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THE FUNCTION OF GUACHIPILIN, *Diphysa robinioides*, IN THE LENCA LANDSCAPE

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ABSTRACT.— Guajiquiro Municipio in the forested highlands of southern Honduras is home to the Lenca. The Lenca subsist in the municipio's mountainous 350 square kilometers on a combination of swidden agriculture, transhumance cattle husbandry, cash crop production, local commercial forestry, and emigrant remittances. Recent designation of almost 20% of the municipio as a cloud forest biological reserve has engendered land use conflicts. Field research of changing patterns of Lenca land use demonstrated the ubiquity of trees in the Lenca's settlement landscape. One particular fabaceous tree, ***guachipilin***, *Diphysa robinioides*, Fam. Leguminosae, Subfamily Papilionoideae, is a prominent landscape feature. The tree serves three purposes for the Lenca that manifest themselves in the Lenca landscape. The Lenca intercrop the tree in their milpas for nitrogen-fixation. They harvest it to construct corner posts for their *bajareque* houses. The Lenca also craft ***guachipilin*** crucifixes for gravesites because they believe the durable wood is an appropriate, and lasting, symbol of a lost loved one's enduring spirit.

Keywords: Lenca, landscape, ethnobotany, Middle America.

RESUMEN.— Guajiquiro Municipio en forested montañas de Honduras meridional es casero al

Lenca. El Lenca subsiste en el municipio que los 350 kilómetros cuadrados montañosos en una combinación de swidden agricultura, la agricultura de los ganados del transhumance, la producción vegetal del efectivo, la silvicultura comercial local, y remesas del emigrante. La designación reciente casi de 20% del municipio como reserva biológica del bosque de la nube ha engendrado conflictos de la utilización del suelo. La investigación de campo de caracteres cambiantes de la utilización del suelo de Lenca demostró la ubicuidad de árboles en el paisaje del establecimiento de Lenca. Un árbol fabaceous determinado, ***guachipilin***, *Diphysa robinioides*, Fam. Leguminosae, Subfamily Papilionoideae, es una característica prominente del paisaje. El árbol responde a tres propósitos para el Lenca que se manifiesten en el paisaje de Lenca. El intercrop de Lenca el árbol en sus milpas para la nitrógeno-fijación. La cosechan para construir los postes de la esquina para sus casas del bajareque. El Lenca también hace los crucifixes del ***guachipilin*** a mano para los gravesites porque creen que la madera durable es una apropiada, y durando, el símbolo de un perdido amó su espiritu que aguantaba.

RÉSUMÉ.— Guajiquiro Municipio dans forested des montagnes du Honduras méridional est à la maison au Lenca. Le Lenca subsistent dans le municipio les 350 kilomètres carrés que montagneux sur une combinaison de swidden l'agriculture, l'agriculture de bétail de transhumance, la production végétale

d'argent comptant, la sylviculture commerciale locale, et les remises d'émigrant. La désignation récente presque de 20% du municipio comme réserve biologique de forêt de nuage a engendré des conflits d'utilisation de la terre. La recherche de zone des caractères changeants de l'utilisation de la terre de Lenca a démontré l'ubiquité des arbres dans l'horizontal de règlement de Lenca. Un arbre fabaceous particulier, ***guachipilin***, *Diphysa robinioides*, Fam. Leguminosae, Subfamily Papilionoideae, est un dispositif en avant d'horizontal. L'arbre atteint trois objectifs pour le Lenca qui se manifestent dans l'horizontal de Lenca. L'intercrop de Lenca l'arbre dans leurs milpas pour l'azote-fixation. Ils la moissonnent pour construire les poteaux faisants le coin pour leurs maisons de bajareque. Le Lenca ouvrent également des crucifixes de ***guachipilin*** pour des gravesites parce qu'ils croient que le bois durable est un approprié, et durant, le symbole d'un perdu a aimé son esprit durable.

FIGURE 1.— Guajiquiro Municipio, Honduras.

INTRODUCTION

Guajiquiro Municipio is a remote forested district in the highlands of southern Honduras in the department of La Paz (Figure 1). More than 16,000 Lenca, Honduras' largest indigenous group, comprise the overwhelming majority of the municipio's population. Although having lost their native language by the 1950s (West 1998), persistent land use practices, handicraft, and local market traditions mark the Lenca as a distinctive ethnic group. The Lenca of Guajiquiro currently subsist within a mountainous 350 square kilometers on a combination of swidden agriculture, transhumance cattle husbandry, cash crop production, local commercial forestry, and emigrant remittances.

In 1987 the Honduran government passed a decree that designated highland cloud forests throughout the country as protected areas (Republic of Honduras 1987). Almost 20% of Guajiquiro Municipio became protected as the Guajiquiro Cloud Forest Biological Reserve. Aerial photos demonstrate that the Lenca have occupied the decreed protected area for more than 45 years. Forests within the protected area occupy small, ten to fifteen-acre islands on the steepest slopes and are surrounded by settlements, agricultural fields, and roads.

Certain protected area land use restrictions of the Guajiquiro Cloud Forest Biological Reserve conflict with traditional Lenca land use. Field research of the conflict between protected area management and traditional Lenca land use led to a peripheral, yet related, discovery. Travel afoot throughout Guajiquiro Municipio demonstrated that, although they have cleared much of the forest belatedly targeted for protection, the Lenca integrate forests and trees into their cultural landscape. Trees, live and harvested, are ubiquitous in the Lenca settlement landscape. Managed pine, mixed pine-oak, and broadleaf cloud forests garland milpas (e.g., a swidden plot, or an agricultural plot cut from forest and cultivated 2-10 years). Legions of burnt stumps retain topsoil in a sloped swidden plot. Sturdy manual sawmills made of pine logs occupy small, sunny forest clearings. Pine, oak, and sweet gum galleries shade footpaths that lead through cultivated areas. Narrow forest corridors line the ditches that demarcate milpa boundaries. Large broadleaf trees that punctuate these ditch borders attest to the longevity of some boundaries. Multiple strands of barb-wire nailed to tree trunk posts, or log rail fences separate some agricultural plots. Closer to Lenca dwellings, apple and peach trees cast shade on kitchen gardens, or compete for sunlight in a milpa. In the municipio's lowlands, ***guama*** trees (*Inga oerstediana*, Fam. Leguminosae, Subfamily Mimosoideae) veil small coffee fincas.

A notable member of the forests and trees that the Lenca include in their landscape is a fabaceous tree called ***guachipilin*** (*Diphysa robinioides*, Fam. Leguminosae, Subfamily Papilionoideae). The tree has become a cultural feature that links Lenca agriculture, folk-housing, and religion. The Lenca encourage the tree's growth in their milpas to improve soil fertility. They harvest the tree from their fields to craft corner posts to support their houses. They carve ***guachipilin*** trunks into cemetery crucifixes that symbolize their faith in the immortality of the human spirit. Their multiple uses of the ***guachipilin*** manifest themselves in the Lenca's forested cultural landscape. This article examines the general distribution and use of the ***guachipilin*** in mainland Middle America and explores the specific functions of the tree in the Lenca landscape.

GUACHIPILIN

Other researchers have noted the utility of ***guachipilin*** in mainland Middle America. Budowski (1987) found that farmers in Costa Rica commonly use ***guachipilin*** as a living fence post. Floras of El Salvador (Flora Salvadoreña 1926) and Chiapas (Miranda 1953) report that the ***guachipilin's*** durability and ease of use make it a popular material for tool handles and, surprisingly considering its shape, railroad ties. Throughout the region people also use the tree for firewood.

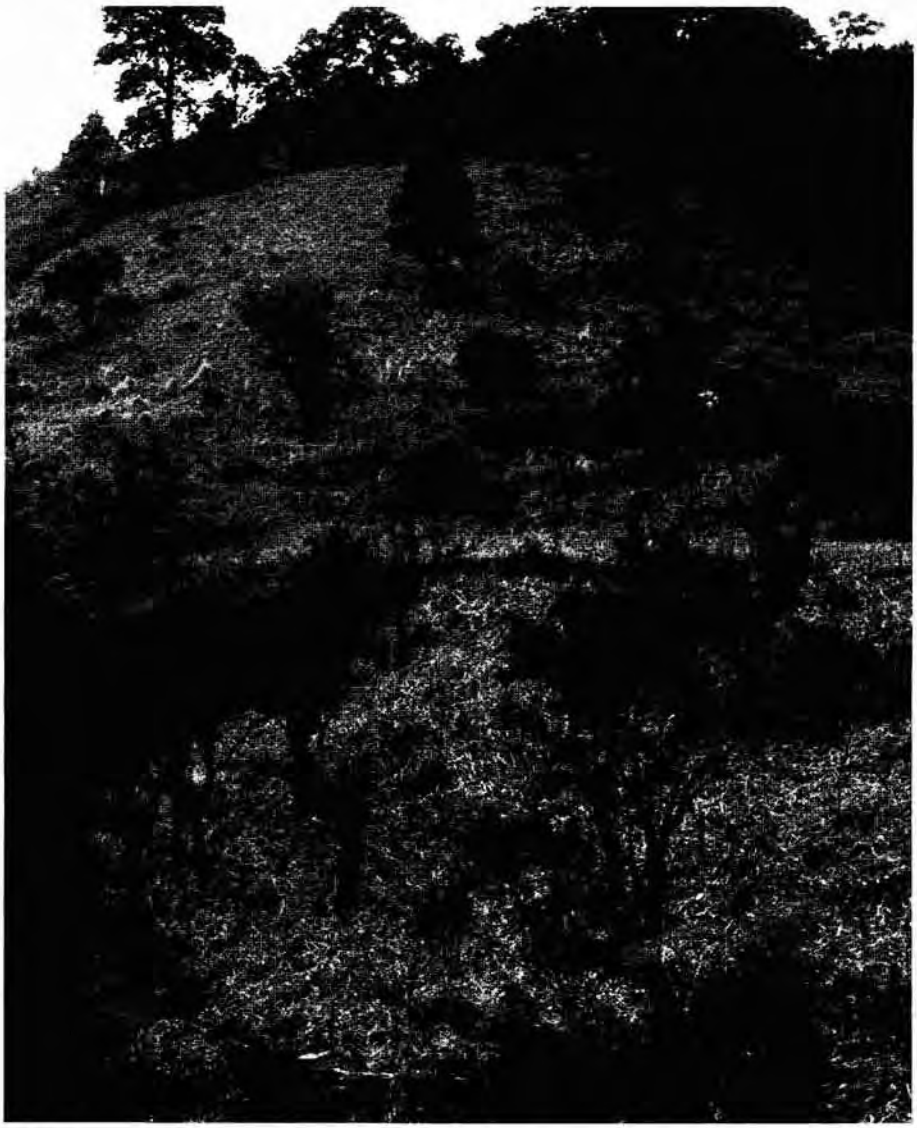

FIGURE 2.— *Diphysa robinioides* intercropped throughout a harvested Lenca milpa (photo by Scott Brady).

Guachipilin trees found in milpas and fallow patches range from 6-10 m in height (Figure 2 and 3). Their branches form an umbelliform crown. The tree's yellowish, fibrous heartwood is cloaked by 2-3 cm thick grayish-brown bark that is marked by an anastomosing network of deep fissures. Its heartwood yields a yellow dye. ***Guachipilin's*** leaflets are borne on 12-14 cm stems in an odd-pinnate arrangement. Stems carry 10-17 small leaflets, 1 - 1.2 X 2.5 - 3 cm, that are oblong, pointed at the base and rounded at the top (Paquet 1981). ***Guachipilin*** produces short, up to 2 cm long, clusters of yellow flowers and inflated, flattened, oblong seed pods that are 8-10 cm long (Record and Hess 1943).

FIGURE 3.— ***Guachipilin*** leaves (photo by Scott Brady).

The tree's serpentine shaped trunk supports the widely accepted definition of the name ***guachipilin***. Santamaria (1959) explains the word as a contraction of the Nahuatl ***cuahuitl***, which means 'tree', and ***chipilin***, a Nahuatl word for the 'twisted shell of a small marine organism'. Examination of regional gazetteers (Defense Mapping Agency U.S. 1982, 1983a, 1983b, 1984, 1985, 1992; U.S. Army Topographic Command 1969; Office of Geography 1956) demonstrates that past cultures have acknowledged the cultural character of the plant by naming settlements after it. This circumstance does not make the gauchipilin exceptional. Large-scale, topographic maps of Latin America commonly include myriad toponyms derived from plant names.

Figure 4 shows the geographical distribution of the toponym "***Guachipilin***," or "***El Guachipilin***," in mainland Middle America. Most of the 36 occurrences of the toponym are clustered in an east-west zone that occupies the southern half of the Central American isthmus in southwestern Honduras, El Salvador, and southeastern Guatemala. More than half of the toponyms are west of Kirchoff's (1943) southern boundary of Meso-America, the pre-Colombian "high culture" area where Nahuatl-speakers lived and Nahuatl was the *lingua franca*. Rather than a distinct dividing line, later scholars consider Meso-America's southeastern a broad margin where Meso-American and non-Meso-American cultures interacted (Stone 1959; Sharer 1974; Fox 1981). Eleven of the remaining twelve ***Guachipilin*** toponyms are to the east of Kirchoff's boundary and lie within the region occupied by the Lenca at A. D. 1500 (Newson 1986). This distribution corresponds to the transitional character of Meso-America's southeastern periphery.

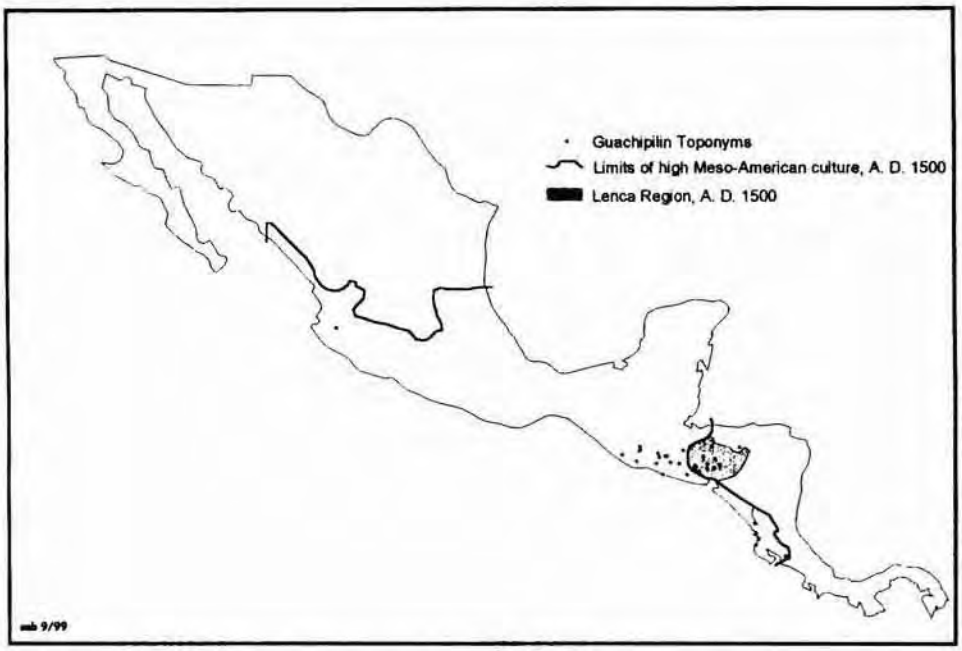

FIGURE 4.— Geographical distribution of the toponym "Guachipilin" in mainland Middle America.

Field observation has demonstrated that within Guajiquiro Municipio the ***guachipilin*** occupies a narrow habitat within the fertile slopes between 1700 m and 1900 m of elevation. Settlements in Honduras that bear the name "***Guachipilin***" are found at elevations ranging from 690 m to 1500 m (Instituto Geografico Nacional 1990). The geographical distribution of the toponym suggests that the tree's habitat extends beyond this 200 m zone. Another possible explanation is that the toponym's wide dispersal reflects ***guachipilin's*** cultural importance rather than its favored habitat.

GUAJIQUIRO MUNICIPIO

Most of Guajiquiro's population resides in loosely-bound hamlets, called *aldeas* and *caserios*, that are scattered throughout the northern third of the municipio at elevations between 1700 m and 2100 m. The *aldea* and *caserio* are indigenous settlement forms that persist throughout Central America's highlands, distinct from the agglomerated-grid settlement model that the Spanish imposed throughout much of Latin America (West and Augelli 1989). The dispersed nature of these settlements creates a landscape in which Lenca communities are closely embedded within the systems of soil, water and forest resources that they depend upon for their subsistence.

The Lenca refer to this upland zone as the *tierra fresca*, 'cool land', or *tierra arriba*, 'upland' (Figure 1). Settlements located below approximately 1700 m are in, what the Lenca call, *tierra calída*, 'warm land'. Both the uplands and lowlands are occupied by milpas, some teetering on steep 40% slopes, fallow patches of briars and ferns called *guamil*, moist, grassy clearings for cattle grazing sometimes called *chaguites*, and a variety of forest patches present in varying stages of manipulated succession.

Forest types include broadleaf cloudforest, generally found above 2000 m on slopes with a northeast aspect. These forests are the primary targets of government protection. They contain towering, buttressed trees (12 m-40 m high) and the rich epiphytic growth common in moist, tropical lowland environments. Mixed pine-broadleaf forests prevail between 1800 m and 2000 m. Several species of pines form this forest's patchy canopy and support masses of epiphytes. Interspersed evergreen oaks and a broadleaf tree/shrub understory complement the pine cover. Pine forests cloak soil-poor slopes below 1700 m. This description of elevational zones is misleading, especially above 1700 m, because of the patchwork nature of temporal patterns of forest clearance. One slope may support several forest types representing several different stages of succession.

MILPAS

Tierra fresca contains the municipio's thickest, most fertile topsoils, known locally as *suelo franco*. The Lenca employ shifting cultivation on these clay loams and produce the traditional maize, beans, and squash crop trio found throughout much of highland Middle America. Annually, the Lenca clear forest or *guamil* for new milpas in February and March. They prepare and plant their milpas during

April and May, the last two months of the dry season and harvest in October and November, the final months of the wet season.

The Lenca rotate their arable land through up to three vegetative stages, milpa, *guamil*, and forest, for periods of varying duration (Figure 5). Traditionally, the duration of each stage depends on factors including slope angle, soil quality, and a family's caloric demand. To determine the timing of *guamil* or forest clearance the Lenca also consider the mix of plants present. For example, a *guamil* patch in which ***frijolillo*** plants (*Acacia angustissima*, Fam. Leguminosae, Subfamily Caesalpinioideae) are dominant is considered suitable for clearance. A *guamil* patch where blackberries, *Rubus* are dominant is not yet ready for clearance.

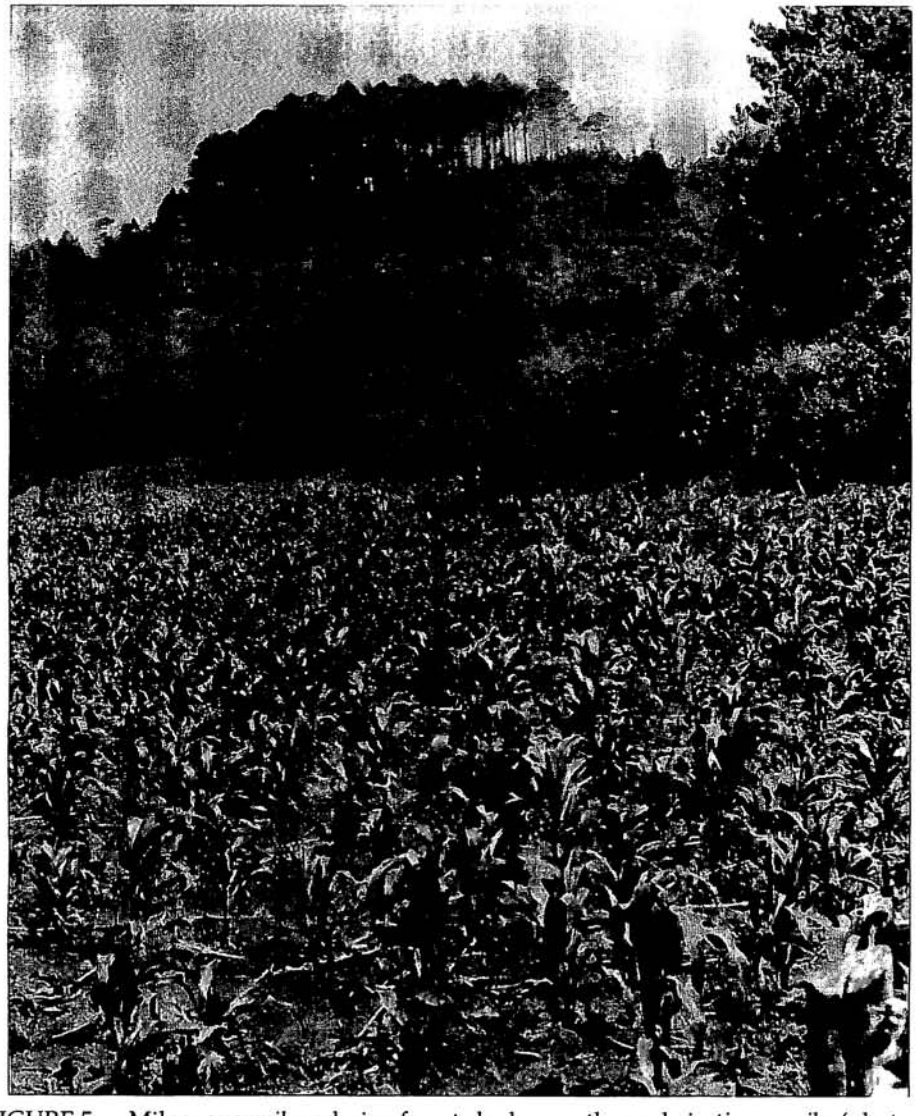

FIGURE 5.— Milpa, *guaymil*, and pine forest cloak a gentle grade in *tierra arriba* (photo by Scott Brady).

Milpa stages customarily ranged from 2-10 years, as did the *guamil* and forest fallow period. Protected area land use restrictions intended to allow forest regeneration have shortened the duration of the fallow cycle. By prohibiting the clearance of forested land and land where forest is regenerating, protected area restrictions force farmers to clear *guamil* patches earlier than usual. Agricultural extension agents in the municipio work to reduce forest clearance by promoting the cultivation of tree crops, like apples and peaches, as a means to allow permanent cultivation rather than shifting cultivation. Protected area restrictions have only recently begun to be enforced. The fines meted out have only penalized forest clearance. They have not yet prevented it. Similarly, the lack of a dependable market for apple and peaches has prevented farmers from abandoning shifting cultivation.

Lenca milpas support the full range of vegetation lifeforms. Verdant, herbaceous, food plants, like maize and several varieties of beans, sprout up through the dark ash, stumps and skeletons of burnt forest. Their milpas also include intercropped living trees. Lenca traditionally have practiced *de facto* agroforestry by encouraging the growth of fabaceous tree species for soil fertility and erosion prevention in their milpas (Figure 2). ***Frijolillo***, and ***guachipilin***, are the two predominant milpa tree species.

Rather than planting ***guachipilin***, the Lenca manage for the plant's presence in their milpas. They refrain from clearing the plant when clearing *guamil* or forest patches for milpa preparation. This is similar to the practice of the Huastec Maya of Veracruz State in Mexico who also manage for the plant, which they call ***chicath*** (Alcorn 1984). Like the Lenca, Huastec farmers consider the tree an indicator of milpa yields. An abundance of *Diphysa* pods portends abundant bean and maize yields.

Alcorn (1984) also found that the Huastec care for the tree because of its multiple uses. They use leaves, shoots, and bark from the ***chicath*** to ameliorate conditions that range from diarrhea to boils. Recent research by Guatemalan ethnopharmacologists confirmed *Diphysa's* medicinal qualities (Caceres et al. 1990, 1993a, 1993b, 1995). Various preparations of *Diphysa* bark acted against dermatophytic infections, gastrointestinal disorders, and strains of gonorrhea.

The high costs and lack of information about chemical fertilizers have limited the adoption of these by the Lenca of Guajiquiro. They continue to depend on fallowing for restoration of fertility; and, make room in their milpas for two fabaceous trees, the ***guachipilin*** and ***frijolillo***, that, in symbiosis with *Rhizobium*, fix nitrogen (Budowski 1987). Enforcement of protected area land use restrictions and the efforts of agricultural extension agents probably will not diminish the function of ***guachipilin*** in the Lenca agricultural landscape. The Lenca will continue to rely on the tree for soil improvement. The tree's monetary value beyond the milpa will further persuade farmers to include it in their plots.

HOUSES

Similar to the Huastecs, the Lenca also value the multiple uses of ***guachipilin***. The tree's durable trunk is an essential construction material for their houses. The

FIGURE 6.— Twisted ***guachipilin*** horcones support a *bahareque* dwelling (photo by Scott Brady).

Lenca primarily construct two different types of houses: the indigenous *bajareque* and white-washed Spanish *adobe*. *Bajareques* are the more traditional house type (Figure 6), although the Lenca have adopted Spanish architectural components. *Bajareques* have wattle and daub walls framed by corner posts, *horcones*. Prior to the Lenca's adoption of clay tiles and hipped roofs, their bajareques were covered with steep thatch roofs.

An adobe house's mud-brick walls stand without the support of corner posts. Both house types are usually two-room, rectangular structures primarily covered by hipped or gabled clay-tile roofs. In Guajiquiro, both house types are constructed by locals with local materials. Adobe walls, tile roofs, and the two-room rectangular floor plan represent Lenca adoption of colonial Spanish architectural features (West 1998). However, the adobe bricks and the clay tiles, even the white wash that the Lenca use to fashion an exterior veneer, are derived from local deposits from within the municipio.

In response to questions about the respective values of the two house types, the Lenca of Guajiquiro commonly report that adobe houses are easier to decorate while *bajareque* houses are sturdier. The Lenca attribute a *bajareque's* durability to the twisted ***guachipilin*** corner posts that support them. While they also use ***tatascan*** (*Tecoma stans*, Fam. Bignoniaceae) for *horcones*, they consider the ***guachiplin's*** contorted trunk the best wood for the corner posts. Throughout the municipio, informants claim that ***guachipilin*** corner posts cut during the first phase of the moon will endure 100 years, the lifetimes of three houses. Indeed, Guajiquiro Lenca

salvage ***guachipilin*** corner posts from abandoned house sites when constructing new *bajareque* houses.

Bajareques with ***guachipilin*** corner posts dot the hills throughout Guajiquiro municipio. ***Guachipilin*** trees, however, do not grow throughout Guajiquiro's uplands. The distribution shown on Figure 4 notwithstanding, in Guajiquiro ***guachipilin*** trees primarily grow in milpas, *guamil*, and secondary forests found on the clay loam slopes located between 1700 m and 1900 m of elevation. Lencas farming in this zone profit by selling the ***guachipilines*** that they have tended in their milpas. The cost of one ***guachipilin*** corner post is 100 *Lempiras* ($7 US). A typical *bajareque* house includes eight corner posts. This makes ***gauchipilin*** corner posts the second most valuable component of a *bajareque* house, after the 3,000 roof tiles that cost 1 *Lempira* each.

A regional authority previously predicted that the Lenca's acculturation would include the wholesale adoption of the Spanish adobe house at the expense of the *bajareque* (West 1998). Recent interviews and field observation suggest that the transition is proceeding only slowly. However, should Lenca throughout Guajiquiro exclusively adopt adobe or substitute the recently introduced cinder blocks for the walls of their houses, the architectural function of ***guachipilin*** will decrease and, similar to the thatch roof, the distinctive contorted *horcones* will recede from the Lenca landscape. A third function of the ***guachipilin*** appears to be less vulnerable to substitution, and figures to remain.

SPIRIT

A final purpose of the ***guachipilin*** tree links Lenca milpa agriculture to Lenca folk housing, and to their faith in the immortality of the human spirit. The tree functions in Lenca religious ritual. Many Lenca of Guajiquiro craft ***guachipilin*** crucifixes for gravesites. They believe the durable wood is an appropriate, and lasting, symbol of a lost loved one's enduring spirit (Figure 7). In this context a reciprocal relationship has developed between the Lenca and the ***guachipilin***. They sanctify the tree by transforming its wood into crosses that embody the human spirit. Conversely, the Lenca bestow a natural characteristic of the tree, its durability, on the human spirit. Masses of ***guachipilin*** crosses stand in formation in the municipio's cemetery bearing witness to this man-plant relationship. The Lenca have endowed the tree with meaning that figures to allow it to persist in their landscape

CONCLUSION

Despite the ***guachipilin's*** utility to the Lenca, development agents in the municipio who promote agro-forestry and prevention of soil erosion ignore the tree, and the potential benefits of incorporating the plant into their projects. A local tree nursery, sponsored by an extension agency to supply seedlings for reforestation and erosion prevention projects, provides some endemic *Pinus* seedlings, but concentrates on introduced trees like *Eucalyptus* and *Casuarina*. Felker and Bandurski (1979) reported similar disinterest in tropical fabaceous trees twenty years ago. Agronomists ignore trees like ***guachipilin*** because they do not produce

FIGURE 7.— ***Guachipilin*** crucifixes in Guajiquiro's cemetery (photo by Scott Brady).

edible fruit. Silviculturalists ignore them because they cannot be managed as a forest crop. Honduras' national forestry school omitted ***guachipilin*** from its list of one hundred useful tree species (Benitez Ramos and Montesinos Lagos 1988). Should the ***guachipilin's*** utility remain unnoticed by outsiders working in Guajiquiro Municipio, the tree will persist in the Lenca landscape because of the interrelated purposes it serves.

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