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The idea for this project began during a brief field trip to Pohnpei in 1997, developing over time into an ethnobotanical and floristic study of the island, its flora, and the traditional uses of plants. We were fortunate to be in a place where traditions are still intact, and respect — including respect for the environment — is still a pillar of Pohnpeian society. However, this is changing rapidly, as traditional values are replaced by contemporary lifestyle and beliefs. We suggest that, on Pohnpei and elsewhere, there is still a great deal to learn from lessons of the past. It is in that spirit that we have gathered the information presented in this book, incorporating it into a single reference intended to be used in support of Pohnpeian culture, biodiversity conservation, and resource management.

The Pohnpeian people, both living and from previous generations, are the owners of the information presented in this book. Pohnpeian traditional knowledge has been carefully developed since the arrival of the first people to the island, who, through their hypothesis-driven experimentation (e.g., are all red fruits sweet and edible?), deliberately constructed the body of traditional botanical knowledge and practices that comprise Pohnpeian ethnobotany. The publication of the information in this book establishes “prior art” and “prior knowledge” relating to Pohnpeian plant use and thus, under current international patent law, could help to protect it from inappropriate exploitation. For this reason, copyright is held by the Mwoalen Wahu Ileilehn Pohnpei (Pohnpei Council of Traditional Leaders).

In a world rocked by global change, we suggest that traditional knowledge and practice has an important role in maintaining a healthy environment and people. Traditional resource management practices can help sustain the ecosystem and its components, particularly on a small island where land and marine resources are so limited. Local foods, combined with a more active lifestyle, can help address the epidemic of diabetes and other diseases that are plaguing Pohnpeians. Food security can be enhanced via increased dependence on products from agroforests, as well as employing traditional food preparation procedures such as fermented breadfruit in underground pits. When disaster struck, or when additional calories were needed, ancient Pohnpeians uncovered their breadfruit pits prepared decades before and fed themselves. In a climate of rising fuel prices, where fiberglass boats powered by imported gasoline are increasingly sitting idle,
traditional canoes, powered by the wind and paddle, could help people capture more protein from the sea. Island clinics, which have been known to run out of imported medicines, could turn to traditional medicines and practices for the treatment of many primary health care conditions. There is no reason for diarrhea to go untreated and result in fatality. Traditional beliefs foster respect for land, sea, and community.

Of the 1,041 plant species recorded in this volume to be found on Pohnpei, we have identified uses or local names for 461 (44 percent). Without a doubt, there are many more species on the island that have uses, and of those plants listed here, most have additional uses. Thus this volume reflects but a small fraction of the rich body of ethnobotanical knowledge that exists on the island and its outlying atolls; much more work of this type must still be undertaken. The intent of our study was to focus on gathering generalist information and specifically avoiding secret or family-owned information. Many families on Pohnpei still keep records of the uses of plants by their clan, particularly in traditional medicine, and this is to be encouraged.

The Pohnpei Council of Traditional Leaders has been extremely supportive of this work, guiding this project from the very beginning. During the past few years, they have helped to ignite new interest in traditional knowledge and practices on the part of the younger generation. Ethnobotany is being taught at the Palikir Campus of the College of Micronesia, and students from throughout the Federated States of Micronesia are learning about their biodiversity-based cultures. Local conservation organizations such as the Conservation Society of Pohnpei and international conservation organizations such as The Nature Conservancy, in partnership with the Pohnpei State government and local communities, have developed realistic plans for conserving the habitats and biodiversity of Pohnpei, and they are implementing them. In addition, the Island Food Community of Pohnpei along with local communities and the state government have made a commitment to conservation of rare varieties of the traditional food crops and to increasing awareness among Pohnpeians about the many values of local foods, including those relating to food security, health, income, culture, and the environment. It is hoped that this will contribute to a shift back to using more local foods, maintaining traditional knowledge and practices, and enjoying happier and healthier lives. As discussed in chapter 1, the results of the “Grow Low” campaign to move sakau production from the upland forest into the lowland agricultural zone has resulted in a significantly lower annual deforestation rate on Pohnpei. All of these are positive developments in the face of a rapidly changing island culture and local and global environment. We hope this book — and the publications that will follow it as part of the Plants and People of Micronesia Project — will serve many constituencies, including those working in science, culture, conservation, resource management, public health, and education.

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Michael J. Balick
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Pohnpei, Federated States of Micronesia
Sakau, known botanically as *Piper methysticum* G. Forst., is a species so tightly woven into the traditional practices of Pohnpei that it has become an integral part of Pohnpeian culture, with no palpable boundary between culture and plant. The power of *sakau* in defining Pohnpeian culture and daily life is perhaps one of the best examples of the extraordinary influence of a single plant species on a people and their identity to be found in the Micronesian region. On Pohnpei, *wahu* (respect or honor) is the historic and contemporary foundation that defines its culture, society, and people. Wahu, in large measure, is structured, maintained, and mediated by *sakau*, based on the people’s reverence for and ritual use of this plant. *Sakau* is ultimate respect, higher than the highest paramount or oratory chief or any other living being in the society — and even higher than the most important of the ancestral spirits, both good and evil. *Sakau* towers above them all, in a way that brings peace and community to the island, holding the cultural traditions together in the face of overwhelming and destabilizing economic and geopolitical forces that emanate from “beyond the reef” — the local term for the rest of the world.

In a recent paper, Garabaldi and Turner (2004) recognized the importance of certain plants in the culture of a people and proposed that the term “cultural keystone species” be used to recognize such individual species. They defined cultural keystone species as “the culturally salient species that shape in a major way the cultural identity of a people, as reflected in the fundamental roles these species have in diet, materials, medicine and/or spiritual practices.” It is *sakau*’s primary role in defining Pohnpeian cultural identity that makes it a cultural keystone species in this context. Based on an index of the identified cultural influence (ICI) of species developed by Garabaldi and Turner, involving criteria such as intensity of use, linguistics, role in narratives, ceremonies or symbolism, persistence of use
in the face of cultural change, level of unique position in the culture, and its use as a trade item for resource acquisition outside of the territory, sakau would receive the highest score possible.

This chapter explores the botany, ethnobotany, ethnomedical practices, and ethnopharmacology of sakau and presents an integrated perspective of this plant based in part on interviews with local historians, chiefs, knowledgeable elders, religious leaders, and observers of the Pohnpeian scene. We provide data on consumption patterns in Pohnpei based on a survey of 180 people during 2001, revealing a very high rate of use by both men and women. We also look at the use of sakau — known as kava in the international herb trade and elsewhere in the Pacific as kava, 'awa, or yagona — in Western medicine, particularly in the fields of integrative and complementary medicine. The most authoritative publication on this plant and its use throughout its cultivated range is *Kava: The Pacific Elixir*, by Lebot et al. (1997). While this comprehensive treatment of many aspects of sakau does provide a general introduction to its classification, chemistry, and use on Pohnpei, the aim of this present chapter is to provide the Pohnpeian perspective on this important species.

**Botany**

*Piper methysticum* is a much-branched, somewhat succulent shrub that can ultimately grow 5–6 m (ca. 16–20 ft) in height, although it is usually harvested at a much lower height, 2–2.5 m (ca. 6.5–8 ft), after two to three years of cultivation. It has ten to fifteen or more upright branches that spread 2–4 m (ca. 6.5–13 ft) across (Fig. 6.1). As the plant ages, the stems can reach 10 cm (ca. 4 in) in diameter, but at usual harvest age they are at most a few centimeters in diameter. The leaves are heart shaped, suborbicular-ovate to 25 cm (ca. 10 in) long and somewhat narrower in width, to 20 cm (ca. 8 in), acuminate, and deeply cordate at the base, containing nine to thirteen radiating veins. The inflorescences are solitary spikes growing to 7.5 cm (ca. 3 in) long (L. H. Bailey Hortorium 1976). The part of greatest interest is the roots, which are stout brown structures that when split open are yellowish in color (Fig. 6.2). The plant grows well in the upland forests, but due to a significant demand for the roots, a great deal of upland forest has been destroyed over the past few decades, resulting in an erosion of the watershed area on this small island. The consequences of forest and watershed loss are widely recognized on Pohnpei, and a local “Grow Low” campaign put into place by The Nature Conservancy, the Conservation Society of Pohnpei, and the Pohnpei State government and local communities has encouraged production to move to the currently cultivated lowland agroforests, resulting in a significant decrease in the rate of upland deforestation (Merlin and Raynor 2005).

There are many local varieties (cultivars) of kava found throughout the Pacific, where it is used as a beverage. Lebot and Lévesque (1989) noted that there were...
eighty-two kava cultivars recorded on Vanuatu. Fiji has eleven cultivars of kava, Tonga has eight, Tahiti has fourteen, while Pohnpei has two (Lebot et al. 1997). The major cultivar used on Pohnpei is known locally as Rahmwhanger and can be distinguished by a series of purplish or blackish spots on the stem (Fig. 6.3). It is the most common variety of sakau in use today, perhaps in 95 percent of all
preparations. Local people report that it is stronger, with the effects lasting much longer than the second cultivar, known as Rahmedel, which is characterized by a smooth, unspotted stem (Fig. 6.4). Mikel Marquez, a noted historian and learned elder on the island, told of a third cultivar known as malahd, which morphologically seemed to be a combination of both of the local cultivars, with both types of stem — smooth and rough. He explained that malahd was “combined,” and that if a person planted a branch of Rahmwhanger, sometimes it would have two different stems, one of that cultivar and one of malahd. He offered no explanation for the evolution of this third cultivar but noted that the soil may have something to do with it. Other people referred to a cultivar that was different than the primary two, but they offered no further specific information.

Origin of Sakau

Lebot et al. (1997) suggested that the center of origin and diversity of Piper methysticum is in Vanuatu, and that it was spread throughout the Pacific Islands through back migrations and voyages. Micronesia, along with Papua New Guinea and Polynesia, are suggested as sites of relatively late introductions, “because of the absence of variation in cultivar isozymes and the limited variation in morphotypes and chemotypes in these regions.” They stated that this species is “clearly a human creation” and that as a crop it may be less than 2,500–3,000 years old. Counterarguments made by other workers for different centers of origin for Piper methysticum are presented in this volume as well.

Legends about Sakau’s Origin on Pohnpei

There are several Pohnpeian legends about the introduction of sakau to Pohnpei, and one case reflects how it was distributed elsewhere in the Pacific. Origin myths told by Pohnpeians have been recorded by various observers (e.g., Ashby 1993) and have as one of their central themes the “external provenience” that Lebot et al. (1997) characterized as one of the two types of origin myths found in all of the Pacific Islands where this species is used. As discussed by these authors, in this type of myth a “god, ancestor, or hero descends from the heavens or sails from across the horizon and bestows kava [sakau] on a society.” On Pohnpei, both gods and heroes are involved, and — consistent with many other Pacific island myths involving this plant — women play an important role in its introduction, despite the fact that in earlier times they did not participate in the sakau ceremonies. Sakau, as is evident from the local myths that follow, is of sacred origin, has special powers acknowledged by all in the community, and is worthy of the sacred status and wahu it is universally accorded on Pohnpei. This is certainly consistent with conclusions from ethnobotanical studies of other cultures by Richard Evans Schultes, who devoted much of his career to investi-
gations of psychoactive plants and their role in traditional societies, particularly in the Amazon Valley of South America. Schultes and his coauthor Albert Hoffman (1979) noted that “The intimate relationship between the human and plant world is easily discerned, but the production of substances profoundly affecting the mind and spirit is often not so easily recognized. . . . Plants that alter the normal functions of the mind and body have always been considered by peoples in non-industrial societies as sacred.”

It is also interesting to note that there are variations of the sakau origin myths, with secondary myths about its introduction into different communities on Pohnpei or with different levels of detail and highlights, depending on the place
the legend is told and the knowledge of the storyteller. Today people recall the stories in different ways, but sakau is always acknowledged to have its origins from outside the physical setting of the island—a plant of the gods, from the heavens, and worthy of its sacred status.

*The Book of Luelen* (Bernart 1977) is a unique reference on the history and lore of Pohnpei in that it was written by an indigenous person, Luelen Bernart, who lived from 1866 to 1946. He is the first Micronesian known to have written a book, and his work is an important record of Pohnpeian life and beliefs beginning in the second half of the nineteenth century through the first half of the twentieth century. He hand-wrote his observations in a notebook, and when he was too old and weak to write, he dictated the final twenty chapters to his daughter Sarihna. The complete story of how this magnificent work was produced is described in great detail by Ballendorf (2005: 21). His explanation of local custom and belief offers insight into the shape of Pohnpeian legends and how they evolve. Writing about the difficulties Bernart faced, Ballendorf noted,

Transcribing onto paper the myths and legends of an oral society proved to be no mean feat. No matter how reliable the source, a single version of any given story could never be considered complete. This is because Pohnpeians, then and now, would automatically withhold certain information in order to preserve their advantage. To share all would be to cheapen a privileged body of knowledge, and to undermine one’s own position as an authority. Then too, no one person knew everything. . . . Over the course of a lifetime, Luelen undoubtedly heard many versions of a single story. By checking and rechecking one version against another, Luelen was able to come up with a reasonably complete and accurate story.

*The Book of Luelen* was translated and edited by John L. Fischer, Saul H. Riesenberg, and Marjorie G. Whiting (1977), with annotations by these workers published in a separate volume. Bernart’s story of the origin of sakau (referred to as Pohnpeian kava in the translation) is here excerpted:

In the beginning there was a man . . . named Wideningar. . . . He was a master prayer. He used to pray to Luhk, the god of the Luhk Clan. This man was a very old man. He was no longer able to walk about for he was blind. Now when he was a young man he had planted a coconut tree. This coconut tree he planted and dedicated to Luhk, and when it bore fruit the man kept collecting the coconuts at the base of the tree all the time. It made no difference if they sprouted, he would just keep piling them up always. Eventually he became an old man and went blind and the coconuts of that palm tree became offerings to the god, for he had offered them to Luhk. This is why Luhk appeared to him when he was old. Now Wideningar used always to lie on his mat, for he was an old man. Now one day he was lying on the mat
and he heard what seemed to be a person stepping on his taboo place [the pile of coconuts], for he used to make offerings to Luhk. He then asked his identity, saying, “Are you man or god?” Luhk replied, “I am Luhk. You are to come with me.” Wideningar replied, “I am an old man and can no longer see things and can no longer walk about, for I am weak.” But Luhk called to him a second time, saying to him, “Stretch out your hand to me that I may get you.” He then stretched out his hand to Luhk, and Luhk then took it and helped the man stand up. And when his hand touched Luhk’s hand he became strong and could see things. Luhk then took the man with him and they went and got a banana skin of the variety Karat, and made a canoe of it and rode in it to Matolenim [Madolenihmw]. They then paddled upwind off Alokhap. They took out their Kourahpw [coconut meat with turmeric, a traditional body ointment] and anointed themselves with it. They then threw away the squeezings in the sea in a certain pool. Some fish came and ate up the squeezings. They then gave these fish the name of Arińij. This is what they are named to this day. The two then went on to Kinakapw and spent the night on the shore, and then walked up to Enimwahn, and then the two men went on out to Na. They walked on out to the south of Na. The two men then went on until they got to a place named Pejiko. They then met a married couple there, Jau-nok and Kat-nok. The woman was preparing a likpuake [suggested by the translators to be a pendant or necklace]. This is an ornament for a man’s breast. The woman then conceived a liking for Luhk and gave away the likpuake as a love gift, giving it to Luhk. Luhk repaid her with skin from the man’s [Wideningar’s] heel, and told this woman to take it and bury it in the earth for it would sprout and form a plant. Supposedly if people would drink its juice, they would become intoxicated with it and it would change their life. The two then walked on further to another place and found a dead person whom they were going to bury. Luhk said to them, “You people bury this person carefully for it will sprout and make a plant, and you shall give it the name of sugarcane, and it will be named “Southern Sugarcane.” The man now went back. Luhk took Wideningar back to his original home in Wenik, in the section of Mallenuht. Various people used to watch and be amazed at how the rats would go and eat at the base of the clump of the plant, and how, after they had eaten the plant they would get weak as if they were sick from it. They were no longer able to run about, but would simply crawl about on the ground and go over to the place where the clump of sugarcane was, and also eat some of it, and then go to sleep, and that was that. Now the people of the land tried eating some of the roots of the plant [sakau], and all those who tried it became intoxicated from it. They therefore named the plant “intoxication”8 because people ate it and became light headed from it. And they also tried eating the sugarcane and they found it likewise delicious because it was sweet. The people of heaven were in
heaven and looking down on the earth, and they saw how the people of that land would consume the kava \( \text{sakau} \) and would become intoxicated from it. Accordingly one day two of them descended to investigate what the plant was like. They descended to Pejik to ascertain the nature of kava. The two of them stole a cutting of kava. They took it up to heaven and they gave it to Nanitenlań [Lord of the Eels of Heaven] and to Nanitenpatanlań [Lord of the Eels of Patanlań]. The two of them took it and planted it in Diwienleng \(^9\) [Garden Plot of Heaven], a garden plot which was in Pwetenleng \(^{10}\) [according to the translators, a place in heaven where Luhk sometimes lived]. The two planted it on that day and had a feast with it on the same day. When the kava was dug up, it was a very big kava plant. The kava was split on that very day. When they were pounding it on that day, a joint [meaning internode, the usual planting material] of kava bounced out as they prepared the kava and fell down on Mallenuht, at Wideningar’s place, and sprouted there. This was the beginning of the kava plant multiplying in Pohnpei. Now here are the names of the women who took the kava up to heaven, Liteme and Litopra.

\( \text{sakau} \), with its bitter taste, is usually followed up with a drink of water or another beverage, and in former times the translators stated that people would commonly chew a piece of sugarcane after taking a drink of \( \text{sakau} \) to make its taste more tolerable. Thus, the role of sugarcane in this origin myth becomes apparent and is early evidence for its status as a sacred plant, commonly found in use for contemporary offerings and ceremonies.

Albert Dores\(^{11}\) provided the following legend on how \( \text{sakau} \) came to Pohnpei, was then removed by the gods and dispersed throughout the Pacific, and later, through deception, reintroduced to Pohnpei by a woman who traveled to Kosrae:

Before there was breadfruit on Pohnpei, \( \text{noni} \) \( [\text{Morinda citrifolia}] \) was presented to the chiefs during feasts. The celebration of the First Fruits was held in Pohntehnmei, Madolenimhw \( [\text{Madolenihmw}] \), and \( \text{noni} \) was offered to the chiefs and spirits. It grew up out of the earth a long time ago. The people oiled their bodies with coconut oil, put \( \text{kide} \) leaf \( [\text{Microsorum scolopendria}] \) ferns on their heads as mwaramwar [head garlands], wore skirts made of grass and \( \text{Hibiscus tiliaceus} \), and began pounding \( \text{sakau} \) roots on stones. The gods looked down and saw the big feast going on and were very happy about the feast but very jealous about the use of \( \text{noni} \). It used to be that they were offered \( \text{pisetikimei} \) \( [\text{Melastoma malabathricum var. mariannum}] \) during the feasts. The gods became angry and made the \( \text{sakau} \) fly off of the stone and out of the feast. Why were they angry? They were jealous of the people’s happiness and decided to put them in their place. The \( \text{sakau} \) that flew off the stone divided into many pieces and landed in Hawai’i, Vanuatu, Fiji, and
wherever else there is sakau, which is why it is now in those places. It left Pohnpei without sakau and the people were not happy. It also fell nearby, in Kosrae, and the Pohnpeians knew this and that the Kosraeans were using it. A woman who visited Kosrae . . . was pounding sakau, and while doing so she spread her legs and a little piece of sakau root fell into her vagina. She pushed it up further and closed her legs. She then left Kosrae and came back to Pohnpei. That is why the sakau now on Pohnpei has a smell to it, while the one that grows in Kosrae does not. The spots that formed on the stems of sakau from Pohnpei were the result of being in the woman’s vagina and being coated with her kirek [smegma] that left marks on the stem.

The late island historian Retty Laurence made a concerted effort to learn much of the history and lore of Pohnpei, following his return to the island after being raised during his youth in Connecticut. He was deeply concerned, as many elders are, about the erosion of traditional knowledge, and he offered two pieces of information on sakau during our interview.12 The spotted sakau was brought to Pohnpei by two ladies from Katau Peidak (an old spelling of Kosrae). The smooth sakau was also brought by two ladies from the Liarkatau clan. This was brought to Awak, a village in U, and they planted it in a place called Diwien Kirek.

There was another woman who lived in U, who worshipped the spirits in the sky, and after worshipping them, they sent one sakau plant down from heaven to her. And [this] is remembered by the ceremony of the Sepera, or Pwungen sepera.

Mikel Marquez provided a very detailed story on the origin of sakau, with additional details not found in the composite legend told by Bernart. For example, in this version a landslide figures prominently in the challenges faced by our hero, here spelled Widenigar, who is covered with mud and is then cleaned by the intense rain from the heavens before Luhk comes down to take Widenigar on their trip. In addition, the shellfish given to Luhk was for consumption rather than ornamentation, following their long journey, and the skin came from the bottom of Luhk’s heel. The origin of the prohibition on the consumption of sakau is explained, based on a ruling of the chiefs that it become a sacred and ritual beverage. As Marquez recounted,

I cannot answer the question of how sakau came to Pohnpei, only how it came to U. There was a man by the name of Luhk Nansapwe, the Thunder god in heaven. And there was an old man staying at Saladak in U, who was very old at the time, and who used to worship Luhk Nansapwe. His name was Widenigar. He was old, and blind, and could not walk. He was lying in
his home and worshiping Luhk Nansapwe. And one day the Thunder god came to him and told him to wake up. And Widenigar woke up and told Luhk Nansapwe that he could not see or walk. So Luhk Nansapwe took him out from his house, and it started raining and thundering and lightning. Widenigar saw an engk [landslide] and began to tremble, and the earth came on top of him, and the rain washed away the soil from under him, and he got up. Then Luhk Nansapwe told him they would go for a walk. And they started walking down to the edge of the island and they saw a Karat — a special kind of banana [high in carotenoid content with an orange color]. Luhk took the Karat and used it as a boat for the two of them [and] paddled it to a place called Pohndawauk. They got off of the banana and started to walk. And Widenigar got lost, out of breath, and arrived to a place called Nannget. And [he] kept walking and finally got to Madolenihmw. And [he] then met a man and his wife on Nah, an island off of the coast of Madolenihmw. And the wife gave Luhk a shellfish to eat. And Luhk took it, and in return for this kindness of the couple, he took off a little bit of his skin from under his foot and gave it to the woman and said, “You plant this and take good care of it.” After several days it sprouted. And when it came up it was a sakau plant. But they did not know that you could get a special feeling from the sakau, so they grew it until it got very large. And each morning they watched the plant. And they noticed that each morning a rat would come and take a big piece of the plant and walk away, but when he was walking it was like he was drunk. And one said to the other, “The rat is eating the plant and something is happening to it.” So they tried the sakau themselves and found out that it was good, that it had a special effect. So they brought it to the chiefs as a tribute. And when the chiefs tried it they ruled that the common people were not allowed to use it anymore, and this was the beginning of the sacredness of the sakau.

The position of respect for sakau and belief in its power within Pohnpeian culture has at its foundation a rich mythology that clearly establishes the sacred realm of this plant. As this drink continues to increase in use as a recreational beverage, each time it is sold or consumed in sakau bars or markets, a small part of that centuries-old and sacred patina is worn away, further impoverishing and to some degree endangering a portion of the traditional culture of the island. On the other hand, the increasing frequency of its use in commercial, nonritualistic ways fosters communication, community, and contact between people, during which time there are often many positive interactions that connect the generations.

Traditional Uses of Sakau on Pohnpei

There is a broad range of traditional uses for sakau on Pohnpei. First and foremost, it is made into a beverage that is used ritually, ceremonially, and in contemporary times, as previously noted, recreationally. From an ethnomedical per-
Sakau is always something that all Pohnpeians understand. It has its own power, and it is highly respected by those that most people respect. It is frequently used between human beings, families, leaders, clans, in all matters: happy families, sad families, a family that needs help, a family that loses a loved one, a family that will bring in somebody from other families. You use sakau to go and ask for a girl. You use sakau when you are giving thanks to somebody who helped you, who helped you in medicine . . . you share sakau with your friends. Sometimes enemies must use sakau to create a different relationship. And you use sakau when you ask for land, the right to use land. You use sakau for funerals and for four seasons of harvesting [feasts] based on what we have on the land. You bring it for the Nahnmwarki and the Nahnken who are the most responsible for the people within their kingdoms, for anything — solving their needs, answering their questions, helping in their situations.

Preparing sakau for drinking can be done in many different ways, depending on the use — that is, the degree of ritual — for which it is intended. Peterson (1995) offered a detailed analysis of the place of sakau in the everyday lives of the people of Pohnpei as well as its preparation and use, based on anthropological fieldwork on the island from 1974 to 1990. Riesenber (1968), based on his 1947–1963 fieldwork, also described the use of sakau in great detail. Both of these references offer insight into the Pohnpeian sakau ritual. Preparation of sakau on Pohnpei involves methodologies that are particular to the island, such as squeezing the freshly pounded roots with a press made from the inner bark of Hibiscus tiliaceus.

The process begins with the harvest of the plant from the field. Plants are not harvested before they are a minimum of two to three years of age, while larger plants are saved for special events such as a feast or tribute. The entire shrub is dug up, preserving as much of the root mass — including the central roots and side roots — as possible. The earth is knocked off the roots to lessen the weight of the plant, traditionally with a piece of coconut husk, and sometimes the roots are dipped in a stream to remove as much of the soil as possible. Usually most of the multiple stems are removed, leaving only one intact, with the balance of the lower, thicker portion of the stems cut into pieces having about three nodes each and used for planting. Traditionally, the entire plant is brought into the nahs (feast house). Of primary importance in a sakau plant is the size and weight of the root mass, as this part of the plant will be pounded to produce the beverage.
When the plants can be found in markets, all stems are often removed, leaving only the root mass. At current prices, a clump of fresh roots sells for about $2.50 per lb. The roots are brought into the *nahs* or other part of the home where the *sakau* is to be pounded (Fig. 6.5). At that point the roots are removed from the stem with a knife or machete, split into smaller pieces, dipped in water, and carefully scrubbed with a brush to remove all of the remaining earth and contaminants. Clean water is essential to this process, particularly following the cholera outbreak of several years ago in which *sakau* bars were implicated in the epidemiology of the illness. Washing is usually done on the ground or on a table, and the wash water is changed frequently when there are many roots to be cleaned. The pieces of the root — many cut open, revealing their yellow center — are placed to one side as the pounding stone is prepared. The stone is a special piece of basalt, found in a limited number of areas on the island and passed down from family to family. It is chosen for its shape, size, and tone — a special sound, almost like the ringing of a bell, that will resonate throughout the area when the pounding has started and alert those within earshot that *sakau* is being prepared.

In a more formal, ritualized setting, the pounding stone will have leaves of *Alocasia macrorrhizos* covering it and four leaves on the floor around it (Fig. 6.6). In an informal setting, the pile of roots may be in a pan or on a piece of plastic near the stone. The stone is carefully washed with a brush and water to ensure its cleanliness when the venerated *sakau* is placed upon it. There is a hierarchy...
of pounding stones, depending on the use. *Peitehl* is the large flat stone used to prepare *sakau* or other pounded foods (Rehg and Sohl 1979). When the stone is within the *nahs*, it is known as *uhpeileng*, *uhpeimwahu*, or *uhpeiuh*. The stone used to pound *sakau* for the Nahnmwarki is referred to as *pelien soumoahl*.$^{16}$ Traditionally the stones are stored on their sides and, when prepared for use, lifted and placed on a foundation, often today of two tires. In the past the support for the stone was a pile of coconut husks, said to provide a more beautiful sound when pounding the stone. The small river stone used to pound the roots while they sit on the larger, flat pounding stone is referred to as *ketia* or *moahl* (Rehg and Sohl 1979). This rounded stone, worn smooth by many years in a riverbed, is the size of an orange, often flattened on one side, and weighs several pounds. It is selected to fit well within the palm of the hand for extended periods of pounding.

During the cleaning and preparation of the *sakau* roots, another participant in this community effort cuts a stem of the *keleu* tree (*Hibiscus tiliaceus*), peels off the inner bark, slices it into strips, and ties it into a press on which the pounded roots will be placed. The *keleu* used must have a rich slimy film of exudate on the inner bark to infuse into the beverage as it is squeezed from the press. Individual trees have different levels of sliminess. In earlier times this slime was completely removed, but today more of the exudate is left on the bark. Pohnpeian *sakau* is distinguished from traditional preparations of *Piper methysticum* beverage on all other islands in that it has the thick slimy consistency provided by the *Hibiscus* sap. *Sakau* drinkers maintain that this potentiates the effect of the *sakau*, making

Figure 6.6. Leaves of *Alocasia macrorrhizos* var. *macrorrhizos* cover the ground around the *sakau* stone in a formal setting. [MB]
its effects stronger and longer lasting, and many have suggested to us that preparations of this beverage that they have tried from other islands where *Hibiscus* is not used are much weaker and less enjoyable.

Cleaning the roots takes about thirty to forty-five minutes, depending on the quantity of roots and available hands. Pieces of very clean root are piled on the pounding stone and pounded by two to four people. In the presence of the Nahn­mwarki, however, four people must pound the stone. In the more formal setting, the stone is loaded only once; in an informal setting, more roots can be added. The conversion begins, with pounders intently focused on producing a large pile of macerated roots in the center of the stone (Figs. 6.7 and 6.8).

In a more formal setting — perhaps a feast where there are several stones being pounded at once — a caller, the Menindei, tells the pounders when to start as well as stop their work. The Menindei need not be an elder or religious leader but must be in the Nahnken’s line, be able to speak “respect” language, have knowledge of the title and rank of people present in the *nahs*, and know the rules for pounding and order of presentation of the cups. Each person working the stone strikes it in unison with others or alternating if there are more people seated around it. Pounding is done according to a particular rhythm that is the same throughout the five municipalities (kingdoms) of Pohnpei and that has been passed down the generations from long ago — but the endings are different. The Menindei calls out, “Sokamah!” to indicate that the pounding is over. Then there is an ending rhythm that is similar in all areas. Then the Menindei calls out, “Kohla liki!” indicating that a final rhythm is to be pounded. Madolenihmw and U share one
ending, known as *chu*, while Kitti, Sokehs, and Nett share a different rhythm, *riau*, which comprises two cycles of final rhythmic pounding. However, each municipality has a special rhythm that ends the pounding, as signaled by the Menindei — always very rapid and lasting less than sixty seconds. Traditionally, everyone who can hear the ringing rhythm of the pounding is welcome to participate in drinking *sakau* — in fact, the stone is said to be calling people to come in this way. Pounding takes about half an hour. When the roots are appropriately macerated and the pounders are engaged in the ending rhythm, the *Hibiscus* bark strips are brought into the *nahs*, tied together into a press, laid on the stone, and filled with a portion of the crushed roots (Figs. 6.9, 6.10, 6.11, 6.12). The *Hibiscus* press is held carefully over a coconut shell cup, twisted with both hands, and thick, brown mucilaginous fluid oozes from between the bark strips (Fig. 6.13). Perhaps a quarter to a third of the total root mass is used at any one time, and the press is squeezed once on a forward twist and once on a reverse twist. As the fluid is squeezed out of the press into coconut shell cups, the press is opened after the two squeezes, the root mass released back into the pile of crushed roots, and the mass turned over and over, reminiscent of a baker kneading fresh dough. The cup is held under the press until it is nearly full, and then the proper sequence of presentation begins, based on the title or rank of those present.

The first four cups are presented to the highest ranking elders in the room as a sign of respect. In some municipalities the first five cups are presented to the elders and guests, and following this, all those present are offered cups. Guests from outside the island usually are recognized for their presence and can be
Figure 6.9. Pile of pounded *sakau* roots (right) and *Hibiscus tiliaceus* bark press (left). [MB]

Figure 6.10. Placing pounded *sakau* roots on the bark press. [MB]

Figure 6.11. Twisting the bark press to hold the *sakau* roots. [MB]
accorded one of the first cups, particularly if the pounding is taking place in a family or village setting and not part of a formal ritual. According to Pohnpeian ritual, the cup should be presented with the right hand, the left hand held under it, and the eyes looking downward, depending on the degree of formality of the setting (Fig. 6.14). Persons presented with the cup accept it with both hands, close their eyes, raise it to their lips, and drink a portion — sometimes the entire...
cup. Pohnpeians feel that when the eyes are closed, the spirits of the sakau cannot enter the body through the eyes, nor can vapors from the drink cause injury to this sensitive part of the body. A kilo or so of root will give twenty or more cups of “stone” sakau, while that found in the market is usually much more diluted, depending on the vendor. Drinking can last for several hours, during which time the conversation, jokes, and even singing begin, eventually tapering off to silence and deep thought as the effects of the sakau take hold of the drinkers.

The Effects of Sakau

Louis Lewin, in his classic work on psychoactive agents, *Phantastica: Narcotic and Stimulating Drugs* (1931: 30), surveyed the powerful plants and synthetic chemicals “capable of effecting a modification of the cerebral functions, and used to obtain at will agreeable sensations of excitement or peace of mind.” He placed *Piper methysticum* in the category “hypnotica,” defining it as a plant used to produce sleep. In this book, as well as a previous monograph (Lewin 1886) on *Piper methysticum*, he staked claim to being the first investigator to study this plant: “I also found confirmation of the fact to which I have repeatedly alluded when speaking of the development of the use of such [psychoactive] substances: namely that there is no obstacle which can arrest the spread of a narcotic, not even the sea with its menacing dangers for the natives of these islands. Not men alone, but the ocean itself yields to the power of narcotics” (1931: 215–216). The recognition of the power of this plant by a nineteenth-century European scientist living thousands of miles from its center of utilization still reflects the current situation on Pohnpei and elsewhere in Oceania. What Lewin was unable to recognize was the richness and depth of the relationship between Oceanic cultures and sakau from the earliest of times.
The effects of drinking *sakau* can thus be divided into two main phases: the initial stage, where a person is uplifted, relaxed, conversational, and communal, and the latter stage, where a person turns inward, becomes quiet, tired, of unsteady gait, and surrenders to an overwhelming feeling of hyper-relaxation and sleep. The physiological effects of the *sakau* experience begin with a numbing of the lips and tongue, when the beverage is first sipped from the cup. *Sakau* manifests its anesthetic properties quite quickly in this way. Next, the anxiolytic properties of *sakau* become evident: conversation, jokes, and even songs flow easily as people begin to drink. Happiness permeates the space where *sakau* is being consumed. The plant is a powerful muscle relaxant; in the later stages, particularly with greater consumption of the beverage, there is a loss of muscle control — people have a hard time standing up and walking home. While loss of muscle control also can extend to speaking, people report that their thought processes are very clear and many ideas come to mind. Vision is also affected after consuming large amounts of *sakau*, which can be quite problematic for the walk home, as the late Narcisso Kostka¹⁹ pointed out: “You must be careful. There are two cars coming and you don’t know which is the real car. You don’t know which one is the real road and you can go off.”

The person eventually goes to sleep, sometimes in the *nahs* or other part of the house where *sakau* is being consumed, or goes to their own home. Some people say they are not hindered in their motor skills unless they are very intoxicated. Signs strategically placed around Pohnpei, particularly near the State Hospital, strongly recommend that driving under the influence of any substance is to be avoided. Sometimes people get sick to their stomachs and even vomit, and this is ascribed to overconsumption, inexperience with the plant, or the quality of the water used to prepare the *sakau*. Overall, *sakau* intoxication is preferred to that from alcohol.

One person interviewed²⁰ described a “progressive relaxation” during *sakau* drinking, with the relaxation beginning in his neck and traveling slowly down his backbone:

> It kind of gets into my hips and I just start feeling really good…. First I get the relaxing feeling — physical and then mentally my mood changes. I start to unwind and I start to enjoy the people I am with and I want to joke and start being kind of funny…. It is a happy feeling, and you are happy with everyone and just want to joke and you are really up. Then you start going the other way. Towards the end I am sensitive to light and don’t really want to hassle with anything…. I hit the pillow and I’m out…. I wake up and pop right up and I feel great…. Except sometimes you have a sick stomach if the water [used to pound *sakau*] is bad. If you have the right amount of *sakau*, it is like the grease that keeps you going.
Ecologist Clay Trauernicht, based on Pohnpei during the first half of 2005 as a research assistant for this project, described his first Pohnpeian experience with sakau as follows:

The first cup (about ¼ coconut shell) produced a similar feeling to powdered/dry root Polynesian kava I have tried: slight and spreading numbing sensation beginning at the lips and tongue and spreading back towards the throat. This feeling may have been enhanced by the sliminess of the *H. tiliaceus* bark coating my mouth and throat. I ingested two more draughts (perhaps two mouthfuls each) over the next 10 minutes and began to feel a mild euphoria by the third drink. The altered perception induced by the sakau felt like pleasant warmth settling over my mind — making the things happening around me seem both slightly fuzzy and extra-amusing. This “fuzziness” did not manifest as any visual hallucinations, but rather as an extreme mental relaxation that lessened my awareness of the details of the events and conversation taking place in my vicinity. Despite this shift in my perception of external stimuli, the lucidity of my own thoughts felt heightened. Over the next half hour of drinking I became extremely talkative, focusing intensively on questions about the Pohnpeian language. There was also a shift in the overall mood and interactions I was having with the Pohnpeians drinking with me. Whereas most were quiet and reserved while we were pounding and preparing the sakau, about a half hour or 45 minutes into drinking they were much more receptive and enthusiastic about my questions and joking about my attempts at speaking the language.

About an hour after beginning to drink I got up to get dinner and felt the first physical effects of the sakau. My legs did not give out from under me but felt weak and less responsive. Although I was capable of supporting myself, my balance was slightly off and there was a definite reduction in my coordination. I recall slipping several times on the tile floor and not feeling very confident or solid in my footing.

At about one and a half hours into the session I started to feel a slight queasiness in my stomach. I am not sure if this was a result of the uneasiness on my feet or from the food, but I believe it began before I started eating. After standing up to get dinner I remained more aware of the physical effects of the sakau — e.g., slight numbness and weakness in my limbs. I continued drinking — consuming a couple mouthfuls of sakau every 10 or 15 minutes. The mild queasiness remained but did not worsen. By about two hours or so into the three-hour session conversation began to slow and the euphoria was replaced by an overall feeling of drowsiness — both physical and mental.

While many studies have been carried out on the ethnobiology, physiology, chemistry, and psychological effects of sakau and much is known, there are still gaps in our knowledge of its effects and mechanisms of action. This is not un-
common, as clinical trials on botanicals and pharmaceuticals that explain the pharmacologic mechanisms for activity are relatively new, with much to be accomplished. For example, the mechanism of action for aspirin — a drug used widely and successfully for over a century in medicine — was until recently completely unknown.

**Sakau Physiology**

Many physiological effects have been attributed to kava, including the following: local anesthetic (Cairney et al. 2002; Gleitz et al. 1996; Singh 1983), muscle relaxant (Bone 1998; Martin et al. 2000; Singh 1983), sedative (Clouatre 2004; Davies et al. 1992; Jussofie et al. 1994; Singh and Blumenthal 1997), anticonvulsant (Cairney et al. 2002; Gleitz et al. 1995, 1996), anxiolytic (Bilia et al. 2002; Davies et al. 1992; Dharmaratne et al. 2002; Dinh et al. 2001; Jussofie et al. 1994), analgesic (Clouatre 2004; Singh and Blumenthal 1997), antimycotic (Loucher et al. 1995), anti-inflammatory (Wu et al. 2002), and antithrombotic (Gleitz et al. 1997). The chemical constituents responsible for these effects are a group known as kavalactones and chalcones. There are eighteen kavalactones that have been identified, with six recognized as the major constituents responsible for reported therapeutic activities: *yangonin, desmethoxyyangonin, kavain, dihydrokavain, methysticin,* and *dihydromethysticin.* Three chalcones have been identified from this plant: *flavokawin A, flavokawin B,* and *flavokawin C.*

As seen in Clay Trauernicht’s description, *sakau* drinkers initially note the sensation of numbing in the mouth and throat. Van Veen (1939) was the first to observe this. Subsequent publications attributed the local numbing effects to *kavain* (Meyer and May 1964). However, Baldi (1980) used an alcoholic solution containing increasing concentrations of *kavain* for subcutaneous injection as an anesthetic and noted the increasing duration from hours to days of local analgesia but also paralysis of the peripheral nerves in higher doses.

After several cups, a mild euphoria is often reported. Seitz et al. (1997) noted that *methysticin,* *kavain,* and a synthetic racemate of ± *kavain* inhibited the uptake of noradrenaline (but not serotonin), which may be one of the mechanisms responsible for the mild euphoria and other psychoactive aspects of kava. Despite reports of potential sedation and muscle relaxation with use of kava in one study evaluating cognitive impairment in intoxicated kava drinkers, there appeared to be normal performance in complex cognitive functions even with an ingested dose of 205 g of kava powder, representing a dose that was 150 times the recommended clinical dosage (Cairney et al. 2003). Usually within the first two hours, a palpable sense of amicability is reported in participants, and this is probably a function of reduced anxiety (Pittler and Ernst 2003) and euphoria. Lack of motor coordination is commonly observed as kava consumption continues. Kavalactones have been reported to cause muscle relaxation by affecting calcium chan-
nels in neuromuscular transmission (Bone 1998; Martin et al. 2000; Singh 1983). Blurry vision or disturbance of visual acuity is another commonly reported phenomenon. Definite changes in pupil diameter, accommodation, and oculomotor balance are not completely understood but are suspected to be a combination of pharmacological alterations in direct muscle activity and central nervous system (brain) effects (Clouatre 2004; Garner and Klinger 1985). Sedative effects or sleepiness is often reported after three or four hours of drinking kava. These effects are thought to be mediated by dopamine antagonism and/or influence of the kavalactones on specific areas of the brain that alter mood and wakefulness: the hippocampus, amygdala, and medulla oblongata (Clouatre 2004; Jussofie et al. 1994). In animal trials, *dihydromethysticin* (DHM) appears to have the most sedative activity (Hansel 1968).

**Sakau and Anxiety**

While chapter 8 lists some of the uses of *Piper methysticum* based on the herbarium collections made thus far in the project, its use for the treatment of stress and anxiety was mentioned very frequently during project interviews. This was particularly prevalent when discussions of the problems of modern lifestyle were mentioned. Retty Lawrence noted that while sakau helps a person to relax, “once the feeling is gone you are back in the same state again. . . . It calms you down for the time being.” But drinking sakau is useful for a problem that is hard to talk about, such as when a partner leaves a person, and that partner is embarrassed and cannot bring his or her feelings out in the open. In this case, Lawrence noted, “You hide everything to yourself until the medicine [sakau] starts having an effect on you, then it is easier to speak of your problems.” In a culture where the community and family relationships are still strong, this kind of “talk therapy” can be quite helpful.

Among all of the pharmacological effects that have been investigated, perhaps the ability of kava to reduce anxiety has been the most thoroughly studied. In a meta-analysis of eleven clinical studies evaluating kava as an anxiolytic, six met criteria for comparison (n = 345) and using the Hamilton Anxiety scale, a statistically significant reduction in anxiety was measured in the verum arms (experimental groups) (Pittler and Ernst 2003). The majority of the clinical studies showing kava’s effectiveness as an anxiolytic have used the standardized extract WS 1490, containing 70 percent kavalactones. Although the kavalactones are thought to be responsible for reducing anxiety, exactly how this psychoactive phenomenon occurs is not entirely clear. Mechanisms proposed for anxiolytic effects include kavalactone interactions with GABA, serotonin, and benzodiazepine binding sites (Bilia et al. 2002; Boonen and Haberlein 1998), the limbic areas of the central nervous system with reduction of excitability (Clouatre 2004), and reduced neuronal reuptake of norepinephrine. The kavalactones ap-
pear to have differences in uptake into the central nervous system. *Kavain* and *dihydrokavain* are the two kavalactones that pass through the blood brain barrier the most easily (Keledjian et al. 1988).

**Early Sakau Use and the Influence of Religion**

The arrival of the missionaries to Pohnpei around the middle of the nineteenth century brought two divergent philosophies regarding *sakau* — one preaching complete abstinence and the other incorporating it into Church ritual. The first path was taken by the Protestant missionaries. Albert Sturgis, one of the first members of the Micronesia Mission who sailed from Hawai‘i to Pohnpei in 1852, baptized his initial three converts on the island in 1860 and by 1862 had two churches with twenty-one members (Hanlon 1988). According to Hanlon (1988: 114–115),

> the missionaries required potential converts to disassociate themselves completely from the traditional rituals of Pohnpeian culture. The missionaries saw *sakau* “*kava*” as the ultimate symbol of the island’s dark ways: its use separated heathen from Christian. Albert Sturgis wrote: “To this people, *kava* is the only means of communication with their spirits; they hold a cup of drink, always in their hands, when addressing the object of prayer. . . . *Kava* is here what the cross is to the Christian; it fell from heaven as is the only means of obtaining a hearing here.” . . .

> The missionary was quite correct in one aspect of his assessment; *sakau* did indeed constitute the sacrament of the island. Pohnpeians employed *sakau*, a gift from the god Luhk en Leng, at all ceremonial functions. . . . They used *sakau* to communicate with their spirits, to bestow titles, to effect peace between warring parties, to seek pardon, and to demonstrate respect. It also possessed curative powers for certain physical as well as divinely caused illnesses. The *sakau* ceremony reaffirmed the order of Pohnpeian society.

Because of the power of *sakau* and its pivotal role in the traditional culture of Pohnpei, the missionaries were not always able to obtain compliance on their teachings, particularly in the early years that followed the introduction of Christianity to the island. The culture of *tiahk en sahpw* (translated as “the custom of the land”) (Hanlon 1988: 198) has always been one of the hallmarks of Pohnpeian culture and life.

The earliest Catholic missionaries began their work on Pohnpei in 1837, but they were not very successful. Beginning in 1886 during the Spanish period, marked by turbulence and competition with the more entrenched Protestant missions, Catholic priests were finally able to establish churches. The Catholic priests recognized the importance of *sakau* and accepted its use by the local
community. Nearly a hundred years later, in the 1970s, *sakau* was introduced into Church ritual by the Jesuits. The idea for this is credited to Father William McGarry, S.J., who explained this moment in Pohnpeian history as follows:

*Sakau* . . . is a heavenly thing. . . . This *sakau* fell down [from heaven]. And so it was considered something sacred. When you are carrying *sakau* on your shoulder, the whole plant, you never bow to the Nahnmwarki . . . because *sakau* is higher than the Nahnmwarki. . . . And so that’s the sacred thing in the Pohnpeian ideal. It has *manaman* [magical, spiritual power, authority] . . . . When I put it into the Catholic liturgy, I brought it right into the Church. I said to myself, *This is going to last ten or fifteen years, because it is becoming commercialized.* The fact is, it didn’t. People still want it. I was surprised. There was opposition in the very beginning, of course. But people want it. And they still want it. And they are making the distinction between the commercialized things, these *sakau* bars, and I think a lot of them are very happy with the fact that the Catholic Church has acknowledged this important symbol, and they want to keep this. . . . The word “syncretism,” . . . where you take two religious things and sort of fuse them — and you foul them up, and you get all confused. That did happen a bit. And I said to myself, *Well, I’m not going to worry about it.* . . . I did not intend that people would see power in the *sakau*. I intended it surely as a symbol of two things, which are alive today. And I don’t like certain things that I hear from other places, where they’ll take a symbol from the past which . . . is not practiced anymore. This [*sakau*] is something which is practiced today. . . . So if you ask for forgiveness of God, this is a fine symbol. Not meaning that it has some special power in it. It’s a symbol. A symbol that you use in order to ask forgiveness. At the same time, it’s used for reconciliation. . . . But I found in the very beginning, I remember the first time when we did it [introduced the ceremony into the Church], having been in Pohnpei I suppose only about nine years, tears came to my eyes. I felt like there was real meaning here. Then I was surprised that people really did appreciate it and it really moved them, because it is something of their own. But I did not worry too much about it. . . . This has always happened in the history of every religion, this mixture of the synchretism of two things coming together.

Father McGarry continued, describing the ritual that is now performed twice each year in the Church, before Christmas and before Easter,

After some reading from the scripture and some remarks, we would have people come up and sort of express something they are sorry about to one of the priests. And then after that was finished, the signal would be for the *sakau* to come in from the outside — a man would bring it in, one man, bring the whole plant. And he’d flip it over on the altar, take it down. They’d al-
ready pounded some, so it did not take too long . . . and then bring up the first cup [to the person leading the service] . . . and ask for forgiveness . . . mainly thanking God for forgiveness, was the idea. And then the second cup would go to one of the others . . . the pastor of that particular place. The third, we wanted someone [such as a lead parishioner] from the congregation to come up and say, “This is our reconciliation among ourselves. Let’s put aside arguments we’ve had, disagreements, and from now on let’s start again.” And the fourth cup was for the person leading the service . . . I’d insist we just leave it [the sakau plant] there and then say a prayer . . . and that was the end.

During our conversations in Pohnpei, people mentioned the introduction of sakau into the Catholic liturgy, sometimes with a positive opinion and other times in a less complimentary way. We did not know the religious background of the people making these comments, so it is impossible to judge the general reaction to sakau’s relatively new role in the Church. One traditional leader interviewed by us made it clear that if sakau was placed in the liturgy to help the people, that was a good thing, but if it was there to direct power away from the traditional leaders and tip the balance of power toward the Church in order to build membership, respect, and control, then he could not, of course, agree with that.

**Current Consumption Patterns**

Most of the information gathered on the uses of this plant on Pohnpei and published over the past few decades involves descriptions of the early or contemporary ritualistic use of sakau or its role as a recreational intoxicant. There is very little quantitative information about contemporary drinking patterns. While sakau drinking was once limited to the chiefs and others with high titles, it is now consumed by both men and women regardless of their rank or title and sold by the bottle as a beverage in the marketplace. This type is referred to as “market sakau” or simply “market” and sold in 1-liter bottles. As noted previously, it is usually somewhat diluted through the addition of more water compared with that made in the home (Fig. 6.15). In sakau markets, places where people come to drink market sakau, the beverage is served in individual cups.

In 2001, we developed a survey instrument designed to gather information on sakau consumption patterns and local canoe building and use as two important and representative aspects of cultural practices that involved plants. This was combined with a group of questions on demographic, environmental, and quality of life issues. Together the survey comprised seventy-two categorical and open-ended questions. The survey was constructed by a transdisciplinary group of individuals with skills in medicine, biology, ethnobotany, ecology, statistics, and Pohnpeian language and culture.²⁶ The four-page questionnaire was translated into Pohnpeian and orally administered to 180 people in July of 2001. Sub-
ject selection was directed toward obtaining an equivalent number of subjects based upon geographical distribution, age group, and gender. Results from the original surveys are being published as a series of papers, beginning with Brosi et al. (2007).

Of the total population sampled, 69 percent reported that they drink sakau, while 31 percent said that they do not drink it. Of these, 83.6 percent of males and 53.2 percent of females drink. Males reported, on average, spending 5.4 hours per week and women averaged 4.3 hours per week drinking sakau. Sakau, as previously mentioned, is consumed by the cup, usually a half coconut shell, at least during the ritual or home processing. In this survey, men reported drinking 8.9 cups of sakau per sitting and women reported consuming 7.7 cups. Market sakau is often consumed straight from a bottle that is passed around, or each person may have a separate bottle. We did not gather sufficient data on bottles consumed to make an accurate assessment of the average, but some people responded that they would drink one to two bottles in an evening. Interestingly, in September 2006, Dana Lee Ling of the College of Micronesia–Palikir Campus undertook a study of recreational sakau consumption in three markets in Pehleng, Kitti. These markets provided a setting for gathering data on how many cups of market sakau were consumed on average by people each evening. A total of 182 custom-
ers were studied during nine evenings of observation, with each market serving an average of twenty customers per night, varying according to the day of the week. The mean data recorded indicated a per capita consumption of 3.3 cups per night. Each market differed in its average sales to an individual person, ranging from 2.6 cups to 3.9 cups. Each cup sells for U.S. $1. Figure 6.16 shows the number of cups per person that were observed to be consumed.

Why do people drink sakau? In our survey, the highest number of people (44 percent) noted that the primary reason for drinking sakau was social, whether at a ritual ceremony, friends’ house, or sakau bar. The second major reason for drinking was the feeling that sakau provided, with 32 percent stating this as their primary reason. Boredom was suggested as a major reason for drinking by 17 percent, while help in sleeping was the fourth major reason, with 15 percent of people stating this reason. A few people reported that it helped them to forget their problems or anxieties. The feelings reported during drinking were the following: relaxation (44 percent); sleepiness (27 percent); dizziness (18 percent); feeling good (11 percent); heaviness (4 percent); numbness (4 percent); drunkenness (3 percent); weakness (2 percent); and tiredness (1 percent).

Jackson Phillip\textsuperscript{28} offered the following reasons for drinking sakau:

The sakau brings people together in a number of ways. First, it will be very difficult for me to sit down and eat the same food or from the same plate as a stranger. But it is very acceptable that I don’t know you and we share one
cup of sakau. That’s one. Sakau brings people together after a hard workday, and they want to sit down and talk about it. And the feeling, when you drink the sakau, I have the feeling that most people say they do — you can ask me for five dollars while I am drinking and I will tell you, “No problem.” During this time I feel really close to you. You might ask me for the five dollars when I wasn’t drinking sakau and I might not be willing to give it to you. When you are drinking the sakau, there are ideas that come to you. I think what is happening is that — because when you drink sakau, you feel mellow and you feel relaxed and all the other problems that you consciously or unconsciously have — there is more room for reasoning and thinking. Sometimes really, the next day, I remember this realization and I say, “How did I get this?” I came up with the nice idea, but how did I? I was drinking sakau.

We also learned from this survey that 64 percent of people on Pohnpei queried reported that they grow sakau (36 percent do not); this segregates into drinkers who grow sakau (72 percent) and nondrinkers who grow sakau (47 percent). The average number of sakau plants reported to be grown each year by these two groups is 297.

**Negative Effects of Sakau**

In response to the question of what people considered to be the negative effects that follow their sakau drinking, with no qualification as to frequency — that is, things that might have happened if they drank too much or on one or several occasions but not necessarily always — they responded as follows: hangover (14.52 percent); tiredness or weakness, particularly the next day (14.52 percent); sickness — such as nausea, vomiting, chest pain, and feelings of sickness (6.45 percent); headaches (4.84 percent); stomach problems (4.03 percent); insomnia (3.23 percent); and skin problems (1.61 percent). Most people report that they go to sleep after drinking (96 percent) or they eat (44.35 percent).

Mark Kostka summarized the negative effects of sakau during an interview on this topic as follows:

First, if you drink too much sakau you start getting scaly skin. So people that drink a lot of sakau, they always use oil — baby oil or coconut oil [on their skin]. It also makes you weak if you drink a lot of sakau. You get very weak. It makes you lazy, if you drink too much sakau . . . the next day. Also it causes other effects . . . And you get bad eyesight. Like you are still young and you cannot read or do things. You need to wear eyeglasses, because it is bad for your eyes. But it also has community problems. If you drink too much sakau, you don’t see your kids. If you drink a whole week, you don’t see your kids almost all week . . . . That’s why when you don’t spend a lot of time with your
kids you start to lose the traditional knowledge . . . and are not passing it down to them. It makes [some people] feel sick the next day, tired and unable to eat a lot of food . . . whatever food is eaten tastes bad.29

The skin condition described above is known as “kava dermopathy” and was first described by the botanist Georg Forster, serving on Captain James Cook’s second voyage to the Pacific, who noted about those who consume this beverage (presumably in abundance) that “the skin dries up and exfoliates in little scales” (as translated in Norton and Ruze 1994). Lieutenant James King, serving on Cook’s third voyage, observed that this skin condition, derived from consumption of this royal beverage, was regarded as “a badge of nobility” (Beaglehole 1967). Ruze (1990) suggested that extracts of this plant might interfere with cholesterol metabolism, and Singh and Blumenthal (1997) in a review article suggested that two pigmented biologically inactive compounds [substituted chalcones, known as \textit{flavokawin A} and \textit{flavokawin B}] may explain the skin’s reaction to excessive consumption. The condition is described as an ichthyosiform eruption (with “fishlike” scales on the surface of the skin) and disappeared following suspension of consumption.

Alcohol is commonly consumed after drinking \textit{sakau}, a practice known as \textit{kapohpo}. People will drink a few cans of beer or a six-pack, noting that it helps to settle the stomach, give them strength, and helps with the dry skin condition that comes with much \textit{sakau} drinking. In our survey, 47 percent of those interviewed said they drank alcohol — usually beer — after \textit{sakau}, while 53 percent reported that they did not drink alcohol with \textit{sakau}. Of women interviewed, 44 percent drank alcohol following \textit{sakau}, while 56 percent did not. Among men, 41 percent reported drinking alcohol following \textit{sakau}, while 59 percent did not. Alcohol is a central nervous system depressant, and its use is not advised when medicinal preparations of \textit{sakau} are taken for therapeutic purposes (Blumenthal et al. 2003). We have spoken with some physicians on the island who suspect that the practice of \textit{kapohpo} may be linked to a sudden death syndrome that they have recorded among people who drink \textit{sakau}. As kava is known to be a muscle relaxant and to have sedative properties, it is possible that the combination of another powerful sedative such as alcohol with kava potentiates both pharmacologic effects. In addition, in early pharmacologic studies it was suggested by Keledjian et al. (1988) that alcohol may enhance the concentration of kavalactones in the brain. Additionally, it has been hypothesized that those with cardiovascular pathology may be even more vulnerable to the strong muscle relaxant properties of the kava/alcohol mixture in \textit{kapohpo}, which would contribute to increased reports of sudden death by suppression of the cardiovascular muscle activity.30

The potential for kava to cause hepatotoxicity, which results in the abnormal elevation of liver enzymes, is another negative effect reported in the medical literature. Between 1990 and 2006, over eighty cases of kava-related hepatotoxicity
were reported. There were, however, fewer than five cases in which causal relationship could be established with “certainty” among the cases that originally appeared attributable to kava, according to an extensive evaluation by Waller (2002), an expert in hepatotoxicity. The cases associated with liver elevations for which there was uncertainty for kava as a direct cause of pathology either contained insufficient information in regard to ruling out other preexisting conditions or included the presence of other medications and or supplements that also may have been responsible (Anke and Ramzan 2004). There have been a number of theories proposed for the presence of this adverse effect. One hypothesis involves the presence of pyridine alkaloids in the form of the alkaloid pipermethystine, known to be cytotoxic and present in the stem of kava. Dragull et al. (2003) suggested that stems rather than lateral roots, the usual source of kava, may have been added as a “contaminant” to supplements but unrecognized by dietary supplement companies as such until patients emerged with liver abnormalities.

Another hypothesis accounting for the presence of kava hepatotoxicity proposes that there is a group of patients with a polymorphism of a cytochrome P450 2D6 deficiency, making them poor metabolizers of kavalactone metabolites (Russmann et al. 2001). In Europe, there exists a 10 percent prevalence of the cytochrome P450 2D6 deficiency, while this phenomenon has not been detected in Pacific Islanders, who have used kava ceremonially for hundreds of years. Thus those with this deficiency taking supplements are hypothesized to develop elevated liver enzymes because they are unable to detoxify intermediary metabolites damaging to the liver. In the Pacific Islands, kava is served as a water-extracted preparation, whereas extraction in kava supplements employs acetone and alcohol as solvents. Experts believe that the use of acetone and alcohol as an extractant may draw out different kava constituents and/or proportions of kavalactones that place those vulnerable at risk for hepatotoxicity (Gurley et al. 2005; Unger et al. 2002).

To further clarify the effects of kava and liver damage, we decided as a secondary objective of the 2001 survey to look at the medical records of the known users in the original kava survey. Permission from the subjects, the Department of Health of the Federated States of Micronesia, and the chief of staff of Pohnpei State Hospital was granted, providing the team an opportunity to look at the medical records of participants of the original survey and evaluate their charts for reports of hepatic abnormalities. The hypothesis was that all subjects in the survey would have received care and would have been registered at Pohnpei State Hospital if there were medical complications of any sort. As the kava usage pattern for each respondent was known, we could see if there was a strong correlation between heavy kava use and hepatotoxicity. We hypothesized that we should see some indication of a positive correlation. Out of 180 respondents, 133 individuals were positively identified as having medical records at Pohnpei State
Hospital. Preliminary results indicated that 15 percent of the charts reviewed show some indication of either pancreatic or hepatic abnormalities; the majority of cases were derived from an infection of *Entamoeba histolytica*. *E. histolytica* is a common gastrointestinal infection in developing countries where water sanitation is poor. Of those identified with gastrointestinal abnormalities, none showed elevations listed as primarily derived from kava ingestion, 30 percent of those identified ingested no kava whatsoever, and 70 percent used kava from one to ten days a month (a modest amount), while 25 percent were heavy users (drinking kava every day). These preliminary results do not suggest a correlation between heavy kava use and hepatotoxicity in a water-extracted source. It is estimated that in 2001 over 250 million daily doses of ethanolic kava extract products were ingested over a ten-year interval, with only two known cases established with a causal relationship to kava (Schmidt and Narstadt 2002). The incident ratio calculated by Schmidt at that time was approximated at 0.0008 cases per 1 million daily doses. By comparison, the hepatotoxicity incidence of various conventional benzodiazepines used for the treatment of anxiety are noted to be 0.90 (Bromazepam), 1.23 (Oxazepam), or 2.12 (Diazepam) cases per million daily doses — rates substantially higher than kava. De Smet (2002), an expert in pharmacology, has suggested that if an herb caused an adverse reaction in one in a thousand users, a traditional healer would have to treat 4,800 patients with that herb in order to have a 95 percent chance of observing the reaction in more than one user. Thus, with such a low incident ratio for kava, we acknowledge that the sample size was too small to capture a significant result in regard to a correlation between kava and hepatotoxicity. However, our preliminary results are encouraging in that not a single case of hepatitis could be linked to kava use.

**Intentionality of Sakau: Folk Classification Based on a Declaration of Purpose**

While Rahmwannger and Rahmedel are the two primary cultivars of sakau recognized by people on Pohnpei, local people recognize a much richer sakau taxonomy at another level that we propose to call “intentionality.” This categorization is based on a *declaration of the intention of its use* — that is, the message that the presentation of sakau and the declaration that accompanies it conveys to the person or persons who hear it, designed to provoke a response. The use of this plant and the distinguishing declaration does not imply that the plant itself is morphologically different or unique from others, but rather it differs at another level: through its meaning. This is consistent with the concept of intentionality originally developed through medieval scholastic philosophy, later refined and currently explained as “aboutness.” According to Dennett and Haugeland (1987), “Phenomena with intentionality point outside themselves, in effect, to
something else: whatever they are of or about.”\textsuperscript{31} Thus we offer this designation in seeking to explain a phenomenon that appears quite unusual based on our other ethnobotanical experiences.

An important example of how a sakau type “declares” an intention would be its preparation, presentation, and consumption as part of the very traditional ritual of a man’s family asking a woman’s family for her hand in marriage. Three sakau plants are utilized during this ritual. Morphologically identical and indistinguishable to the plant taxonomist, they possess very different intentions. The first is called Sakau en Tomw or Koalodamwahu. This is presented as part of the classical apology ritual, where resolution is asked for any problems between the families. The man’s family brings a plant, presents it to the woman’s family, and then cleans, pounds, and serves the sakau. Four cups are served, the first to the family leader of the woman’s side, then to the father or mother of the woman, followed by a cup to her brother or sister, and finally to the person who will be officially asked to relinquish this woman to the intended groom as her husband. On the fourth cup, conversation begins, while others in the setting continue to drink the sakau.

The second plant, referred to as Sakau en Pwahda, is then introduced. As with the first sakau, the plant is brought in, cleaned, and pounded, and four cups are prepared (five cups are used in Nett). The order of the presentation of cups of sakau is reported as follows: father, person preparing the sakau, oldest brother of the woman, and the woman who is being asked for her hand in marriage. In the Kingdom of Nett, the first cup is presented to the family or clan leader present, followed by the above sequence. At that point the person on the man’s side who is talented in oration, perhaps the father, asks the woman’s father, mother and family leaders to permit her to marry the man they are presenting. As part of this oratory, the canoe, a key element in traditional Pohnpeian culture, is used as a metaphor for the intended union. The orator describes the young man as the main body of the canoe (wahr) and the woman as the outrigger (dahm) whose purpose is to provide stability. The orator reflects on the fact that a canoe without an outrigger cannot sail, and the people within it would drown and die. With an outrigger, a canoe can sail properly, the people in it together and safe. The head of the visiting group making this speech explains why they are there: “This cup is presented to ask for your daughter in marriage,” and the orator then introduces all members of the group on the man’s side who are present at the ceremony. At that point the other family knows the purpose of this visit and why this group has come to their home. If they accept this offer of marriage, the head of the host family will formally introduce the members present. Rarely will a proposal be turned down. It is said that in the past, if the answer was negative — for whatever reason — the two families would pound and drink sakau until the answer was positive and the marriage could be planned.

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The third *sakau*, *Sakau en inen Pahnta* (or *Sakau en Pahnta*), is used to end the ritual, agreeing to mutual acceptance of the proposal. The word “*pahnta*” literally means “blood” and refers to the lineage of a family — the blood of one family joining with that of another. The woman’s family brings in this *sakau* as a farewell to their daughter and demonstration of acceptance of the joining together of the family. The order of presentation of the four (or five) cups is the same as with *Sakau en Pwahda*, and the cups are presented to the man’s family, honoring the visiting family by presenting the first cup to its highest ranking member. In today’s nontraditional world, there may only be one *sakau* presented to the woman’s family — *Sakau en Tomw*. Alternatively, a gift such as a case of soda or drinking coconuts can be brought and used in place of *sakau*. If the woman is part of the royal lineage — coming from the family of the Nahnmwarki or paramount chief — then an additional ritual is added to the ceremony. The man’s family brings a red-stemmed cultivar of sugarcane (*Sehu Nta*, alternative form *Seunta*; or *Sehu Weita*, alternative form *Seuweita*) that is peeled and cut into four pieces, raised up, and presented to the Nahnmwarki. If he selects one piece of cane and chews it, this is a signal that he agrees that the marriage can take place.

There are numerous daily activities for which intentions are declared by a person stating the type of *sakau* being presented to another individual. These include the following:

- **Sekewen padahk.** To encourage conversation, particularly if you wish to hear a legend from a storyteller or perhaps something on the history of Pohnpei. While not used much at present, it is the polite way to ask for information.
- **Sakau en enihtik.** To speak with someone about local medicine.
- **Sakau en pwahda.** When you have something in particular to speak about.
- **Sakau en pwahpwa.** When you wish to have general, open conversation.
- **Sakau en tomw.** To apologize and ask forgiveness for any insult or problem between you or your family or between families, undertaken in the common language.
- **Sakau en kasohralap.** A second *sakau* that follows *Sakau en Tomw*, erasing the problem from memory, after the forgiveness ceremony, declaring “Whatever is forgiven is forgotten now.”
- **Sakau en misik.** To apologize and ask forgiveness from the Nahnmwarki, discussed in respect language, or in general to ask for his help.
- **Sakau en pekimahk.** To apologize and ask forgiveness from someone without the Nahnmwarki or chief present.
- **Sakau en elu.** To ask forgiveness from a spirit or family ghost, such as an ancestor who is unhappy and has come back to haunt you, usually using the largest *sakau* plant a person has, along with a baked pig. A cup of *sakau*
is prepared and taken to the grave of the ancestor or place that the ghost is present and is thought necessary to appease the spirit.

- **Sakau en uremei.** A type of sakau used when a person is pounding on a new stone for the first time to inaugurate it.

Much of traditional life in Pohnpei revolves around respect, particularly for the king, chiefs, and elders in the society. The following activities pertaining to royalty are declared through the specific names a person uses for the sakau when entering the royal household or setting:

- **Sakau en kapwarsou.** Sakau that is presented to the Nahnmwarki in the morning to wake him up.
- **Sakau en pahnsou.** Sakau presented to the Nahnmwarki at noon, in the middle of the day, and only presented to the Nahnmwarki.
- **Sakau en pahnkiol.** Sakau presented to the Nahnmwarki in the afternoon.
- **Sakau en keduhsou.** Sakau presented to the Nahnmwarki at the end of the day to bring the sun down.
- **Sakau en kampwul.** Sakau presented to the Nahnmwarki at night, needing a light to locate it in the field.
- **Sakau en ahmwadang.** Sakau that is brought into the nahs or feast house upon the arrival of the Nahnmwarki.
- **Sakau en kesoumwoal.** This is a very important and powerful sakau, as it is the one that will move the Nahnmwarki or Nahnken (oratory chief) from wherever he is sitting and follow the person to another place, no matter what the royal person is doing or the time of day. The person brings the sakau to the king or chief, throws it down wherever he is sitting, and declares that it is Sakau en kesoumwoal. At that point, the Nahnmwarki must speak with them to resolve the problem or emergency. “Kesou” means to move a person and “mwoahl” is the place where the Nahnmwarki is sitting.
- **Sakau en kourdienial.** If the Nahnmwarki gets angry and walks out of the nahs, a person can take the sakau plant and throw it in front of the Nahnmwarki, and he would have to stop and stand where he is. Then the person cuts off the stems of the sakau, takes four pieces of root wrapped in four leaves, and presents it to the Nahnmwarki, who cannot go around the sakau once it is set in front of him. If he accepts the root, the Nahnmwarki must return to the nahs and pound it. At the time when the Nahnmwarki returns to the nahs, a person presents Sakau en misik to him to ask forgiveness for what he was angry about. This is further evidence of the power and sacredness of the sakau — that even the king cannot cross over it and must return to the nahs when it is declared.
- **Sakau en wisikipwel.** Harvest of the first sakau plant given to the Nahnmwarki as tribute.
• **Sakau en kamalau.** When thinning out the *sakau* plants as they may be growing too close together and will not grow well, the removed plant is presented to the Nahnmwarki.

• **Sakau en Luhwen Mwet.** The last *sakau* plant in a person’s field that is given to the Nahnmwarki as tribute, and thus he knows you have no more.

• **Sakau en kadawahl.** When the Nahnmwarki is giving a title to a person, it is done during a feast, and while the Nahnmwarki is not present, the person getting the title collects this *sakau* and brings it back to the Nahnmwarki as tribute, using this name. It is said that this rarely happens today.

During the interviews, people remembered other traditional names for *sakau* but did not recall the intentionality suggested by the name, reflecting the continuing state of erosion of this set of cultural knowledge on Pohnpei. As we continue our work on the island, a greater understanding of this phenomenon may be possible and perhaps extend to other important cultural keystone species of plants.

### Conclusion

From its divine origins and revered status in Pohnpeian traditional culture to its modern-day use in sacred ritual and recreational activity, *sakau* is without doubt the most important plant on Pohnpei. It has influenced the way Pohnpeians view each other, their community, and the world ever since its arrival, presumably from Vanuatu via innumerable voyages, trading, and back migrations. There is still much to be learned about contemporary cultural use of *sakau*, as well as the science of how its effects influence human physiology. Potentially, this plant could play a much more important role in global health care, but only if questions about the benefits as well as the adverse effects of some of its preparations are answered via research in basic science and clinical trials. We suspect that *sakau* will continue to “speak” on Pohnpei for many generations to come, even as globalization exerts such a dramatic change on local lifestyle.

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Notes

2. We have been told by many people in general conversation that consumption of sakau has increased since the time of the survey, with more young people drinking.
4. The other type of origin myth as classified by these authors reflects the indigenous generation of the plant — that is, its local origin.
6. The original paragraph numbers have been removed, the text modified slightly, and sections of the annotations of the translators, based on their commentary in the second book, as indicated, inserted in brackets. Note also that in the English version, the word "sakau" is translated as "kava."
7. The spelling of the name as cited in the original publication was Uitanńar; additional minor changes in the spelling have also been made.
8. Noted by the translators as soakoa in the Kitti dialect and sakau in the main dialect, meaning "intoxication" or "liquor," the latter referring to alcohol.
9. The spelling of the name as cited in the original publication was Tiuienlań.
10. The spelling of the name as cited in the original publication was Patanlań.
15. A larger plant with multiple clusters of roots is separated by a sharpened wooden stick.
16. In all municipalities except U, this stone is located on the left side of the nahs (as a person faces the entrance).
18. Water is added to the root mass following the squeezing of the first four cups — but only as needed once the root mass becomes too dry to produce sufficient liquid. It is kneaded into the mass until the pounded roots are rehydrated.

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