid during all phases, although some fluctuations are evident.



Atzmaut Rockshelter



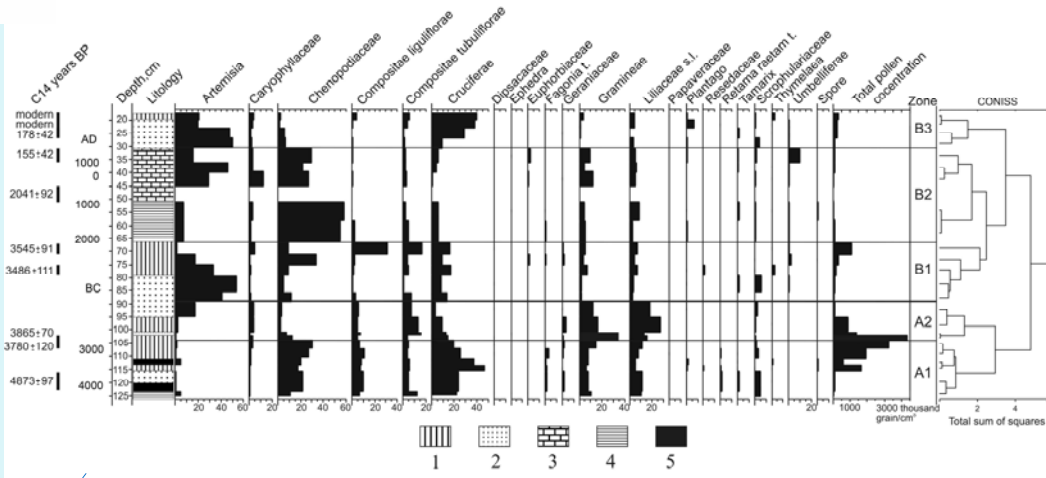
The Atzmaut Rockshelter section shows a clear pattern of layers rapid accumulation of sediment during periods of pastoral exploration, reflected well in layers of compressed dung identified micromorphologically, and periods of slow accumulation with little evidence for pastoral presence. Calendric dates have been recalibrated approximately to account for fractionation in C4 plants, not measured in the initial assays.



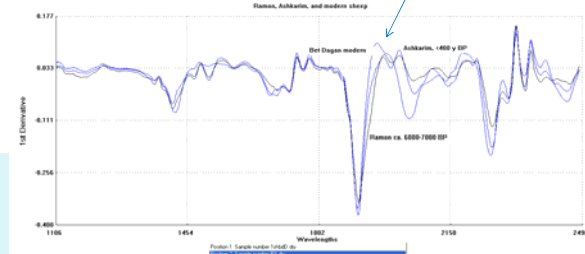
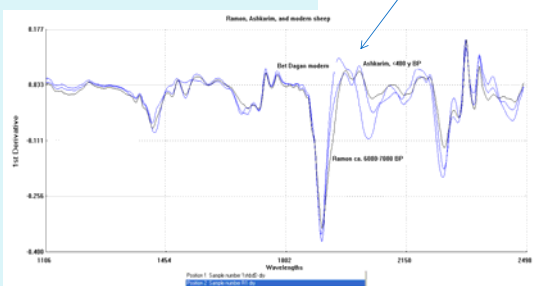
Photomicrograph of Azmaut M10B showing typical unburned but humified organic and horizontally layered deposits of monocotyledonous plant remains and phytoliths; best described as stable floor crusts. PPL and XPL, frame is ~4.6 mm. Detail, frame is ~0.46 mm (note calcite spherulites)

- Atzmaut pollen data show:
1. There is no correlation between the lithology and the pollen sequence.
 2. Arid vegetation always dominated, although constituents varied, suggesting fluctuations in the degree of aridity.
 3. Correlation between episodes of pastoral exploitation and fluctuating vegetation is weak at best.

Pilot study of dung biochemistry indicates Late Winter/early spring exploitation.



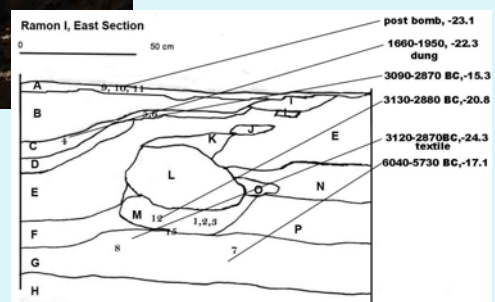
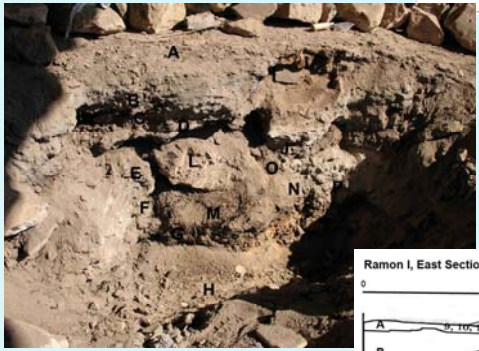
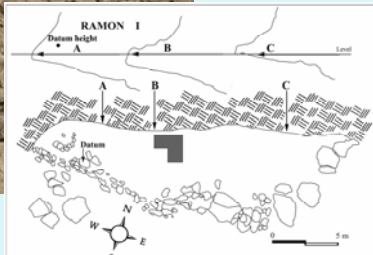
Individual fecal Pellet spectra (averages within sites)



First-derivatives of fecal spectra showing the particularity of archeo-dung (camel double hump at the 1984-96 nm, CONH2 and urea bonds).



Ramon I



Ramon Rockshelters

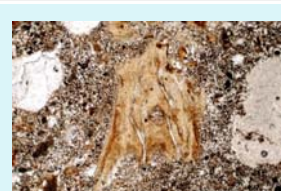
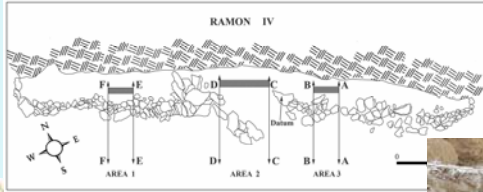
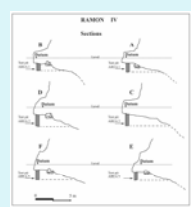
Work in progress

C14 dates from the middle layers of Ramon IV are 4th millennium BC Cal.

Thin sections were studied from the lowermost levels at Ramon 4; in this region strongly bioturbated and vesicular deposits are typical, with secondary gypsum also being common

Ramon I contained preserved goat dung dated to ca. 6000 BC Cal.

Ramon IV



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