

Investigating Site Use through Ethnobotanical Analysis in the Upper Gila River Valley, Arizona

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INTRODUCTION

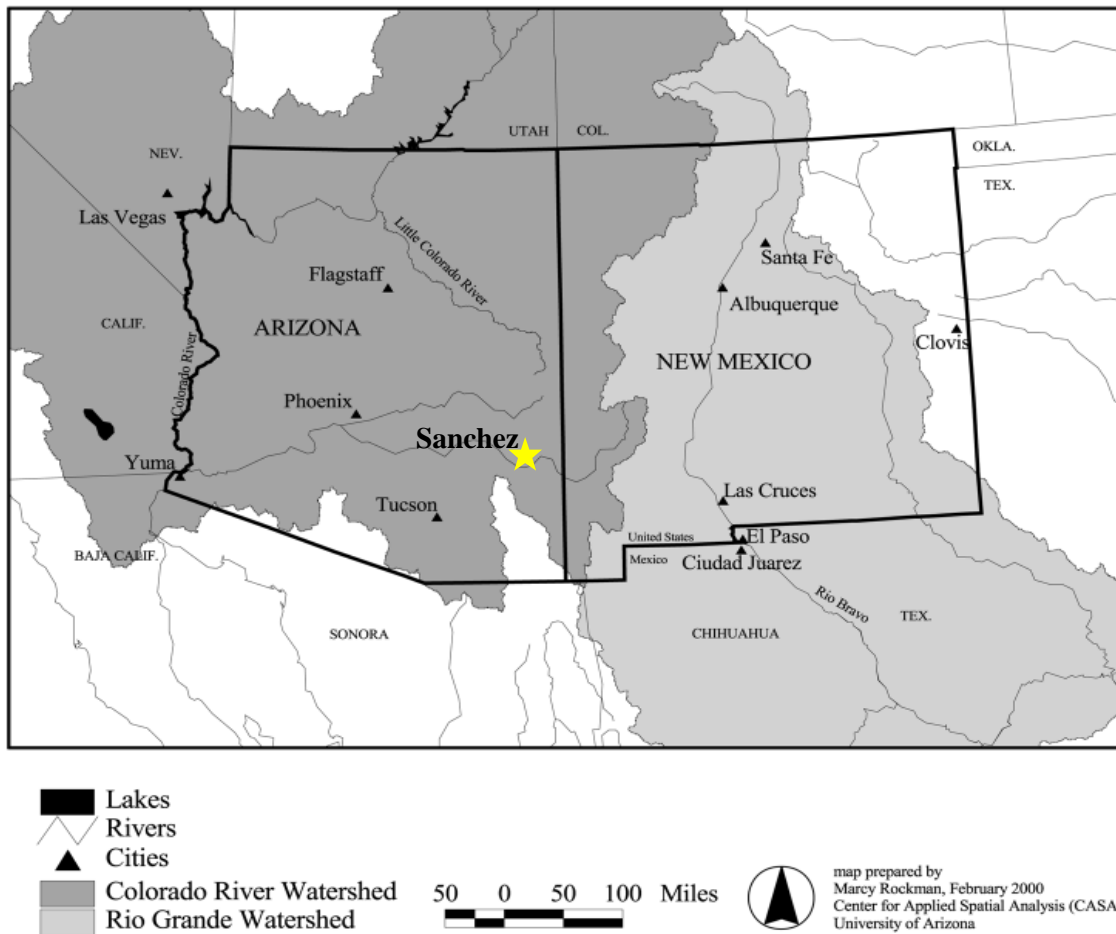
At the Sanchez archaeological site near Safford, Arizona, ancient plant remains were collected and identified. Surprisingly, there is high frequency of charred creosote bush and a low frequency of charred mesquite wood. Creosote is a poor fuel wood but readily available on the site. Mesquite is an excellent fuel wood, but requires walking some distance. What drives resource selection, preference or cost of acquisition?

BACKGROUND

The Sanchez site is an archaeological site near Safford, Arizona along the Upper Gila River. It is one of many *cerros de trincheras* sites, or hilltop settlements, in the southern Southwestern U.S. and Northwestern Mexico. The local environment is in a transitional zone between the Sonoran and Chihuahuan Deserts. The authors participated in the Summer 2018 UTSA Southwest Archaeological Field School.



Fig. 1 Sanchez site



Based on radiocarbon dating, the site has two occupations that are dated to 650 BC and AD 350. The site was constructed on the top of a steep ridge 650 feet above the Gila River. This hilltop site likely could have been used for defense, social, and/or ritual purposes. During these occupation periods there was an increasing reliance on maize. The site contains 142 rock rings, a plaza, and over a mile of walls implying that a considerable number of people occupied the settlement. Mesquite is an excellent fuel but requires traveling to the base of the hill while creosote is common on the ridge top. Creosote bush is considered a poor fuel because its small stems burn fast.

RESEARCH QUESTION

What drives resource selection, preference or cost of acquisition?

Creosote is available at minimal cost but is a less desirable fuel wood. Obtaining mesquite requires traveling to the base of the hill but is a superior fuel wood.

METHODOLOGY

Plant remains were collected using either a screen in the field or through a flotation process. Dr. Adams identified the charred plant materials. Charring preserves the plant materials, therefore uncharred materials are considered modern. *Ubiquity* is the percentage of samples that contain the charred remains of a particular taxa. The *n* is total number of samples that yielded any charred remains. Samples that yielded no charred remains are not included. The sample volume of sediment for each sample was typically four liters.

RESULTS

Wood	Ubiquity Flotation n=22	Ubiquity Screen n=13
Creosote	13 (59%)	11 (85%)
Juniper	3 (14%)	
Mesquite	2 (9%)	
Willow/Cottonwood	1 (5%)	
Mormon Tea	1 (5%)	3 (23%)
Monocot Stem (grass?)	1 (5%)	
Unknown	10 (45%)	1 (8%)
Reproductive Tissue	Ubiquity Flotation n=22	Ubiquity Screen n=13
Cheno-am	4 (18%)	
Maize	1 (5%)	1 (8%)
Unknown	3 (14%)	



Creosote (*Larrea sp.*) is a drought-resistant evergreen bush that produces small, sticky leaves and white flowers. The leaves are often decocted to treat various illnesses and the twigs may be used as kindling. Most documented uses are medicinal, though one source cites creosote used as fuel in roasting pits (Adams and Hanselka 2019).

Mormon Tea (*Ephedra sp.*) is a desert shrub with spiny leaves that are often harvested and used as a medicinal tea.



Mesquite (*Prosopis sp.*) is a shrub with thorny branches that produce small flowers and edible pods. The pods were an important food source, oftentimes ground into flour. Mesquite wood is also suitable as building material and firewood. Today, mesquite is not common at the site due but is abundant in the river valley.

Maize (*Zea mays*) requires human cultivation and was increasingly used during the time that Sanchez was occupied. Increasing reliance of maize transformed human societies. Maize was likely cultivated in the river valley below the Sanchez site.

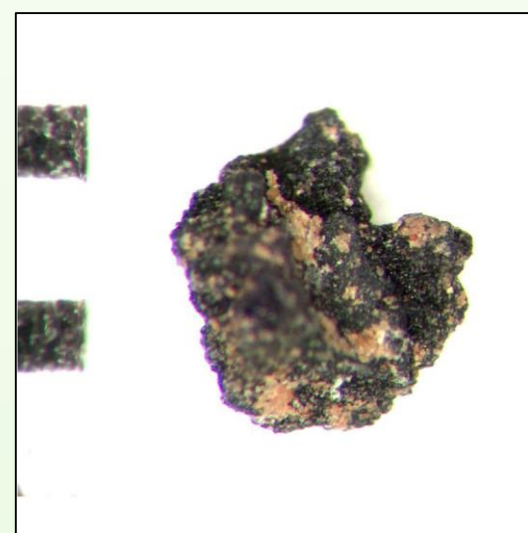


Fig. 2 Zea Mays cupule. The kernel would have sat in the depression at the top right. Photo courtesy of Karen Adams

DISCUSSION

- ❖ Samples yielded a high frequency of charred creosote and a low frequency of other woods such as mesquite.
- ❖ The high ubiquity rate of creosote is unusual considering that hardwoods, like mesquite, are preferred for firewood due to their long burning capacity while the small stems of creosote bush burn quickly (Adams and Hanselka 2019).
- ❖ Charred plant preservation was generally poor. The shallow soils on the Sanchez site accelerate deterioration of plant remains as does disturbance of soils by insects and rodents. Low sample sizes can yield biased results.
- ❖ The Sanchez site may have been built during times of raiding and warfare. Its location on a steep hill and extensive walls are consistent with a settlement constructed for defensive purposes.
- ❖ Descending the hill for resources may have not only involved travel costs but security risks.

CONCLUSION

- ❖ Creosote bush was used as a fuel to a greater extent than mesquite, perhaps due to its low cost of acquisition relative to mesquite.
- ❖ Ethnographic examples of plant use can help us to develop interpretations of plant use
- ❖ The Sanchez site is thought to be defensive in nature. Conflict could lead to hesitance to leave the site to gather preferred fuel sources like mesquite. Mesquite was likely abundant below in the river valley and scarce on the site.
- ❖ The energy required to carry hardwood to the peak could also lead to greater use of creosote. Creosote was likely abundant on the site.
- ❖ Cheno-am seeds, maize, and Mormon tea were all used as food or drink sources.
- ❖ Environmental factors like depth of deposits and soil disturbance can affect sample size.

REFERENCES

- Adams, Karen R. and J. Kevin Hanselka
2019 Appendix 8.3 Comparative Ethnographic and Archaeological Plant Use .In *Early Farming and Warfare in Northwest Mexico*, by Robert J. Hard and John R. Roney. In Press, Expected publication September 2019.
- Curtin, L.M.
1949. *By the Prophet of the Earth*. San Vicente Foundation, Santa Fe..
- Hard, Robert J. and John R. Roney.
2007. Cerros de Trincheras in Northwestern Chihuahua. In *Trincheras Sites in Time, Space, and Society*, Edited by Suzanne K. Fish, Paul R. Fish, and M. Elisa Villalpando, pp. 11-52. The University of Arizona Press, Tucson.