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Author(s) / Editor(s): Linda J. Scott, PaleoResearch Institute

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POLLEN AND MACROFLORAL ANALYSIS AT NMAS 5476:
A LIMITED ACTIVITY SITE IN EDDY COUNTY, NEW MEXICO

By

Linda J. Scott
Palynological Analysts
Montrose, CO 81401

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Carlsbad, New Mexico

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INTRODUCTION

A prehistoric Jornada Mogollon site east of Artesia, New Mexico was the subject of salvage mitigation. The site is postulated as a campsite used for food processing and lithic reduction. To augment the interpretation of the site, pollen and macrofloral analyses were undertaken on material from Feature 2, a firepit. The site is located on a rolling plain southeast of Red Lake and immediately east of Bear Grass Draw. The area contains medium-sized hummocks interspersed with denuded areas and is broken by shallow arroyos. The vegetation consists of mesquite (Prosopis juliflora), which grows thickly on the hummocks; four-wing saltbush (Atriplex canescens); yucca (Yucca glauca); croton (Croton); snakeweed (Gutierrezia sarothrae); and a grass (Tridens pulchellus) (Hunt n.d.; Self and Hunt 1983).

METHODS

Pollen was extracted from soil samples submitted by New Mexico Archaeological Services, Inc. A chemical preparation based on flotation was selected for removal of the pollen from the large volume of loamy sand and charcoal with which they were mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the flotation process. The samples were treated with hot potassium hydroxide (5%) for 5 minutes to help remove some of the charcoal and humates present. All samples received a short (5 minute) treatment in hot hydrofluoric acid to remove any remaining inorganic

particles. The samples were then acetolated for 3 minutes to remove any extraneous organic matter. Further removal of charcoal was accomplished through the use of a swirl technique and additional potassium hydroxide washes following completion of the above extraction process.

A light microscope was used to count the pollen to a total of 100 pollen grains per sample at a magnification of 430x. Pollen preservation in these samples was fair. A comparative reference collection was used to identify the pollen to the family and genus levels.

The flotation samples were floated using a modification of the procedures outlined by Matthews (1977). The samples were measured and floated, after which the floated portion was dried and passed through a series of graduated screens (US Standard Sieves with 4mm, 2mm, 1mm, and .5mm openings) to separate the seeds by size. The contents of each screen were then measured and examined. The material which remained in the 2mm, 1mm, and .5mm sieves was scanned under a magnifying glass, while the finest material, which passed through the .5mm sieve, was examined under a binocular microscope at a magnification of 35x. Macrofloral and charcoal identifications were made by Peter Gleichman.

DISCUSSION

A Jornada Mogollon site, NMAS 5476, containing two firepits, flaked lithics, groundstone, ceramics, and burned adobe was dated to AD 950-1350 based on the presence of Jornada Brown potsherds. The site was described as having been used for camping, food processing, and lithic reduction purposes (Self and Hunt 1983). Pollen and macrofloral analyses of material from Feature 2, a 2 x 2 meter firepit presumed to have been used for food preparation, was designed to provide specific information concerning food

processing at the site.

The pollen content of two of the three pollen samples (samples 2 and 3) submitted from this feature is summarized in Table 1. The pollen in sample 1 could not be concentrated sufficiently in relation to the charcoal for analysis. The pollen observed in samples 2 and 3 from this feature includes primarily high-spine Compositae (Gutierrezia or snakeweed), low-spine Compositae (ragweed, cocklebur, and others), Chenopods (saltbush and others), and Prosopis (mesquite) (Table 1). These plants are elements of the environment at present at the site, and appear to have also been elements of the environment at the time of occupation from the pollen record. Other pollen types observed in these samples, including Artemisia, Ephedra, Juniperus, Pinus, and Quercus, are probably wind transported from areas farther away. The samples were also scanned for evidence of cultigens, such as Zea (maize), but none were found.

Macrofloral analysis of remains from this feature yielded one chitinous fragment of an insect body and no seeds. The charcoal was examined in an effort to identify the wood burned. Unfortunately, the pieces of charcoal were so small that no identification could be made even on the family level. The charcoal is, however, ring porous, which excludes gymnosperms as fuel. Wood from members of the Leguminosae family is classified as ring porous, as is wood from the Rosaceae and Salicaceae families. The most abundant local fuel source today is mesquite, a member of the Leguminosae family. The local abundance of this wood, as well as the morphological characters, point to the probable utilization of mesquite as fuel in this feature.

SUMMARY AND CONCLUSIONS

Pollen and macrofloral analyses of material from Feature 2 at NMAS 5476

TABLE 1
POLLEN OBSERVED AT NMAS 5476

Scientific Name	Common Name	Sample 2	Sample 3
ARBOREAL POLLEN			
<u>Juniperus</u>	Juniper		1
<u>Pinus</u>	Pine	3	3
<u>Quercus</u>	Oak	1	1
NON-ARBOREAL POLLEN			
Cheno-ams	Members of the goosefoot family and pigweed	10	19
Compositae	Sunflower family		
<u>Artemisia</u>	Sagebrush	5	3
Low-spine	Includes ragweed (<u>Ambrosia</u>), cocklebur (<u>Xanthium</u>), etc.	17	17
High-spine	Includes snakeweed (<u>Gutierrezia</u>), rabbitbrush (<u>Chrysothamnus</u>), sunflower (<u>Helianthus</u>), etc.	41	37
<u>Ephedra</u>	Mormon tea	3	2
<u>torreyana-type</u>			
Graminae	Grass family	2	
Polemoniaceae	Phlox family	1	
<u>Prosopis</u>	Mesquite	8	9
<u>Sphaeralcea</u>	Globe mallow	2	
Indeterminate	Too poorly preserved to identify	8	8
Total Pollen Counted		100	100

contained no evidence of food processing within the hearth. Instead, the pollen record is representative of vegetation similar to that of today. No seeds were recovered from the flotation of material from the hearth, and the charcoal fragments were very small, making identification at even the family level impossible. The lack of pollen and macrofloral evidence of food processing cannot be taken as proof that food processing activities were not undertaken at this site. The processing of root crops and/or plants not currently in flower or containing seeds is not expected to yield either pollen or macrofloral evidence. Additionally, it is possible that evidence of food processing could be gathered by taking pollen washes of subsurface groundstone. Continued exploration of the smaller, limited activity sites for pollen and macrofloral remains should assist in the definition of subsistence activities. The pollen record from various features, including hearths, at several larger Jornada Mogolloan sites near Riodoso to the northwest of this site, indicates that these people grew Zea and Cucurbita, and exploited several native plants including Cleome, and possibly Opuntia, Apocynum, Liliaceae, Malvaceae, Sphaeralcea, Onagraceae, and Solanaceae (Scott 1980).

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