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**The Maya Mountains Archaeological Project (MMA):  
Field Report of the 2000 Season**

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Abstract

The ninth season of the Maya Mountains Archaeological Project (MMA) was completed during April and May, 2000. Work was conducted again in the upper Bladen drainage of the Monkey River. Archaeological research consisted of cave reconnaissance and settlement survey and excavations, including tombs. Multiple biological investigations were performed. Plants were collected for studies of ancient Maya tree farming, resource phytoliths, cacao DNA, and forest product development. We also sampled turtle and snail DNA for research on evolutionary genetics. Soil samples were gathered from the surface for plant distribution studies and from caves for the analysis of antibiotic properties among cave-dwelling microbes. Extensive mapping of the region was conducted with a Global Positioning System (GPS) for building a local Geographic Information System (GIS). A number of major finds were made. The main operations and discoveries are summarized herein.

### Introduction

The Maya Mountains Archaeological Project (MMAP) is an ongoing multidisciplinary study of ancient Maya resource exploitation and exchange in the remote and rugged Maya Mountains of southern Belize. Launched in 1992, the reconnaissance phase of the research consisted of a broadscale survey of mineral and biotic resources and the associated sites. A multitude of unusual montane resources was identified, along with over a dozen centers that likely exploited and exchange these materials. Recently, a more intensive phase has been initiated, focusing on the major finds from Phase I. Phase II is concentrated at Ek Xux and Muklebal Tzul, the principal centers in the upper Bladen drainage of the Monkey River.

The ninth season of the MMAP was completed in April and May of the Year 2000. We finished our reconnaissance of caves in the vicinity of the two ruins. The mapping of the suburban settlement surrounding both sites was almost completed, along with the excavation of associated tombs and other deposits. Numerous plant specimens were collected, including materials for studies of ancient Maya tree farming, resource phytoliths, cacao DNA, and forest product development. Turtle and snail DNA was sampled for research on evolutionary differentiation. Surface and cave soils were sampled, the former for plant distribution studies and the latter for microbes with antibiotic properties. Additional progress was made on the GPS (satellite locator) survey of the Ek Xux canyon system for GIS (Geographic Information System) studies. A number of important finds were made.

### Archaeological Operations and Finds

Four major archaeological operations were performed in the environs of Muklebal Tzul and/or Ek Xux: (1) the reconnaissance of caves, (2) the survey of suburban settlement, (3) the excavation of tombs and suburban settlement, and (4) the preliminary sampling of soils. The cave reconnaissance was essentially completed. The settlement excavations and mapping are nearly finished and will probably require one more extended season of field study. The soil survey will lay a foundation for further study.

### Cave Reconnaissance

The 2000 season concluded five years of cave survey in the environs surrounding Muklebal Tzul and Ek Xux. This year's work focused on completing the reconnaissance of three hillsides in the Muklebal catchment and two hillsides associated with the Ek Xux pocket. Lateral transects were conducted along the bases and summits of the hillsides. No new caves were found in the Muklebal area; several caves with cultural deposits were encountered in the Ek Xux zone. Test excavations were conducted in the well or pseudocave encountered last year in the stela group at Muklebal Tzul and at Mayehal Xheton, a cave to the east of Muklebal with a large rockshelter-like opening. The existence of a plastered collecting basin was established at the entrance to the well. It was also demonstrated that the flooring extends under the walls of the feature, indicating that it was installed prior to the construction of the masonry tunnel. The excavations at Mayehal Xheton revealed evidence of additional plaster flooring and platform masonry but no remains of mortuary activity. The cave apparently did not function as a burial site.

Several major survey finds were made in caves. Workmen cutting a new trail encountered a sizable cave, U'tuch Qui, in the "rock chute" southeast of Ek Xux. This cave contained a single polychrome plate with a well-executed black and red over cream scene on the interior, showing a

stylized fish apparently swimming, a wholly appropriate Underworld image. The cave was evidently used for one discrete ritual event, probably more individual- than group-oriented. Four caves were investigated on the high hillside southeast of Ek Xux and above the Saki Tzul rockshelter. Two were significant. Kab'il Sak'unak contained several plastered platforms, one of which retains at least two lateral wooden retaining beams. Evidence of crystal extraction was also found. Two flowstone formations had been fractured and calcite crystals removed. Calcite crystals were deposited elsewhere in the cave. A partial flanged censer with an effigy face was also recovered. At Toq'bil Roq'ikal Kabpek, the remains of at least five vessels, including a handled censer lid and three small unslipped bowls, were found atop several unplastered platforms. Numerous torch and carbon samples were also collected for dating purposes.

### Settlement and Tomb Excavations

This year, we continued excavations in the settlement at Muklebal Tzul and initiated excavations in the settlement at Ek Xux. The settlement at Muklebal Tzul is notable for its many complex tombs, which appear to be thoroughly distributed throughout the site periphery, not just in the core. Three additional tombs were excavated in order to evaluate further the social significance of this unusual distribution. In West V, less than 300 m from the core, we completed excavation of the serial burial uncovered in 1999 in the tomb within Structure 36, we excavated the sealed tomb in Structure 38 identified in 1999, and we conducted salvage excavations in a tomb within Structure 34 that had been partially looted during the offseason. Medial trenches were also excavated in structures with tombs that had already been excavated, both within West V and in West I, 1.3 km from the core. The purpose of the medial trenches was to reveal architectural details associated with the buildings that contain the tombs. At Ek Xux, ten 1 x 1 m and one 1 x 2 m test units were excavated alongside several outlying structures in an effort to secure charcoal from trash middens for radiocarbon dating. Two 1 x 2 units were also excavated in gaps within settlement groups to assess the possibility that nonplatform structures had been present.

Last year, we recovered the partially articulated eastern skeleton in the Structure 36 tomb in Muklebal West V. This year we removed three to four disarticulated individuals and associated ornaments in the western and southern sectors. The tomb in Structure 38 was extremely well preserved with a crude corbelled vault. The ceiling of the tomb in Structure 34 had been completely destroyed by the looting, but much of the deposit was still intact. It produced a large assemblage of ceramics, including several polychrome sherds, one with partial texts, as well as a few lithic artifacts. The medial trenching revealed simple box-like constructions. All stairways had been added after the construction of the main platforms. The medial trench along the south face of Structure 1 in West I yielded a formal cache. The main part of the cache consisted of two 1k-footed dishes placed lip to lip. A miniature incised jar, a complete obsidian prismatic blade, and a small, crude limestone figurine were all placed between the vessels. An incised vase was found immediately to the southwest of the main vessels, and may also be part of the cache. Many of the settlement excavations at Ek Xux uncovered middens. All produced carbon. One revealed a nonplatform structure. The settlement excavation program was highly successful.

### Settlement Survey

The settlement survey was greatly extended in 2000. Approximately 100 additional mounds were mapped with infrared total data stations. Sixty-five were in the massive West 7 group, about 1.5 km west of the site core of Muklebal Tzul. Thirty-five were north of the creek, some 200 m north of the site core at Ek Xux. Under the direction of PhD archaeology student Andrew

W. Kindon of UCLA, the settlement survey is rapidly nearing completion. Likely fewer than 50 of 300 mounds remain to be mapped at Ek Xux. An undetermined number is left at Muklebal Tzul, but it cannot be high. The valley has been almost completely surveyed, particularly along the most heavily settled central ridge. All settlement will probably have been fully mapped at both sites after one more extended season. The precise delimitation of the two canyons and the settlement they contain by the surrounding precipices makes it possible to map the two sites in their entirety, allowing for the first such complete mapping and comparative study. Muklebal Tzul and Ek Xux are producing some of the best settlement data in the Maya area.

Settlement discoveries in 2000 were especially compelling. West 7 proved to be an enormous group with core-like features. The structures are arranged linearly along the spine of a major spur of the central ridge. The arrangement is particularly well developed in its upper reaches. Settlement is concentrated on the highpoints along the spur. Two of these are linked by a small causeway, in the manner of major groups within site cores. The uppermost rise supports only two mounds, the tallest just over 1 m high. Immediately in front of this structure are the remains of three plain limestone stela. The occurrence of another monument complex in such close proximity to the core agrees well with Kindon's hypothesis that status, wealth, authority, and power are more dispersed throughout the site periphery at Muklebal Tzul than at Ek Xux. It also accords well with the distribution of complex tombs and burial goods throughout the Muklebal periphery. The fact that only one of the groups mapped north of Ek Xux even approximates a formal courtyard again supports the contrast between the two sites. The only truly formal organization evident at Ek Xux is in the site core.

### Soil Sampling

In 1999, we excavated three test pits for a pilot study of soils in the Ek Xux valley. The goal of these pits was to provide both profiles of the soil system and samples for pedological analysis. 1 x 1 m units were excavated in the suburban settlement near the site core, halfway down the valley, and at the center of the distant cacao quad. The soil materials were gathered for two primary purposes. One was to establish the relative acidity of the soils and degree to which they are derived from the volcanic divide of the mountains. This information would help complement the phytolith studies, as phytoliths would be more likely to develop and preserve in acid volcanic soils. The other objective was to assess the distribution of cacao-favoring soils. The clustering of the cacao trees near the ruin might be at least partly explained by a concentration of cacao soils there. Pedological analyses by the Ohio State University revealed a slightly acid pH, favoring a volcanic parent material and phytolith development. Only one cacao nutrient tended to be distributed in association with the site. To enhance our understanding of the relationship between cacao and soils, however, it would help to sample similarly the soils of Muklebal.

In 2000, we conducted a preliminary sampling of the Muklebal soils. We excavated two 1 x 1 m test units, one near the center of the cacao quad and corresponding cluster close to the site core and another at the center of the distant cacao quad. The most complex wall of each was profiled and samples taken from every major layer. Both units were excavated to bedrock, which at less than 1 m of depth is indicative of the difference between Muklebal Tzul and Ek Xux. The Ek Xux soils are deep, rich alluvial deposits derived from the acid volcanics. The Muklebal materials are much darker, derived from basic limestone, and considerably thinner than those of Ek Xux. The Muklebal valley floor is less mature geologically than that of Ek Xux. Muklebal is

more heavily incised and still in the process of eroding. Since cacao is generally known to prefer slightly acid soils, the occurrence of a significant cacao population on the basic Muklebal soils may prove to be something of note. It may point to the development by the ancient Maya of a limestone tolerant or preferring species. Pedological analysis of this year's soil samples may shed important light on the distribution and nature of the Muklebal cacao.

### Botanical Operations and Finds

There were four major components to the botanical program this year. We collected (1) reference samples for phytolith studies of prehistoric plant use, (2) cacao leaves for DNA fingerprinting of the aboriginal cacao populations, (3) data on plant distributions for research on ancient Maya tree farming and its effects on modern forest composition, and (4) mammey seed specimens for development into renewable forest products.

### Phytolith Reference Specimens

Phytoliths are small silica bodies that form in many plants. They sometimes preserve well and can be indicative of the plants of origin. Their occurrence in a trash midden can help identify those plants that were used by a population. They develop and preserve better in slightly acid conditions. Given the basic pH of the mainly limestone Maya lowlands, they have generally not been recovered in quality or quantity at other lowland sites. As our preliminary soil studies have demonstrated, however, the soils of the Ek Xux canyon are derived primarily from the acid volcanics of the main divide of the Maya Mountains. In 1999, we collected samples from three middens associated with two structures in the inner settlement at Ek Xux. Analyses by Irwin Rovner's laboratory at the University of North Carolina in Chapel Hill revealed that these materials contained some of the highest and best-preserved concentrations of phytoliths ever recorded in the Maya lowlands. Unfortunately, without a comparative collection of phytoliths extracted from known local flora, it is not possible to identify the Ek Xux phytoliths.

This year, we collected specimens from over a dozen contemporary plants of recognized resource value in the Ek Xux environs (see Appendix I for list). These are the species that are most likely to be represented among the Ek Xux materials. Many of them are also promising candidates for phytolith production. We gathered samples from various portions of the plants in order to ensure that we secured the different phytoliths from each part. It is our goal to conduct a pilot study of the viability of reconstructing the plant resources that were used at Ek Xux by identifying their remains among the phytoliths in the middens there. We intend to extract phytoliths from the modern plants that we can use to identify the corresponding ancient ones. If we are able to identify a significant amount of the prehistoric phytoliths, then we will proceed with a full-scale study, collecting further samples, both ancient and modern. The Ek Xux materials will probably provide a uniquely penetrating window into ancient Maya plant use.

### Cacao DNA

In 1996, in conjunction with cacao scientist Vish Mooleedhar of the University of the West Indies in Trinidad, the MMAP identified two populations of aboriginal chocolate still growing around the ruins of Muklebal Tzul and Ek Xux. The trees fruit but reproduce by shooting, which means that they are essentially clones of the prehistoric trees. In 1997 and 1999, we mapped large quadrats of trees in both groups and determined that they were clustered around the two ruins, perhaps in a fossil pattern. The distribution suggests that they may have been cultivated in

close proximity to the average household, not in association with distant rotational maize fields. Our preliminary soil assays support this assessment, with only one major cacao nutrient also concentrated near the ruins. At Muklebal there may even have been a single grove, although it is unclear whether it was under individual or community control. Interestingly, the Muklebal trees grow in limestone soils, indicating that at least one population tolerates or prospers in basic conditions. Such a tree might be widely cultivable in the tropical carbonates.

One of the main remaining aspects of the Maya Mountains cacao to document is its genetic composition. It would be useful to know the relationship between the Ek Xux and Muklebal populations, modern commercial stocks, and any other archaic strains. Like many commercial crops, contemporary cacao has been highly overbred. It has lost much of its reproductive vigor and is increasingly vulnerable to blights and substandard conditions. Consequently, there is great interest in the chocolate industry in developing aboriginal varieties to cross with commercial stocks. The Maya Mountains cacao may prove to be of significant commercial value. The Government of Belize, living Maya, and research community are already involved in discussions regarding its development in a mutually beneficial fashion. Part of developing a commercially viable identity for the material is to establish its broader genetic signature. We sampled three leaves each from over twenty widespread trees in each population in order to determine the wider genetic profile. These specimens will be submitted to DNA analysis.

#### Precolumbian Tree Farming

Numerous scholars have proposed in recent years that the Maya engaged in the cultivation of trees or silviculture. While a great deal of provocative evidence has been advanced, the debate remains unresolved. Few conclusive cases have been developed. The Maya Mountains may offer an unusual opportunity to explore the matter further. As the cacao trees attest, we already know that at least one tree was cultivated around sites in the Maya Mountains. The fact that the cacao trees retain their fruit beyond the point of germination proves that these trees were domesticated and therefore cultivated (in domesticating plants, people almost universally select for individuals that hold their fruit for harvesting). The fact that cacao is an understory tree and thrives under the shade of higher canopy trees suggests that another overstory tree may have been grown along with it. Considering that the cacao trees seem to preserve traces of their prehistoric patterning, detailed study of contemporary plant distributions in the area might reveal this association and other potential crop trees. Moreover, the rugged nature of the Maya Mountains has diminished logging in the interior and may have protected these relationships.

CSU ethnobotany undergraduate student Ramon I. Vargas, former manager of the Forest Herbarium of the Forest Department of the Government of Belize, directed a preliminary study of plant distributions in the Muklebal and Ek Xux pockets. Four 50-by-50 m plots were established near the site cores and at significant remove (1 to 2 km) within each cacao quad. Every identifiable plant was documented and sampled along 2-m wide transects at 10-m intervals within the plots. 180 fertile specimens were collected and pressed. These results of these efforts will be utilized to devise a larger sampling strategy that might detect subtle variations in the distributions of trees and other plants within the Muklebal and Ek Xux forests. It may well reveal that the current forests in these areas are not just products of forest recovery from deforestation for Maya agriculture over 1,000 years ago but also have been at least partially conditioned by the effects of Maya tree farming.

### Sustainable Forest Product Development

One of the major goals of the MMAP is to help local populations develop renewable forest products that will generate additional income alternative to that supplied by poaching or looting and to provide an economic incentive to maintain the forest and not destroy or degrade it or its contents. It is our hope that the cacao find might prove to be particularly helpful on this front. Last year, we collected samples of the “coffee vine,” chibayal (*Tynanthus guatemalensis*). Bark from this vine produces a clove-like tea, the flavorant of which might make an appealing additive to coffee or chocolate. These samples are currently being subjected to phytochemical studies at Northeastern University in order to determine if they contain toxins. At the same time, we gathered nuts from the mammey fruit (*Pouteria zapota*), which when dried and ground have an almond-like taste and might make a similarly attractive flavorant. Unfortunately, the seeds were not dried sufficiently and molded before we could send them off for analysis.

This year, we gathered new mammey nuts to replace the ones that we lost last year to mold. We dried them in the sun and wiped them down with alcohol to kill off any mold that was beginning to develop. We managed to dry them to the point that the internal seeds are rattling around inside their external husks. We believe that we have now secured a sufficiently dried body of nuts to allow us to pursue phytochemical analyses. If the chibayal and mammey turn out not to contain toxins, we will encourage and assist the Government of Belize and a local community organization in developing and marketing a commercially viable product for sale domestically and perhaps even abroad. There would likely be considerable demand for such ecologically friendly and culturally appropriate products. We have already had discussions with both the Forest Department and Belize Indigenous Training Institute (BITI) regarding the development of these materials. We hope next to turn to the lemon-leaf tree for a tea or flavor additive.

### Zoological Operations and Finds

The MMAP helped to support two zoological investigations this year: (1) the sampling of mud turtle and snail DNA for the study of a new evolutionary mechanism for differentiation and (2) the collection of soil samples from caves for the analysis of antibiotic properties among microbes that they might contain.

### Evolutionary Differentiation

Evolution provides populations with the diverse adaptations that allow them to continue to prosper in changing conditions. There are a variety of mechanisms that generate this diversity. Jack Corbo, a CSU doctoral student in molecular biology, hypothesizes that in branching riverine systems, populations in the upper tributaries become adapted to the specific local conditions of each branch. As upstream individuals are periodically washed downstream, they introduce the associated traits and genetic signatures into the populations in the main channels. Main channel populations, then, are composed of a mixture of these characteristics and adapted to a wider range of situations. The tributary populations serve as a repository of specific adaptations for the main channel populations, and main channel populations act as a reservoir of broader adaptations for branch populations. Last year, Corbo sampled blood from white-lipped mud turtles (*Kinosternon leucostomum*) in the upper Bladen to extract DNA to test this scenario. If true, tributary DNA would be more specific and main channel DNA more diverse. Unfortunately, some of the blood samples were insufficient to extract adequate sequences.

In 2000, Corbo returned to the upper Bladen to enhance his study. He sampled tissue from the rear legs of the mud turtles and from the foot of the *jute* snail (*Pachychilus indiorum*), a freshwater gastropod, in an effort to extract sufficient genetic material to detect the requisite pattern. He sampled nearly 50 mud turtles in the Ek Xux creek, AC branch of the Bladen, Muklebal stretch of the Bladen, Bladen headwaters, and upper Snake Creek. While the numbers are low in the uppermost drainages, which are smaller in extent, they may be sufficient for him to document minor variations between the lower watersheds, in particular Ek Xux, AC, and Muklebal. He also gathered some 60 samples of *jute* tissue. The availability of *jutes*, however, did not seem to vary so much with the size of the catchment as it did with the degree to which water the water was derived from limestone sources, was basic, and contained adequate calcium carbonate for the molluscs to secrete their shells. Patterns in the DNA among these specimens might provide evidence that the mechanism is sufficiently generic and powerful to apply across species boundaries to many aquatic organisms in dendritic or branching systems. If the hypothesis is supported, it will become an important factor in designing conservation areas.

#### Antibiotic Microbes in Caves

Dark zones in caves often contain few nutrients, especially if the system is closed to the introduction of outside organic materials. Consequently, competition is particularly heavy among microbes that inhabit cave soils in such environments. Cave-dwelling microbes of this sort are known in some cases to secrete antibiotic chemicals to hold off competing organisms, helping to ensure preferential access to an adequate food supply. At a time in which antibiotic medications are losing efficacy due to increasing resistance by pathogens, this phenomenon is of growing interest. At least one company, Biomes, Inc., has been incorporated expressly for the purpose of attempting to develop viable antibiotic products from the secretions of cave microbes. CSU molecular biology PhD student Jack Corbo arranged with biochemist David Newman of the US National Cancer Institute to analyze cave soils from the upper Bladen for antibiotic microbes. Our intention in working with the NCI, which has a very favorable biological properties protocol, was to avoid any commercial entanglements that might result if a find is made.

Twenty-two soil samples were gathered from four major cave systems: U'toch Qui, Black Pot Cave, and the AC Cave in the Ek Xux system and Tusbil Pek in the middle Snake Creek. The samples are approximately 10 mg in weight. They were obtained by scraping the material from the cave floor with a wooden sampling stick into a ziploc sample bag. Each bag and sample stick was sterilized by exposing it to ultraviolet light to ensure that the samples contain only microbes from the caves and not any that would otherwise have been introduced from the stick and bag. Dr. Newman anticipates that the contents should remain viable for at least a month. We are exporting the materials under our US Department of Agriculture soil importation permit. The analyses will be conducted in the biosecure laboratories at Ft. Detrick, Maryland.

#### GPS/GIS Mapping

In 1999, we began mapping the Ek Xux canyon with a Global Positioning System (GPS) or satellite locator. The existing maps of the region were made from aerial photographs and are too small in scale for us to be able to plot our wealth of multidisciplinary data on them. The mapping is being conducted in several phases. The initial phase consists of securing Universal Transverse Mercator (UTM) readings for major points defining the base of the cliff faces that



form the canyons. These readings delimit the canyon walls from the canyon bottoms, helping us to delineate the habitable area. We also acquire GPS readings for the main watercourses, such as the Bladen and the Ek Xux Creek. In the future, we hope to map the configuration of important features on the canyon bottomlands, like the upper riparian terraces and ridgetops that support settlement, further enabling us to clarify the area that was suitable for habitation. With these figures, we may ultimately be able to reconstruct carrying capacities. We will also be able to construct a basemap for plotting our data within a Geographic Information System (GIS), a computerized management program for spatial data.

In 2000, we managed to map the narrow neck of the Bladen gorge that links the Ek Xux and AC pockets, as well as most of the AC canyon. We were actually pleasantly surprised to complete this sector, as the canyon walls are so high and so close as that they nearly prevent satellite signal reception. We were well on schedule to finish mapping the main segment of the AC canyon, when our work was interrupted by rainy weather and clouds. We completed mapping the southeast, southwest, and northwest sections. The entire AC stretch of the Bladen and the AC Creek were also mapped. Thick cloud coverage, in combination with the canyon wall and dense forest canopy, prevented mapping of the last bits of the northeast portion of the canyon wall. We expect to conclude the mapping of the AC canyon in short order in 2001, when we will initiate mapping the Muklebal valley. We will also probably employ two GPS teams on a constant basis next year in order to ensure that we conclude the survey. We will attempt to begin the second phase of terrace and ridge mapping at that time.

### Conclusions

The 2000 season of the MMAP was another great success. We have essentially completed our cave reconnaissance in the Muklebal Tzul – Ek Xux area. The settlement survey and excavation programs will likely be finished next year. Preliminary soil sampling was finished in the Muklebal valley. Reference phytolith specimens were collected, as were cacao DNA samples, data that may reflect on ancient Maya tree farming, and mammy seeds for sustainable forest product development. Mud turtle and snail DNA were also gathered for studies of the evolutionary mechanisms behind genetic differentiation. Cave microbes were also sampled to see if they exhibit any antibiotic properties. The GPS mapping of the AC Canyon was nearly completed, making for significant progress on our GIS basemap.

A number of important finds were made. The cave reconnaissance produced the painted fish pot, the wooden retaining beams, modeled effigy censer, and extraction locus for calcite crystals. The Muklebal settlement excavations completed the recovery of the serial burials from last year and yielded a useful cache. The Ek Xux settlement excavations produced numerous charcoal fragments for radiocarbon dating and promising midden materials for phytolith extraction. The settlement survey uncovered a second stela plaza in large outlier of Muklebal Tzul and further evidence that the settlement at Muklebal Tzul is more formalized and the distribution of power there more dispersed than at Ek Xux. The season was highly productive.

Appendix I:  
Contemporary Plant Specimens Collected for Comparative Phytolith Analysis

Common Name	Family	Genus/species
Basket Vine	Palmae	<i>Desmoncus schippii</i>
Breadnut/Ramon	Moraceae	<i>Brosimum alicastrum</i>
Cocoa/Chocolate	Sterculiaceae	<i>Theobroma cacao</i>
Cedar	Melilaceae	<i>Cedrela mexicana</i>
Cohune Palm	Palmae	<i>Orbigyna cohune</i>
Copal/Pom	Burseraceae	<i>Protium copal</i>
Gumbolimbo	Burseraceae	<i>Bursera simaruba</i>
Mammy	Sapotaceae	<i>Pouteria zapota</i>
Sapodilla	Sapotaceae	<i>Manilcara zapota</i>
Warrie Cohune	Palmae	<i>Astrocaryum mexicanum</i>
Wild Yam	Dioscoreaceae	<i>Dioscorea</i> sp.
Chibayal/Coffee Vine	Bignoneaceae	<i>Tynanthus guatemalensis</i>
Cow Foot	Piperaceae	<i>Piper auritum</i>
Tapir Foot	Curcurbitaceae	<i>Guarania makoyana</i>

