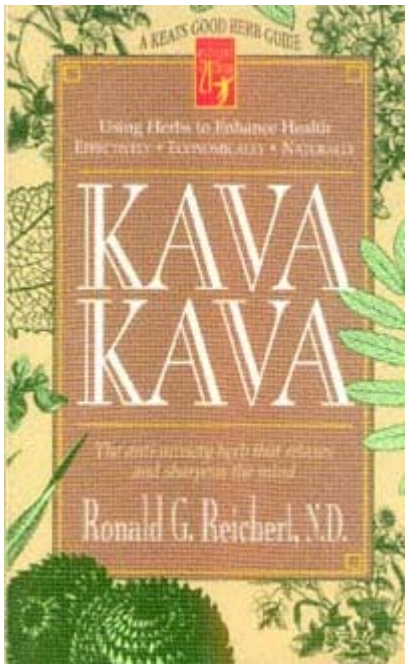

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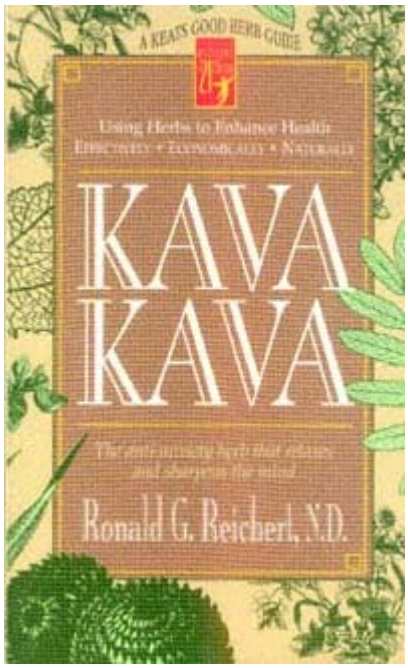
The Antianxiety Herb

Kava kava is the perfect herb for relieving anxiety. Without the heavy sedating side effects of prescription drugs, it promotes both a relaxed and alert state of mind. This remarkable dual effect has been confirmed by numerous German research trials.

In addition to its mild antianxiety activity, kava helps with both mild insomnia and alcohol withdrawal.



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About the Author

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A KEATS GOOD HERB GUIDE

Kava Kava

The Anti-Anxiety Herb that Relaxes and Sharpens the Mind

Ronald G. Reichert, N.D.

Keats Publishing, Inc.
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Kava Kava is not intended as medical advice. Its intent is solely informational and educational. Please consult a health professional should the need for one be indicated.

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Contents

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Introduction

What is kava kava? While readers who are unfamiliar with Polynesian traditional medicine can be forgiven if they confuse the name with some of the latest rap lyrics, it is actually an important plant native to the Pacific islands of Polynesia and Melanasia. In these cultures, kava has an important significance as a social and ceremonial herb. For example, in Samoan society, kava drinking represents the most crucial aspect of the *aiava*, the ceremony of welcoming visiting parties (*malaga*) and, as such, carries with it much of the weight of native hospitality. Numerous international dignitaries from Pope John Paul II to Hillary Rodham Clinton have been so honored.

Kava drinking not only helps to welcome distinguished visitors but also serves as a ritual for the commemoration of any meaningful affair ranging from marriages to honoring the gods. The traditional use of the herb has been preserved by Pacific island cultures in a ritual called the kava ceremony. After chewing or pounding, the kava root is mixed with water, resulting in a cloudy, milky drink. Mixed with the lipid or fatty portion of this drink are the active ingredients known as kava lactones or pyrones. It is these unique plant chemicals that are primarily re-

sponsible for kava's antianxiety and sleep promoting actions.

Standardized kava root extracts containing 70 percent lactones are highly touted in Europe as herbal alternatives to such commonly prescribed antianxiety agents as Valium. Unlike the heavy sedating action that this class of prescription drugs encourages, kava seems to promote a relaxed state of mind while at the same time heightening mental awareness. This remarkable combination has been confirmed by numerous German research trials. Kava not only helps individuals deal with the symptoms of generalized and menopausal anxiety, but may also promote a more restful sleep for those suffering from insomnia. One of the kava pyrones called kavain has even been shown to be of use in individuals trying to stop drinking alcohol.

In addition to clinical trials, hundreds of research papers have been devoted to kava pharmacology. In these experiments, kava or its active ingredients have shown themselves to be anesthetic, anticonvulsive, anti-ischemic as well as pain-relieving agents. When taken over a four- to eight-week time period, research has shown that 100 mg of a standardized kava extract (70 percent kava lactones), taken three times a day, is amazingly free of side effects. Even in cultures where kava is a central part of the religious and ceremonial events, if not too strong a preparation, it promotes a relaxed and tranquil state of mind that fosters socializing.

However, this does not mean that kava cannot be abused. Although successfully introduced to Australian aborigines to counter the effects of alcohol abuse, heavy and long-term use of the herb seems to

carry with it its own brand of health risks. For example, long-term consumption of the liquid leads to a dry scaly skin condition called *kava dermopathy*. Recent reports of motorists charged with intoxication while driving under the influence of kava makes it very clear that this plant should be used with care. Mixing this herb with alcohol and/or other recreational or prescription drugs may be a recipe for disaster and must be avoided. Whether kava can be classified as an herb or a drug is open to debate at this point. It is hoped that the following information on kava will help the reader make informed and safe choices.

Botanical Facts about
Kava

Kava kava (*Piper methysticum*) is a member of the black pepper family and native to many gardens throughout the islands of the Pacific. This robust perennial plant thrives at altitudes of 500 to 1,000 feet above sea level and grows best in warm, sunny and moist climates with rich soil. In these types of habitats kava can reach up to 18 feet in height, but it is usually harvested when it is about seven to eight feet tall. Kava is an attractive plant with woody, jointed stems and leaves that are heart-shaped and dark green in color. Three to five years after planting, the mature kava root can be up to two feet in length and two to three inches thick. Roots that are heavily knotted and intertwined have been highly valued by natives because as the root ages it is said to gain in both strength and flavor. Modern herbal preparations primarily use the root and rhizomes (lateral roots) for extraction purposes. Kava is, however, not the same from island to island; botanists and local growers are able to differentiate various strains of the plant based on stem or leaf color. For example, in Hawaii there are 14 variants of the herb, each with a unique traditional name. Fiji has

five types of kava, three white and two black, while Samoa is said to have nine varieties. It is reported that for Hawaii and some other Pacific basin societies, this species differentiation meant that only certain types of plants could be used by certain tribe members. That is, the more scarce forms of kava could be used only by royalty or for certain ceremonies, while the common man could use only ordinary kava. Remarkably, native growers on the island of Vanuatu have recently been able to differentiate 80 types of kava, suggesting that the herb probably originated from these islands. Other sources disagree with this claim, noting that kava has its origins in New Guinea and Indonesia, where it was spread throughout the region by trade and explorers.

The History of Kava

Captain James Cook, the legendary British naval officer and explorer, commanded the ship *Endeavour* on scientific expeditions to the South Pacific in the late 17th century. Although his expeditions are often given credit for the European discovery of kava kava, historical facts suggest otherwise. While looking for new trade routes across the Pacific, Dutch explorers Jacob LeMaire and William Schouten witnessed the kava ceremony on the Home Islands 150 years earlier than the Cook expedition. Nonetheless, it is the Swedish botanist Daniel Scholander and the *Endeavour's* artist Sydney Parkinson who were the first Europeans to record the kava plant in some detail. Commenting in his journal, Parkinson originally called kava *Piper inebriens*, referring to the herb's origin as part of the pepper family and its role as an intoxicating drink. Credit for the actual formal taxonomic description was given to botanist George Forster who accompanied Cook on his third voyage. It is he who provided the Latin name *Piper methysticum*, roughly translated as "intoxicating pepper."

In Polynesian, the term kava (*kawa*) means bitter, sour, sharp. While *kava* is the term most often associated with the plant, ceremony and drink, the name may be changed depending on what part of the Pa-

cific you are in. In the islands of Hawaii, Tahiti and the Marquesas, the k is dropped, and the plant is called '*ava* or '*awa*. On the island of Fiji, kava is known as *yaqona* meaning beverage and/or bitter.

Throughout the islands of the Pacific, kava has several traditional uses not formally recognized by clinical or pharmacological research, such as to help alleviate kidney and bladder problems; soothe crying babies; treat gonorrhea; alleviate coughs, colds and sore throats; and act as a contraceptive. It is said that the juice from the crushed leaves helps heal old and new injuries. However, despite these traditional medicinal uses, in the Pacific islands kava is first and foremost an important ceremonial herb.

The Kava Ceremony

For natives of the Pacific basin, the kava ceremony is a key event for welcoming visiting dignitaries, honored guests and, in general, for commemorating any key event or meeting. Kava may also be drunk on informal occasions which do not require a set ritual. When kava is drunk at these gatherings, it has been compared ". . . to the European cocktail or highball, in that it produces a relaxed and friendly atmosphere conducive to social cooperation." 1

What takes place in a formal kava ceremony? While there are some variations in this ritual from village to village and island to island, the basic components are much the same. Much of the description that follows is based on an excellent review of the kava ceremony by Dr. Lowell Holmes from the De-

partment of Anthropology, Wichita State University in Kansas.

In Samoa, it is the responsibility of the talking chief, who directs the ceremony, to select a piece of the kava root. This root is then cut into smaller pieces by one of the younger unmarried and untitled men. These individuals, called *aumanga*, are entrusted to prepare and distribute the kava, as well as master the etiquette of the ceremony.

When cut into sections, kava is known as the scales of the sacred or forbidden fish (*una o le ia sa*), referring to the belief that kava is sacred food and is therefore reserved for use by the chiefs. In this form, kava was traditionally chewed by young men (or women in some cultures) who had strong, clean teeth and gums and were free from any illness. Chewing the root, it is interesting to note, expanded the weight of the kava root from 6 to 17 ounces. As this task of chewing the root was a difficult and tiresome one, authorities on the ceremony have commented that "a desire to escape from this fatiguing duty is a traditional explanation of the old-time elopement of the chief's daughters." 2 Because this ancient method of preparing the kava horrified European missionaries and colonialists, it was outlawed and then abandoned in the early 1800s. Since then the root has been prepared and pulverized by a crude stone mortar. Other important pieces of equipment necessary for the ritual include a carved bowl 18 inches in diameter with anywhere from 4 to 24 legs, a strainer made out of shredded hibiscus bast and a polished coconut cup.

Village kava ceremonies, according to Dr. Holmes, are held in the same house in which the village coun-

cil meets for meetings. The jovial atmosphere in the house becomes solemn and reverent as the chief enters and the men now speak in whispering tones. Nothing is worn above the waist and all ornaments are removed. Three members of the *aumanga* sit around the kava bowl, with a fourth member standing just outside the hut ready to clean the strainer of kava fibers thrown to him by the wringer. The man who wrings or prepares the kava sits directly behind the bowl, flanked by two other individuals. To the right is the man who pours the water and to the left is the man who carries the finished kava beverage to the chief. By tradition, the wringer must wear no clothing except a wrap-around type of attire called a *lavalava*.

The preparation of the drink involves five specific steps, each with a unique name. This includes using the strainer to cover the kava root at the bottom of the bowl (*fa 'apulou*), pressing down with the hands and fingers on the strainer (*vau*), driving the collected kava fiber towards the back of the bowl with the strainer (*aoga*), wringing the kava (*tatau*) and cleaning the strainer itself (*mapa*). This process is done again and again until the cloudy, milky concoction is free of debris. At this point, the wringer clears the strainer himself by snapping out any remaining kava fiber. Forming the strainer into a ball, he plunges it into the liquid, lifts it above the bowl and lets it fall back in (*sila alofi*). This gesture allows the talking chief, sitting behind and to the right of the bowl, to judge the kava liquid and determine whether more water should be added. As the liquid becomes clearer, the talking chief begins to recite a legend about the origin of kava. This story ends exactly

when the liquid is clear of fiber and the talking chief pronounces the kava is clean. If the kava is of the correct color and consistency, the assembled chiefs clap their hands in unison several times.

At this juncture, the kava server dips a coconut cup into the mixture and carries it at waist height to the center of the house. Here he raises it to his forehead and walks toward the high chief. Dr. Holmes comments that at "about four feet from the chief, the server lowers his right hand and with his left places the cup on his upturned right palm. The left hand is placed behind his back, and the cup, held by the server at chest height, is handed to the high chief, who receives the cup with both hands. The young man then walks to the center of the house where he stands at attention until the chief has finished drinking."

Prior to swallowing the liquid, the chief pours a few drops on the floor and announces, "May God be with us today." The chief now drinks the contents of the cup and says *soifu* ("Life" or "May you live"), to which the remaining chiefs respond with *manuia* ("Blessing" or "May the gods bless you").

The procedure for receiving and serving the kava varies slightly depending on one's rank in the community. Furthermore, the order in which one is served is linked to an individual's status. For example, the high chief gets served and drinks first, followed by the highest ranking talking chief. The cup is then given to the second ranking chief down the entire hierarchy of dignitaries. After all of the assembled and talking chiefs have drunk, or have been acknowledged as having the right to drink, the kava

announcer concludes the ceremony with the words "The kava is broken off, the strainer is poor, and the company of chiefs has fallen down." The chief acknowledges these final words with an expression of thanks (*malo fa'asoasoa*).

What does it taste like and how does one feel after drinking kava? Reports on the taste of the kava liquid vary widely. While some have described it as pleasant, aromatic and cooling in nature, others argue that it has a bitter, soapy, pungent and acrid quality. Kava seems to have an initial numbing effect on the mouth and tongue of the user, which eventually progresses into a mellow state of relaxation. Herman Melville, the author of *Moby Dick*, participated in a number of kava ceremonies on the Marquesas islands. He commented that "the effects of [kava] upon the system are at first stimulating in a moderate degree; but it soon relaxes the muscles and, exerting a narcotic influence, produces a luxurious sleep." 3

Modern accounts of kava ingestion have been described by Dr. Gadjusek from the National Institute of Health.4 He notes that after drinking 100 to 200 ml of kava, natives of the New Hebrides reported falling into a stupor. Although annoyed at having their kava-induced stupor broken, Dr. Gadjusek found that they were quite easily aroused. He writes that "the drinkers reply rationally and are well-oriented in time, place and person; they respond intelligently, even sometimes quickly, to complex questions. Bright or moving lights, noise or other sound, touch and even the subdued bustle of nearby activity annoy them . . ." Kava drinkers describe their legs and feet as being heavy and weak with numbness, coldness and tingling. Surprisingly, Dr.

Gadjusek notes, after drinking kava, natives appear fresh the next morning without any hangover-like after effects. However, when kava is over-used, long-term problems, including skin rash, are anything but pleasant.

The Chemistry and Pharmacology of Kava

Kava's reputed intoxicating actions have prompted numerous researchers over the past 130 years to investigate this ceremonial and medicinal plant for its biologically active constituents. In 186061, researchers M. Gobley and M. Cuzent were the first scientists to isolate and identify some of kava's unique chemical compound referred to as *methysticin*. Expanding on the work of these and other researchers, the pharmacologist Louis Lewin published a comprehensive review of the plant's active ingredients and their chemistry and pharmacology in 1886. Dr. Lewin, a German pharmacologist, toxicologist and medical doctor was a unique individual. A graduate of the University of Berlin, he was hailed by his contemporaries as a brilliant scholar and lecturer. In addition to his scientific acumen, he also exhibited a broad knowledge of contemporary and classical literature. It was said of him that "he could quote flawlessly in foreign languages, and marshal facts from all four corners of the world and all periods of history." 5 He counted the great Albert Einstein as one of his friends. A prolific writer, he published 248 major papers during the years 1874 to

1929. Although his remarkable work on kava is now out-of-date, his pioneering work represents a historical turning point, after which the plant's active chemical ingredients were heavily investigated. Fourteen papers on kava's chemistry were published after this time, which led to the discovery of newer compounds, *kawain* and *dihydrokawain*. These agents, along with *methysticin* and *yangonin*, represent some of the basic constituents crudely extracted during the kava ceremony.

After the root is chewed or ground up, it results in a cloudy, milky-looking drink. Once excessive plant debris has been strained off, the liquid is swallowed. Suspended in the lipid or fatty portion of the drink are the active ingredients known as kava lactones or pyrones. Acting in concert or alone, it is these unique plant chemicals that are primarily responsible for the herb's antianxiety and sleep-inducing actions. Modern research methods, using state-of-the-art analytical equipment (e.g., gas, high-pressure liquid or thin-layer chromatography), have been able to identify or fingerprint the individual constituents that make up these kava lactones. This includes seven compounds: *dihydrokawain, kawain, desmethoxyyangonin, tetra-hydroyangonin, yangonin, dihydromethysticin*, and *methyisticin*. Depending on the plant's age, crude kava root can contain anywhere from 3 to 20 percent kava pyrones. The plant additionally contains 43 percent starch, 20 percent fiber, 12 percent water, 3.2 percent sugars (saccharose, maltose, fructose and glucose), 3.6 percent protein and 3.2 percent minerals (potassium, calcium, magnesium, sodium, aluminum, iron and silica). 6 Alkaloids such as *pipermethystin* have been found primarily in the leaves of the herb.

Plant pigments, called *flavokavin A* and *B*, have also been recently extracted, prompting scientists to speculate that it is these agents that may cause the yellowing of the skin seen in individuals who are heavy kava users. European extracts of this plant have now been standardized to contain either 70 percent kava lactones or they are utilized as an isolated constituent of the plant called kavain.

Kava's Anesthetic Effect

When kava is first swallowed it typically produces a numbing action on the mouth and tongue. Not surprisingly, scientists have shown that certain kava pyrones (e.g., *kawain, dihydrokawain, methysticin, dihydromethysticin*) are anesthetics as potent as cocaine when applied topically to animals. 7 The kava pyrone called *dihydromethysticin* (DHM) seems to potentiate or add to the general anesthetic action of barbituate medications. Barbituate-type drugs are usually given to knock out individuals during surgery. In animal experiments, the administration of DHM and a barbituate (e.g., hexobarbital) together produced a state of anesthesia that lasted up to 72 hours.8 In comparison, a similar dose of the hexobarbital alone produced an anesthetic effect that lasted only two hours. Dr. Rudolph Hansel, a well-known German author and researcher on phytotherapy, comments that "with the help of the EEG, it was shown in greater detail that the pyrones not only increase the duration of the anesthetic, but, more importantly, that they intensify and deepen the anesthetic effect."8 Practically, this means that kava should not be em-

ployed when one is taking drugs, alcohol or prior to anesthesia for surgery, as side effects from the combinations may be a problem.

Kava and Epilepsy

Barbituates such as phenobarbital and phenytoin are also used in modern medical practice to treat individuals suffering from epileptic seizures. The two most common types of seizures are grand mal and petit mal. In petit mal episodes, the seizure lasts only a few seconds with the individual experiencing a brief loss of attention and consciousness. In contrast, grand mal epiodes are far more serious. Consciousness is suddenly lost with the major muscle groups contracting and becoming rigid (tonic phase). After a few seconds, the arms and legs start jerking up and down (clonic phase). Although this exaggerated movement eventually slows down and stops, the person experiencing this is in a coma and may take several hours to awaken.

Strychnine, the principle alkaloid in the herb *nux vomica* (poison nut), has long been employed as a poison for rats and other animal pests. When poisoned with strychnine, violent tonic muscular contractions similar to what one experiences in grand mal epilepsy are the result. Research has clearly demonstrated that animals pretreated with kava pyrones (e.g., *methysticin*) survive even when given repeatedly lethal doses of strychnine. 9 That kava would exert such a strong antispasmodic action prompted Dr. Carl C. Pfeiffer and his associates from the section on Neuropharmacology at the New Jersey Insti-

tute to see if kava or its active constituent *dihydromethysticin*, would be effective in epileptic seizures.

In nine prison inmates with uncontrolled epilepsy, he noted that either six grams of the crude kava root or one gram of the alcoholic extract per day gave the volunteers a better degree of seizure control. However, as side effects such as yellowing of the skin and sclera of the eye became evident after several weeks of therapy, the active constituent was substituted for the crude herb and alcoholic extract. Although Dr. Pfeiffer notes that the incidence of petit mal seizures did not change, 1200 mg of *dihydromethysticin* per day did indeed reduce the number of grand mal episodes. However, despite this clinical success the experiment was abandoned after one month. The reason? This dosage began to cause swelling and redness around the eyes along with frequent episodes of vomiting and diarrhea. 10

Kava, Blood Flow and the Brain

Without blood and oxygen flowing to our brains, we would lose consciousness within 5 to 10 seconds. Our brains cells, starved for oxygen, would begin to shut down metabolically. If this dire situation were not rapidly corrected, brain cells would die. The medical term for lack of blood flow to tissue is called ischemia and it is the reason why a stroke can be so physically devastating. Animals pretreated with either a kava extract or individual kava constituents had smaller areas of brain damage when subject to experimentally induced ischemia.11

In order to understand how kava helps protect brain tissue we must briefly consider how nerve cells work electrically. A nerve cell or neuron is like a tiny electrical battery with a negative charge inside and a positive pole outside. What keeps it "fired up" is the amount of electrically charged minerals called ions surrounding each nerve. In order for a neuron to release its electrical impulses, specific doors or gates in the wall of the cell open up, allowing sodium (salt) to flow in and potassium to leave. This swapping of ions across the nerve cell membrane creates an energy surplus resulting in an electrical discharge that sends information down the neuron. As the brain uses about half of its energy to help maintain this sodium/potassium flow, using kava to block sodium helps lower the cell's need for energy. This helps protect the neuron from lack of blood and oxygen flow by decreasing its demand for energy. While this has exciting implications, it is too early to suggest that kava may be useful in the treatment or prevention of brain damage caused by stroke.

Kava and Pain

Kava root, in addition to its anti-ischemic actions, may also help to reduce pain. Although reported to be highly prized by tribal elders for its ability to alleviate pain, it is rarely employed in this way outside the Pacific basin. Animal studies have clearly shown that kava liquid and pyrones have potent analgesic actions. While part of this effect is no doubt the result of kava's anesthetic action, researchers wanted to find out whether the herb worked similarly

to other pain-killing drugs like the narcotic morphine. While many medications help with pain, morphine is considered to be the gold standard by which the action of all other analgesics are judged. Morphine, along with codeine and papaverine, are alkaloids derived from the opium poppy (*Papaver somniferum*). These drugs seem to work by blocking opiod or morphine-like pain receptors at several sites of the brain and nervous system. However, when scientists gave a drug (e.g., naloxone) for pain that specifically blocks these pain-modulating receptors, it had no effect on kava-induced analgesia. This prompted scientists to conclude that kava does not work like morphine and has an entirely different way of reducing pain. 12 How kava works in this manner is still a mystery.

Kava and Anxiety

Since kava has a pronounced antianxiety action, researchers have wondered if it is comparable to such well-known benzodiazepine drugs as Valium. This medication and others like it are used for a wide variety of conditions ranging from anxiety to insomnia to muscle relaxation. Valium acts by attaching to and exciting certain sites in the brain known as GABA (gamma aminobutyric acid) receptors. This process, much like putting a key into a lock, sends out signals which slow down the firing of nerve cells. Once this happens, individuals taking such drugs become sleepy, less anxious and relaxed. Scientists working in the field of botanical medicine have speculated that herbs like valerian may act on GABA

receptors, explaining in part why this herb has been so sucessful in helping people relax and sleep. However, investigators were surprised to find that unlike valerian, kava pyrones attach themselves very, very weakly or not at all to these sites. 13

If kava does not act like Valium, then how does it work? Kava lactones seem to act more generally on a part of the brain called the limbic system. This ancient structure, located deep within the brain, is primarily associated with feelings, emotions, instincts and drives. While scientists are not really certain how kava influences these psychological processes, the apparent action of kava lactones on the limbic system partially explains why the herb has such a broad and unique way of working.

Clinical Applications: Anxiety

Karen, a 25-year-old part-time secretary, first noticed her problem when she was in a crowded movie theatre. She suddenly noticed that her heart was racing uncontrollably, her skin was soaked with sweat, her hands were tingling, and she had difficulty breathing. She thought she was going to faint, although she had never fainted before, and fearing that she was out of control, raced toward the nearest exit. Once outside she felt better, but did not know what had happened to her.

Two weeks later, while standing in line at the bank, the same problem recurred. She thought at the time that her heart had given in and that she was about to die. Understandably frightened, she checked herself into the local hospital emergency room where they thoroughly tested her heart. The verdict was that she was completely healthy. Karen was frustrated, to say the least, but subsequently stopped going to crowded places. Fortunately, a sympathetic friend suggested she seek out psychological or psychiatric services. Doing so, she found that cognitive retraining was very helpful in dealing with her problem of situational anxiety. Although the psychiatrist she

attended recommended a short cause of the drug imipramine (Tofranil), consultation with a naturopathic physician provided her with several options, including the herb kava which she found to be extremely beneficial.

Normal Anxiety

Because fear and nervousness are a normal part of the fabric of everyday life, how does one know the difference between the reactions Karen experienced and ordinary daily anxiety? The answer may lie in our automatic reaction to life-threatening situations called the flight or fight response. This term, coined by the famous American physiologist Dr. Walter Cannon, is also known as the alarm reaction; it helps us prepare for mortal combat with predatory animals, fellow human beings or situations of extreme danger. Whether we are running away from a tiger, or speaking to a group of corporate executives, our bodies respond to the emergency in similar ways.

Upon receiving the alarm message, the adrenals, which are small hat-shaped glands that sit on top of the kidneys, start pumping the blood full of the hormones needed for survival. These powerful chemical messengers are called adrenaline and noradrenalin. Although both hormones are released at the same time, adrenaline and noradrenalin make one feel anxious and scared, providing that surge of physical energy needed to fight or flee. In addition to releasing these stress signals, the body simultaneously introduces a wide number of physiological changes that

help pump more blood, open the pupils of the eyes, thus sharpening vision, expand the lungs and increase the breathing rate so that the muscles and the brain get more oxygen. Blood sugar levels are also increased for immediate energy as are the number of clotting chemicals that stop us from bleeding to death if we are injured.

While these changes help us prepare and deal with short-term crisis, what happens when we have to deal with minor day-to-day problems such as deadlines, telephones, bureaucratic hassles and so on? Much like our Stone Age ancestors, who prepared themselves to face a lengthy and harsh winter, we too put our bodies on long-term alert. This is called a vigilance reaction. In response to these situations, our adrenal glands produce another hormone called cortisol. This chemical allows us to keep battling long after the initial flight or fight hormonal response has worn off. Cortisol stimulates a wide range of physiological reactions:

1. Stimulating the conversion of protein into fuel for the body so that it has a large supply of energy;

2. Helping retain salt and eliminate trace minerals like magnesium and calcium which keeps our blood pressure elevated;

3. Increasing stomach acid production;

4. Raising the level of fat and cholesterol in the bloodstream;

5. Making us more alert and also more irritable.

Elevation in this vital hormone has some positive effects as well that do not relate to the fight-or-flight

response. For example, by helping to block the damaging effects of excessive inflammation as a result of trauma or infection, cortisol promotes a more rapid rate of healing.

However, putting one's body on alert 20 to 30 times a day eventually leads to a state of adrenal exhaustion. Early in this stage, individuals often complain of feeling stressed out, tired and catching every flu or cold that comes around. If these same people do not change their lifestyles, this eventually leads to a total collapse of the body and/or a severe weakening of its organs. Heart attacks, high blood pressure and adult onset diabetes are just a few of the conditions linked to this chronic state of arousal. Fortunately, these potentially life-threatening physiological changes can be prevented by mastering such anti-stress techniques as meditation, biofeedback, exercise, hypnosis, and progressive relaxation. In addition, supplying the body with adrenal supportive nutrients (e.g., vitamin C, pantothenic acid and potassium) and herbs (e.g., *Panax ginseng*) is also of immense benefit.

It is entirely normal and natural to experience the emotional twinges of fear, nervousness and even terror when giving a talk, preparing for a school examination or jumping out of the way of an oncoming car. Although our incredible biochemical coping mechanisms have helped us to survive as a species, these same changes can also betray us. For individuals like Karen, stress and anxiety becomes a disorder only when it is so incapacitating and crippling that it drastically affects one's ability to cope with the normal events of everyday life.

Anxiety Disorders

Anxiety disorders are common psychiatric problems affecting approximately 16 percent of the U.S. population. While the term anxiety covers a wide number of conditions, for the sake of brevity, we will only consider generalized anxiety and panic disorder.

Panic Disorder

On its symptoms alone, panic disorder is probably one of the most recognized types of anxiety. Episodes of heart palpitations, fatigue, nervousness, chest pain, dizziness or sweating can occur unexpectedly and last anywhere from 5 to 30 minutes. Attacks usually start between the ages of 20 and 35 years, and may happen as frequently as several times a month or just once a year. Panic disorder occurs twice as frequently in women as it does in men. Furthermore, if a first degree relative has been diagnosed with this condition one is 25 percent more likely to suffer from it, compared to a 2 percent incidence in the general population.

While there may be a genetic link for developing panic disorder, scientists have been unable to pin down a precise biological cause. However, in the late 1960s researchers proposed that patients with panic disorders have a highly sensitive alarm system that is triggered by biochemical changes within the central nervous system, leading to unexplained episodes of panic. They found that in individuals with a history of panic attacks, about 75 percent of them developed panic episodes when given sodium lactate intrave-

nously (IV). 14 Sodium lactate, along with sodium bicarbonate, are common IV solutions given to patients suffering from a condition called acidosis. Vomiting, starvation, uncontrolled diabetes or acute infections may require the infusion of alkalinizing substances like sodium lactate to help counteract the excessive acidity induced by these disorders.

This same acidic shift that occurs in certain medical conditions also happens to us when we are exercising strenuously. Along with this acidosis is a concomitant increase in blood levels of lactate. Lactate or lactic acid is the body's by-product of utilizing glucose for fuel when there is not enough oxygen, as is the case in hard exercise. However, despite the exhaustion and nausea that can occur as a result of too much exercise, for most of us, full blown panic/anxiety attacks are an unlikely occurrence.

Nonetheless, science has shown that in individuals with a history of anxiety, exercise induces increases in lactic acid levels that parallels the rise in anxiety symptoms for susceptible individuals. Intravenous sodium lactate or too much lactic acid triggers a structure deep within our brains that stimulates the emotions of fear and anxiety.

Generalized Anxiety Disorders

Generalized anxiety disorder shares many of the same features as panic disorder. Those who suffer from this problem are excessively anxious and constantly worry about everyday events. For example, a mother may fret all day about the possibility of her son or daughter being hit by a car even though she drives them everywhere. However, unlike panic dis-

order sufferers, these individuals are not anxious or worried about having a panic attack. Shortness of breath, muscle tension, feeling shaky, sweatiness, dizziness and heart palpitations tend to occur, but far less frequently than those diagnosed with panic disorder. Generalized anxiety disorders are quite common, with community surveys showing a prevalence of two to eight percent in the adult population. Individuals may have a lesser degree of this problem, which is called stress-induced anxiety; in these instances the anxiety is proportional to the adverse conditions encountered.

Treatment for both types of anxiety disorders usually involves some sort of counseling with or without medication. Drugs typically given in these circumstances include benzodiazepine-type agents like Ativan and tricyclic antidepressants like imipramine. While counseling techniques are free from side effects, drug therapy is not. Kava kava, unlike many prescriptive medications, is not addictive, has no side effects when taken in moderate doses, and has proven itself to be of great value in the treatment of problems related to anxiety.

Kava and Anxiety: The Research

To date, clinical studies on kava and anxiety have utilized either one of its active ingredients, *kavain*, or the whole plant, standardized to contain a given percentage of kava lactones. While the former preparation is clearly more pharmacological in nature and the latter more herbal, both types of investigations

are important as information from one complements the other.

In the late 1980s, Dr. B. Saletu and his colleagues from the Department of Psychiatry at the University of Vienna were dismayed by the lack of well-controlled pharmacological studies on the actions of kavain. In order to rectify this oversight, they asked 15 psychologically and physically healthy subjects to participate in a controlled study. 15 Eight men and seven women randomly received, in weekly intervals, single oral doses of a placebo followed by kavain at a strength of 200, 400 and 600 mg plus 30 mg of the benzodiazepine clobazam as a reference or comparative dose. At the time the kavain was administered and one, two, four, six and eight hours later, subjects had their brain activity monitored electrically with an electroencephalograph (EEG) and their pulse and blood pressure also was checked. A large number of psychological tests were given at the same time and any adverse effects were recorded.

The researchers noted that the more kavain the subjects took (unlike the placebo) the more characteristically relaxed their brain waves became with an increase in sleep-promoting theta and delta waves along with decreases in beta waves.

Beta wave activity is especially evident when people are concentrating, anxious or taking tranquilizing drugs like clobazam. Many people try to achieve this anxiety-free alpha state through meditation or biofeedback training. This increase in alpha activity along with a decrease in beta and alpha waves was most evident with the 200 mg dose of kavain. The scientists observed that the individuals taking kavain at this dose were more vigilant, although the effect

disappeared as more time passed and with higher, more sedating doses of the plant extract.

The differences between kavain and clobazam were even more pronounced on the psychological tests. All three doses of kava, unlike the placebo, produced a significant increase in intellectual performance, reaction time, motor speed, attention and concentration. Completely opposite results were observed in those individuals who took the 30 mg of clobazam. Furthermore, while psychological variables such as drive, wakefulness, well-being and mood improved at the 200 mg dose, 600 mg of kavain along with clobazam produced changes in the opposite direction, suggesting more pronounced sedation. The authors observed minimal side effects with no clinical changes noted for pulse or blood pressure in either of the medications tested.

In contrast to the EEG results obtained by kavain, standardized kava extract produced a somewhat different response. Two men and five women were given either 300 or 600 mg of kava extract daily for one week following a one-week drug-free period. Unlike the placebo group, the seven subjects given the kava showed EEG changes characteristic of patients taking sedative-hypnotic type drugs. Thus, they had an increase in beta and a decrease in alpha wave activity. However, unlike prescription antianxiety medications, kava did not induce sleep-promoting delta and theta waves. Furthermore, through evoked potential studies, the investigators determined that kava actually helped improve information-processing in the brain. In an evoked potential EEG, the normally recorded high voltage wave spikes are canceled

by a special technique, allowing one to focus on the smaller wave changes precipitated by simple stimuli such as a flash of light. In this way, when a visual or auditory stimulus is presented, the brain's electrical response can be followed precisely.

Much like the psychological results obtained by kavain, people taking kava in this study experienced better concentration and greater attention to detail. These paradoxical results prompted the researchers to conclude that kava has the active profile of an anxiety-relieving drug without any of the sedative or hypnotic properties normally associated with this class of medication. 16

This effect is quite unusual for an herb and places it in a very unique class. It is interesting to note that antianxiety medications like oxazepam (Serax) distort how we process information, resulting in fuzzy thinking. In comparative studies with this type of drug, subjects taking kava had excellent results. After five days of taking three 200 mg capsules of kava extract or placebo per day, volunteers reported an improved performance and reaction time in the word recognition test. Those individuals taking the prescription drug, however, did not fare as well as those taking the herb.17 While kavain and kava affect the physiological and psychological responses of healthy individuals, the next question is, does kava influence those who already have an anxiety disorder? And the answer is an unequivocal yes!

German psychiatrists have concluded that kavain compares quite favorably to the drug oxazepam (Serax) in patients suffering from anxiety-associated disturbances. Thirty-eight such individuals were assigned to receive either one 200 mg capsule

of kavain three times a day along with one placebo capsule twice a day or 10 mg of oxazepam twice a day plus one placebo capsule three times a day for 28 days. The effectiveness of the medications were evaluated using the Anxiety Status Inventory (ASI) and the Self-Rating Anxiety Scale (SAS) of Carl Jung. While the authors reported no statistical difference between the two types of medications, the anxiety symptom scores as measured by the two psychological scales decreased on average by a whopping 65 percent. This prompted the scientists to conclude that oxazepam and kavain were equally helpful for individuals with anxiety episodes. No side effects were reported by the patients taking either substance.

While kavain seems to be very effective for such psychiatric conditions as generalized anxiety disorder, can the same be said for anxiety of nonmental origin? Dr. Lehman and his associates attempted to answer this study in a recent clinical experiment. Two groups of 29 patients were given 100 mg of standardized kava extract three times a day for a period of four weeks. Several psychological scales of measurement, including the Hamilton Anxiety Scale (HAMA), were employed in order to determine treatment outcome. Not surprisingly, kava significantly reduced HAMA scores in contrast to the placebo group. Dr. Lehmann pointed out that kava's relaxing action was rapid, with subjects reporting an improvement in their symptoms of anxiety, tension and nervousness after one week of therapy. In fact, at the end of four weeks, the difference between the kava group and the placebo group was even more pronounced. People who took the herb commented that

they were less nervous and had an improved sense of well-being. 19

Kava and Menopausal Anxiety

Wendy, who just turned 45, lived by the motto "age is a matter of mind; if you don't mind it doesn't matter." This vibrant and active woman suddenly began experiencing unexplained periods of sweating and hot flushes. At first they were bearable but then they increased to such a degree that she became very uncomfortable. Worst of all, despite her successful and fulfilling career, she started to have periods of memory lapses, poor concentration, heart palpitations, feelings of anxiety and failing sexual desire. "I'm only 45." she lamented, "Could this be menopause already?" A visit to her family doctor confirmed that her estrogen levels had decreased quite dramatically. With the help of her physician, Wendy determined that she was not at risk for osteoporosis or heart disease and decided to try natural sources of plant estrogens including soy and the herb black cohosh (*Cimicifuga racemosa*). While these natural treatments helped tremendously with the hot flushes and the night sweats, she was still plagued by periods of profound anxiety and heart palpitations. As prescription antianxiety drugs made her feel drowsy, she wondered if there were a natural short-term alternative to using such medications. The answer, according to the latest European research, may lie in the herb kava.

Concerned with side effects of benzodiazepine-type drugs used to help women deal with some of their menopausal symptoms, Dr. G. Warnecke, a German medical doctor and gynecologist, began search-

ing for an alternative. Although he found the research on kava and anxiety impressive, no studies had yet been performed on its role in menopause. Thus he gave 20 female subjects between the ages of 45 and 60 who had numerous menopausal symptoms a standardized kava extract at a dose of one 100 mg capsule three times a day over a period of eight weeks. Treatment success was measured using a battery of tests. The major psychological variables that were evaluated included anxiety (Hamilton Anxiety Scale), depression (Depression Status Inventory), severity of menopausal symptoms (Kupperman Index) as well as the treating physician's observations. Dr. Warnecke was highly satisfied with the outcome of the experiment. Unlike results in the placebo group, the symptoms of anxiety dropped by an amazing 50 percent within one week of starting the kava therapy. Symptoms dropped practically to zero at the one-month point and remained at this value up to the end of the eight-week experiment, confirming kava's profound antianxiety action.

Additionally, the symptoms of depressive moodiness, restlessness and anxiety also decreased significantly in the group using kava, with a 58 percent reduction in such symptoms. Complaints about the severity of menopausal symptoms completely disappeared in those taking the plant extract at the end of one month. In short, the menopausal women taking kava felt a whole lot better. 20

Kava and Insomnia

You're tense, anxious and worried. You toss and turn desperately needing some sleep but you are unable to stop thinking. Muscles become tense and you check the clock frequently, getting more frustrated as the night goes on. Exhausted, you finally fall into a restless sleep for one to two hours until morning. This is insomnia.

Insomnia, or the inability to get to sleep or stay asleep, is a common problem. Current statistical surveys indicate that 30 to 35 percent of the overall adult U.S. population suffers from difficulties relating to the amount and/or quality of sleep. Sleep disorders seem to affect women more frequently than they do men, with complaints of sleeplessness increasing with advancing age. This is particularly so for the population aged 65 and older. While only 9 percent of the individuals aged 20 to 29 years complain of insomnia, 35 to 50 percent of the elderly above the age of 65 complain of disruptions in sleep. Most of the sleep disturbances experienced by elderly people have to do with problems of maintaining sleep (e.g., waking up a lot and being unable to get back to sleep) whereas younger people tend to have trouble falling asleep. Unfortunately, only about half the people suffering from sleep disturbances seek out the

advice of a health care professional. This is tragic, as many individuals suffering from insomnia may have more serious underlying disturbances including diabetes, fibromyalgia, arthritis, depression, restless leg syndrome or drug and alcohol abuse, to name just a few. While these sleep-robbing medical conditions may be responsible for sleeplessness lasting for months or years, many people suffer from short-term sleep problems less than three weeks in duration.

Anxiety, grief, loneliness, changing jobs or the loss of a loved one are some of the reasons why people suffer from short-term insomnia. Most people dealing with short-term insomnia are given sedative-hypnotic drugs like Valium. It is estimated that 25 million prescriptions for such drugs are written annually in the United States, with the elderly consuming a whopping 40 percent of them. Although this class of drugs can be effective for insomnia, side effects, including morning sleepiness, rebound insomnia and cognitive dysfunction, can be a problem. Furthermore, long-term use of these sedative-hypnotic medications can create a drug dependency for 15 to 30 percent of the users. Fortunately for those suffering from sleeplessness, there are a wide number of natural and complementary therapies available, ranging from acupuncture to hypnosis. Although a detailed review of each of these modalities is beyond the scope of this book, herbal or phytomedicines have a long and successful history of helping people overcome insomnia.

Passionflower (*Passiflora incarnata*), lemon balm (*Melissa officinalis*) and valerian (*Valeriana officinalis*) are just a few of the many traditional herbal remedies available to help one sleep. While many

people are familiar with these types of insomniarelieving phytomedicines, the research surrounding kava and sleep is not well-known. However, before we consider the research on kava and sleep, let's look at the basics of sleep physiology.

The ABCs of Sleep

Much of what we currently know about sleep physiology is a direct result of the information gathered in sleep laboratories. These institutions monitor their subjects' sleep patterns through a device called a polysomnograph (PSG). After placing electrodes in a specific location on a subject's face and scalp, one is able to record any electrical changes that occur in the brain, eye or muscle simultaneously. The PSG monitors brain wave activity through an electroencephalograph (EEG), eye measurements through an electroculogram (EOG) and muscular changes through an electromyogram (EMG). The PSG records these physiological changes on graph paper in a series of jagged lines that resemble the undulating contours of a mountain range. These squiggly lines help researchers tell the difference between arousal and the various stages of sleep.

When a person is awake and alert, the EEG records the electrical activity or firing of millions of individual nerve cells in a series of fast and choppy squiggles called alpha and beta waves. Beta waves are present during periods of tension or mental arousal whereas alpha waves predominate when one is quietly relaxing. In contrast, larger and slower

EEG tracings called delta or theta waves are recorded during non-REM sleep.

REM Sleep

Sleep can be divided into two distinct stages: non-REM and REM. The acronym REM stands for rapid eye movement. REM sleep has become strongly associated with dreaming. As one tends to move around when dreaming, so do the eyeballs, hence the term rapid eye movement. Individuals awakened from REM sleep phase often recall dreams that are vivid and detailed in nature. REM is called activated or paradoxical sleep for good reasons. Not only is there active eye movement, but also marked increases in pulse, heart rate and blood flow to the brain. Furthermore, blood pressure may also rise, prompting scientists to link REM sleep activity with an increased risk of triggering both heart attacks and strokes.

Despite pronounced activity in both the EEG and EOG, muscular activity, as recorded by the EMG, is virtually absent. This remarkable paradox is due to the fact that the brain sends out signals that relax the large muscle groups in the body so thoroughly that they are literally paralyzed. This is clearly of great advantage because it stops people from physically acting out their dreams. For most adults, REM sleep occurs every 90 minutes throughout the night. Although the first REM period of the night is brief (five minutes), as the evening progresses towards morning, REM periods become longer (30 to 45 minutes) and a more dominant part of the sleep cycle. As each REM period ends, the sleeper ascends back into the non-REM (or nondreaming) phase of sleep. This type

of sleep, cycling between REM and non-REM, occurs approximately three to five times a night.

Non-REM Sleep

The stages of non-REM sleep are very much like going down a flight of stairs with each step representing some of the physiological changes that occur. When drifting off and becoming drowsy the sleeper enters the twilight zone of Stage 1 non-REM sleep. For adults this lasts anywhere from one to 20 minutes with the PSG beginning to show rolling eye movements and general muscular relaxation. From Stage 1 the sleeper takes another step down the sleep stairway into Stage 2. This intermediate step lasts about 30 minutes; the sleeper becomes increasingly detached from the surroundings and is difficult to awaken. EEG waves become slower and are characterized by the appearance of brief electrical bursts of activity from the brain called sleep spindles. After this a deeper state of unconsciousness follows called slow wave, or deep non-REM sleep. Sleep Stages 3 and 4 are dominated by the appearance of delta waves on the EEG. Although researchers are still debating about the precise role of each sleep stage, delta-wave sleep seems to be the kind of sleep that allows the body to recover physically. Take away a person's delta sleep and he or she may wake up feeling tired and snarly. REM sleep, in contrast to non-REM sleep, helps in recovering from mental exertion. Scientists have postulated that both REM sleep and dreams may help the brain engage in some sort of housecleaning so that it is able to organize, discard and update information from the day's activities.

Without enough REM sleep, it becomes harder and harder to focus on day-to-day activities.

This problem becomes even more pronounced when one stays up until the wee hours of the night. This results in a shortened sleep latency (e.g., the typical 10- to 20-minute time period it takes to fall asleep) along with a phenomenon called REM rebound. After an "all-nighter," someone who has missed sleep and is deprived of REM enters REM sleep and starts dreaming much more rapidly. The time spent in REM becomes much longer than normal and occupies a greater portion of the sleep cycle, literally forcing the individual to sleep later the next morning.

Kava and Sleep: The Research

Two groups of six subjects (three females and nine males) between the ages of 20 and 31 years of age were invited to participate in the following experiment, conducted by Dr. W. Emser and his colleagues from the Department of Neurology, Ceritas Hospital in Dillingen, Germany. Volunteers were divided into two sections with each group receiving either one 50 mg or one 100 mg dose of standardized kava extract three times a day. Responses were recorded using EEG, EMG and EEG polygraphic devices during the four days and nights the experiment was run. The researchers came up with several interesting conclusions. They determined that, much like prescription sedative-hypnotic drugs, kava enhanced EEG sleep-spindle density which was 20 percent higher in 11 out of the 12 subjects given the kava extract regard-

less of the dose employed. Not only was sleep latency reduced, but deep and slow-wave sleep (Stages 3 and 4) was increased without any changes in the REM phase being recorded. Stage 1 sleep as well as duration of the wake phase showed tendencies to decrease after administration of the higher kava dose. Those who stopped taking the herb reported having no REM rebound. Dr. Emser noted that unlike sedative-hypnotic drugs, which may cause suppression of deep and REM sleep, kava supports the natural course of the sleep cycles. 21

Kava and Alcoholism

National statistics suggest that two-thirds of adult Americans drink alcohol. While the average American adult consumes an amazing 2.7 gallons of alcohol per year (almost two drinks per day) this figure can vary depending on a person's age, sex and region of the country. The social and health care costs associated with alcohol use are grim. Suicide is reported to be 30 times higher in alcoholics than in the rest of the population. More than 50 percent of the drivers involved in fatal car accidents are drunk. Alcohol abuse plays a role in the death of approximately 200,000 American citizens each year. Alcohol abuse additionally places a tremendous burden on the health care system. Alcohol-related problems consume billions of health care dollars each year. The cost to society in terms of fires, crime, lost productivity and automobile accidents was estimated at well over 90 billion dollars in 1983. Those who abuse alcohol tend to be heavy users of medical care, accounting for one in every five or six visits to a physician.

Not everyone who consumes alcohol has a problem or suffers from alcoholism, however. Five to ten percent of the adult males in the U.S. are alcoholic. While the average user of alcohol tends to lower consumption of alcohol in his or her late 20s or early 30s, the alco-

holic continues to drink at an increasing rate. Chronic abuse of alcohol inevitably leads to a breakdown in physical health along with an inability to stop drinking. The long-term impact of alcohol is severe, with alcoholics dying on average 15 years earlier than the rest of the population. While accidents, suicides and cancer account for a large percentage of deaths in the United States, other problems such as infection and liver cirrhosis can be equally as devastating.

Alcohol and the Liver

As alcohol is filtered and detoxified by the liver, too much of the drug creates an excess of fat in this organ. While this condition is reversible, continued use of alcohol results in a permanent scarring of the liver tissue called cirrhosis. In America, alcoholic cirrhosis accounts for 50 percent of the 35,000 cirrhosisrelated deaths that occur each year. Without a healthy liver, the immune system suffers, certain vitamins (A, C, D, K and B-12) are not absorbed, protein is not processed properly and toxic chemicals are not broken down and excreted. While the liver is most severely affected by excessive alcohol, other organs such as the heart, brain, pancreas, liver, kidneys and skin also suffer tremendously from this chronic drug abuse.

Withdrawal: How Kava Can Help

Alcohol's drug effects are well known to most people. As the blood alcohol level rises, one's perfor-

mance and judgment begin to suffer badly with confusion, disorientation, blackouts and coma being the end result. While long-term intervention (such as Alcoholics Anonymous) is clearly necessary for those suffering from alcoholism, dealing with the symptoms of withdrawal is another matter. The acute symptoms of alcohol withdrawal are the result of decreasing blood levels of the drug and can last anywhere from 72 to 96 hours. They include shaking, nausea, diarrhea, lack of sleep, fever, high blood pressure, muscle cramps, ringing in the ears and seizures. A condition called *delirium tremens* (DTs) may occur in about 4 percent of alcoholics undergoing withdrawal. In addition to many of the aforementioned problems, individuals with DTs are confused, agitated and suffer from hallucinations. Medical treatment for alcohol withdrawal symptoms typically includes a nutritious diet, rest, fluids, multiple vitamins, B-2 (thiamine) shots plus benzodiazepine-type drugs (e.g., oxazepam). Antianxiety medications are not only employed in cases of major withdrawal symptoms such as DTs but are also employed for minor problems associated with short- and long-term alcohol withdrawal as well. Unfortunately these same drugs may lead to dependence, substituting one addiction for the other.

This concern led Dr. Kryspin-Exner from the Psychiatric Clinic at the University of Vienna in Austria to find out whether or not kavain might be effective in helping individuals deal with their long-term withdrawal symptoms. Fifty patients diagnosed with chronic alcoholism, who were attempting to withdraw from the drug, were divided into two groups of 25. The first group received kavain, one 200 mg capsule

three times a day, while the second group received a placebo over a five-week period. Prior to the treatment with kavain alone, 28 of the volunteers were treated with sedative-hypnotic medications during the first three to five days of acute withdrawal. All volunteers were also given a multivitamin injection during this time period. Dr. Kryspin-Exner was surprised and pleased with the results. Although the outcome was not statistically significant, 23 out of 25 patients receiving the kavain reported that they had far fewer episodes of fear, anxiety, fatigue, dizziness, nausea or lack of appetite. In contrast, 11 of the 25 subjects receiving the placebo still complained of withdrawal symptoms. Kavain was generally well-tolerated, and Dr. Kryspin-Exner observed that kavain showed no signs of becoming an addictive substance. It is indeed ironic that kava, a substance that is under much scrutiny for its abuse as a drug, can help individuals successfully deal with the symptoms of alcohol withdrawal. 22

Side Effects

Headlines from the August 5, 1996 issue of *Deseret News* in Salt Lake City, Utah warned about the recent conviction for impaired driving of a man under the influence of kava kava. When Utah State Highway Trooper Paul Hiatt stopped a motorist swerving in and out of traffic, he suspected he was dealing with a drunk. Although the man's poor reaction time, staggering gate and slurry speech were highly suggestive of too much alcohol, much to Trooper Hiatt's surprise, the man's breath test registered zero. Upon being further questioned, the motorist had admitted to drinking 16 cups of kava that evening! Law officers warn, whether the substances are legal or not, that driving under the influence will get you arrested. A spokesman from the Utah Highway Patrol pointed out that they are not opposed to kava, but that they just want people to drive responsibly.

This recent news story is very indicative of kava kava's split personality. On the one hand, numerous European studies have shown that this phytomedicine is remarkably free from side effects at doses of up to 600 mg daily for one to two months. However, like many other intoxicating substances, kava can also be abused when consumed in large quantities.

There is no better example of this than the problem it has created among certain groups of northern Australian aborigines. While the use of kava as an alcohol substitute has allowed certain native communities to abandon alcoholic binges, fighting, intensive gambling and gasoline sniffing, heavy and long-term users of this herb have generally suffered from ill health.

Professor John Matthews and his group from the Menzies School of Health Research in Darwin, Australia, decided to investigate the health status of 39 kava users and 34 nonusers. A structured questionnaire revealed that consumption among users varied from very heavy to occasional use. Very heavy (average 410 grams per week) and heavy use (average 310 grams per week) was reported in 27 percent and 21 percent of the respondents respectively. Only five percent of those surveyed reported using kava occasionally at less than 100 grams per week. Heavy users were more likely to experience shortness of breath, a puffy face and a scaly rash on the arms, legs and trunk of the body. Furthermore, these same individuals were 20 percent underweight. This fact, according to Dr. Matthews, is attributable to the link between the use of kava and malnutrition. He comments that "such malnutrition could be due in part to the high cost of kava (which leaves less money for food), to the many hours that are spent around the kava bowl (which leaves less time for food preparation and eating) or to the loss of appetite and nausea that are caused by kava." Heavy consumers of the herb were also more likely to have blood in the urine and increases in a liver enzyme called gamma glutamyl transferase (GGT). While this enzyme is

usually found in individuals who drink excessive amounts of alcohol, it is the researchers' contention that, like too much alcohol consumption, excessive kava use may also be toxic to the liver. "It is not known," writes Dr. Matthews, "whether the long-term use of kava causes liver damage which progresses to cirrhosis of the liver . . ." Although kava liquid was originally touted as a safe alternative to alcohol, it is clear that overindulgence carries with it other health problems. 23

Kava Dermopathy

An additional problem encountered with long-term use of the nonstandardized kava liquid is a skin condition called kava dermopathy. Too much kava use leads to a scaly or scabby brownish skin outbreak, medically called an ichthyosiform eruption. It occurs in 70 percent of heavy kava drinkers.24 Natives of the Pacific Islands have long recognized that excessive kava use changes the skin. These skin eruptions were considered to be marks of privilege or nobility as only a certain class of people could abstain from work and spend their days in conversation and religious ceremony. One of the crew members on James Cook's third voyage to the Pacific commented that "After kava drinking, the skin begins to be covered with a whitish scurf, like leprosy, which many regard as a badge of nobility . . . the more scaly their bodies are, the more honorable, it is with them."25 Kava drinkers with such characteristic skin changes have been reported to spend an average of 50 hours a week drinking kava, consuming about 13 liters per evening.

While this rash is reversible once individuals stop drinking kava, the reason why heavy users of the herb get this condition is not yet known. Suggested causes range from allergy to light sensitivity from skin accumulation of kava lactones. Another possible reason for this scaly rash was thought to be the result of niacin (vitamin B3) deficiency. Lack of vitamin B3 can cause serious problems in people leading to a nervous disorder, mania and certain skin changes. This symptom triad is called *pellagra*, a word which has its origins in the Italian language and means rough skin. Those suffering from this condition, much like that seen in heavy kava users, develop a cracked, scaly and pigmented skin that is irritated by sunlight. While vitamin B3, in the form of nicotinamide, reverses the skin changes characteristic of pellagra after several weeks of therapy, the question is: does it help in kava dermopathy?

In order to investigate this, Dr. P. Ruze, from the Department of Internal Medicine at the University of New Mexico, gave individuals diagnosed with kava dermopathy 100 mg of niacinamide daily for three weeks. Although 5 out of 15 subjects in the vitamin B3 group demonstrated improvement in their skin, so did 5 out of 14 volunteers in the placebo group. In fact, a worsening of the skin was noted in two of the niacinamide and three of the placebo users. These results prompted Dr. Ruze to conclude that vitamin B3 has no effect on the skin and that kava dermopathy is not the result of a niacinamide deficiency. 26

While Dr. Ruze could not explain why some individuals' skin did improve on niacin therapy, she did propose another reason for the characteristic skin changes. She believes that certain cholesterol-lowering

drugs induce skin changes similar to those found in heavy users of kava. This suggests that kava dermopathy may be due to a defect in how the body metabolizes cholesterol. This is highly interesting in light of the fact that heavy kava users report having an increase in HDL cholesterol levels (the good cholesterol). 27

It is unlikely that individuals using kava on an occasional basis will suffer from this skin-related problem. As Drs. Norton and Ruze conclude: "The recent promotion of kava products by health-food industries may lead to some kava-related disorders outside the Pacific basin. Still, a health-food enthusiast would need to consume an enormous quantity of kava to affect the skin, so it is unlikely that kava dermopathy will occur in temperate users."

The Commission E Report

Some of the world's finest documents on herbal medicine are the German Commission E monographs. Similar to our *Physician's Desk Reference*, these papers carefully and briefly list the actions, side effects and drug interactions for kava and hundreds of other herbs as well. Although both standardized and isolated extracts of kava have proven themselves to be remarkably free of side effects, certain cautions originating from this document need to be mentioned. At the therapeutic dose of 140 to 210 mg of kava lactones per day for from four to eight weeks, the only reported side effects have been mild gastrointestinal upset and yellowing of the skin, hair and nails. Allergic skin reactions (e.g., rash) may occur in rare in-

stances. If you encounter either of these latter conditions, you should stop using the extract immediately. Problems with balance may also occur, although recent research suggests that this only occurs at a dose of several grams daily. Furthermore, the monograph suggests that as a result of Kava's sedative actions, it should not be utilized while driving a car or operating machinery. Alcohol, barbituates and other antidepressant medications should not be used in conjunction with kava. Additionally kava is not recommended for use by women who are pregnant or nursing, children or those suffering from depression.

Some recent case studies from the medical literature have pointed out that in certain individuals kava may cause either involuntary muscle movement or muscular spasms of the head, neck, tongue, etc. 28 These conditions are called dyskinesia and dystonia respectively. Problems like these have been commonly experienced by individuals using long-term antipsychotic drugs for such conditions as schizophrenia. While these case studies do represent an area of concern, they are not confirmed by double-blind studies and may be the result of other interfering factors such as use of other drugs including alcohol. The weight of the evidence in other human clinically controlled trials have clearly demonstrated kava's short-term safety and efficacy.

Kava and Other Herbs

For conditions of insomnia, anxiety, menopause and alcoholism there are a number of other plant medicines that may be employed in conjunction with kava.

Black Cohosh and Menopause

Most conventional doctors agree that estrogen replacement of some type is of great advantage to women suffering from menopausal symptoms. Not only does it help reduce or relieve episodes of hot flushes, it also seems able to lift depression, ease anxiety, improve memory, restore libido and help maintain a healthy heart and strong bones. While millions of women worldwide are taking prescription estrogen to help them deal with menopause symptoms, both major and minor side effects are a concern. These can include bothersome problems like a return of menses, weight gain or bloatedness as well as more serious conditions such as breast or uterine cancer and venous inflammation. Thus, an increasing number of women are looking towards plant-based estrogens as an alternative.

Many herbs are known and used for their phytoes-

trogenic action. These plants contain certain classes of bioflavonoids that act as natural estrogens. Although they are only about 1/100th as potent as our own human internal estrogens, they are invaluable in treating menopausal symptoms. One of the most well-researched of these phytoestrogens is black cohosh (*Cimicifuga racemosa*). Science has confirmed this herb's estrogen-like action in both animal and human experiments. Investigators from the Department of Clinical and Experimental Endocrinology at the University of Gottingen in Germany have concluded that a tincture of black cohosh root lowered lutenizing hormone (LH) secretions in menopausal women. LH, along with follicle-stimulating hormone (FSH), are two types of chemical signals sent from the brain's pituitary gland to the ovary telling it to produce more estrogen and progesterone. As a woman ages, these hormonal signals between ovary and pituitary begin to fade, increasing blood levels of FSH and LH, which usually indicate that estrogen is on the wane and that symptoms like hot flushes may soon follow.

What makes black cohosh work? A specific group of bioflavonoids called isoflavones may account for this herb's estrogen-like effects. Interestingly, these isoflavones are also found in soybeans and may explain why Asian women who consume a lot of tofu and miso have lower incidences of menopausal symptoms. Unfortunately, research has not yet determined whether black cohosh can stop bone loss or protect women from heart disease.

However, since it takes one to three months for black cohosh to kick in, temporary use of kava may

provide the menopausal woman with an effective short-term treatment for anxiety-related problems.

Valerian, Passionflower and Lemon Balm for Insomnia and Anxiety

Numerous plant medicines in addition to kava have a sleep-promoting and antianxiety action. Passionflower (*Passiflora incarnata*), lemon balm (*Melissa officinalis*), and valerian (*Valeriana officinalis*) are just a few of the traditional herbal remedies available in this category. Of all these herbs, valerian has been the most heavily researched. When Dr. Peter Leatherwood and his colleagues from the Nestlé Research Laboratories in Switzerland gave a liquid extract of valerian to 128 volunteers, he determined that both sleep quality and sleep latency was improved. While valerian did not increase total sleep time, sleep was reported to be more stable during the first part of the evening. Best of all, people taking the herb reported that valerian, unlike most benzodiazepine-type drugs, did not cause sleep hangover the morning after it was taken. 29

But is valerian an effective substitute for typical prescription drugs in the treatment of insomnia? The answer is *yes*, according to Dr. Dressing, a medical doctor and researcher from the city of Mannheim in Germany. Twenty healthy volunteers between the ages of 30 and 50 years were invited to participate in a study on valerian's effectiveness. Subjects randomly received either one capsule of a valerian and lemon balm combination or 0.125 mg of triazolam

(Halcion) at bedtime over a period of nine evenings. Individuals in this experiment were further divided into sound and poor sleepers, according to the median of sleep efficiency. While both groups reported an increase in sleep efficiency, it was the bad sleepers that benefited the most. EEG results in this latter group clearly demonstrated that the valerian/balm combination increased delta wave sleep (Stages 3 and 4). Daytime drowsiness or a rebound effect was not reported by the volunteers using the herbal combination. Furthermore, unlike the Halcion, valerian and lemon balm did not negatively influence the concentration or performance of the participants. These results prompted Dr. Dressing to conclude that ". . . valerian/balm combinations present a thoroughly effective and sage alternative to benzodiazepines in the treatment of specific sleeping disturbances." 30 While valerian and/or valerian/lemon balm combinations are useful additions for those suffering from insomnia, what about anxiety reactions?

European research suggests that valerian in combination with the herb passionflower may be helpful to individuals suffering from anxiety, insomnia and mild depression. Two groups of ten subjects were given the drug chlorpromazine hydrochloride or a valerian/passionflower combination over a six-week period. Each herbal tablet contained 100 mg of valerian and 4.5 mg of passionflower and was given at a dose of two tablets three times a day during the first week of therapy. Volunteers were instructed to lower their dose of the herbal combination to one tablet three times a day during the remainder of the trial. All subjects were monitored using the EEG along with psychological questionnaires for depression and anxi-

ety. The investigators noted that at the beginning of the study, patients with symptoms of anxiety were so hyperactive that they could not produce any alpha waves indicative of a more relaxed state of mind. While both the valerian/passionflower combination and the drug eventually induced alpha brain waves, the resulting EEG changes occurred after using the plant medicines for just two weeks. In contrast, the alpha-increasing action of the prescription drug took up to six weeks to show any effect. According to the results of the psychological tests, in both groups depression and anxiety were eventually significantly decreased. However side effects including tiredness and low blood pressure occurred only in those taking the prescription drug. 31

While valerian, passionflower, lemon balm and black cohosh may be used in conjuction with kava, readers should bear in mind that no studies have yet been completed combining kava with some or all of these herbs. While these herbs are individually and in general quite safe to use, certain questions remain to be answered. For example, does the combination of valerian and kava produce a stronger sedative action? If so, is there a possibility of adverse side effects? This uncertainty is presented to the reader as a warning to use caution when combining these herbal medicines.

Valerian, passionflower and lemon balm should not be used with alcohol or while driving or operating machinery of any type. Women who are pregnant or nursing should not take black cohosh or any sedative herbs. Too high a dose of black cohosh may produce nausea, vomiting, dizziness, a lowered pulse rate and increased sweating.

Silymarin and Alcohol

While kava may be useful in helping individuals deal with the symptoms of alcohol withdrawal, the remarkable herb milk thistle (*Silybum marianum*) and its bioflavonoid complex called silymarin may help alcoholics in other ways. Numerous European research studies have repeatedly demonstrated that a standardized extract of the herb, containing 70 percent silymarin, helps to protect liver cells from the damage imposed by numerous toxins, including alcohol. Silymarin is able to achieve this remarkable effect in three ways: by sticking to and protecting the outside of liver cells; kicking the protein-synthesizing mechanisms into high gear, thereby regenerating damaged liver tissue; and increasing the liver's production of a powerful antioxidant called glutathione. The effectiveness of this herb's triple protective action has been confirmed in a recent German study involving well over a thousand patients with liver disorders (e.g., fatty infiltration, hepatitis, cirrhosis). Subjects in this study received an average of three to six capsules per day of a standardized milk thistle extract (140 mg silymarin per capsule) for a period of eight weeks. After two months of silymarin therapy, 63 percent of the volunteers noted that they no longer had any symptoms of nausea, itching, abdominal bloating and fatigue. Physicians who examined these patients not only noticed a reduction in the size of their livers on examination, but their liver enzyme laboratory values as well. The enzymes involved (SGPT, SGOT and GGT) reduced in number by an average of 34 to 46 percent, confirming silymarin's liver-protective and restorative actions. A small mi-

nority of individuals withdrew from the study complaining of stomach upset, nausea and mild diarrhea. 32 As alcohol-induced liver damage continues to be a problem, the widespread use of standardized milk thistle extract could provide tremendous nationwide benefits in both improved patient care and reduced treatment costs.

Summary of Uses, Dosages, Contraindications

Therapeutic uses of kava kava (*Piper methysticum*): Anxiety, menopausal anxiety, insomnia, symptoms of alcohol withdrawal.

Adult dosage: 140 to 210 mg kava lactones per day for a period of no longer than four to eight weeks without consulting a practitioner. While tinctures, powders and other crude extracts are available, the best form to utilize is a root/rhizome extract standardized to contain kava lactones. All of the research to date has employed either the isolated extract kavain, or a preparation containing 70 percent kava lactones. The latter is readily available in health food stores and some pharmacies.

a) Insomnia: 150 mg of a standardized extract (70 percent kava lactones) in capsule or tablet form one hour before bedtime with some water for seven to ten days.

b) Anxiety, tension, nervousness: 100 mg of a standardized extract (70 percent kava lactones) in

capsule or tablet form three times a day with food for four weeks.

c) Menopausal anxiety: 100 mg of a standardized extract (70 percent kava lactones) in capsule or tablet form three times a day with food for four weeks.

d) Symptoms of alcohol withdrawal: 200 mg of the extract kavain three times a day in capsule or tablet form over a five-week period with food. *This should be under the supervision of a practitioner.*

e) Human research has not yet supported the use of kava as a muscle relaxant, anesthetic, pain reliever or for improving blood flow to the brain. Thus, no accurate recommendations can be given for dosages. Kava should not be employed by epileptics as research suggests that at an effective dose, side effects from this phytomedicine are too toxic.

Contraindications: This product may cause drowsiness and as such, should not be used while driving or operating machinery as reaction time may be affected. Do not take while pregnant or lactating. Kava should be not be given to children and should be kept out of their reach. Kava should not be used in conjunction with alcohol, baribituates, antidepressants or other medications without consulting a practitioner. It also should not be used by those who are depressed.

Caution: The concomitant use of herbs such as valerian, passionflower, hops and other sedative plants with kava may cause additional drowsiness and other unwanted effects.

Side effects: Long-term use may cause yellowing of the skin or result in a scaly brown rash called kava dermopathy. Mild stomach upset may occur when using this herb. Stop taking kava if any of these effects become apparent.

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Index