In Search of Ramon: A Paleoethnobotanical Study of Plant Remains from Tikal

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Abstract

Although excavations at Tikal, the capital of the ancient Maya realm, began nearly 50 years ago, the site's paleoethnobotanical remains have yet to be formally analyzed. This project attempts to remedy this situation by looking at 200 samples from several excavations conducted by the University of Pennsylvania from 1956-1970. The aim of our research was to test Dennis Puleston's hypothesis that ramon, (*Brosimum alicastrum*) was used as a staple crop by the ancient Maya. The fact that our analysis uncovered no evidence of ramon use in any context suggests that ramon was not a staple crop at Tikal, but the fragmentary nature of our data will not allow us to absolutely reject Puleston's hypothesis. Nevertheless, this study has uncovered remains of many other plant species that were in use at Tikal. We recovered samples of staple crops like maize, beans, and squash as well as less common foods like cacao, ciruela, avocado, and fig. These results draw a detailed picture of how plants were being used by the ancient Maya while also hinting at how they may have been harvested, domesticated, and cultivated.

Introduction

In the mid-70's Dennis Puleston popularized his theory by arguing that modern ramon trees growing at the site are the remnants of a population that was cultivated by the ancient Maya for their nut-like seeds. Furthermore, Puleston proposed that the site's *chultuns* (underground pits) were designed specifically for storing large quantities of ramon seeds. (Puleston 1982) Although the ramon hypothesis is found in many introductory texts on the Maya, it has never been directly tested using paleoethnobotanical evidence. This study has attempted to fill this informational void by examining 200 archaeobotanical samples that were excavated by the University of Pennsylvania from 1956-1970. Although these samples were collected primarily for radiocarbon dating, we found many plant species that were used for subsistence at Tikal. These results will help us better understand the ancient Maya and how they exploited the region's flora.

Methods

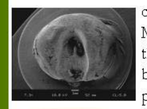
- Samples were organized by location, time period and function (i.e., domestic, ceremonial, midden).
- Samples were sorted by family name and plant part using a Leica S6D light microscope

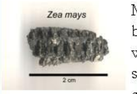
- Analysts assigned unique form numbers to each sample and all identifiable items within the sample (e.g., 10001-001, 10001-002, etc.) All items were described and drawn where applicable.

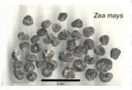
- Used the Chicago Field Museum's Amray 1810 scanning electron microscope to increase the accuracy of our identifications
- Analyzed and identified remains to estimate relative importance of certain species and made tentative conclusions based on the results.

Results

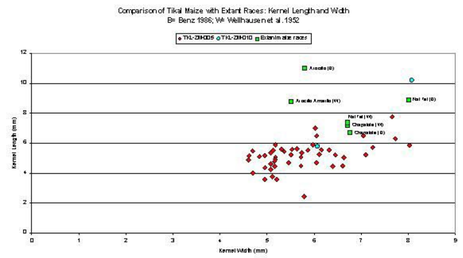
Brosimum alicastrum Our study set out to test Dennis Puleston's ramon hypothesis and we found no evidence of its use at Tikal. Yet, we do know that the historic Maya use the ramon fruit, commonly called the breadnut or *ox*, as a famine food. The pits are sometimes placed in a gourd to create a diviner's rattle, and the milky sap is used as a remedy for asthma and coughs (Roys 1976: 272).





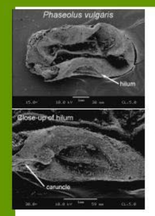


Zea mays Maize was by far the most important agricultural crop for the ancient Maya. Maize made up a large part of the Maya diet and was included in many of their rituals. We know that like the modern Maya, the ancient Maya used corn to make bread and brew beer on a daily basis. But, maize also played a part in the ancient Maya creation myth, which states that the Maya were created from corn. We found maize in offerings, burials, and middens, which demonstrates the many different ways the ancient Maya used maize. The maize we found is similar to the extant races Nal-Tel and Chapalote, which are cultivated today in the lowlands of Mesoamerica. The chart below provides a visual representation of these similarities according to kernel attributes. The red diamonds stand for kernels found in a single midden, while the blue circles stand for two kernels found in an offering. The latter kernels are of particular interest, because the extreme outlier could represent a different race of maize that was only used in ceremonial contexts.



Scatterplot shows similarities between Tikal samples and Nal-Tel/ Chapalote maize races.

***Cucurbita* spp.** Along with maize and beans, squash completes the full nutritional complement of amino acids the human body needs to function. We identified at least two species of squash, both of which were found in ceremonial contexts. The use of squash in graves and offerings reinforces the importance of this crop to the ancient Maya

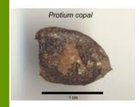


***Phaseolus* spp.** Used largely for their high concentration of proteins and amino acids, beans made up a large part of the ancient Maya diet. We found three species of beans, *P. vulgaris*, *P. lunatus*, and *P. coccineus*, in both ceremonial and other contexts. As with squash, this demonstrates the variable ways the Maya used and valued this genus of crop plants.

Arecaceae (Palm Family) The importance of palms to the ancient Maya has been a relatively recent discovery (Lentz 1991; McKillop 1994; Morehart 2003). Palm oils provided essential fats not abundant in Maya diets. The fruits of palms were also fermented to make a wine used for ceremonial feasts. The leaves and trunks also were used for construction. We found two species of palm remains, one in a burial and one in a midden, reflecting palms' many uses.

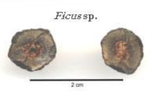
Theobroma cacao The seeds of the cacao tree are the main ingredient in chocolate. The ancient Maya ground and roasted the seeds to make a beverage called *chucua* (Roys 1931). Two of our samples contained cacao, both ceremonial contexts. While this distribution may be an artifact of preservation, it could also show that cacao was a sacred food used mainly by the Maya elite.

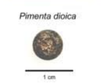
Persea americana The fruit of the avocado tree served as a tasty and nourishing compliment to the ancient Maya diet. The Maya also depicted avocado in elite iconography. Recovered from the North Acropolis, Tikal's ceremonial center, this cotyledon and rind fragment could have been used in such a context.



Protium copal: Copal was used as a form of incense by the ancient Maya. We found this seed and a fragment of uncarbonized residue in samples from the North Acropolis, which implies that copal was being used in Maya ceremonies and rituals.

Other Findings: Our study also found several other tree species that could have been under cultivation by the ancient Maya. ***Spondias* sp.** has an edible fruit that may have been grown in dooryard orchards (Lentz 1999:12) ***Manilkara* zapota** bears an extremely sweet fruit that was probably harvested from the forest by the ancient Maya. The tree also produced a gum called *cha* that could be chewed. (Roys 1976: 297) ***Pimenta dioca,*** or allspice, was used as a seasoning. ***Ficus* sp.** produces a sweet fig fruit. We also found one ***Gossypium* sp.** seed, or cotton, from Temple 1. It is possible that the ancient Maya grew cotton as an annual in their dooryard gardens (Alcorn 1984: 658).





Conclusion

From the wide variety of plant species identified in archaeobotanical samples collected from Tikal, it is safe to state that the ancient Maya cultivated and harvested many of the plants in their surrounding environment. Although we did not find ramon, we did find many other species at Tikal that were potential tree crops, supporting the idea that arboriculture was part of the subsistence economy at Tikal. Continuing research on botanical remains from Tikal may contribute additional evidence of ancient Maya tree-cropping. We also found many agricultural domesticates in the samples, such as maize, beans, and squash. These crops were used in both domestic and ceremonial contexts, suggesting that agriculture and religion were closely related in ancient Maya society.

Acknowledgements

- Betty Strack (Scanning Electron Microscopy, Field Museum)
- Support from: NSF-REU 2004 Grant and the Chicago Botanic Garden

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