

This series of essays explores lessons and observations from fieldwork that might be of interest to the integrative medical community. In this context, the authors discuss “new” or less celebrated botanical medicines and unique healing practices that may contribute to the further development of contemporary integrative medical practices. Perhaps this column can facilitate an appreciation for our own roots and those of other cultures, before such ancient wisdom disappears forever.

TRADITIONAL USE OF SAKAU (KAVA) IN POHNPEI: LESSONS FOR INTEGRATIVE MEDICINE

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The outrigger canoe moved effortlessly through the topaz-hued water, its sturdy bow cutting through the peaceful sea, passing over the coral reef 2 m below. In this setting, as clear as an aquarium, we could see brightly colored fish feed off the branches of staghorn coral, then dart below the brain coral to hide from larger fish that also came in search of food. Two giant manta rays glided just below us, their wings stirring up the white sandy surface of the reef. There are not many places on earth where this type of environment still persists, and we were thankful to be present in this place, to observe this remarkable drama.

As we paddled closer to the shore of the island of Pohnpei, we could see the coconut trees and seaside vegetation common to the area, highlighted by the fiery orange hues of the 4 o'clock sun. A few meters from land we began to hear an unknown sound—a sharp strike followed by a short, ringing reverberation, reminiscent of the old circular steel gongs used to summon volunteers outside 19th-century firehouses. We glanced at our guide, and he could tell immediately that this sound was as new to us as we were to his island. “Sakau,” he said. “People have started to pound sakau for drinking tonight. When their neighbors and friends hear that sound, people will come over to the *nahs*, the traditional feast house, and help the family pound sakau, and then drink it with them. Maybe there is a family celebration, a child’s birthday or forthcoming trip off of the island, or a funeral, or maybe they just want to pound and drink sakau and talk.”

The pounding took on a distinct cadence, getting louder and louder as more people joined the group in the *nahs*. It was a wonderful sound, enchanting and even seductive as we approached the shore. The rhythm would increase, slow down, and then stop. As we were to learn later, when the sakau roots—also known in Oceania and the West as kava (*Piper methysticum*)—were fully pummeled, another batch was brought for processing.

Sakau plants are grown in agroforestry plots in Pohnpei, mixed in with bananas, breadfruit, mangoes, sugar cane, taro, tapioca, and other plants common to the traditional diet of this island. The plant is a member of the pepper family (*Piperaceae*) and has been grown on Pohnpei for many generations. Its origins are attributed to eastern Melanesia or the New Hebrides.¹ It is thought that the distribution of kava was initially Pacificwide, but died out in the Society Islands, the Marquesas, Tubuai, the Cook Islands, Niue, and Hawaii. The waning use of kava in these islands is partially attributed to religious influences discouraging its use during the colonial period, as kava drinking was considered an unhygienic, heathen practice.² In many of the islands in precolonial times, preparation of kava required premastication of the lateral roots by those preparing the drink. They would subsequently spit the contents into the mouth of a coconut shell and strain all of the fibrous content before its final serving to honored recipients.³

The plant’s above-ground portion is made up of heart-shaped leaves (characteristic of this family) and up to a dozen stems 2 to 2.4 m in length, each 2.5 to 5 cm in diameter. Two varieties are known to this island, one with smooth green stems and one with purplish spots on the stem. Like all pepper-family plants, the flowers are short, white spikes up to 15 cm long that form at the end of the stems. The above-ground portion of the plant has some value; for example, the leaves can be squeezed on wounds as a source of antiseptic juice. But the plant is revered for its below-ground

portion, a massive root ball that can weigh 4.5 kg or more. The root ball is constructed of a central root system that reaches down into the ground and a network of side roots, known as lateral roots, which grow outward from the stem cluster and give the plant its stability. These lateral roots are of interest to sakau drinkers, and when the plant is harvested, most of the stems are cut—a few are kept with the plant if it is to be used in a traditional way such as a gift to a traditional leader presiding over a funeral or festival. The cut stems are then reinserted into the ground, where roots grow from the swollen nodules characteristic of this stem, and the plant propagates endlessly in this way.

The lateral roots are 15 cm or more in length and the diameter of a wooden pencil. They are cut from the root mass and washed in water, removing the soil in which they grew. The roots are then placed on a flat, round stone, about 1 m in diameter and 15 cm thick. Rounded, egg-shaped pounding stones about the size of a large avocado are gathered from a stream. Up to 4 people use the stones to pound the roots at a tempo set by the senior person in the nahs. The sakau is pounded for 10 minutes or more until the roots are finely macerated, then water is added to the pile of pale brown fibers that sit in a small mound on the stone. Next a person takes the bark of a local tree, *Hibiscus tiliaceus*, and strips away the outer portion, revealing a cream-colored inner core. The fiber-like pieces of the inner bark are stripped, beaten, laid flat on the pounding stone, and filled with wet sakau root. The person appointed to squeeze the sakau packs the fiber with as much as it will hold, then twists the hibiscus fibers to make a simple press. As the press is twisted, a viscous brown fluid flows from the fissures in the fiber and fills the coconut cup that another person holds under the press. Once many islands served kava in this manner, but now Pohnpei is the only island that uses hibiscus fiber as part of the preparation process.²

The cup is ceremonially presented to the ranking member of the clan present in the nahs, who drinks the entire cup of bitter, thick fluid. Often a glass of water follows the sakau cup to dilute the bitter taste. The next 3 cups of sakau are given to those present who hold the highest titles, and then the cup is presented to everyone who will drink. Drinking goes into the night, often very late. In the beginning, sakau fosters much conversation, and topics range from family matters to community to island politics. Sakau drinkers tell

of a feeling of camaraderie when drinking, of concern for all in the room, even describing it as love. In contrast to alcohol, the mood is passive, peaceful, and calming. Physiological research on the effects of sakau support these indigenous observations. Seven clinical trials have shown the efficacy of kava as an anxiety-reducing, sedative hypnotic.⁴ Finally, in the late evening, people become quiet, absorbed in thought.

Lewis Lewin, the great 19th-century German psychopharmacologist, placed this psychoactive plant in the category of *hypnotica*. Some Pohnpeians will drink alcohol, primarily beer,

after sakau, and then go to sleep in the nahs or at home. If one has consumed many cups of sakau, it is hard to walk, drive, or be very mobile. Someone described to us a major difficulty of driving under the influence: the impossibility of distinguishing which of the 3 pairs of headlights on the other side of the road is attached to the real automobile. Here on Pohnpei, most people know not to drive while under the influence of sakau.

Sakau is the most important plant in this island's culture. It is used to ask forgiveness when a family member harms a person in another family. It is used to settle disputes between parties, always mediated by a chief or titled clan member. It is used to ask a father for his daughter's hand in marriage, and during all of the required feasts, such as the yam festival or the beginning of the breadfruit harvest. It is the plant that symbolizes respect for oneself, one's

family, and one's culture. It holds the culture together through the most difficult of times. If a visitor comes to your house, an offer of sakau shows respect for the visitor even more than food or television.

During a field trip to the island by 2 members of our research team, Berry Brosi and Rob Wolkow, MD, data were gathered on the traditional use of sakau. The results were most revealing. The average sakau drinker spent 4.27 hours (women) and 5.36 hours (men) drinking between 7.72 (women) and 8.87 (men) cups per sitting. As we will see, Pohnpeians drink a great deal of kava, based on kavalactone content (the active ingredients found in kava roots).

In Europe, controversy swirls around the use of this hypnotic botanical. In 1998, isolated reports of hepatotoxicity began to appear.⁵ At least 28 cases of liver toxicity associated with the use of kava have been reported in Germany (24) and Switzerland (4), prompting regulatory action. The adverse



Pohnpei islander carrying sakau roots (*Piper methysticum*). Photo courtesy of M. J. Balick.

event reports included cases with cholestatic hepatitis, jaundice, elevated liver enzymes, severe hepatitis with necrosis, and, in 4 cases, irreversible liver damage requiring liver transplant.⁶ The cases in Switzerland identified an acetone-based kava extract called Laitan, a brand associated with these reports. The product was standardized to a 70% kavalactone content. Subsequently the product was removed from the Swiss market. Ironically, the acetone extract had been the subject of substantial scientific scrutiny, with at least 7 clinical trials indicating its safety and efficacy.⁴ In November 2001, the German Federal Institute of Drugs and Medical Devices issued a letter informing all manufacturers of kava-containing products about the federation's intention to withdraw the products from the market, based on the adverse event reports.⁶ In response to the German action, the American Herbal Products Association (AHPA) contracted Donald P. Waller, PhD, professor of toxicology at the University of Illinois at Chicago, to review the 24 cases (Roy Upton, e-mail, December 2001). We understand this report will be released shortly.

The press has picked up this story, sometimes erroneously overreporting the true number of adverse event reports, and the public is very concerned. What can our observations of the traditional use of kava in Micronesia reveal about this controversy? Are there lessons that practitioners of integrative medicine can learn from understanding the use of a drug

in its native setting? And what aspect of those lessons needs to be transferred from the forest to the clinic? We think these issues merit consideration, especially in this case. Based on the average content of approximately 250 mg of kavalactones per "cup" (half of a coconut's inner shell), the average estimated Pohnpeian consumption per sitting is 2,400 mg of kavalactones. The daily dose recommended by herbalists and medical practitioners is around 300 mg per day. The Pohnpeian "dose" is 8 times the recommended daily dose. If kava were toxic in its water-extracted form, we would expect to see an epidemic of hepatotoxicity in Pohnpei and other regions. However, this does not seem to be the case, based on my (R. L.) experience as a medical doctor in Micronesia, where kava is commonly consumed.

What is happening here? One answer may be that the kava sold commercially in Europe that has resulted in hepatotoxicity is extracted with acetone-based or methanol-based solvents. Compare this to the water extract produced by traditional cultures. The resulting extract differs greatly in its content and concentration of kavalactones. There are other possibilities as well, such as differences in genetic variability to metabolize the kavalactones and their byproducts. Are the reports of hepatotoxicity accurate and detailed enough to positively associate this condition with the use of the kava product? Finally, is there any other aspect of traditional preparation that protects the liver? Our fieldwork this summer in Micronesia will try to answer some of these questions, at least in a preliminary way. Perhaps kava is not the only herbal supplement that deserves further study in the regions where it is native, where it has been used in vivo for thousands of years. This is an important frontier in the field of ethnomedicine, and we suspect that there is much to be learned through such study.

Acknowledgments

This report covers one aspect of the work of a multidisciplinary field project studying the relationship between plants and people in Micronesia. This effort focuses on botany, ethnomedicine, traditional land management and resource systems, conservation and education. Collaborating groups include The College of Micronesia-FSM, The Continuum Center for Health and Healing at Beth Israel Medical Center, The National Tropical Botanical Garden, The Nature Conservancy, The New York Botanical Garden, Pohnpei Council of Traditional Leaders, Pohnpei State Government, and The University of Arizona College of Medicine Program in Integrative Medicine. We are grateful to the Overbrook Foundation, The Gildea Foundation, CERC—The Consortium for Environmental Research and Conservation at Columbia University, The MetLife Foundation, Edward P. Bass and the Phileology Trust, and the Prospect Hill Foundation for support and interest in this project.

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