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Incidental Agroforestry in Honduras: The jícaro tree (Crescentia spp.) and pasture land use

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Abstract

Plant distributions result from a variety of biophysical conditions and, often, human activities. Distributions change depending on numerous factors, such as climate change or the presence of seed dispersal agents. The present distribution of the *jícaro* (*Crescentia alata* and *Crescentia cujete*) or calabash tree in Central America may be the result of several factors, key among them direct human management. Many savanna pastures in Central America have been invaded in recent decades by woody vegetation, mostly as a result of fire suppression and fencing. However, observations reveal that its presence is not merely due to invasion. Humans manage the tree, protecting and encouraging its presence in semi-arid cattle producing landscapes where it serves as food for cattle when the dry season drastically reduces herbaceous forage. This adaptive strategy addresses issues of agroforestry and biodiversity, biomass and carbon sequestration, and the domestication process in which we humans have so long been engaged.
Keywords: *Crescentia*, *agroforestry, plant management, cattle, Honduras*

Resumen

Las distribuciones de las plantas resultan de una variedad de condiciones biofísicas y, en muchos casos, de las actividades humanas que cambian en relación con numerosos factores como el clima, o la presencia de agentes que esparcen las semillas. La actual distribución del *jícaro* (*Crescentia alata* y *Crescientia cujete* o calabaza) en América Central puede ser el resultado de varios factores, clave entre ellos, el manejo directo del hombre. Las observaciones revelan que su presencia no es solamente causada por invasión, sino que cómo el hombre está manejando el árbol, protegiéndolo y apoyando su presencia en un paisaje semi-árido de ganadería, donde sirve como insumo para el ganado cuando la estación seca reduce el forraje. Esta estrategia de adaptación la confrontan los asuntos de silvicultura y biodiversidad, el biomasa y la captura del carbón y también el proceso de domesticación en el cual el hombre ha estado envuelto a largo plazo.
Palabras claves: *Crescentia, silvicultura, manejo de plantas, ganadería, Honduras*

Introduction

Central America is home to a variety of ecological settings. Geographers have long been engaged in studying these environments and how people live in and impact them. Many such studies have appeared in the pages of this publication in its previous incarnation. This study adds another contribution to attempts to understand the human relationships with the biophysical world in Central America, specifically in Honduras.

This paper explores the contemporary situation of the *jícaro*[1] tree, commonly known in English as the calabash tree (*Crescentia cujete* and *C. alata*), in Honduras. My interest

comes from simply enjoying seeing the fruits growing on the tree, however, I am also interested in understanding the tree's distribution. In an effort to explain such a distribution, I began to look at the different cultural and biophysical conditions within which the tree occurs in Central America. In some places, such as La Mosquitia, the tree occurs nearly exclusively in domestic settings and in relatively small numbers. In other areas, such as the Pacific Coast of Honduras and Nicaragua, the tree occurs in large dense stands, very often unassociated with domestic settings, or human settlements. Through observation and ethnographic inquiry, I have developed a better understanding of the tree's distribution and the factors involved in explaining it, especially in the context within which *jícaro*s occur in some cattle producing landscapes.

Some Hondurans have developed a strategy that utilizes the *jícaro* trees that grow spontaneously in cattle pastures. The resulting landscapes may be a form of *incidental agroforestry*. This article examines such incidental engagement in agroforestry – agriculture that integrates perennial tree crops and/or natural vegetation (Denevan 2001: 16) – among cattle producers in Honduras. It seems evident that the development of this practice and the resulting landscapes were not conscious acts. Rather, through the incremental development of an adaptive strategy, cattle producers have incidentally become engaged in a type of agroforestry and have also incidentally changed landscapes.

The methods for gathering data for this project were twofold. Empirical observation was the basis for much of the information presented here. Ethnographic inquiry formed the basis for anecdotal information from which I learned about how people perceive and utilize the *jícaro*. I talked with many people in various parts of Honduras about the tree and about the relationships it shares with cattle. These inquiries were all unstructured interviews. Allowing informants to respond to inquiry is often one of the most enlightening methods of gathering field information. I spoke in detail with 10 cattle producers about the presence and use of *jícaro*s on their lands. Information from this group offered me a better understanding of the relationships between cattle and *jícaro*s and of the distributions that I had observed.

Given that the sample size of informants used here is relatively small, future reearch regarding the ecology or the cattle production aspects of *jícaro*s will necessitate a more rigorous quantitative methodology.

An ancient tree

The *jícaro* tree is an ancient tree of the American tropics. It is a member of the family *Bignoniaceae* and of the genus *Crescentia* (Vázquez et al. 1999). Of the five tree species that make up *Crescentia*, the name *jícaro* generally refers to two of these, *C. cujete* and *C. alata* (see Gentry 1980). Though different species, these two trees are similar in morphology and distribution. *C. alata* is a non-domesticate (Johannessen 1963: 88). It has smaller fruits and trifoliate leaves, hence its Philippines name of *cruz-cruz* (cross-cross). It is far more common than *C. cujete*, which has simple oblongate leaves and much larger fruits (Janzen 1983). *C. cujete* is considered to be a domesticate or, at least, to be more domesticated (Johannessen 1963: 88). Perhaps Denevan's (2001) distinction *semi-domesticate* (27) is most appropriate, though see Doolittle (2000: 6-7, 23-25) on the complexities of the concept and processes of domestication. It is less common than *C. alata* but is far more likely to occur in domestic settings. For example, the *jícaros* found growing in La Mosquitia are practically always found in a domestic setting and are generally *C. cujete*. Consequently, for simplicity and to reflect frequent local usage, the word *jícaro* in this

Figure 1. *Crescentia alata.* (Photo by author)

paper refers to both species, though the majority of *jícaro* trees in the study area are *C. alata* (Figure 2).

Figure 2. *C. Alata* with fruit. (Photo by author)

Jícaro trees are shrubby and range in height from 4-12 m with trunk diameters ranging from 30-60cm. The tree's wood is soft, making it a popular residence for a variety of orchid species. Trees are cauliflorous with bell-shaped flowers sprouting directly from the trunk or branches. Pollination takes place with the assistance of bats, particularly *Glossophaga* and *Artibeus* (Janzen 1983). Pollen is located in the dorsal side of the flower, leading to its eventual deposition on the head and shoulders of pollinating bats (*Ibid.*).

Fruits – hard, woody berries – are perhaps the most important aspect of *jícaro*

trees. In fact, the name *jícaro* refers to the bowl-shaped containers often crafted from them (Kiddle 1941). Remarkably cauliflorous, the globular gourds grow on the tree's trunk and branches, ranging from 7-15 cm in diameter for *C. alata* or 15-25cm for *C. cujete* (Janzen 1983). Fruits are green and smooth and are filled with a seed pulp. When dried, the thin fruits become brown and hard, making them amenable to a variety of uses (Table 1). Most commonly, it has been used as a container. The seed pulp is eaten by some herbivores and is also occasionally used in some parts of Central America to make a refreshing beverage. The seed pulp, along with dried seeds, leaves, and flowers, is used by some groups in the preparation of medicinal products. Janzen asserted that the fruits, once dropped "in contemporary natural habitats" generally rot before dehiscing and consequently rarely release viable seeds (1983:223). This leads to questions about *jícaro* dispersal and distributions.

Uses of Crescentia cujete and Crescentia alata	**Part of Tree**	**Source**
Food	Seeds	Hernández 1943
Beverage	Seed pulp	Morton 1968, Martínez 1959
Containers	Fruit	Towle 1961, Mors and Rizzini 1966, Martínez 1959, Hernández 1943, Mabberly 1987
Musical instruments	Fruit	Williams and Williams 1941
Orchid Growing	Wood	Williams and Williams 1941
Medicine	Leaves, flowers, seeds	Morton 1968, Towle 1961, Brown 1957, Martínez 1959, Hernández 1943, Mabberly 1987
Shade	Tree	Vázquez-Yañes et al. 1999
Firewood	Wood	Vázquez-Yañes et al. 1999
Construction	Wood	Vázquez-Yañes et al. 1999
Cattle Forage	Leaves, flowers, fruit	Hernández 1943, Vázquez-Yañes et al. 1999

Table 1. Selected uses of *Crescentia cujete* and *C. alata.*

Distribution and ecology

The natural habitat of the *jícaro* is tropical savanna setting (Vazquez et al. 1999: 49-50; Beard 1953:172, 173; Wagner 1964: 250, 263; Johannessen 1963: 89; Taylor 1963: 49-50). Its distribution, however, is much broader (Janzen 1983: 222), though its natural distribution is difficult to determine, as the tree is widely planted and in different ecological settings (*Ibid.*). Contemporary distributions extend from southern Sonora in Mexico through Middle America and the northern half of South America, extending from Colombia and Venezuela into Ecuador, Peru, Brazil, and Bolivia (http://www.mobot.org/MOBOT/research/ven-guayana/bignoniaceae/crescent.html 2004). This wide expanse likely reflects the tree's pre-Columbian distribution and utilization, as its remains occur in prehistoric archaeological records from Belize (McKillop 1994) to Peru (Towle 1961). In 1745, Gumilla noted its presence in intercroppings by the Otomaco on the Orinoco (Denevan 2001:63). Today, it is also found in Africa and the Philippines and is cultivated in southern Florida and the U.S. Southwest.

The tree adapts to a wide variety of soils and is most often found in tropical

savannas or other tropical lowlands. It is both fire and drought tolerant and Wagner (1964: 263) attributed its savanna presence in Middle America with humans and fire. *Jícaro* trees tend to grow in three ecological zones: temperate sub-humid, tropical humid, and tropical sub-humid. Vegetation types with which it is often associated are pine-oak forest, spiny (deciduous) forest, tropical deciduous forest, tropical semi-deciduous forest, tropical sub-perennial forest, savanna, and savanna pastures (Vázquez et al. 1999: 49-50). Though commonly associated with savanna habitat - Johannessen stated that it is perhaps "the most characteristic genus of pre-Columbian savannas" (1963: 89) – it grows well in a variety of biophysical settings, as is evidenced, for example, by its ubiquity in settlment landscapes throughout the humid lowlands of La Mosquitia. I have even seen the tree thriving in permanent stands of water in southern Honduras.

The distribution of the two *jícaro* species is broadly tropical in the Americas, to which it is native. Field observations throughout the hemisphere combined with distribution maps from the Missouri Botanical Garden indicate that the tree grows best in warmer areas at lower elevations. In Honduras, for example, the tree's presence decreases as elevation increases and I have rarely seen it growing above 1500m, even in domestic settings. I have not observed nor seen reference to *jícaro* trees growing at higher elevations. However, along Honduras' Pacific coast, a savanna environment (Pineda 1997 :135, 167-170), the tree thrives in dense stands, known locally as *jícarales*. They also occur commonly in Honduras' interior savannas, though not as densely or frequently as on the Pacific coast. In the interior savannas, the frequency of occurrence decreases as one moves north toward the humid Caribbean coastal lowlands.

Like its distribution, its use seems to have been common throughout tropical America. The fruit is a hard, round, woody berry that, when dried, is used in many ways (Table 1). Its primary use appears to be as a container. Columbus is reported to have seen it being used as masks with eyeholes for natives who would sneak up on unsuspecting water birds and catch them by the feet (Mabberley 1987: 154). He was also apparently once bombed with *jícaro*s filled with hot peppers and ashes which made a sort of tear gas when they broke open on the deck of his ship (Duke 1986: 68). Human use presumably is related to differences in size between the two species under consideration here. Often *C. cujete* is more likely to be associated with domestic settings since it produces the larger fruits.

Questions of *jícaro* dispersal and fruit morphology led Janzen and Martin (1982) to speculate that this was one of the fruits that large, hoofed Pleistocene herbivores, such as *Gomphotheres* ate, as they were able to crack open the hard fruit. This notion was based on observations of horses cracking, eating, and subsequently dispersing them in Costa Rica. Otherwise, they reported, the fruits would generally fall to the ground and rot before dehiscing viable seed stock. They thus speculated that Pleistocene distributions were tied to the hoofed herbivores that ate them, further suggesting that the distribution changed at the end of the Pleistocene when many large American herbivores became extinct. Consequently, this distribution likely changed again after Europeans brought Old World herbivores to the Americas following contact.

As stated, *jícaro* distribution in Honduras is broad but shows distinct patterns. In much of the country the *jícaro* is a domestic tree, planted near homes to produce containers. In La Mosquitia, the *jícaro* appears to be exclusively a domestic plant. This is true for much of the country but with increasing availability of plastic containers, this will likely change and the *jícaro* may become a vestigial domestic species, a pattern documented from some settlements in nearby Belize (Bass 1999: 101, 135). As a result, fewer people apparently harvest or select *jícaros* for domestic use than in years past.

The greatest variation in this pattern comes in the savanna areas where some *jícaro*

trees are found. In some cases, they may stand in savanna pastures as a few broadly dispersed individuals. Other times, they occur in the dense, nearly monocultural stands, known locally as *jicarales*. Consequently, the geography of *jícaro*s in Honduras has distinct patterns, both in presence and in landscape morphology. How may one explain these distinctive distributions?

Forty years ago Carl Johannessen (1963) discussed the changing nature of Honduran savannas. His primary point was that areas that were formerly open grasslands had relatively recently been invaded by sclerophyllous trees and shrubs with the *jícaro* being one of the predominant species. "Throughout extensive areas of former savanna a valuable grass resource has been exchanged for a relatively useless thorn-scrub forest" (Johannessen 1963: 2). The cause of this change is asserted to be fire suppression, which indeed is probably the primary control in the maintenance of the bulk of tropical savannas (Beard 1953). Fires that would check woody vegetation are not as frequent. As well, the decreases in herbaceous vegetation through grazing removes both fire fuel and competition. Further, grazing cattle eat and disperse seeds of some of the woody plants. However, in some cases and places, the situation may be more complex and the thorn-scrub not quite as useless.

The geographical distribution of the *jícaro* in Honduras is based on a combination of factors, both physical and cultural. The domestic distribution can be attributed to the plant's utilitarian aspects. Simply, people have dispersed the plant as part of domestic vegetation assemblies in large part to produce containers.

Outside of the domestic setting, the *jícaro* is often found in savanna settings in association with trees and shrubs indicative of American tropical thorn scrub, such as *carbon* (*Mimosa tenuiflora*), *espino blanco* (*Acacia farnesiana*), and *negrito* (*Simaruba glauca*) (Johannessen 1963: 23). This vegetation is often indicative of savanna invasion or degradation due to overgrazing and fire suppression (*Ibid.*). However, in some cattle producing areas of Honduras, the *jícaro*'s presence may be due to a more complex adaptive strategy by humans and cattle. The result is a landscape of ecological management that addresses a variety of issues, from habitat diversity to carbon storage to the domestication process.

Cattle and the jícaro

One of the most remarkable patterns of the tree is its high degree of occurrence in savanna landscapes (Figure 3), especially in the savanna region of Honduras' Pacific Coast. As these same savannas landscapes are known as cattle producing landscapes and cattle appear to be associated with dispersal of *jícaro* seeds, cattle production must be addressed.

Cattle ranching in Latin America has been the subject of much research and many development projects (DeWalt 1983, Jordan 1993, Butzer 1988, Sluyter 1996, Parsons 1993, Perramond 2002). It has been blamed, in part, for some cases of underdevelopment and habitat degradation. Latin Americans have been raising cattle since the earliest days of European presence in the New World. Practices and strategies have varied, depending in large part on the diffusion source area(s) and local environments and adaptations. In Central America, cattle ranching has been most pronounced in interior savanna areas (Johannessen 1963, Pineda 1997: 256-257) and along the Pacific Coast (Parsons 1965), where it continues. It also exists in other areas such as La Mosquitia where it has received much less scholarly attention. The central concern here is understanding the role that cattle and their managers play in dispersing *jícaro* seeds and thus expanding the tree's distribution.

Figure 3. *Jícaral* near Choluteca in southern Honduras. (Photo by author)

Johannessen, in his study of change in Honduras' interior savannas (1963), pointed to a handful of thorn-scrub plant species, including the *jícaro,* as prevalent invaders of what were formerly open savanna pasture lands. He further asserted that such invasion and change had taken place due to overgrazing combined with barbed-wire fencing and fire suppression. Consequently, we are led to believe that the high density of *jícaro* trees as part of a group of invader species, is simply a result of fencing cattle in the non-burnt savannas. In large part, this seems correct, but it is also more complex.

Since Janzen and Martin (1982) had pointed to the *jícaro* as part of the diet of large, hoofed Pleistocene herbivore, I examined the notion of cattle consumption of *jícaro*s. Though Janzen and Martin had documented range horses eating 20-40 of the fruits per day, producing dung filled with viable seeds in 2-3 days, they noted that "cattle show no interest" in the fruits, either whole or broken open (*Ibid*., 224). However, Hernandez affirmed that "the cow frequently eats these fruits during the dry season" (1943: 440). Godier et al. (1991) and Vazquez et al. (1999:50) have also documented cattle consumption of *jícaro*s. Field informants subsequently confirmed such practices.

However, the data are confusing: some farmers told me that cattle do not eat *jícaro*s, that they merely use the trees as sources of shade. Others asserted that, of course cattle eat *jícaro*s. The land of all of these farmers contained *jícaros* that were accessible to the cattle. Just as from the literature, I was being told two different things. The correlation between cattle, *jícaro* distribution, and the affirmations of some producers that their cattle do consume the fruits made me think that cattle must be playing a role as seed dispersal agents through consumption of the seed-bearing fruits. As for why some producers told me that their cattle do not eat *jícaro*s, one can only speculate that this is due to land quality and availability of dry season browse.

One day while walking down a path through a *jícaro* thicket near the Gulf of Fonseca, I saw a man approaching. He was slowly driving two goats pulling a small cart. As he neared and stopped to share a greeting, I noticed that his wagon was loaded with three large bulging sacks (Figure 4). After exchanging pleasantries, I asked him what was in the sacks. "*jícaro*s," he replied. I asked him what he was doing with them. He re-

sponded that he was taking them home to feed his cattle. So, his cattle do eat *jícaro*s. Following this encounter, I also noted in the same region piles of *jícaro* fruits in cattle corrals as a food source. Further research on consumption rates, percentage of browse, and other production/ecological data would contribute to understanding the process.

Figure 4. Man hauling *jícaro* fruits to feed to his cattle, near San Lorenzo in southern Honduras. (Photo by author)

Figure 5. Drying *jícaro* fruits in a cattle pen in southern Honduras, near Nicaragua border. (Photo by author)

Jícaro fruits, then, are utilized by some cattle as a food source, at least by some cattle. Consequently, cattle must be serving as seed dispersal agents. This must account for some of the high numbers of *jícaro*s in some of the cattle producing landscapes. Two other questions now beg attention. First, why aren't *jícaro*s as evenly distributed throughout all of Honduras' cattle producing savanna landscapes? Second, how are humans playing a role in the development of the *jícaro's* distribution?

The answer to the first question appears to be, in part, climate. Hernández (1943) stated that cattle eat *jícaro* fruits during the dry season. The man I saw pushing the cart loaded with *jícaro*s told me the same thing, that the *jícaro*s were dry season food. Another cattle producer, in the Otoro Valley, one of Honduras' interior savanna areas, told me the same thing. He said that *jícaro* fruits, along with the leaves as well as several other plants, serve as dry season forage for the cattle when there is not enough herbaceous forage. This has been further corroborated by Johannessen (personal communication). The ecological zones in Honduras known as savanna (Aw climate regions) are characterized by a marked dry season (Pineda 1997: 167-170) and make up about 15% of the country. The 100-200 cm of annual precipitation falls during a six-month wet season. The dry season then lasts for six months and is especially dry. The places in Honduras that experience this climate pattern are also the places that often support significant numbers of *jícaro* trees. Areas of the country with the most marked dry season are along the Pacific Coast. The country's interior savannas also experience this climate pattern.

However, the intensity of the dry season decreases toward the humid Caribbean coast. "In Honduras, days with rain tend to decrease from north to south" (Pineda 1997: 131). This essentially mirrors the intensity of *jícaro*s. Where the dry season is especially marked, food for cattle can be scarce. This is especially true for herbaceous browse.

Cattle then browse on arborescent species. *Jícaro* fruits are one of these and are a good source, since they produce plenty of potential dry season forage. In the driest areas, such food sources area essential. As the dry season decreases in intensity, such food sources are less essential. By utilizing these food sources, cattle also disperse their seeds within their fenced grazing plots, contributing to their increasing presence. The association of cattle and *jícaro*s in such environments likely began as incidental. Neither is responsible for the other. However they both likely support each other's presence. The variations in frequency or density of *jícaro* trees across Honduras in such landscapes correlate with variations in climate or dry season, if cattle are present. This explains, in large part, the first question. What about the role of humans?

As Johannessen pointed out, savanna invasion by trees typically involves a group of arborescent species, including the *jícaro*, most commonly *C. alata*. However, it is not unusual to find such landscapes with a nearly monocultural aborescent population of *jícaros*. It seems evident that this is the result of humans.

Some ranchers, as mentioned previously, are aware that their cattle eat *jícaro*s and, as a result, gather *jícaro*s as cattle forage, much as others gather hay. Additionally, it turns out, some cattle producers also manage the landscapes upon which their cattle browse with an eye toward long-term food availability. Some cattle producers actively manage for and encourage *jícaro*s by selection. The evidence can be frequently seen in piles of brush in these landscapes. Producers periodically clear out or 'weed' the land on which their cattle browse, using machetes to clear the woody vegetation of the thorn-scrub species on their land with the exception of the one tree species. They leave the *jícaro* trees, clearing out the others so that the resulting landscape is essentially a *jícaro*-studded savanna. Cleared vegetation is piled and later burned. The result is a monocultural landscape of selection.

Land managers actively select for this one species for the benefit it confers, a reduction of risk perhaps (Denevan 2001:299). Consequently, rather than be seen as evi-

dence of overgrazing and fire suppression, the presence of *jícaro* trees can be seen as evidence of a local adaptive strategy to local climatic conditions.

Figure 6. *Jícaro* trees growing in a former pasture, now used for rice cultivation in the Otoro Valley, Honduras. (Photo by author)

Further, it is a strategy that may have even been learned by humans by observing the cattle select the *jícaro* fruits as browse and then managing for them. This strategy may be called *incidental agroforestry*, wherein land managers have engaged in a sort of agroforestry by way of managing for seasonal climatic conditions within the parameters of their production system. Another term for this is *silvopastoralism*. Silvopastoralism is the intercropping of trees within a system of livestock production. It is "specifically designed and managed for the production of trees, tree products, forage, and livestock" (Clason et al. 1997:1).

As evidenced in literature, cattle production in the tropics is a controversial practice. Silvopastoral studies in the American tropics do mention the *jícaro* as part of potential or existing systems (Rosales et al 1998:5, Benavides 1998), though it has received little to no in-depth attention. Several aspects of the *jícaro* system described here are perhaps relevant to more general silvopastoralism issues, such as: livestock production and seasonal forage availability; the enhancement of biodiversity with the addition of an ecological niche absent in pastoral systems; conservation of species, in particular of birds and bats, similar to that in other systems, such as shade coffee (Greenberg et al 1997, Perfecto and Snelling 1995, Thiollay 1995, Young 1988); and, carbon sequestration (Ayling 2001).

Conclusion

Understanding the distributions of phenomena on the Earth's surface and the processes behind them lies at the heart of geographical research. The relationships between pattern and process are complex. Geographical patterns often lead us to investigate the processes behind them. Such is the case with this article seeking to understand the distribution of the *jícaro* tree in Honduras. As is also common in geographical inquiry, examination of such patterns and processes leads one to examine both biophysical and cultural phenomena and their interrelationships. Indeed these rarely can be separated.

In my effort to explain the distribution of the *jícaro* tree in Honduras, human action and adaptive strategies necessarily became part of the story. As this article demonstrates, the effort to understand the distribution of the *jícaro* tree in Honduras led to the discovery that it is related to a system of cattle production that involves agroforestry or silvopastoralism that has previously gone unnoticed. The resulting landscape results from a combination of both biophysical factors and cultural action. This system has changed the distribution and populations dynamics of the *jícaro* tree.

This system also stands to benefit not only cattle producers, who benefit by managing for a dependable dry season forage, but also by contributing to increasing species diversity, conservation, and potential carbon sequestration. It also offers an example of another viable option for humans with which to utilize a particular environmental setting for a particular cultural practice of producing food. Further, as the *jícaro* may begin to disappear from some areas within its range due to larger cultural changes, such as the availability of plastic utensils, this ancient tree is being utilized by humans in yet one more manner. Thus, this relatively unknown tree continues to be an important part of life for people in the American tropics. This information contributes to our efforts to understand how people interact with and influence the environments and resources that make up our lived-in world. As well, it reminds us of the discovery that often accompanies intellectual curiosity. Indeed, discovery is one of the truest goals of research.

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Note

[1] I choose to use the vernacular term *jícaro* to refer to the two species under investigation here as this is the most common name used in the study area. Indeed the plant has many vernacular names throughout its area of occurrence, 'calabash' being the English name. The word *jícaro* itself is most likely a Nahuatl word from highland Mexico that underwent a fascinating process of adoption and diffusion through the meeting of indigenous America and colonial Spanish (Kiddle 1944).

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