

Plants Used for Reproductive Health by Nahua Women in Northern Veracruz, Mexico¹

VANIA SMITH-OKA

Department of Anthropology, University of Notre Dame, Notre Dame, Indiana, USA;
e-mail: vsmithok@nd.edu

Plants Used for Reproductive Health by Nahua Women in Northern Veracruz, Mexico. This paper reports the use of medicinal plants by Nahua women in the state of Veracruz, Mexico. It documents the women's plant knowledge for reproductive purposes, which includes uses such as conception, pregnancy, birth, contraception, menstruation, post-partum, and general reproductive health. The concept of equilibrium is very important in regaining health among the Nahua; consequently, many of the medicinal plants have this as their primary purpose. The introduction of biomedical clinics and hospitals in the region has had a significant effect on the loss of knowledge about medicinal plants. Additionally, the midwives are not taking any new apprentices and laywomen are not passing on their knowledge to future generations. This generational gap contributes to the loss of knowledge about medicinal plants. This research contributes to the study of indigenous ethnobotany by (a) creating a record of the plant knowledge possessed by indigenous women, (b) giving voice to some of their health concerns, (c) indicating how the introduction of biomedicine has affected their plant use, and (d) providing a framework for understanding how marginal peoples around the world respond to the impact that globalization and change has on their health needs and local ethnobotanical knowledge.

Key Words: Ethnobotany, indigenous women, reproduction, plant knowledge, Nahua, Mexico.

Introduction

The introduction of biomedicine into rural and indigenous regions has affected women's knowledge about reproduction, particularly causing the increased transition from a reliance on medicinal plants and traditional healing to the use of biomedical techniques and treatments. In the process there has been a loss of usage, and knowledge, about medicinal plants. This article examines the plants used for reproductive purposes by the women and midwives of the Nahua village of Amatlán (a pseudonym, as agreed with the villagers), in northern Veracruz, Mexico, and the effects that biomedicine has had on knowledge of these plants. This research on reproductive plants is part of a larger research project aiming to understand how indigenous women have responded to social, political, and economic

changes over the past decade, especially regarding their knowledge about and access to health.

Although there has been a significant amount of research about the ethnobotanical knowledge of different ethnic groups in Mexico (Alcorn 2000; Frei et al. 1998; Leonti et al. 2002; Weimann and Heinrich 1997), there has been less research done regarding the plant knowledge possessed by indigenous women (Browner 1985; Rodríguez López et al. 1998; Vázquez-García 2008). Additionally, there are few studies that examine the effect of globalization and change on indigenous women's knowledge (Vázquez-García 2008; see Michel et al. 2006 for information on Q'eqchi Maya in Guatemala). This article will contribute to this discussion.

As is true in other parts of the world (Leslie 1998; Michel et al. 2006), health in this region of Mexico is often associated with equilibrium. The hot/cold duality is central to the idea of equilibrium in Mesoamerica; it refers to the humoral qualities of plants, people, illnesses, etc. When a

¹ Received 29 April 2008; accepted 1 July 2008; published online 24 July 2008.

person loses equilibrium (by an imbalance in hot/cold, by not following certain cultural norms, etc.) the body becomes weak and ill. Women—who are believed to be “weaker” than men—are more susceptible to a loss of equilibrium; this is especially the case during vulnerable situations: pregnancy, menstruation, birth, etc. (Castañeda et al. 1996).

The concept of “weakness” is very present in this region. Women are perceived to be more delicate than men, so they can be more easily hurt. Some women are weaker than others. As one midwife stated, “They are delicate, their body is soft, and that is why they [fall ill]. Others are tougher... they have more energy, their body is solid.” This concept of weakness is especially visible in the Andes, where it is a biocultural phenomenon reflective of the individual’s relationship with society, combined with the interaction of stressful life experiences (Oths 1999). In this region of Mexico, the stresses of reproduction are counteracted with plants that help women regain strength and overcome illness.

The complicated effects of the introduction of medical changes to rural and indigenous regions are beyond doubt. The compounded effects of such changes on marginalized people have been especially evident with regard to indigenous women’s health and reproduction. With the introduction of biomedicine, there is frequently a shift in knowledge about traditional medicine. This shift can simply mean a movement toward a pluralistic medical system that incorporates both traditional and biomedicine, or it can involve a loss of knowledge about traditional medicine, its practitioners, and medicinal plants. The latter is the case for the region under study, where the introduction of biomedicine, Pentecostal religions, and economic development has been linked to a diminishment of the population’s knowledge about medicinal plants. Biomedicine and development have been introduced in a linked fashion, both of which encourage the use of Western medicine over medicinal plants. The Pentecostal beliefs that have become prominent in this region emphasize faith healing and the use of medicinal plants that are not associated with Catholicism or “sorcery.” The list of “harmless” plants is quite short.

Though a large percentage of traditional medical practitioners in this region have seen a diminution of their role as healers, midwives have

been especially affected by the introduction of biomedicine (Smith 2006). The reason behind this is that women are increasingly receiving reproductive care in clinics and hospitals rather than from midwives. Through this change there has been a rapid loss of the use of medicinal plants for reproductive purposes (even though knowledge regarding them has remained within the specialist and lay population).

This study documents the use of medicinal plants for reproductive purposes in light of the introduction of biomedicine to this region. Specifically, my purposes include the following: (1) to document Nahua women’s knowledge of medicinal plants used for reproductive purposes; (2) to assess the continuation of this knowledge within the framework of medical change; and (3) to generate an inventory of the knowledge and plants in a format accessible for the women.

Study Site and Methods

The area of northern Veracruz is a land of contrast. Very wealthy *mestizo* (mixed indigenous and European ancestry) and white landowners coexist with extremely marginalized indigenous populations. Large industrial cities such as Poza Rica are juxtaposed with the rest of the region, which is dotted with small villages and remote hamlets high up in the sierras. The area contains some of the highest rates of illiteracy in the country and a marked lack of services, means of communication, schools, and jobs. The cities, however, are home to people with a high socioeconomic standard of living (Ruvalcaba Mercado 1998). The Nahua are the largest indigenous group in the region and number nationally around 1.5 million people.

As recently as 60 years ago, the tropical rainforest in this region extended almost without interruption from the lowest to the highest altitude. However, the connection between the mountains and the coast is now highly fragmented and degraded, though it is still important ecologically (Paré et al. 1997; Vázquez-García 2008). This fragmentation is primarily due to agricultural activities, which include maize farming, cattle ranching, and citrus growing. Nonetheless, agriculture has taken place for several millennia in this area, as indicated by palynological data as well as archaeological records (Goman and Byrne 1998), which suggest that this has been a domesticated landscape for some time

(Terrell et al. 2003). Additional ecological pressures on the forest landscape are rapid population growth as well as overgrazing and the leaching of the soil.

This study was conducted during three field seasons (2004, 2005, and 2007) in the Nahuatl village of Amatlán, an *ejido* (communal agricultural land) measuring roughly 500 hectares in the municipality of Ixhuatlán de Madero, in northern Veracruz (Fig. 1). This village has approximately 600 people, the majority of whom make their living by *milpa* (maize field) agriculture and very small-scale cattle ranching and orange-farming. The steep hills surrounding the village are now practically denuded of their original forest cover and are used for agricultural purposes.

Amatlán has an altitude of less than 800 meters above sea level and has temperatures ranging from 0°C in January to above 38°C during May and June, the driest time of the year. July to October is the wettest time of year, with temperatures averaging 25°C. Most of the year's rainfall (1,200–2,000mm/year) occurs during these months. Much of the forest vegetation is long gone, though the few remnants of forest are composed of small patches of *Inga paterno* Harms., *Arthrostylidium racemiflorum* Steud., *Swietenia humilis* Zucc., *Cedrela mexicana* M. Roem., *Protium copal* (Schltdl. & Cham.) Engl., *Parmentiera edulis* DC., *Bombax ellipticum* Kunth., *Coursetia* sp., and *Bursera simaruba* (L.) Sarg.

The ethnographic methodology used to address the research question of the continuation of Nahuatl women's knowledge about medicinal plants included participant observation, semi-structured and unstructured interviews, ethnobotanical collection, and *ex situ* interviews using a combination of fresh material and photographs (see Thomas et al. 2007). I spoke with five midwives (all of whom were above the age of 55 and had been practicing most of their adult lives) and 47 laywomen, ranging in age from 18 to 60 (ten of whom were key informants regarding plant use). In these interviews we discussed the medicinal plants used for reproductive purposes; indigenous names, traditional uses, and local taxonomy were documented for each of them. I also spoke with these women about changes in health techniques and knowledge, in particular the changing role of the midwives and traditional healers in light of biomedicine.

The collection of the medicinal plants was carried out in conjunction with the midwives, three of the key informants, and Camila, my field assistant. The midwives were accompanied during their gathering trips to the pastures, *milpas*, riverbanks, and disturbed areas; additionally, plants were collected from people's homegardens in the village. Independent collection was also carried out with the assistance of three of the women, who went to areas where the plants mentioned by healers and laywomen could be found (Fig. 2). It is important to note that homegardens are women's domain and thus a large variety of plants frequently grow there, which women can harvest throughout the year and use for purposes such as food, medicine, ornament, or construction (see also Vázquez-García 2008).

During this research, the Spanish and Nahuatl names for each of the plants were obtained; these were then cross-checked for accuracy. For most plants, the informants provided a local, indigenous classification, but in the case of those for which they had given no information, it was obtained from two of the midwives and one of the key informants. There was a surprising amount of agreement between the informants regarding the names and classification of the plants. The plants collected were scientifically identified by the staff at the National Herbarium of Mexico (MEXU), and the voucher specimens were deposited at MEXU and the Herbario del Instituto de Ecología in Xalapa, Veracruz (IE-XAL).

Results

PLANTS COLLECTED AND THEIR USAGE FOR REPRODUCTION

During this research, 170 plant species used economically by the people were collected; they are spread over 33 families. Of these, 80 plants are used medicinally. The following uses for the medicinal plants were found: gastrointestinal and urinary, respiratory, endocrinal, dermatological, behavioral, ritual, and reproductive. Knowledge about medicinal plants is found in all of the people of the community to some degree, but the people with the greatest knowledge are women (especially those who are married and have children) and healing specialists. A total of 26 species collected are used to treat issues related to reproduction, with purposes (and minor plant overlap) such as contraception (3 spp.), conception (1 spp.), menstruation (5 spp.), pregnancy (1

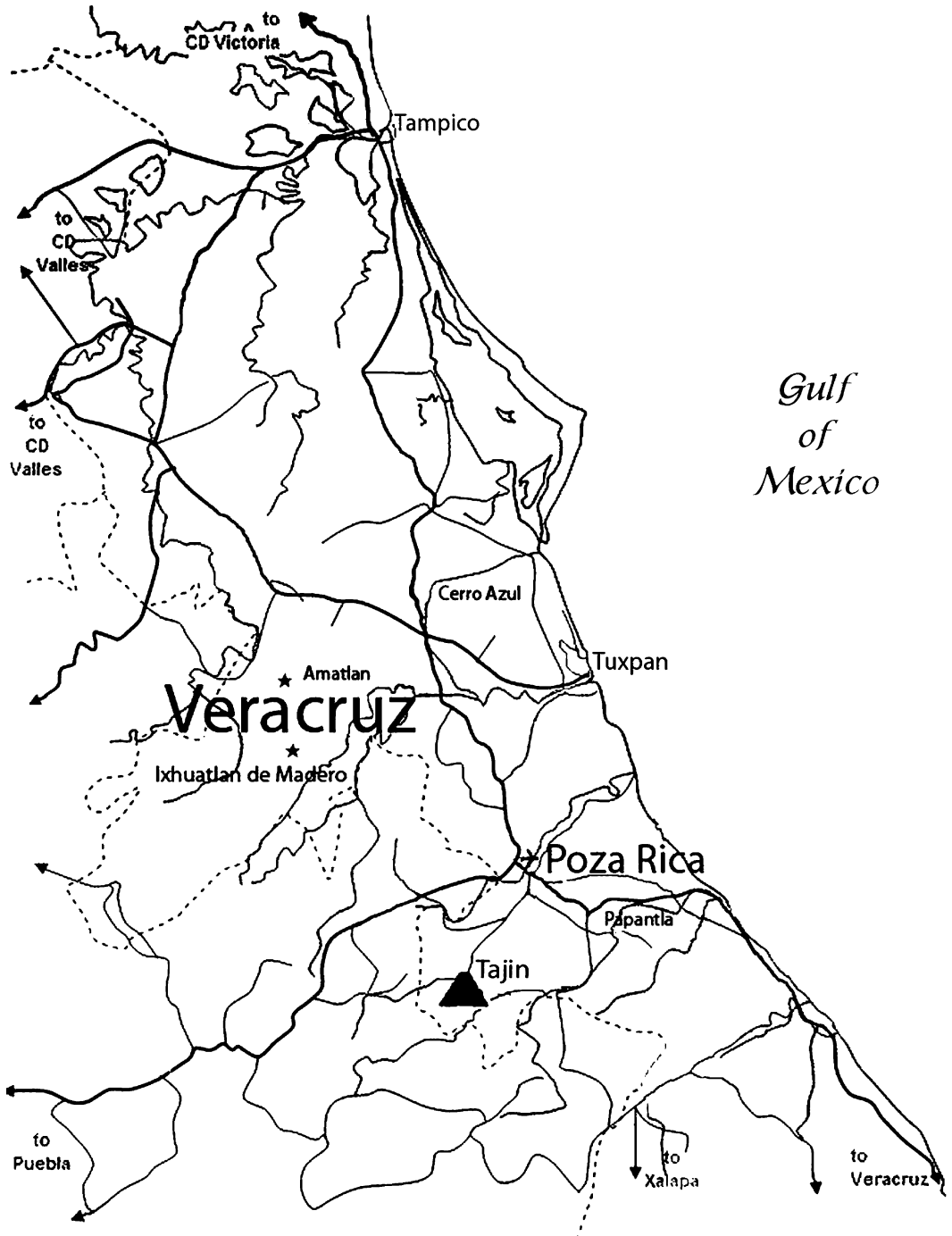


Fig. 1. The location of Amatlán in the municipality of Ixhuatlán de Madero, northern Veracruz.



Fig. 2. María Antonia collecting *Adiantum tenerum* (known as Ecahuile in Nahuatl, and as Brittle Maidenhair Fern in English) along the Pilpuerta stream in northern Veracruz, Mexico.

spp.), birth (2 spp.), and the post-partum period (11 spp.) (Tables 1 and 2). The category of reproductive health (4 spp.) included plants used to maintain uterine health. None of the women discussed plants used for menopause, which could indicate that there is no such illness category among these women (Beyene and Martin 2001).

Table 2 shows the usage of the plants collected during this study. The category with the highest number of plants (containing almost 50% of the plants collected) is for post-partum concerns. Women and their newborns are bathed immediately post-partum with a mixture of seven plants, which accounts for the higher number found in this category.

All of these plants are either domesticated or semidomesticated and are managed by the people (primarily the women) in homegardens, fields, or along streams and roads. Even plants that are found in common areas (river banks, roads, etc.) will frequently be managed by people (sometimes several people over the course of the plant's lifetime) if they are found in areas with heavy foot traffic. Most plants are collected while people walk to and from the fields or other villages, and thus they are managed during these encounters.

CONCEPTION, PREGNANCY, AND CONTRACEPTION

Five plants total were found for conception, pregnancy, and contraception. *Priva lappulaceae* is

used to prevent miscarriages. This plant is covered with white hairs that stick to people's clothes and skin, a property that is perceived to help the fetus "stick" to the uterus and develop properly (see also Rodríguez López et al. 1998). Only one of the midwives used this plant, which she collected from her homegarden; she prepared a tea by boiling the plant along with a piece of leather cut from a man's machete cover. The pregnant woman drinks this to make sure that her pregnancy does not fail. I could not find a reason to the use of the leather in the tea.

Hamelia erecta and *Bombax ellipticum* are used together to bring about full sterility in a woman; they are used by women who no longer want children and want to be "like girls," as one of the midwives said to me. The plants are made into a tea and drunk over several days, while chile, coffee, and other irritants are avoided. *Hamelia erecta* is used for many other purposes—digestive and dermatological—and is considered a very medicinally active plant. *Cydista potosina* is used for the same purpose, though it can be consumed in tea or raw form. All three plants can also be used as abortifacients if a woman is already pregnant.

Only one plant to promote conception was found, *Hybanthus attenuatus*, which was used by Lourdes, a midwife. She mentioned that the flowers resemble sexual organs (there are slight variations, so that some flowers are more female-looking and others more male), which can

TABLE 1. LIST OF PLANTS USED FOR REPRODUCTIVE PURPOSES.

Nahuatl Name	Use	Scientific Name	Family
Ahuacachile	BI	<i>Nectandra</i> sp.	Lauraceae
Ixhuaqué	BI	<i>Heliocarpus glanduliferus</i> B.L. Robinson	Tiliaceae
Xiloxochitl	CN	<i>Bombax ellipticum</i> Kunth.	Bombacaceae
Cajlmecatl	CN	<i>Cydista potosina</i> (K Schum & Loes) Loes	Bignoniaceae
Yerba familia	CO	<i>Hybanthus attenuatus</i> (Humb & Bonpl. ex Schult)	Violaceae
Cuamimisi	ME	<i>Tillandsia recurvata</i> (L.) L.	Bromeliaceae
Aguacate oloroso	ME	<i>Persea americana</i> Miller var. <i>drymifolia</i> (Schldl. & Cham.) S.F. Blake	Lauraceae
Zapote	ME	<i>Achras zapota</i> L.	Sapotaceae
Yahuajcuahuitl	ME/PP	<i>Solanum nudum</i> Kunth ex Dunal	Solanaceae
Cacahuaxochitl	ME/ CN	<i>Hamelia erecta</i> Jacq.	Rubiaceae
Sempoalxochitl	PP	<i>Tagetes erecta</i> L.	Asteraceae
Pitahaya	PP	<i>Hylocereus undatus</i> (Haw) Britton & Rose	Cactaceae
Nopal	PP	<i>Nopalea cochenillifera</i> (L.) Salm-Dyck	Cactaceae
Matlaxcalxihuitl	PP	<i>Tectaria</i> sp.	Dryopteridaceae
Tulipán rojo	PP	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae
Platano rojo	PP	<i>Musa</i> sp.	Musaceae
Carriz	PP	<i>Arundo donax</i> L.	Poaceae
Ecahuile	PP	<i>Adiantum tenerum</i> Sw.	Pteridaceae
Necaxancuamecatl	PP	<i>Solanum wendlandii</i> Hook	Solanaceae
Unknown	PP	<i>Thelypteris tetragona</i> (Sw.) Small.	Thelypteridaceae
Jehuite chicloso	PR	<i>Priva lappulaceae</i> (L.) Pers.	Verbenaceae
Talachía	RH	<i>Ocimum basilicum</i> L.	Lamiaceae
Mala mujer	RH	<i>Mentzelia aspera</i> L.	Loasaceae
Pilicxitl	RH	<i>Pedilanthus thymaloides</i> (L.) Poit.	Euphorbiaceae
Acoyo	RH	<i>Piper umbellatum</i> L.	Piperaceae

Uses: BI=Birth, CN=Contraception, CO=Conception, ME=Menstrual, PP=Post-partum, PR=Pregnancy, RH=Reproductive health.

determine the sex of the infant to be conceived. Such plant selection criteria are common in other societies as well (Leonti et al. 2002). This doctrine of signatures of the plant's morphology is most likely a mnemonic device (Bennett 2007) used by Lourdes once she had established the plant's effectiveness through other means.

Castañeda, García, and Langer 1996 for opposing views). Additional care must be taken, including dietary proscriptions such as avoiding chile and coffee, which, because they are irritating and humorally hot, can cause greater flow (Etkin 1996).

MENSTRUATION

As shown in Table 1, there are five plants (*Tillandsia recurvata*, *Hamelia erecta*, *Achras zapota*, *Solanum nudum*, and *Persea americana*) used for menstruation concerns, which are chiefly used to treat problems related to heavy blood flow; in this culture, heavy menstruation is believed to weaken a woman. These plants are prepared as infusions, which the woman drinks to "cut the hemorrhage," as several of the women said to me. These plants are classified as "cool" plants that are needed to counteract the heavy bleeding because blood is humorally hot (see

TABLE 2. USE CATEGORIES FOR REPRODUCTIVE HEALTH WITH THE ASSOCIATED NUMBER OF PLANTS (THE TOTAL ADDS UP TO MORE THAN 100% BECAUSE OF PLANT OVERLAP).

Use	Number of Species	Percentage
Post-Partum	11	42.3
Menstrual	5	19.2
Reproductive Health	4	15.4
Contraception	3	11.5
Birth	2	7.7
Conception	1	3.8
Pregnancy	1	3.8

These plants can either be used individually or combined in some way. Each woman or midwife has her own particular preferences for these plants and will collect them and use them accordingly. The parts used include the leaves (*Hamelia erecta*), bark (*Achras zapota*), or root (*Solanum nudum*).

BIRTH

The role of midwives has been especially reduced in the birth process. More than 90% of the women who had given birth in the last five years had done so at a clinic. Traditionally *Nectandra sp.* and *Heliocarpus glanduliferus* were the two plants used during birth. Both of them were used to speed up birth. One way to do so was to make the birth canal “slippery”; this was achieved by consuming *Heliocarpus glanduliferus*, which, when crushed in water, produces a slimy mixture, believed to help the fetus slide out easily. *Nectandra sp.* was also mixed with a bit of cooking oil and given to a woman in the last stages of labor. This mixture served a dual purpose: the oil made the birth canal slippery, and the plant gave the woman renewed strength to handle the final contractions of labor. One of the midwives said to me, “When a woman is giving birth, she drinks one or two glasses of water [with this plant] so she warms up.” It is believed that by warming the body, the woman gains strength and can give birth faster (see Rodríguez López et al. 1998).

REPRODUCTIVE HEALTH: UTERINE DISPLACEMENT

A condition prevalent in many parts of Latin America is organ displacement (Berlin et al. 1993; Castañeda et al. 1996), which among the women of Amatlán takes the form of fallen uterus: *baja de matriz* (*isihuayo* in Nahuatl—literally: female part). Fallen uterus is somewhat similar to the biomedical condition of prolapsed uterus. In biomedicine it is caused when the ligaments holding up the uterus weaken and stretch, allowing the uterus to fall down and hang into the vaginal canal. The women of Amatlán experience slightly different causations, which includes carrying heavy loads, falling down, washing clothes in cold water on a hot day, lack of social support, and weakness. As one of the women said to me, “I lack strength; I lack vitamins... With so much work one gets tired. I need medicine, a treatment.” It is a relatively

common complaint; over 20% of the women of reproductive age in Amatlán have suffered from this condition (some more than once). About 90% of those afflicted are above the age of 45 and have, on average, five children. Knowledge about its causes and treatments is well known among women.

Four plants are used to rectify the disequilibrium that comes about from this condition: *Mentzelia aspera*, *Ocimum basilicum*, *Piper umbellatum*, and *Pedilanthus thymaloides*. The first plant is made into a tea and drunk for as long as needed. This plant has a prickly surface that adheres to people’s clothes, a property believed to help the uterus attach itself with greater strength to its proper position. It is also bitter, which is a doctrine of signatures associated with medicinal effectiveness (Bennett 2007). The second two plants are also made into infusions, but the woman must squat over the steam. The last plant is used as a vaginal wash (see also Rodríguez López et al. 1998). All of these treatments are believed to help the uterus become stronger and settle back into place, restoring a woman’s bodily equilibrium.

POST-PARTUM PERIOD

As mentioned above, seven plants (*Tagetes erecta*, *Hylocereus undatus*, *Nopalea cochenillifera*, *Tectaria sp.*, *Musa sp.*, *Arundo donax*, *Adiantum tenerum*, and sometimes also *Thelypteris tetragona*) are used immediately post-partum. These plants are torn up and crushed by the midwife, soaked in well water for a few hours, and then used to bathe the mother and infant. We find this concept of bathing in a mixture of medicinal plants in other societies, such as the use of the *bakera* in Indonesia (Zumsteg and Weckerle 2007), the *temazcal* in parts of Mexico (Castañeda Camey et al. 1996), and herbal baths in Guatemala (Michel et al. 2006). Blood expelled during birth is perceived to be both polluting (Douglas 2000) and humorally hot; it is the latter property that is perceived to harm the mother and infant, and thus they both have to be bathed in a mixture of cooling plants to counteract the effects of the blood. All the women spoken with, whether they had given birth in the hospital or at home with a midwife, had received this bath. In addition, any family members and people who participated in the birth are also bathed in this mixture to remove the polluting effects of the blood. The women mentioned the cool nature of the plants as well as

their fresh aroma; this doctrine of signatures (Bennett 2007) is associated with a calming and cooling property.

Two plants, *Solanum nudum* and *Hibiscus rosasinensis*, are used to stop infants from crying too much. These species have been placed in the post-partum category because reproduction is not strictly what occurs up to the point of birth, but also includes the role of young children in society. The use of these plants is not confined strictly to the immediate post-partum period but instead can spread over the first few months of a child's life. Although these plants have the same purpose, they are used independently; the infant is bathed in water that contains the crushed plant, which calms her down.

Necaxantle ("weakening illness") is a condition that occurs when a post-partum woman has not rested long enough (40 days) after giving birth. With this illness, considered a wasting disease, a woman becomes thin and worn, loses interest in food, and experiences chills and body pain. A woman with *necaxantle* is bathed with *necaxancuamecatl* (literally: liana that eats *necaxantle*), *Solanum wendlandii*. It is prepared by mixing it with well water. The woman needs to accompany this treatment with rest so her body can return to normal. I could not find the reason behind the name or the rationale for using the plant. It was the only plant used for this condition, however.

Discussion and Conclusion: Changing Knowledge and Practices

CHANGING KNOWLEDGE: LAYWOMEN

Laywomen's knowledge about plants used for reproductive purposes was usually restricted to more commonly-used plants. No men knew about plants used for reproductive purposes, not even the male healing specialist in the community. This differs from other indigenous societies in Mexico, where such knowledge is shared by both sexes (Browner 1985). Instead, only the sex that is considered most likely to be involved in health concerns about reproduction, i.e., women, will have this knowledge. Of the women who participated in this study, only women 40 years of age and above had a deeper sense of the plants used for reproduction. Younger women tended to know fewer plants unless they had given birth (and then they were aware of plants used during birth and post-partum).

The knowledge possessed by laywomen is confined to plants used for birth, for the immediate post-partum, and for uterine health. All the women spoken with knew about the plants for the abovementioned purposes, while only the midwives knew about the plants used for other reproductive concerns. The reason for this is because birth was traditionally a shared experience, so many women participated in the process, thereby learning about plants used during and afterwards. Thus this knowledge was also shared and participatory.

Knowledge and usage of these medicinal plants has been affected by the introduction of biomedical clinics and hospitals; this loss is particularly evident in regard to reproductive plants. Although there has been some borrowing of plants from general Mexican plant lore (such as cat's claw, *Uncaria tomentosa* [Willd.] DC.), there was little evidence to suggest that this borrowing would increase the people's rates of plant use. The diminishing use of medicinal plants is found throughout the village. As one of the people told me, "Before only herbs were used. But when one does not use [allopathic] medication one does not get better... But we no longer use herbs, only injections we can buy in pharmacies... In the past there was a lot of knowledge [about plants] but it has been forgotten... But it is easier with medication; they are already made, and you only have to swallow or inject it."

The introduction of biomedicine is a necessary part of globalization, as health policies are framed by global health and development policies. Biomedicine and development parallel other economic changes, all of which have an effect on people's medical traditions. As part of the national push for modernity and development, people are enrolled in a conditional cash transfer program. The conditions include people's attendance at the clinic at least twice a year (Smith 2006). Over time this situation has eroded their knowledge about the *medicina de los abuelos*, the grandparents'/ancestors' medicine. Young people are less likely to have grown up with an intimate knowledge of medicinal plants because there is an abundance of allopathic medications available in the stores in nearby towns. For instance, in the past women used *Solanum wendlandii* if they became weak after birth. Nowadays they might instead go to the store and buy Voltaren, which is a very strong anti-inflammatory and pain medi-

cation associated with an ability to strengthen internal organs and improve people's wellness and "strength."

Another pathway to knowledge loss is the lack of laywomen's transmission to future generations. If they share their knowledge about medicinal plants, it is done through use and practice, but they do not necessarily share techniques and reasons for use. Thus, though many of the younger women could talk about certain plants, and could identify them, they did not know what they were used for or why. Additionally, the arrival of clinics, hospitals, and development programs frequently tend to discourage the application of this traditional knowledge in favor of biomedical systems. Though the women were aware that their traditional medicine was in decline, they felt they could not prevent this process—they were involuntarily tied to biomedicine, they trusted its efficacy, and they stated that it was easier to take a pill than to collect, prepare, and consume a medicinal plant.

CHANGING KNOWLEDGE AND PRACTICE: MIDWIVES

With the recent introduction of biomedicine, the midwives have had to negotiate their position within this new health system. Many of them have been certified by the government, they have introduced new healing techniques borrowed from biomedicine, they have diversified their practice spheres, and they have established new collaborations and networks. Plants continue to be integral to their practice. However, several of the midwives will also prescribe allopathic pills or injections to their patients for particular conditions. Some of the midwives are proficient at injecting, and they have incorporated this knowledge in their practice (see Castañeda Camey et al. 1996). For many of them, their practice has shifted from assistance during birth to post-partum and general reproductive health care (see also Zumsteg and Weckerle 2007).

The plants only known by midwives involve issues that are more specific, "medical," and secret (such as abortifacients, conception, etc.), and thus only an expert can possess this knowledge. These practices are much less common in this region than are issues surrounding fallen uterus, birth, or post-partum. This knowledge is heavily guarded by the midwives. As Lourdes said to me,

regarding obtaining knowledge about abortifacients, "Socorro [one of the village midwives] knows about plants that can make you abort, but she is very stingy [with her knowledge]; she does not want to share it." Both these women are older midwives who are able to work without being outright competitors because they are known for different types of expertise. Thus they do not share plant knowledge with each other, or their practice spheres would overlap and their prestige would disappear.

Many of these plants that are used for medical purposes have also been mentioned in the prehispanic codices (Smith-Oka 2007), so the selection of these plants for their efficacy goes back well over 500 years and was institutionalized across large regions in Mexico. This knowledge is in danger of disappearing, however, as many of the midwives and healing specialists are not taking any new apprentices. Each of the healers heavily protects this knowledge, because it is their livelihood. Additionally, the ability to heal is considered a gift from god, so not anyone can apprentice and know about medicinal plants. None of the young women of the region seem interested in becoming midwives; their glances are instead turned towards more prestigious careers such as accounting or law.

The outcome of the certification of the midwives is that, despite the training, many of them have continued to lose patients to the clinics and hospitals. They are aware of this problem, but view it philosophically. As Refugio said to me, "Now they no longer [come to see me], they go to the clinic. But I'm fine with that. I am tired [old] and I want to go [die]." The midwives have been certified but are still not deemed important or competent by the biomedical staff; many of them have been told that the treatments and techniques they use are harmful. The clinic continues to be the authority regarding reproductive health and therefore is also the most "modern" choice for the women of this area.

FINAL CONSIDERATIONS

This research on the knowledge of indigenous women can have additional significance, such as the following: (a) create a record of the plant knowledge possessed by the least powerful members of an already marginalized community, i.e., women; (b) give voice to some of their health

concerns; (c) indicate some of their responses to medical change regarding their plant usage; and (d) provide a broader framework for understanding how marginal peoples around the world respond to the impact that globalization has on their health needs and local ethnobotanical knowledge.

Future steps in this research involve additional collection of medicinal plant data as well as returning this information to the women in this community. The latter project would involve a handbook with images and drawings of the plants, and possibly a creation of a "talking book" to accompany this information (Bletter 2006). In this way, the knowledge can be returned to the source and possibly shared with the younger generations.

Acknowledgments

I would like to thank the women and midwives in Amatlán for their knowledge and patience, with special thanks to Esperanza and Camila for help in plant collecting. This research would not have been possible without the financial support from the Foundation for the Advancement of Mesoamerican Studies, Inc., (Grant # 05063), and the Institute for Scholarship in the Liberal Arts, College of Arts and Letters, University of Notre Dame. I would also like to thank the staff at MEXU for their invaluable help in plant identification, in particular Dr. Gerardo Salazar C. and M. en C. Angélica Ramírez Roa. Thanks also go to Crystal Truong, Christopher Smith, and Alejandro Gonsenheim for their help with the images. I would like to give special thanks to the anonymous reviewers for their suggestions and careful reading of this article.

Literature Cited

- Alcorn, J. B. 2000. Factors Influencing Botanical Resource Perception among the Huastec: Suggestions for Future Ethnobotanical Inquiry. Pages 17–28 in P. E. Minnis, ed., *Ethnobotany: A Reader*. University of Oklahoma Press, Norman.
- Bennett, B. C. 2007. Doctrine of Signatures: An Explanation of Medicinal Plant Discovery or Dissemination of Knowledge? *Economic Botany* 613:246–255.
- Berlin, E. A., V. M. Jara, B. Berlin, D. E. Breedlove, T. O. Duncan, and R. M. Laughlin. 1993. *Me' winik: Discovery of the Biomedical Equivalence for a Maya Ethnomedical Syndrome*. *Social Science and Medicine* 375:671–678.
- Beyene, Y. and M. C. Martin. 2001. Menopausal Experiences and Bone Density of Mayan Women in Yucatan, Mexico. *American Journal of Human Biology* 13:505–511.
- Bletter, N. 2006. Talking Books: A New Method of Returning Ethnobiological Research Documentation to the Non-literate. *Notes on Economic Botany*. *Economic Botany* 601:85–90.
- Browner, C. H. 1985. Plants Used for Reproductive Health in Oaxaca, Mexico. *Economic Botany* 39:482–504
- Castañeda, X., C. García, and A. Langer. 1996. Ethnography of Fertility and Menstruation in Rural Mexico. *Social Science and Medicine* 421:133–140.
- Castañeda Camey, X., C. García Barrios, X. Romero Guerrero, R. M. Nuñez-Urquiza, D. González Hernández, and A. Langer Glass. 1996. Traditional Birth Attendants in Mexico: Advantages and Inadequacies of Care for Normal Deliveries. *Social Science and Medicine* 432:199–207.
- Douglas, M. 2000 [1966]. *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. Routledge, New York.
- Etkin, N. L. 1996. Ethnopharmacology: The Conjunction of Medical Ethnography and the Biology of Therapeutic Action Pages 151–164 in C. F. Sargent and T. M. Johnson, eds., *Medical Anthropology: Contemporary Theory and Method*. Praeger, Westport, Connecticut.
- Frei, B., M. Baltisberger, O. Sticher, and M. Heinrich. 1998. Medical Ethnobotany of the Zapotecs of the Isthmus-Sierra (Oaxaca, Mexico): Documentation and Assessment of Indigenous Uses. *Journal of Ethnopharmacology* 62:149–165.
- Goman, M. and R. Byrne. 1998. A 5,000-Year Record of Agriculture and Tropical Forest Clearance in the Tuxtla, Veracruz, Mexico. *Holocene* 81:83–89.
- Leonti, M., O. Sticher, and M. Heinrich. 2002. Medicinal Plants of the Popolucas, México: Organoleptic Properties as Indigenous Selection Criteria. *Journal of Ethnopharmacology* 81:307–315.
- Leslie, C. (ed.). 1998. *Asian Medical Systems: A Comparative Study*. Motilal Banarsidass, India.
- Michel, J. L., G. B. Mahady, M. Veliz, D. D. Soejarto, and A. Caceres. 2006. Symptoms,

- Attitudes and Treatment Choices Surrounding Menopause among Q'eqchi Maya of Livingston, Guatemala. *Social Science and Medicine* 63:732–742.
- Oths, K. S. 1999. *Debilidad: A Biocultural Assessment of an Embodied Andean Illness*. *Medical Anthropology Quarterly* 133:286–315.
- Paré, L., J. L. Blanco, D. Buckles, J. Chevalier, R. Gutiérrez, A. Hernández, F. Ramírez, and E. Vázquez. 1997. Características Generales de la Sierra de Santa Marta. Pages 17–37 in L. Paré and E. Velázquez H., eds., *Gestión de Recursos Naturales y Opciones Agroecológicas para la Sierra de Santa Marta*, Veracruz. UNAM, Mexico.
- Rodríguez López, T., A. Aguilar, and H. Macías Cuéllar. 1998. Plantas Medicinales y Salud Reproductiva de las Mujeres Nahuas de Tamazunchale, San Luis Potosí. Pages 253–262 in J. Ruvalcaba Mercado, ed., *Nuevos Aportes al Conocimiento de la Huasteca*. CIESAS, México.
- Ruvalcaba Mercado, J. 1998. Presentación. Pages 11–26 in J. Ruvalcaba Mercado, ed., *Nuevos Aportes al Conocimiento de la Huasteca*. CIESAS, México.
- Smith, V. 2006. National Policies, Local Knowledge: Women's Health and Political Ecology in an Indigenous Mexican Village. Ph.D. thesis, Anthropology, University of Illinois at Chicago.
- Smith-Oka, V. 2007. Traditional Medicine among the Nahua: Contemporary and Ancient Medicinal Plants. Report to FAMSI. [online] URL: <http://www.famsi.org/reports/05063/index.html>.
- Terrell, J. E., J. P. Hart, S. Barut, N. Cellinese, A. Curet, T. Denham, C. M. Kusimba, K. Latinis, R. Oka, J. Palka, M. E. D. Pohl, K. O. Pope, P. R. Williams, H. Haines, and J. E. Staller. 2003. Domesticated Landscapes: The Subsistence Ecology of Plant and Animal Domestication. *Journal of Archaeological Method and Theory* 104:323–368.
- Thomas, E., I. Vandebroek, and P. Van Damme. 2007. What Works in the Field? A Comparison of Different Interviewing Methods in Ethnobotany with Special Reference to the Use of Photographs. *Economic Botany* 614:376–384.
- Vázquez-García, V. 2008. Gender, Ethnicity, and Economic Status in Plant Management: Uncultivated Edible Plants among the Nahua and Popolucas of Veracruz, Mexico. *Agriculture and Human Values* 25:65–77.
- Weimann, C. and M. Heinrich. 1997. Indigenous Medicinal Plants in Mexico: The Example of the Nahua (Sierra de Zongolica). *Botanica Acta* 110:62–72.
- Zumsteg, I. S. and C. S. Weckerle. 2007. *Bakera*, a Herbal Steam Bath for Postnatal Care in Minhasa (Indonesia): Documentation of the Plants Used and Assessment of the Method. *Journal of Ethnopharmacology* 111:641–650.