

# ANTES AND HOY DÍA: PLANT KNOWLEDGE AND CATEGORIZATION AS ADAPTATIONS TO LIFE IN PANAMA IN THE TWENTY-FIRST CENTURY<sup>1</sup>

NINA K. MÜLLER-SCHWARZE

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**Nina K. Müller-Schwarze**, (*Department of Anthropology, Tulane University, 1021 Audubon Street, New Orleans, Louisiana 70118*); e-mail: nmullers@tulane.edu. ANTES AND HOY DÍA: PLANT KNOWLEDGE AND CATEGORIZATION AS ADAPTATIONS TO LIFE IN PANAMA IN THE TWENTY-FIRST CENTURY. *Economic Botany* 60(4):321–334, 2006. *Ethnobotanical studies often assume plant knowledge is shared by all members of an arbitrarily bounded human group. By describing the uses and local categorization of plants in one village in rural Panama in a heteroglossic approach, the different knowledges within a village are presented in one article. Plants used in the daily work of women and men, and the work of village specialists are described. Villagers negotiate changing realities by adapting plant use and knowledge; this is reflected in local categorization of plant names into antes and hoy día. Unlike the established ethnobotanical assumption that bounded units of plant knowledge are dying, the younger generations of villagers, who work both within and outside the village, know more plants useful to their changing economic opportunities. Subsistence agriculturalists possess the adaptive plant knowledge skills to be stewards of the environment.*

**Key words:** Panama, Coclé, peasants, ethnobotany, heteroglossia, memory

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## INTRODUCTION

Many bemoan a perceived loss of plant knowledge as rural people become increasingly tied to urban areas; this article shows how the skills for using local plants are used to adapt to new times in one rural Panamanian village. Certain segments of a community retain plant knowledge by adapting that knowledge to present times. Is plant knowledge really shared? Do all members of a community use plants the same way?

The plants used in La Martillada, a village in the northern Coclé province of the Republic of Panama, are described. Peasants in the village depend on the natural environment for survival (Müller-Schwarze 2003). The 152 villagers (Weeden Gamboa 2000) speak Spanish, are mainly Catholic, live in adobe (*quincha*) houses, and subsist as swidden farmers. Surrounded by forest, the peasants make order from the microhabitats of the natural environment by carving out cultural spaces recognized as yard, garden,

riverbank, swidden, fallow, farm, pasture, fence, the healers' preserves, and common wild spaces. Women and men have separate work, and each gender moves through these spaces differently. Agricultural development agencies are a constant presence and encourage new species and agricultural techniques.

## METHODS

Following accepted anthropological practice, the author lived in the village for three years, established friendships, and conducted informal interviews with all 152 adult villagers about their plant knowledge and use. The author's role as an economic and ethnic outsider facilitated close friendships with female and male villagers. Slightly more than half of the villagers are women. Interviews were conducted in all village spaces, including fallows and swiddens, often while accompanying and observing villagers in their work.

With permission from Panamanian agencies, voucher specimens were collected and then stored at the University of Panama Herbarium and the Tulane University Herbarium. The author collected the voucher specimens with in-

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formants present over a period of eight months in 2005 (special thanks to the Alveo Nuñez family). These specimens then were identified at the University of Panama Herbarium with the help of Dr. Luis Carrasquilla, Vielka E. Murillo G., and Lucila de Zaratí, with thanks to Anne Bradburn of the Tulane University Herbarium. Local names are used in the text of this article. Although the villagers speak Spanish, regional names may differ from those used in other areas (i.e., *yucca* refers to *Manihot esculenta*).

Anthropological methods of memory ethnography and oral history (*sensu* Vansina 1965) are used to explore local understandings of plant knowledge. In the interviews, villagers narrated

experiences with plants in terms of local cognitive categories for organizing and remembering the past. Villagers distinguished between two time periods: before (*antes*) and nowadays (*hoy día*). The data are described in *antes* and *hoy día* categories within women's daily work, men's daily work, and the daily work of village specialists. This article simultaneously describes the plants used today and remembered from earlier times. The plant names and the spaces in which they are found have been organized by the author's categories into tables based on use: medicinal, ornamental, manufacturing, and caring for houses and households (Tables 1, 2, 3, and 4).

TABLE 1. MEDICINAL PLANTS.

Local name	Scientific name	Village space
albahaca	<i>Ocimum campechianum</i> Mill.	yards
anamú	<i>Petiveria alliacea</i> L.	yards
árbol de pan	<i>Artocarpus altilis</i> (Parkinson) Fosberg	yards, riverbanks
cabima	<i>Copaifera aromatica</i> Dwyer	farms
cabresto	<i>Ormosia coccinea</i> (Aubl.) Jacks.	farms
caña agria	<i>Costus villosissimus</i> Jacq.	healers' preserves, riverbank
cedrón	<i>Simaba cedron</i> Planch	farms
cerillo	<i>Symphonia globulifera</i> L.	healers' preserves
cipré(s)	<i>Tecoma cf. stans</i> (L.) Juss. ex Kunth	yards
coca	<i>Guarea multiflora</i> Adr. Juss.	healers' preserves
contragavilana	<i>Neurolaena lobata</i> (L.) R. Br.	yards
dormilona	<i>Mimosa pudica</i> L.	yards
escobilla amarga	<i>Scoparia dulcis</i> L.	yards
gingibre	<i>Zingiber officinale</i> Roscoe.	yards
guanabana	<i>Annona muricata</i> L.	yards
guarumo	<i>Cecropia peltata</i> L.	fallows
hierba de pujo	<i>Tradescantia commelinoides</i> Scult. & Schult.f.	yards
hinojo	<i>Piper peltatum</i> L.	yards
hombre grande	<i>Quassia amara</i> L.	healers' preserves
lengua de vaca	<i>Asplundia vegans</i> Harling; <i>Tradescantia commelinoides</i> Schult. & Schult.f.	yards
manzanilla	<i>Spilanthes alba</i> L'Hér.	yards
maracuyá	<i>Passiflora edulis</i> Sims.	gardens, yards
maravilla	<i>Kalanchoe pinnata</i> (Lam.) Pers.	yards
naranja agria	<i>Citrus x aurantium</i> L.	yards
negrita	<i>Elaeis oleifera</i> (Kunth.) Cortés ex Prain	yards
noni	<i>Morinda citrifolia</i> L.	farms
ortiga	<i>Urera elata</i> (Sw.) Griseb.	yards
pasmo	<i>Siparuna pauciflora</i> Beurl.	yards
peiko	<i>Sanseria trifasciata</i>	yards
sábila	<i>Aloe vera</i> L.	yards
tilo morado, tilo verde	<i>Justicia comata</i> L.	yards
urenia	<i>Senna reticulata</i> (Willd.) H. S. Irwin & Barneby	farms
yuquito	<i>Lasiacis ruscifolia</i> (Kunth.) Hitch	yards

TABLE 2. ORNAMENTAL PLANTS

Local name	Scientific name	Village space
acacia	<i>Acacia mangium</i> Willd.	yards
flor de la cruz	<i>Petrea volubilis</i> L.	yards
novio	<i>Impatiens walleriana</i> Hook.f.	yards
palma de indio	<i>Cordyline terminalis</i>	cemetery, healers' preserves, yards
papo	<i>Hibiscus rosasinensis</i> L.	yards
pino	<i>Pinus caribaea</i> Morelet.	yards

### WOMEN'S WORK

Women spend their days close to the adobe houses. Female children follow their adult female relatives through the activities of the day, learning the work of women in the yard, garden, and river spaces. Medicinal, food, and ornamental plants are planted and tended in the yard. Women spend mornings washing at the river, and return to the house and yard to harvest and prepare food crops. Later in the day, women weave hats. After a hard day of work, women retire to sleep in the houses. This section describes the plants women use for these tasks, and examines whether the plants used, and therefore knowledge of plants, has changed between the older and younger generations of women.

Northern Coclé peasants cannot afford the cost of traveling to the provincial capital for medical care, nor can they afford the expensive pharmaceutical treatments the doctors prescribe. Instead, most illnesses are treated with medicinal plants. Women care for the sick, and therefore care for the medicinal plants in the village yards. The elder women grow and use *peiko* and *lengua de vaca* to cure intestinal parasites, *yuquito* to give energy to ill people, *contragavilana* to cure wounds, *albahaca* to relieve muscle cramps, and *hierba de pujo* or *guanabana* against constipation. Each household has favorite medicines or combinations of medicines, which at one time may have been prescribed to a family member by a village healer. *Escobilla amarga* heals headaches, toothache pain is treated with *ortiga* root, *hinojo* is grown to treat muscle aches, *dormilona* induces sleep,

a small tobacco plant is used to treat scabies, and people who claim to have high blood pressure drink *maracuyá* juice. Teas are made from the leaves of lemongrass and citrus trees. A crushed paste of *pasmó* repels insects. The elder women prepare black hair coloring from the *negrita* palm. Villagers recognize sympathetic magic connecting the inhabitants of a house and some yard plants. Planting lemongrass and *anamú* near the house keeps snakes at bay and cures snakebite. Each yard contains a *sábila* plant, which is understood to reflect the mental and physical health of the owner in its robustness and color; villagers sing to these *sábila* plants in order to prevent illness. Citrus fruits, especially lime, are associated with cleanliness. On Tuesdays and Fridays, women sweep the house with a broom containing green lime to protect the house from witches. On New Year's Eve, a bundle of green lime and rice is hung in the entranceway to keep good luck in the house. In yards, women care for *papo*, *flor de la cruz*, and *novio* for ornamental use.

In addition to the plants received from the elder women, younger women have incorporated many more plants into their yards. The younger women often spend several years working as domestic servants outside of the village. During that time, they have access to buying plants at markets and *botánico* shops in towns and cities. Plants are harvested from wild areas and new ornamental plants are brought as gifts. Some young women grow *anamú* to treat asthma and clear skin infections. *Lengua de vaca* is applied directly to wounds and scorpion stings. *Tilo morado* and *tilo verde* cure scars and treat insomnia. Teas of *albahaca* or *maravilla* relieve headaches. *Manzanilla* teas ease the recognized illness of trauma (*susto*, *nervios*). *Gengibre* is added to medicinal mixtures. Washing the head with a tea of *ciprés(s)* treats hair thinning. A tea of the bark of *naranja agria* is used as a medicine for liver difficulties. The crushed bark of *arból de pan* cures wounds. *Acacia* and *pino*, introduced *hoy día* by agricultural development agencies, are planted as ornamentals. Thus, young women not only use the same plants as the elders; they also have incorporated new plants into their healing activities and yards.

Dense stands of fruit trees like *pifa*, *otoe*, and *guineo* mark the edge of the yard microhabitat as it blends into the mix of cultivated and

TABLE 3. FOOD PLANTS AND PLANTS USED IN FOOD PREPARATION

Local name	Scientific name	Village space
achiote	<i>Bixa orellana</i> L.	yards
aguacate	<i>Persea americana</i> Mill.	gardens, yards
ají	<i>Capsicum</i> sp.	yards
arroz	<i>Oryza sativa</i> L.	gardens, swiddens
batata	<i>Ipomoea batatas</i> (L.) Lam.	yards
bijao	<i>Calathea panamensis</i> Rowley ex. Standl. <i>Calathea marantifolia</i> Standl.	riverbanks
cacao	<i>Theobroma cacao</i> L.	yards
cacao de monte	<i>Herrania purpurea</i> (Pitt.) R.E.Schult.	riverbanks
café	<i>Coffea arabica</i>	farms
caimito	<i>Chrysophyllum cainito</i> L.	gardens, yards
calabasa	<i>Crescentia cujete</i> L.	yards
caña de azucar	<i>Saccharum officinarum</i> L.	yards
coco	<i>Cocos nucifera</i> L.	gardens, yards
coquito	<i>Clidemia sericea</i> D.Don	wild areas
culantro	<i>Eryngium foetidum</i> L.	yards
frijol	<i>Phaseolus vulgaris</i> L.	gardens, yards
fruta china	<i>Averrhoa carambola</i> L.	gardens, yards
garapata	<i>Licania hypoleuca</i> Barth.	fallows, wild areas
guabo	<i>Inga spectabilis</i> (Vahl) Willd.	gardens, yards
guanú	<i>Cajanus cajan</i> (L.) Millsp.	yards
guayabito	<i>Psidium friedrichsthalianum</i> Nied.	gardens, yards
guayabo/a	<i>Psidium guajava</i> L.	gardens, yards
guineo	<i>Musa</i> sp.	riverbanks, yards
jira	<i>Socratea exorrhiza</i> (Mart.) H. Wendl.	wild areas
jobo	<i>Spondias purpurea</i> L.	fences
limón	<i>Citrus × limon</i> (L) Burm. f.	riverbanks, yards
limón chino	<i>Citrus × aurantifolia</i> (Christm.) Swingle.	farms
limón criollo	<i>Citrus × aurantifolia</i> (Christm.) Swingle	riverbanks, yards
maíz	<i>Zea mays</i> L.	gardens, swiddens
mamey	<i>Mammea americana</i> L.	riverbanks, yards
mango	<i>Mangifera indica</i> L.	yards
marañon	<i>Anacardium occidentale</i> L.	gardens, yards
membrillo	<i>Gustavia superba</i> (HBK) Berg.	riverbanks, yards
nance	<i>Brysonima crassifolia</i> Cav.	yards
naranjillo	<i>Swartzia simplex</i> (Sw.) Spreng.	riverbanks, yards
naranja/a	<i>Citrus reticulata</i> Blanco; <i>Citrus × sinensis</i> (L.) Osbeck	yards
ñajú	<i>Abelmoschus esculentus</i> (L.)	yards, gardens
ñame cimarrón	<i>Disocorea</i> cf. <i>alata</i> L.	swiddens, wild areas
otoe	<i>Xanthosoma violaceum</i> Schott.	riverbanks, yards
papaya	<i>Carica papaya</i> L.	gardens, yards
pifa	<i>Bactris gasipaes</i> Kunth.	gardens, yards
piña	<i>Ananas comosus</i> (L.) Merr.	gardens, farms
pomarosa	<i>Syzygium jambos</i> (L.) Alston	gardens, yards
saril	<i>Hibiscus sabdariffa</i> L.	gardens, yards
tití	<i>Topobea pittieri</i> Cogn.	fallows, wild areas
trupa	<i>Oenocarpus bataua</i> Mart.	riverbanks
yucca	<i>Manihot esculenta</i> Cranzt.	gardens, swiddens, yards

TABLE 4. PLANTS USED FOR HOUSES, HOUSEHOLD ITEMS, AND DAILY ACTIVITIES

Local name	Scientific name	Village space
(unknown)	<i>Ocotea</i> sp.	farms
alcabú	<i>Zanthoxylum panamense</i> P.Wilson	fallows, riverbanks
alcarreto	<i>Aspidosperma cruenta</i> Woods.	farms
almácigo	<i>Bursera simaruba</i> L.	fences
balo	<i>Gliricidia sepium</i> (Jacq.) Kunth. ex Walp.	fences
bayano	<i>Gurania makoyana</i> (Lem) Cogn.	fallows, swiddens, wild areas
bejuco colorao	<i>Martinelli obovata</i> (Kunth) Bureau & Schum.	yards
bejuco real	<i>Heteropsis oblongifolia</i> Kunth.	yards
bellota	<i>Carludovica palmate</i> Ruiz y Pavoa	riverbanks
cabeza de negro	<i>Dioscorea mexicana</i> Schweidw.	wild areas
canalú	<i>Sloanea</i> sp.	farms
caña brava	<i>Bactris major</i> (Oerst) H. Wendl.	wild areas, riverbanks
carbonero	<i>Lindackeria laurina</i> Presl.	farms
caucho	<i>Castilla elastica panamensis</i> Cook.	farms, riverbanks
cedro amargo	<i>Cedrela odorata</i> L.	fallows, farms
cedro espino	<i>Pachira quinata</i> (Jacq.) W.S. Alverson	farms
ceibo	<i>Hura crepitans</i> L.	farms, wild areas
chisna	<i>Arrabidaea chica</i> (Humb. & Bonpl.) B. Verl.	fallows
chumico suave	<i>Tetracera volubilis</i> L.	riverbanks, swiddens, wild areas
chumico grueso	<i>Doliocarpus major</i> J.F. Gmel.	riverbanks, swiddens, wild areas
chunga, chonta	<i>Astrocaryum standleyanum</i> L.H. Bailey	wild areas
conga, casita	<i>Welfia regia</i> Mast.	wild areas
corotú	<i>Enterolobium schomburgii</i> Benth	farms, pastures
cortezo	<i>Apeiba tibourbou</i> Aubl.	fallows, pastures, wild areas
criollo	<i>Terminalia amazonia</i> (J.F. Gmel.) Excell.	farms, wild areas
cucua rojo	<i>Naucleopsis ulei</i> (Warb.) Ducke.	wild areas
dormilón, arelillo	<i>Schizolobium parahybum</i> (Vell.) S.F. Blake	farms
escoba	<i>Cryosophila warscewiczii</i> (H. Wendl) Bartlett	wild areas
espave	<i>Anacardium excelsum</i> (Bertero & Balb. Ex Kunth) Skeels.	wild areas
guacimo	<i>Luehea seemannii</i> Tr. & Planch.	fallows
guamo	<i>Doliocarpus olivaceus</i> Sprague & RO Wms ex Standl.	farms
guayacán	<i>Tabebuia guayacan</i> Seem.	pastures
harino	<i>Enterolobium schomburgii</i> Benth.	farms
higuerón	<i>Ficus insipida</i> Willd.	farms, riverbanks
indio	<i>Jacaranda copaia</i> (Aubl.) D. Don.	wild areas
jaboncillo	<i>Sapindus saponaria</i> L.	riverbanks
lana	<i>Ochroma pyramidale</i> (Ca. ex Lam.) Urban	yards
laurel	<i>Cordia alliodora</i> (R. & P.) Cham.	fallows, farms, wild areas
leucaina	<i>Leucaena multicapitula</i> Schery.	farms
macano	<i>Diphysa robinoides</i> Benth.	swiddens, fallows, wild areas
malagueto	<i>Xylopia frutescens</i> Aubl.	fallows
mangle	<i>Termstroemia tepezapote</i> Schlecht.	fallows
maría	<i>Calophyllum longifolium</i> Willd.	farms
marica	<i>Paragonia pyramidata</i> (L.C. Rich.) Bur.	yards
matarrón	<i>Coccoloba manzanillensis</i> Beurl.	fences
mucuna	<i>Phaseolus lunatus</i> L.	gardens, yards
nim	<i>Azadirachta indica</i> A. Juss.	farms
níspero	<i>Achras sapota</i> L.	farms
ojo de vena(d)	<i>Mucuna mutisiana</i> (Kunth) DC.	riverbanks
olivo	<i>Sapium aucuparium</i> Jacq.	farms
pa' lavarse	<i>Luffa aegyptiaca</i> Mill.	riverbanks
palma real	<i>Attalea butyraceae</i> Bonder.	riverbanks, swiddens
papelillo	<i>Miconia argentea</i> (Sw.) DC	fallows

TABLE 4. CONTINUED

Local name	Scientific name	Village space
palo santo	<i>Erythrina fusca</i> Lour.	fences
pasto mejorado	<i>Isachne polygonoides</i> (Lam.) Doell.	pastures
pegle	<i>Vochysia ferruginea</i> Matt. & Zucc.	fallows, farms, pastures
pintamozo	<i>Vismia macrophylla</i> Kunth.	fallows
pita	<i>Aechmea magdaleneae</i> (André) André ex Baker	riverbanks
roble	<i>Tabebuia rosea</i> (Bertol.) DC.	fallows, farms, wild areas
sigua	<i>Nectandra globosa</i> (Aubl.) Mez.	farms
sangrillo	<i>Croton panamensis</i> (Klotsch.) Müll.	farms
teca	<i>Tectona grandis</i> L.f.; <i>Erythrina fusca</i> Lour.	farms, yards
tortugo	<i>Anemopaegma orbiculatum</i> (Jacq.) D.C.	riverbanks
verotillo	<i>Ischnosiphon pruinosis</i> Petersen	yards
yuco	<i>Pachira sessilis</i> Benth.	fallows, farms, wild areas

wilder vegetation at the riverbank. Food plants such as *ají*, *batata*, and *yucca* are grown in yards. Food producing plants such as *aguacate*, *caimito*, *frijol*, *fruta china*, *guabo*, *guandú*, *guayabito*, *guayabo/a*, *limón*, *limón criollo*, *mamey*, *maracuyá*, *marañón*, *membrillo*, *ñajú*, *naranjillo*, *papaya*, *pifa*, *pomarosa*, and *saril* are all planted and cared for in the yard and garden areas. *Naranjo/a* trees, *cacao*, and *mango* are grown in the yard. *Nance* trees are highly valued for aromatic firewood and edible green fruit. People actively replant stakes of *nance* and *marañón* trees. Children pick the fruit as they like to climb trees. Composition in the yard for food plants has changed since *antes*. Villagers note that *hoy día*, *yucca* has replaced other root crops. The elders note that *hoy día* there are many more varieties of *mango* than *antes*. New citrus varieties, including grafted grapefruits, have been introduced into yards in recent years.

The village lies along a small river; each family uses one specific area of river. The plants women use in the morning to complete their riverside tasks of washing laundry, dishes, and themselves have changed. Women of the older generation remember *antes* rubbing the fruit of *jaboncillo* on clothes to create suds, and using the dried fruit of *pa'lavarse* to wash themselves. Children *antes* played with the fruit of *tortugo*. *Cacao de monte* is seldom found at the river today, but people of the older generations remember eating the fruit often. *Hoy día*, women wash clothes in the river with bars of commercial laundry soap. Recent encourage-

ment by Peace Corps volunteers has caused a resurgence of interest in *pa'lavarse* plants. Baths in the river or in a small shelter near the house are taken by dumping water over oneself with a large bowl made from the *calabasa* fruit. Most women use *chumico suave* or *chumico grueso* leaves as inexpensive alternatives to metal scrubbing pads to scrub metal cooking cauldrons. *Hoy día*, children play with plastic toys donated by churches and agencies. After washing at the river, women return to the house, hang the laundry on shrubs to dry, and begin preparing food.

The plants women use to prepare and present food have changed. The elder women remember many cooking utensils made from plant materials; nowadays, members of the younger generation are gradually replacing such with non-plant materials. *Antes*, food and supplies were carried in large *bijao* leaves; today plastic bags are used. *Antes*, the spine-covered stilt roots of *jira* served to grate. *Antes*, people remember wooden plates and the gourd-like cauliflory *calabasa* fruit was sawed in half, hollowed, carved with designs, and dried overnight for use as bowls. Three varieties of *calabasa* trees are classified and named by the household use of the fruit: bowls, serving spoons, and spoons. The elders remember a vine with gourds was used for utensils; the vine can no longer be found in the village because people no longer have the seeds. In contrast, *hoy día*, cooks use a nail-perforated sardine can (in imitation of the palm stilt roots) to grate *coco* or *yucca*. Food wrapped in fresh *maíz* husks, *bijao*

leaves, *guineo* leaves, *trupa* leaflets, or *palma real* leaflets are boiled in a cauldron of water over an open fire. During harvests, women accompany men to the swiddens and cook under makeshift *palma real* roofs. *Hoy día*, plastic bowls and plates are used instead of *calabasa* bowls with increasing frequency; villagers no longer plant or take care of *calabasa* trees in yards and gardens. *Hoy día*, women prepare *arroz* seeds for consumption much as their elders remember. After beating the seeds separate from stalks, the seeds are left in the sun to dry. The dry seeds are dehusked in a tall mortar and beaten with vertical poundings of a wooden pestle. The thudding sound echoes across the village every morning. After pounding, the rice and husks are placed into a *batea*, which is a low oval wood bowl, for winnowing. *Achiote*, *ají*, and *culantro* are used as condiments.

In the afternoons, women make clothing and hats. *Antes*, clothes were manufactured from the cambium of *cucua rojo*; and *indio* and *ojo de vena(d)o* were used to dye cloth. *Hoy día*, peasants wear secondhand North American clothing. Some women in the village sew clothing on hand-operated sewing machines. Women and men collect unfurled *bellota* leaves along the riverbank and it is the work of women to prepare the fiber to make hats. The soft inner part of the unfolded leaves is separated from the hard green outer edges with a sewing needle. These inner leaves are tied into oval bundles, and boiled with *limón* for whitening. Some leaves are dyed and boiled black with black earth or *chisna* vine or *ojo de vena(d)o* seeds. The fibers are braided and delicately sewn together starting from the center top of the hat, and moving to the brims. For peasant men older than their mid-thirties, a well-made hat may be their most expensive possession, a status symbol, and a mark of regional identity. A more affordable alternative to the hats made from *bellota* are those woven from coarser fibers and worn for work in the fields. Peasant men and women sell both types of hats in the regional capital. As money can be earned by selling the finer hats, plants with coarser fibers are no longer selected for nor found in the village.

After a day of work, peasants sleep on raised platforms above a dirt floor. *Antes*, people slept on a mat made of dried leaves from the leaf stalk of *guineo* bound together with *cortezo* rope. Some families have found synthetic foam

mattresses problematic because of mold from high humidity and have returned to making *guineo* leaf mattresses. With growing popularity in a return to more affordable plant products, young women stuff pillows for their families with *lana* fibers.

## MEN'S WORK

After looking for and harvesting firewood (*acacia*, *guamo*, *laurel*, *malagueto*, *mangle*, *nance*, *papelillo*, *pintamozo*) each dawn, men leave for the spaces of forests, farms, swiddens, and fallows. They may carry a lunch wrapped in *guineo* leaves. Many days, men work in groups with other men from the village, in a reciprocal work system (*junta*). Heavy work is usually accompanied with drinks such as fermented *maíz*, *palma real* wine, or fermented *caña de azúcar*. In a *junta* group, men may clear a swidden, harvest rice, or build a house.

Agricultural clearing and planting in the swiddens has changed little since *antes*. In swiddens, men clear the area for subsequent planting, selecting useful plants like *chumico grueso*, *chumico suave*, *cortezo*, *espave*, *macano*, *ñame cimarrón*, and *palma real*. Crops planted in swiddens include the staple *arroz* as well as some *maíz* and *yucca*. *Maíz* yields are low because of humid soils and fungi. Men find and eat *coquito*, *garapata*, and *titi* berries during the day. After clearing an area, men may have hands stained yellow from clearing *pintamozo*, a plant used *antes* as a dye. After two years of farming swiddens, men abandon the area, and succession takes over. *Alcabú* trees are selected and harvested from fallows and the riverbank; the spiny trunks are fashioned into a large cross placed in yards on the Day of the Cross (in May), understood to provide year-round protection from witches. *Guarumo* harvested from fallows provide medicine for the circulatory system. More manufactured metal tools are used in addition to the wooden tools used *antes*. Because of a drought during which people eat stored seed tubers, there is less *yucca* growing in swiddens and gardens than in previous years.

Fences dividing farms and pastures are grown from living tree stakes of *almácigo*, *balo*, *canalú*, *jobo*, *matarrón*, and *palo santo*. In the farm space, crop species, large medicinal plants, and wood trees are selected and tended. Families harvest medicinal plants, such as *cabima*, *cabresto*, *cedrón*, and *urenia* from the

family farm. *Urenia* is used in medicine for muscle pains. Crushed *cedrón* seeds are applied to insect and snake bites. There are plants that men avoid touching, and therefore clearing, because of associated folklore. For example, men do not clear the *bayano* vine because they are afraid a fly that causes leishmaniasis lives on the vines and they do not want to disturb it. *Antes*, *cabima* provided aromatic incense and medicine to ease women's pain after childbirth. Children *antes* were given a tea of *cabresto* seeds to cure general ailments. Red seeds from the *cabresto* tree adorned infants *antes* to ward off the evil eye. *Hoy día*, infants wear red and black plastic bead bracelets.

Men craft all the wooden implements used in peasant life from the many wood species that are selected for and harvested from the farm. *Antes*, the soft wood of *ceibo* or the trunk of large *higuerón* trees were hollowed into canoes. Today, the road has replaced the river for regional travel, but wood is still harvested for other implements needed for daily life. *Hoy día*, tables and caskets are made from *cedro amargo*. The handles of agricultural tools are carved from *corotú* and *guacimo* wood. *Sigua* is harvested from the farm as a fine wood. The buttress roots are sawed off a living *higuerón* tree, and *batea* trays are hollowed out with a metal tool from this wood. The *higuerón* tree trunk is hollowed out to make large mortars.

Villagers build their own houses. To build a house, men harvest variously sized trees from the forest and farm spaces. For corner posts, trunks of *canalú*, *carbonero*, and *sangrillo* are harvested from the farm. Thin roof beams are made from *maría* wood. To this, a *palma real* frond roof is attached with *cortezo* rope. To harvest *palma real*, men climb up the palm, cutting mature palm fronds with a machete and leaving the younger leaves on the tree. Stalks of *caña brava* or *macano* are stuck into the ground side by side to create a wall underneath the free-standing roof, and onto this the mud and grass adobe mixture (*quincha*) is lumped. Much has changed since *antes* in the plant materials used for house construction. *Hoy día*, peasants have economic resources to buy motorized tools, and houses are built out of wooden planks cut vertically from tree trunks with chainsaws. Chainsaws enable village men to use larger trees for sturdier houses. *Hoy día*, *criollo*, *corotú*, *harino*, *olivo*, *dormilón*, *pegle*, *cabima*, and *pino* trees

are increasingly harvested for the planks of thicker-walled houses. *Ocotea sp.* is remembered without a name and is no longer harvested *hoy día* as timber for house construction. Zinc metal or *palma real* roofs are nailed to *alcarreto* beams. Older generation men complain that *palma real* thatch used *hoy día* is not as watertight or durable as the *chunga* or *conga* thatch used *antes*.

Men's work includes building houses and making furniture; young men have expanded connotations of masculine work by applying their knowledge of timber to new economic opportunities. People of the older generation remember timbering days when giant trees were floated downriver as rafts. *Antes*, men sold rubber. The elder men remember cutting diagonal lines into the bark of *nispero* and *caucho*. This rubber sap was then mixed with crushed *batata* vine, heated and formed into a ball. Another product sold *antes* was charcoal made from *nance* wood. *Hoy día*, young men sell timber for use in construction in the regional capital. Timber is transported on the road in a construction company's four-wheel-drive pick-up truck. When asked about timber trees, younger men recognize and know names of timber trees that men of the older generation are not familiar with. Such timber trees include *maría*, *yuco*, *laurel*, *roble*, and *cedro amargo*. These trees are selectively cut by hand from fallows, farms, and the forest. Young men enter the forest and extract specific timber. Forest management decisions are based on the economic needs of men's families. Young men are finding economic gain in reforesting native trees, such as *yuco*, on their farms. Introduced timber species *cedro espino* and *leucaina* are planted as seedlings.

*Hoy día*, men are eager to incorporate new plant knowledge. Village men attend workshops with visiting representatives of various development agencies with agendas as diverse as improving nutrition, promoting organic agriculture, and increasing yields with agrochemicals. All of these interventions are called *proyectos* by the villagers. Men have learned to plant higher-yielding aquatic rice in flat rectangular flooded areas bordered by a short wall made of mud and clay. *Hoy día*, agricultural development agencies encourage the planting of economic plants such as *piña*, *coco*, *papaya*, *café*, grafted *naranja*, *noni*, and *limón chino*. En-



couraged to raise cattle, villagers grow *pasto mejorado* and a purple variety of *caña de azúcar* as cattle feed. Environmental protection agencies distribute *leucaína*, *teca*, and *nim* tree seedlings. Lectures and discussion groups have taught villagers to plant green fertilizers such as native *balo* and introduced *mucuna*. Peasants have developed medicinal uses for plants, such as *noni*, that have been introduced by agricultural agencies. A newspaper article taught some peasants about medicinal uses for berries of *coquito*. *Guabo* and *corotú* trees are encouraged as shade cover for coffee. Although organized by outside agencies into a kibbutz-like development group, individual men prefer to plant these on their own land, in yards, farms, or swiddens. Not all plants are incorporated; higher-yielding varieties of *maíz* were rejected because stored cobs were more prone to fungi. Although agricultural agencies have encouraged the growth of *café* in rows in cleared fields, peasants prefer growing shade varieties in the understory of large trees. Choosing whether to incorporate new plants and knowledge is up to each individual.

On particularly hot days, families spend the day fishing with the men at the river. The elder men remember using the pounded root corm of *cabeza de negro* liana as a poison to stun fish in the river. *Antes*, fishing lines were made from *pita* fibers. *Hoy día*, people claim a denser population as reasons why fish poisons are no longer used. *Hoy día*, families walk up the river chasing the fish into a plastic net. Young boys know how to use a spear, a woven fish trap, and a plastic net to catch fish. Fishing spears are made from old machetes, wood, rubber, and metal rods. River crayfish are caught with bare hands. Villagers today eat less river fish; ocean fish are bought from vendors who enter the village in trucks and on foot.

On a rest day, a man will stay close to the house, tending fruit trees or manufacturing household items. *Antes*, on a rest day, a man might have woven a hammock out of *cortezo*, but today longer-lasting synthetic fibers are preferred. Some elderly men remember women *antes* making fiber from *pita* and rope from *malagueto*. *Hoy día*, men make rope from *cortezo* stems and bark soaked in the river. Brooms are made from *palma real* leaves tied onto the bottom of a wooden handle. *Antes*, other species of palms like *escoba* were used to make

brooms. As in the remembered past, knowledge of basketry and other skills are known by only a few specialists.

### SPECIALISTS' WORK

Within the village, individuals have specific bodies of plant knowledge. One man knows about timber used in house construction. His wife knows many medicinal plants. Villagers recognize this special plant knowledge of individuals. When seeking a certain household item, people go to a specific person and pay them a small money fee for the work. For family and godparent (*compadrazgo*) relations, the artisan may give the finished product free of charge, knowing a favor will be reciprocated. A healer (*curandero*) is the only profession with a specific name. However, basketry specialists, sugar producers, musicians, and healers have specific bodies of plant knowledge.

Three men in the village specialize in basketry. Their house yards and farms reflect their identity, as they tend the plants used in basketry. Basketry specialists use *bejuco colorao*, *bejuco real*, sliced *marica*, and *verotillo* vines to fashion three types of baskets, strainers, and a woven fish trap.

Sugar cane presses are made of *guayacán* wood. *Antes*, grease for the sugar cane press wheels was mixed from animal grease and the ash of a burned *cortezo* wood. *Hoy día*, some households use a handmade wooden sugar cane press, but use machine oil to grease the parts. Only those who own a sugar cane press plant *caña de azúcar* in their garden. *Caña de azúcar* stalks are ground into sweet products, such as hard brown sugar and molasses.

Musicians in the village manufacture instruments. Drums are made from *espave* wood. An oval dried *calabasa* fruit is rhythmically rasped with a piece of metal. *Antes*, people played *calabasa* maracas, but these are no longer used. *Hoy día*, battery-operated radios play international music such as *reggae*, *merengue*, *ballinata*, and *salsa*. Villagers listen to both radio music and village musicians.

Healing is a specialty learned through apprenticeship. The elders remember bonesetters *antes* using the sap of *cerillo* to make casts. *Hoy día*, the village has three male healers (*curanderos*), and people are loyal to their particular healer. Healers cure with incantations and prescriptions combining medicinal plants, ani-

mal products, and pharmaceutical remedies. Medicines and medicinal plants may be mixed with animal fats to be administered as a cream. Villagers believe *coca* bark tea induces abortions. *Hombre grande* treats people who claim to suffer from high blood pressure. Healers harvest *caña agria* from riverbanks to treat kidney problems. The wife of the healer goes along on house visits; she knows the cures and may cure patients herself. Healers conserve plant resources differently than other villagers; these three men own large tracts of undisturbed forest for conserving their medicinal plants.

The entire village plants *palma de indio* on graves at the village cemetery.

### DISCUSSION

This article describes plant knowledge and use in one village in Panama. By respecting villagers' understandings of time, space within the village, and plant conservation, the context within which people use plant knowledge can be understood. Humans make sense of the world on the ground differently than the models humans such as scientists use to organize knowledge (Geertz 1973:93–94). In ethnobotanical studies and related articles, plant knowledge in rural populations are extracted from social contexts and depicted as consolidated wholes called *bodies of knowledge* or *traditional ethnobiological knowledge (TEK)* by authors such as Balée (2000), Schemo (1999), and Ventocillo et al. (1995). Plant knowledge of an entire village or group of people is united and presented as a whole *body*. Ethnobotanists recognize the validity of local plant knowledge (Conklin 1961), and study local flora and details of categorization (Berlin et al. 1974). Underlying structures of classification are recognized as either intellectual (Lévi-Strauss 1962), cognitive and reflecting patterns inherent in nature (Berlin et al. 1974), or behavioral and practical *activity contexts* (Hunn 1982, Balée 1994). These perceived wholes are understood to be in danger of being lost, and researchers use a discourse of *death* and *dying* (Case et al. 2005) to refer to these *bodies of knowledge*. A few researchers (Hays 1974, Simsek et al. 2004) critique arbitrary monolithic conceptualizations of plant knowledge; yet they still dichotomize the maintenance and loss of knowledge. These assumptions make us ask the following basic questions.

- Which gender and generation are represented in depictions of *bodies* of plant knowledge?
- Who determines the boundary of a human group allegedly sharing such knowledge?
- What happens after the *death* of a *body of knowledge*?

Paradigms of *bodies of knowledge* not only locate rural people outside of the changes of history, but also lump a diverse group of people into one bounded unit. Plant knowledge in rural Coclé differs for members of the village community. This paper uses concepts of heteroglossia (Clifford 1988:46–50) to depict the diversity in knowledge by gender, generation, and specialization. As daily work differs for men and women, each gender has knowledge specific to the cultural village spaces wherein they spend their days. Rural peasant women rarely receive formal education, often are responsible for children, and work in the role of *alma de casa*, or housewife, which requires staying close to the house, yard, and river areas in order to care for children and cook meals. Men leave the house area daily to work in agricultural spaces such as swiddens and fallows. These social roles are reflected in the plants women and men know. For example, the elder women remember *jaboncillo* used for washing and the elder men remember harvesting *caucho* from farms and wild areas *antes*. Specialists collect plants in wild areas and plant them in guarded areas such as a yard or a healer's preserve. Healers' preserves are untouched by other activities, including wood harvesting. In this village, women who sometimes share the work of healing as the wives of male healers have extensive experience in healing with medicinal plants, which is similar to other studies that mention the wives of healers (Schultze and Raffauf 2004, Kane 1995:193). Thus, knowledge is situated in the activities important to a villager of a specific age, gender, and informal occupation. This article describes at one time the plant knowledges of men and women as representatives of the younger and older generations as well as the specialists. This heteroglossic approach depicts interacting individuals instead of a bounded group of unchanging, carbon-copy humans.

The study of internal variations within a culture allows researchers to document and understand change as it occurs in a social context and through the practices of necessity, knowledge

transmission, and communication (Barth 1987:85). Within Panama, human groups use plant resources differently in each region (Carmargo 1984:128); specific information from a specific locale such as that collected by a cultural anthropologist can inform how researchers categorize plant knowledge. Anthropologists generally define culture as the knowledge individuals share in their long-term memory. They debate whether these memories have an unchanging underlying structure, which suggests that humans store new information under pre-conceived categories (Bartlett 1932); or whether memories are negotiated and created in formal and informal social interactions (Halbwachs 1950). Thus, social scientists distinguish *semantic memory*, decontextualized knowledge, and *episodic memory*, which is of the experiences remembered by an individual or group. In the village of La Martillada, plant knowledge is classified under the episodic categories of *antes* and *hoy día*, and by categories of spaces or microhabitats, as each villager uses plants in specific contextual experiences. People often make sense of historical changes through dichotomous categories (Comaroff and Comaroff 1992) in the cognitive function of memory. The dichotomy *antes* and *hoy día* describes great changes and a generational difference.

There is constant change in the way villagers use and know plants. Permanent changes occur as adobe and wood houses fall into disuse. Cyclical changes occur as swiddens succeed into fallows. From year to year, people in the village actively make choices regarding plant use, such as the one family that recently built a sugar cane press and began to grow a garden plot of *caña de azúcar*. Life in the village has changed through the construction of a dirt road and a gravity water system, and through more exchange with the regional capital. Rural people exercise choice as they creatively negotiate specific changing times. Because of the road, the village is experiencing an increase in ties to the regional capital, similar to other areas of rural Panama (Gudeman 1976:25). Being tied to highway networks has increased movement in and out of the village. When a family needs money, the elder women may make a hat and the men travel to the provincial capital and sell handmade hats to tourists. Coclé hats are manufactured in a similar way to earlier descriptions from the greater area (de Leon

1904:494, Rivet 1991). The skills to make hats are applied to another context. Unlike other rural Panamanian populations (Kane 1994:137, Little 2003:50), men sell plant products in the regional capital. Young men have reinterpreted masculinity by applying knowledge of timber to entrepreneurial activities in the money economy. Easier transportation and the possibilities for earning money have made knowledge of marketable plants more important in the younger generations. In the interviews, the elder men repeatedly admitted not being familiar with timber species discussed by the younger men. The raw materials demanded by the regional economy have changed; the elder men remember selling rubber whereas younger men sell timber. The road has brought many more manufactured goods, replacing items previously made of plant materials. Younger peasants prefer baseball caps, identifying themselves as more urban and modern than their fathers, who wear handmade plant fiber hats. Clothing has changed dramatically, as low-priced T-shirts and pants arrive from second-hand U.S. organizations and Asian manufacturers. Young villagers prefer urban clothing as a testament to their modernity. Metal tools have replaced wooden agricultural tools. Access to batteries and radios has made popular music more accessible; the modernity associated with popular music has caused a decrease in drum and maraca making. The road has brought more access to knowledge, such as the plant seedlings and advice brought by agricultural agencies *hoy día* with the aim of improving yields for subsistence agriculturalists. As villagers often comment, the educated agricultural agents would only feel comfortable visiting villages with road access. Although the staple crops and swidden agriculture have not changed, the men incorporate what they have learned from agricultural agencies, such as aquatic rice tanks, grafted fruit trees, and cattle ranching, when they are convinced these choices will improve their family's diet and their ability to provide for their family. Peace Corps volunteers living in the village have encouraged cultural revitalization of plants such as *lana* and *pa'lavarse*. The road brings increased knowledge and increased economic opportunities into the village.

Although they have increased access to manufactured goods, villagers still make use of

their plant knowledge and skills as caretakers of plants. In fact, because of the economic realities of extreme poverty, villagers are forced to continue to depend on the natural environment for their food and daily tasks. Plant knowledge and use are reserve skills that do not die out, but have practical applications within *hoy día* times. This suggests a model of selective survival of plant knowledge, as some plant uses are remembered but no longer practiced, and new uses are learned. Young women who are faced with the realities of poverty eagerly learn about and grow new medicinal plants in addition to the plants their mothers have shown them. A peasant family may earn less than U.S. \$150 a month; pharmaceutical medicine prescribed at the hospital in the regional capital often costs more than \$60. Women's and healers' knowledge of medicinal plants continue to be important. Villagers prefer plants to commercial products in some instances. Women find that plant products, such as the materials used for bedding, are more affordable and adaptable to the local tropical climate than comparable manufactured goods. This article emphasizes the survival and adaptation of plant knowledge and use skills, making a case for subsistence farmers as stewards of the natural environment. Other authors (Etkin 2002) discuss the cultural misunderstandings between plant conservationists and local people who often depend on the natural environment for survival. Ethnographic models reprimanding local peoples for *losing* knowledge do not take into account people who are adjusting to economic, political, and practical realities. Cultural change is important for innovation, invention, and adaptation to occur in each generation (Freilich 1991:33, Lévi-Strauss [1962]). Faced with economic hardship in what government reports consistently characterize as an *area of extreme poverty*, villagers use elaborate strategies that allow the continuation of the social security of daily life in a community and the earning of money by the harvesting of plant products.

Interchanges between rural life and manufactured goods are multifaceted. For example, the stilt roots of the *jira* palm are no longer used as graters, yet the same function of a coconut grater is needed for the village cuisine. Aluminum cans are refigured into graters resembling the palm root graters and called by the same name. In another example, the red *cabresto*

seeds tied to infants' wrists are replaced with plastic beads to fulfill the same cultural function of protecting babies from the evil eye. In continual human-environment interactions, people are changed by new activities. Although men continue to grow the same staple crops, new food plants brought by agricultural agencies have diversified the diet of villagers. Understanding the interface between people and the environment requires observing complex interactions of human minds, culture, plant knowledge, practice, and choice.

Studying specific local management decisions about the natural environment could improve our understanding of plant conservation. In a study of two villages in the eastern Republic of Panama, Dalle and Potvin (2004) found differences in plant use and frequency of harvest due to sociocultural reasons; the authors encouraged further studies of local decision-making regarding plants. Other authors describe how humans have altered environments by plant selection (Alcorn 1990, Denevan 2001, Heckadon-Moreno 1983, Kirke 1980, Peters 1983, 2000). Human-environment interactions have been occurring in this geographical area for a long time. The northern Coclé landscape has been inhabited and farmed by humans long before Spanish conquest (Linares 1979:32, Lothrop 1946:145). Panamanian forests have more microhabitats (Condit et al. 2002); human groups survive by utilizing resources from the different microhabitats (Anderson 1996:75, Heider 2004:188). In this article, the culturally recognized spaces correspond to different microhabitats, with different types of soil, sun exposure, and flora. Selection for economic and useful plants by peasants may affect the ecological diversity in and around the village. There are fewer large trees and forested areas around the village in recent decades (ANAM and Cuerpo de Paz 1982). Plants requiring forest habitats, like *chunga* or *conga*, can only be found in some areas, such as the forests between swiddens. Most roofs *hoy día* are made from *palma real*, which is plentiful in the village because of its resistance to the swidden clearing fires and adaptability to less forested areas. Scarcity of some species, such as *jaboncillo*, may be due to a combination of villagers no longer selecting for the plant and the plant's unique reproduction. Plants that recently have fallen out of use, such as *calabasa* and *jira*, can

still be found in isolated stands. Elders remember species that are no longer found in the village area, but this has not decreased plant knowledge; it is simply a change. Human activities foster the preservation of other species. This paper describes how and why villagers choose to conserve or eradicate certain species. For example, because of folklore, each yard has *sábila* and the river is lined with *alcabú* plants. Men do not cut down *bayano* when clearing a swidden. Yard plants are brought close to houses as they are understood to need the warmth (*calor*) of people and, as an extension of the owner's self, reflect the owner's health, an aspect that is similar to other rural Panamanian populations (Gudeman 1976: 87). A young man interested in gaining money for timber clears his swiddens in areas with few valued timber trees. Each family preserves timber trees on their farm as a resource for the future, and fell them when needed for construction or for generating income. By way of the choices the villagers have made, it is most likely that the economic changes and the road have altered the plant composition of microhabitats. Plant conservation can be understood by studying *ethnoecological factors* (Conklin 1961). The importance of cultural factors in understanding human-environment interactions cannot be underestimated.

### CONCLUSION

Describing the processes of change in plant knowledge, use, and conservation requires specific ethnographic detail. Northern Coclé peasants utilize microhabitats for the plants related to their subsistence and culture. This article describes the plant knowledge specific to each gender, generation, and specialty in a heteroglossic approach. Women and men relate to the environment in different roles, as they move about the village microhabitats during their daily work. This paper also describes both plant uses and emic, or local, cognitive categories of plants. Villagers use the dichotomy of *antes* (before) and *hoy día* (nowadays) to reflect their contextual experiences of historical change and the changes between generations. Differences in plant knowledge between *antes* and *hoy día* are more complex than simply loss. Village youths choose which plant knowledge they will retain and which new knowledge they will incorporate for their survival in rural poverty, suggesting a

model of selective survival of plant knowledge. Ethnoecological factors described in this article include villagers' choices, detailed local names, emic understandings of time or history, and the local use of space or microhabitats.

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