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HERBALGRAM

The Journal of the American Botanical Council

Number 73 | USA $6.95 | CAN $7.95

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Lavender

Lavandula angustifolia Mill.

(Syn: *L. officinalis* Chaix., *L. spica* L., *L. vera* DC.)

Family: Lamiaceae (Labiatae)

Introduction

Lavender is an aromatic subshrub native to the low mountains (1,970-3,940 feet) of the Mediterranean basin. It is cultivated in France, Albania, Bulgaria, Hungary, Italy, Spain, the nations of the former Yugoslavia (Montenegro, Serbia, etc.), China, Russia, Moldova, Argentina, the Netherlands, the United Kingdom, the United States, and Australia.[1,2,3,4] It should not be confused with the hybrid lavandin (*Lavandula* x *intermedia* Emeric ex Loisel), which is more widely cultivated and far exceeds lavender in essential oil production.[4] Because lavenders have been cultivated for such a long time throughout history, garden lavenders are mostly hybrids and identification is often difficult.[3] The dried flowers, containing not less than 13 ml/kg of essential oil, and the essential oil obtained by steam distillation from the flowering tops are the official articles of the European Pharmacopoeia.[2,3,5,6]

History and Cultural Significance

Of all the essential oils, lavender is probably the most versatile, possessing an extremely diverse range of clinical and economic properties.

While *L. stoechas* is mentioned by Pliny the Elder (23-79 BCE) as being used medicinally by the Romans, *L. angustifolia* was apparently unknown to them at that time.[4] It has been widely published that lavender's genus and common names come from the Latin *lavare*, to wash. However, since neither lavender flowers nor oil are mentioned in a comprehensive review of Roman bathing, this commonly held belief is probably in error. It is more likely that the genus and common names came from the Latin *livere*, meaning livid or bluish.[4] Various species of lavender were reportedly used to disinfect hospitals and sick rooms in ancient Persia, Greece, and Rome.[7] In the time of Pliny the Elder, the blossoms sold for 100 Roman denarii per pound. Knowledge of its healing abilities spread to India and Tibet. In the 17th century Persian medical text *Makhzan-El-Adwiya*, it is called the broom of the brain, because it is reputed to sweep away impurities. The *Gyu-zhi*, or *Four Tantras*, by Chandranandana is the earliest Indian medical text to be translated into Tibetan (8th Century BCE). In it, lavender is included as part of psychiatric formulas. These formulas are in an edible ointment or medicinal butter form and are still used today in Tibetan Buddhist medicine for treating insanity and psychosis.[7]

Lavender preparations are traditionally employed to treat symptoms of certain nerve-related disorders like minor sleeplessness.[1] In European systems of traditional herbal medicine, the main use for lavender flower teas, baths, and pillows is as a mild sedative.[8] In European folk medicine, lavender preparations are also used for their spasmolytic, carminative, stomachic, and diuretic actions. Lavender flowers and oil have also been used for laryngitis, asthma, sinusitis, and candida infections.[9] When lavender oil is massaged into the temples, it can help relieve many forms of headache. It can also relieve many causes of muscular pain. In aromatherapy, lavender is used for many varied skin conditions, including insect bites, burns, inflammation, and for healing small cuts.[9,10]

Fresh lavender flowers are added to jams, ice cream, vinegar, and herbal teas.[11] The aromatic oil possesses a soothing fragrance used to scent many cosmetics, shampoos, and industrial products. Lavender oil is used as a flavor component in food products, including beverages (both alcoholic and non-alcoholic), aromatic vinegars, baked goods, candy, frozen dairy desserts, gelatins, and puddings.[12]

The internal use of lavender flower (as tea infusion, extract or bath additive) is currently approved by the German Commission E for restlessness or insomnia, nervous stomach irritations, and nervous intestinal discomfort.[2] It is also approved for treatment of functional circulatory disorders in bath therapy. The current German Standard License (GSL) for lavender flower tea approves its internal use for treatment of disorders such as restlessness and sleeplessness, and functional upper abdominal problems such as nervous irritable stomach, Roemheld's syndrome, flatulence, and nervous intestinal discomfort.[13] For bath therapy (10 to 50 g dried flowers per 10 liters water), the GSL monograph indicates the use of lavender flower for treatment of functional circulatory disorders.[13]

Modern Research

Current research for external uses of lavender flower oil has shown some evidence for the relief of anxiety and depressive mood, ability to promote sleep, and as an antibacterial.[14] Lavender oil's antibacterial properties have been found effective in the healing of the perineum in post-partum women who had episiotomies while giving birth.[15] In addition, lavender oil aromatherapy reduced the level of perceived anxiety and physical symptoms of anxiety in nursing students.[16] In hospice patients, it has elicited a decrease in perceived pain and depression and an increased sense of well-being.[17] In other studies, lavender oil was found effective in reducing anger-frustration moods and negative responses about the future.[18] Lavender essential oil has also been studied for its ability to reduce agitation and mitigate the effects of dementia in elderly patients.[19,20]

Future Outlook

Although lavender has been cultivated for centuries, little is known about its sustainability as a long-term crop. Lavender crops in the United Kingdom and France go 20 years without crop rotation. The Bridestowe Estate plantation in Australia is currently researching the sustainability of lavender and soil management with the long-term cultivation of lavender.[21] Aspects being studied include possible trace element depletion and using rotation and green manure (organic matter) to restore organic matter levels.[21]

As of 2002, worldwide annual lavender essential oil production

Continues on page 4

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LAVENDER *Continued from page 1*

was estimated at 200 tons, produced mainly in Europe. The reason for this relatively low level is that much of the "lavender" of commerce is actually lavandin, a lavender hybrid that is much easier to grow and which produces more essential oil on a per-plant basis.[21]

The lavender industry in Australia is diverse and expanding.[4] Lavender is grown in all the Australian states except for the Northern Territory, with Tasmania accounting for the largest area of commercial cultivation and the greatest lavender oil production in the southern hemisphere. Estimated lavender oil production in China as of 2005 was 50 metric tons. England produces a few metric tons per year. Bulgaria does not produce enough to satisfy its domestic market. France produced 60 metric tons in 2002. Russia produced almost 42 metric tons in 2000. Moldova and Ukraine combined produced between 20 and 30 metric tons in recent years.[4] HG

—Gayle Engels

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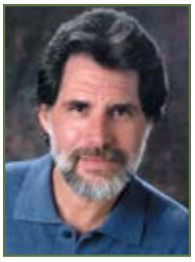
(continued)

dear *reader*

Several years ago I was invited to be the keynote speaker at an herb conference at Mountain State University in the beautiful mountains of West Virginia. I was picked up at the airport by an affable fellow who was working towards his master's degree in botany. His interest in and passion for plants eventually led him to his thesis project: saving wild native medicinal plants—black cohosh, ginseng, goldenseal, and others—from destruction caused by the highly invasive practice of mountain top removal to mine coal.



Try to imagine, if you possibly can, the act of literally blowing up the top of entire mountains to access the coal under the surface. If this seems incredulous, please take a look at the photos on page 53 in the article that Dean Myles, the driver and botanist, wrote at our request. It's not just about blowing up mountains to extract the coal; the mining companies take the debris from the mountain tops and then dump them into the "hollers"—the canyons and valleys along the sides of the mountains—the perfect habitat for many wild native medicinal plants. Dean and his crew hike into the canyons before the mining companies dump the debris; they dig out the living plants and then transplant them into herb gardens and other areas where they can be grown for educational and research purposes.

In his article Dean lists 15 species of medicinal plants that his program has been able to relocate and thus save from destruction. If ABC were ever to grant an award for our favorite environmental hero, at least from a medicinal plant perspective, then Dean would be one of our first candidates for consideration.

Speaking of conservation efforts, this issue also reports on the endangered rosewood tree (*Aniba rosaeodora*), which was historically over-harvested for its aromatic oil and placed on the World Conservation Union's Red List of Threatened Species about 10 years ago. Some Brazilian women have started a plantation of young rosewoods and are promoting the sustainable harvesting of these endangered trees. They plan to rely on the leaves and branches of their cultivated rosewood trees as a sustainable source for the oil. Currently, they use illegally-harvested oil—confiscated and given to them by Brazil's environmental enforcement agency—in the production of soaps, candles, and other products.

One of our key features deals with Sho-saiko-to (SST), the traditional Kampo herbal formula from Japan (aka, minor bupleurum formula in traditional Chinese medicine, TCM), which is increasingly being used as a medicine of choice for various forms of chronic liver disease. Kampo medicine is the traditional Japanese system of herbal medicine based on TCM. Being an island, Japan's plant biodiversity is extremely limited compared to the Asian continent, and for hundreds of years the Japanese have been importing herbs from the mainland. The key distinguishing feature between Kampo and most TCM herb formulations is that the Japanese government requires Kampo preparations to be made according to Western good manufacturing practices for drugs—the processing plants are designed to pharmaceutical grade standards, and the Kampo medicines are sold via a physician's prescription. Numerous pharmacological and clinical trials, reviewed in the article, support the benefits of SST for treating chronic liver disease.

In the waning hours of the 109th Congress, the House of Representatives passed the Dietary Supplement and Nonprescription Drug Consumer Protection Act, otherwise known as the "AER Bill." It was signed into law by President Bush on December 22, 2006. In this column from issue #71, I wrote about this legislation, which requires mandatory reporting to FDA of all *serious* adverse events (SAEs) related to supplements and OTC drugs. It received bipartisan support from traditional dietary supplement industry supporters (e.g., Senators Hatch and Harkin) plus those who have often criticized the industry (e.g., Senators Durbin and Kennedy), as well as support from all major trade associations in both the dietary supplement and OTC drug industries, plus various consumer groups. What is required now is accurate reporting of well-documented SAEs, a process that has been unreliable for all supplement related adverse events in the past.

[redacted]

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A.M. TODD

BOTANICAL THERAPEUTICS

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HERBALGRAM

The Journal of the American Botanical Council

Number 73 • February, March, April 2007

Bupleurum *Bupleurum falcatum*. Photo ©2007 stevenfoster.com

departments

Correction

The article titled "FDA Denies Medicinal Value of Smoked Marijuana" by Mariann Garner-Wizard, which was published in HerbalGram 72, incorrectly states that US Representative Ron Paul, MD, is a Democrat when in fact he is a Republican.

HerbalGram® is printed on recycled paper at Branch-Smith Printing, Ft. Worth, Texas

Published by the American Botanical Council, P.O. Box 144345, Austin, TX 78714-4345.

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ISSN #0899-5648. Printed in the U.S.A.

ABC Collaborates with Academy of Oriental Medicine at Austin to Create Chinese Medicinal Herb Garden

Several colleges of acupuncture and Oriental medicine* in the United States have established student garden programs to enhance herbal studies and to provide a contact point for their respective local communities. In 2001, High Falls Garden (HFG), a farm-based, nonprofit educational organization in Philmont, New York (www.highfallsgardens.net), obtained funding to create or improve these student gardens, and has been offering seeds and botany instruction since then. New funding has allowed HFG to expand these programs from 2006 through 2008.

Dr. Luo Song from the Academy of Oriental Medicine at Austin (AOMA) sprays an organic herbicide of orange oil and vinegar on the ground for the future Oriental Garden. Photo ©2007 ABC

One of the 15 schools benefiting from this program is the Academy of Oriental Medicine at Austin (AOMA). When AOMA approached the American Botanical Council (ABC) about working together to create an Oriental Herb Garden at ABC's headquarters, it did not take long to determine that this was a collaboration that would benefit both organizations. ABC had long wanted an Oriental Herb Garden, as well as to work more closely with AOMA on a project. AOMA had access to some funding, seeds, and plants for a garden, but no place to put it. A few meetings ensued and soon representatives of both organizations were forming plans and working on the design for the new garden.

It was important to both ABC and AOMA to fulfill the specific objectives of HFG's Botanical Studies for Oriental Medicine program. These objectives are as follows:

- to provide the means and opportunity for all oriental medicine students and practitioners to have hands-on contact with living medicinal plants;
- to adapt the study of botany for graduate-level electives and continuing education in oriental medicine;
- to build the capacity of the profession to assess and monitor medicinal plant quality, including plant identification, cultivation techniques, traditional processing methods, and description analysis;
- to increase demand for local ecologically-grown farm products; and
- to continue to develop connections among herbalists, conservators, and farmers on a local and regional basis.

To address these objectives, the students at AOMA are closely involved in researching the specific Chinese medicinal plants that will grow in Central Texas and that will be representative of the major functions of herbs in oriental medicine. AOMA students are part of the garden design process and will be an ongoing part of the implementation and maintenance of the garden. They will keep records of their activities in the garden during each of their visits and this information will be collated and used to report on the project's progress to HFG, as well as shared with the other designated sites participating in the program. Once the garden is actually growing (spring 2007), AOMA faculty and ABC staff will present classes in the garden for both AOMA students and the general public.

Work began on the garden on July 29, 2006, when a group including ABC staff, AOMA staff, students, and faculty gathered at ABC headquarters to lay black plastic over an area of approximately 360 square feet where the garden will be located. The intense summer sun coupled with the black plastic will work to "solarize" the soil beneath, effectively killing any grass or weeds that are growing there. The plastic has been left in place for two months, and upon its removal, paths will be laid down, beds will be dug, and planting will begin.

The garden will be octagonal, the shape of the ba gua (an energy map based on the concepts of yin-yang, the eight trigrams of the I Ching, and the theory of the Five Elements). The actual garden beds will be located in a 4-foot wide outer octagon containing approximately 200 square feet of planting space. Inside the garden will be a 4-foot wide octagonal decomposed granite path and a central design element that will represent Oriental medicine. Some of the plants for the garden will be started from seedlings grown in ABC's greenhouse this winter, and some will be started from cuttings of plants already at ABC. Additional plants will be obtained from other sources.

The grant AOMA receives from HFG will cover only part of the costs for implementation of the new Oriental Herb Garden, and it is spread out over a three-year period. To complete the garden and make it a showplace garden and teaching tool, ABC is seeking additional funding to support this project. The creation of an Oriental Herb Garden among ABC's existing medicinal theme gardens has generated much interest and excitement locally, and ABC hopes it will also generate interest among its supporters. HG

—Gayle Engels

* *Editor's note: In principle,* HerbalGram *does not prefer the term* oriental *as an adjective to describe items from* Asia*, generally preferring the term Asian as a more precise geographic term. However, insofar as the word oriental has become widely used in the Acupuncture and "Oriental" medicine community, we use this term in the narrow context in this article.*

Sarah Bentley, community services coordinator for AOMA, and ABC gardener Nate Sponseller cover the ground with black plastic to solarize the area for the future Oriental Garden. Photo ©2007 ABC

ABC Employee Profile: Nancy Moon


Moon

Like so many positions in a small organization, Nancy Moon's job title does not begin to adequately describe the many important roles she plays at the American Botanical Council. Since she first started working as my executive assistant in June 2005, Nancy has continued to expand her many activities and responsibilities to include additional key functions that go well beyond her role as my assistant.

One of the first aspects that almost everyone notices about Nancy is her almost boundless, positive energy, which she channels in numerous directions simultaneously. She and her trademark orange tennis shoes are involved in many key areas of ABC's operations and activities.

As my assistant, Nancy performs the following functions. She serves as liaison between others and me, which includes handling all formal communications to and from the Board of Trustees, Advisory Board members, journalists and members of the media, appointments with Sponsor Members, and others. She also handles all press releases, media alerts, and ABC Member Advisories, which includes helping to edit such documents before they are released. Every morning, Nancy provides relevant ABC staff with "heads-up" e-mails about articles on herbs and related topics that have just been published in world media; these articles often find their way to the MediaWatch section of the monthly HerbalEGram, our electronic newsletter. Speaking of the world, Nancy arranges all of my travel plans as well as all invitations for speaking engagements, and she formats most of my Power Point presentations. She handles much of my professional and personal correspondence, including Thank You notes (yes, some people still send them, and, no, I'm not a member of the Junior League!), condolence cards, and so on. Nancy also handles my entire schedule, incoming mail, phone appointments, and conference calls.

Nancy helps to coordinate ABC attendance at conferences, trade shows, and exhibitions, as well as ensuring that ABC educational materials and handouts (such as *HerbalGrams*) are sent to conferences and speaking venues. She also plays a key role in planning for ABC-sponsored events.

If that were not enough, Nancy is one of the key people performing human resource management at ABC, helping to coordinate performance reviews and the many functions related to HR. In addition, Nancy, with a strong compulsion to volunteer for whatever task needs attention, has become the de facto recorder of all monthly staff meetings.

Nancy recently assumed another important role by becoming a key member of the expanded Development and Marketing Team, assisting the always necessary function of helping ABC to expand its revenue base as a means to expand ABC's nonprofit educational mission.

Without Nancy, there is no way ABC or I could cover so many areas and function so effectively! HG

—Mark Blumenthal

Duke and Foster Lead Pharmacy from the Rainforest Trip to the Amazon

Terraced hillside view of Machu Picchu.
Photo ©2007 ABC

It was a sultry day in late October, 1994, when James A. Duke, PhD, introduced a group of travelers in Peru to purslane (Portulaca oleracea L., Portulacaceae), a "weed" common to South and North America filled with potential cancer-preventing antioxidants. At the time, Dr. Duke was a co-founder and trustee of the American Botanical Council (ABC) and an economic botanist for the USDA; his audience members were the participants in ABC's first Pharmacy from the Rainforest ethnobotanical trip.

ABC sponsored that first trip in conjunction with the Texas Pharmacy Foundation (TPF) and International Expeditions (IE) in response to a survey of Texas Pharmacy Association members expressing interest in learning about herbal medicine. Thirty-seven pharmacists received continuing education credit for participating in the workshops that fall. Thus began 12 years of exciting eco-tours to various locations including Belize, Costa Rica, Kenya, South Africa, and Germany. All tours have been accredited for continuing education for physicians and pharmacists.

During this first trip, participants spent a day at the Amazon Center for Environmental Education and Research (ACEER) research station on the Sucusari river, a small river flowing into one of the Amazon's major tributaries, the Rio Napo, which has headwaters in the Ecuadorian highlands, and flows into the Amazon north of Iquitos in northern Peru. Here they attended workshops and took an early-morning walk on the spectacular rainforest canopy walkway, a series of suspension bridges high in the trees, 12 stories above the jungle floor. ACEER is a nonprofit organization dedicated to promoting conservation of the Peruvian Amazon by fostering awareness, understanding, action, and transformation. Since ABC's second trip to the Amazon, ACEER has been one of the sponsoring organizations (Dr. Duke and ABC founder and executive director Mark Blumenthal have been members of the ACEER board for many years).

Over the years, many aspects have changed about the annual Amazon trip while others have remained constant. ABC and ACEER have remained committed to the highest quality phytomedicinal education for healthcare providers and others who travel to Peru on the ethnobotanical tours. Dr. Duke has continued to participate, delighting attendees with his humor and sharing his encyclopedic knowledge of the plants that grow in the Amazon River basin as well as in the Andes. However, he has been talking about slowing down a little and not going on the Amazon trips any longer. Since his retirement from the USDA in 1995, Dr. Duke has been busy writing books, running a botanical consulting business and building the Green Farmacy Garden at his homestead in Fulton, MD. He has many reasons to want to stick closer to home and says this will probably be his last year to lead the trip to the Amazon.

Thus, ABC and ACEER are encouraging everyone who has ever wanted to go on one of the Amazon trips to do so this year so they can benefit from Dr. Duke's vast knowledge and experience. The two organizations are also trying to contact the alumni of prior trips to make this a reunion experience.

This year's participants will travel to the following: new ACEER facility in southern Peru, ACEER-Tambopata at Inkaterra where they will visit the Nature Interpretation Center, the Jardín de Plantas Medicinales, Children's Rainforest Garden, and the 3.5 km Useful Plants Trail that highlights an additional 125 species of economically valuable plants. They will also have the opportunity to get a bird's eye view of the rainforest from the 1,135 foot-long Canopy Inkaterra, opened in 2005, a complex of 7 hanging bridges, 6 treetop observation platforms, and two 95-foot-tall towers, woven through the crowns of the tallest trees, offering visitors glimpses of rare and unusual flora and fauna, impossible to see from the ground.

Noted herbal expert and veteran botanical photographer Steven Foster will accompany Dr. Duke as his co-leader. Steven has over 30 years experience with herbs, has written numerous books (his latest, *Desk Reference to Nature's Medicine*, is published by National Geographic and is reviewed in this issue on page 69), and he is the principal supplier of botanical photography for *HerbalGram.* Steven will conduct a workshop on botanical photography so that everyone who brings a camera will be sure to come home with the best-quality photos possible!

For more information on itinerary and registration for the July 30-August 6, 2007 trip and the optional extension to Machu Picchu August 5-9, see ABC's Web site (www.herbalgram.org; select the "Botanical Medicines from the Amazon" button) or call ABC at 512-926-4900. HG

—Gayle Engels

Madalene Hill Receives AHS Award

Madalene Hill, internationally recognized herbalist and author, was awarded the Catherine H. Sweeney Award for extraordinary and dedicated efforts in the field of horticulture by the American Horticultural Society (AHS) on June 2, 2006.[1]

Mrs. Hill was one of 12 award winners honored at the 2006 Great American Gardeners Awards Ceremony and Banquet at AHS headquarters on George Washington's River Farm in Alexandria, VA.

"These awards celebrate the best and brightest in our nation, from scientists who develop tough plants for our gardens to public garden professionals who promote earth-friendly gardening practices to journalists who popularize gardening throughout America," said AHS President Katy Moss Warner.[1]

Mrs. Hill, curator of the Susan Clayton McAshan Herb Gardens at the International Festival-Institute in Round Top, TX, has worked with herbs for almost 50 years. She opened Hilltop Herb Farm with her late husband in 1957, where she worked for over 35 years growing, selling, and cooking with herbs.

Throughout the years, Mrs. Hill has shared her knowledge of herbs with the public through her many lectures and through her two books (co-authored with her daughter Gwen Barclay): the *Houston Garden Book* (1983) and the perennial favorite *Southern Herb Growing* (1987), which is still in print.

Seven herbs have been named after, discovered, or introduced by Mrs. Hill: Mexican mint marigold (*Tagetes lucida* Cav., Asteraceae), Madalene Hill doublemint (*Mentha* x *gracilis* Sole 'Madalene Hill,' Lamiaceae), Hilltop oregano (*Origanum* x *majoricum* Cambess., 'Hilltop,' Lamiaceae), tulted or ball basil (*Ocimum basilicum* L. 'Thrysiflora,' Lamiaceae), Arp hardy rosemary (*Rosmarinus officinalis* L. 'Arp,' Laminaceae), Madalene Hill rosemary (*Rosemarinus officinalis* L. 'Madalene Hill,' syn. 'Hill Hardy,' Lamiaceae), and silver sage hybrid (*Salvia officinalis* L. x S. *fruticosa* Mill. 'Ne'we Ya'ar,' Lamiaceae).[2]

Mrs. Hill is in her 14th year at the International Festival-Institute, where the McAshan Herb Gardens now include 14 gardens with a wide variety of themes including the Mediterranean Garden, the Medicinal Cacti Garden, the Fruit Tree Garden, and the Pharmacy Garden, among others.[3]

Mrs. Hill served as president of the Herb Society of America (HSA) from 1986 to 1988 and was honored by HSA with the Helen de Conway Medal of Honor in 1978, the Nancy Howard Award for Horticultural Excellence in 1997, and the Gertrude B. Foster Award for Excellence in Herbal Literature (shared with Mrs. Barclay) in 2005.[4]

"Madalene Hill is one of America's great national and natural treasures," said American Botanical Council Founder and Executive Director Mark Blumenthal. "She has worked tirelessly to promote the beauty, flavor, fragrance, and traditional lore of herbs, spices, and medicinal plants for half a century. She is a great teacher, inspiring all the people with whom she comes into contact with a deeper appreciation of the many values and benefits of these plants. Madalene is clearly the grande dame of American herbalism." HG

—Dana Donalson

Madalene Hill in her garden. Photo ©2007 Madalene Hill

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AHPA Developing Database of "Old Dietary Ingredients"

By Courtney Cavaliere

The American Herbal Products Association (AHPA), the leading trade association in the United States dealing with herbal products, announced in August 2006 that it will be compiling a database of all "old dietary ingredients" (ODIs), which consist of all dietary ingredients marketed prior to the passage of the Dietary Supplement Health and Education Act (DSHEA) of 1994. AHPA has asked that companies submit printed materials that document their marketing and sales of ODIs for use in creating this "ODI Substantiation Database."[1]

Under DSHEA, all dietary ingredients introduced to the market after October 15, 1994, are considered "new dietary ingredients" (NDIs). Manufacturers are required to provide evidence of safety of NDIs to the US Food and Drug Administration (FDA) before such ingredients can enter the market. (For more information on NDIs, see the article by Chris and W. Patrick Noonan in *HerbalGram* 63 and/or ABC's HerbClip on Michael McGuffin and Tony Young's article in the *Food & Drug Law Journal*.[2,3]) On the other hand, dietary ingredients that were lawfully sold before the passage of DSHEA, referred to within the herbal industry as ODIs (this term is not found in DSHEA), do not require such FDA approval. They are presumed safe unless evidence suggests otherwise.

"As we approach DSHEA's 12th anniversary, we need to preserve the records that substantiate which ingredients were already in the market," AHPA President Michael McGuffin explained in an AHPA press release.[1] "This will become even more important as more years pass, so now is the time to consolidate the records of the industry's historical uses."

Although AHPA claims to already be in possession of numerous dated herb catalogues from 1994 and earlier, the organization is also enlisting the help of the supplement industry to ensure a more complete list of ingredients. AHPA is specifically soliciting records that clearly identify ingredients included in products marketed pre-1994 that would today be recognized as dietary supplements. Such records could include product catalogues, labels, invoices, packing lists, certificates of analysis, product specification sheets, product or packaging records, or any other information that clearly establishes the marketing of the ingredients in as much detail as possible. Companies may redact the information they submit by removing confidential or proprietary information (pricing, customer names, etc.) or request that AHPA redact such information. Companies that submit new information to AHPA will receive a discount for accessing the AHPA ODI Substantiation Database, the price of which has not yet been determined.

AHPA conducted a similar project in 1995 and used its collected list of ODIs as a basis for the 2nd edition of AHPA's *Herbs of Commerce*.[4] In its press release, AHPA encouraged even those companies that provided information for the 1995 call for ODIs to submit information that would substantiate their original submissions.[1] All records can be sent to: AHPA, ODI Substantiation Database, 8484 Georgia Ave., #370, Silver Spring, MD 20910. HG

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Organic Center Launches Campaign to Promote Increased Organic Food Consumption

By Dana Donalson

The Organic Center, a nonprofit organization devoted to producing and communicating science-based information about organic farming and consumption, launched a 4-year campaign in June of 2006 directed at mainstream America to stimulate a greater awareness of the benefits of organic foods.[1]

Organic food consumption currently accounts for 3% of food sales in the United States and is projected to increase to 5% by 2010.[2] The Organic Center plans to double this projection and increase organic food consumption to 10% by 2010 by releasing scientific data about organic farming and foods through media outlets in consumer-friendly formats. The campaign, titled Mission Organic 2010, aims to reach mainstream America by monitoring and following the trends of society.

"Trade, LOHAS (Lifestyles of Health and Sustainability), Boomers, Gen[eration] X and Gen[eration] Y are all being targeted with different messages about the benefits of organic that appeal to them," said R. Mark Davis, Organic Center CEO (M. Jarrell e-mail, November 10, 2006). "For example, one of our tools for getting the word out to Gen[eration] Y is a Mission Organic 2010 Myspace page: www.myspace.com/missionorganic2010." Those who access the online networking profile page will see various media celebrities in the campaign's friends section.

Mission Organic 2010 will also be promoted at conferences, and the program used will be licensed to manufacturers and retailers in the food industry for the purposes of educating consumers about the benefits of opting for organic foods (M. Jarrell e-mail, November 9, 2006).

The Organic Center is asking all campaign supporters to log onto the campaign Web site (www.MO2010.org) and officially join the mission by filling out a short form, which will grant them access to a free download of the Organic Starter Kit. The 9-page kit includes basics on the campaign, present and future benefits of organic farming and consumption, and tips for grocery shopping and reading organic product labels, as well as recipes for organic meals.

According to the Organic Center, eating organic will benefit human health by lowering developmental problems in children, lowering premature births which can cause developmental problems in infants, eliminating exposure to insecticides, and reducing interference with human sex hormones.[3]

The Organic Center recently selected 2 new leaders to head this campaign. At the center's annual meeting, held in August 2006, Anthony Zolezzi was named board chairman and Alan Greene, MD, was named board chairman-elect for the organization's 2006-2007 term. Zolezzi is president of Zolezzi Consulting Inc. and Natural Pet Nutrition LLC.[4] As an organic advocate, he has worked with a wide range of companies including Nestle, Horizon Organic Dairy, and Paramount Pictures in developing over 25 entrepreneurial products that increase nutrition or support sustainable agricultural practices. Zolezzi is also known in the industry for keeping his eye on social trends to carry over into the food industry, as he did in creating Bubba Gump Shrimp Co. Restaurants, modeled after the award-winning 1994 film *Forest Gump*. Dr. Greene is a professor in the Pediatrics Program of the Stanford University School of Medicine.[5] He has achieved much recognition for his award-winning interactive Web site Dr.Greene.com, and he is the Chief Medical Officer of A.D.A.M., Inc., an online source for health information.

Organic Center Board Chair Anthony Zolezzi. Photo ©2007 Organic Center

"The more organic land we have, the better it is for all people and the planet," Zolezzi said. "Through this campaign we want to show that organic can benefit everyone. It's time to expand organic to the masses and Mission Organic 2010 will help us get there."[1]

Mission Organic 2010 suggests at least 1 of every 10 grocery items purchased and 1 of every 10 meals made be organic. Everyone who joins the campaign effort is also encouraged to ask 10 friends to join as well.

The Organic Center was founded in 2002 and is funded by individuals, foundations, businesses, and government programs. Additional information on the Organic Center and its campaigns and reports can be found at www.organic-center.org. More information about the Mission Organic 2010 campaign can be accessed at www.MO2010.org. HG

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International Collaboration Develops a Sustainable Wild Collection Standard for Medicinal and Aromatic Plants

By Nancy Dennis and Courtney Cavaliere

A Canadian and German consortium has begun to develop a set of principles and standards to help stop the unsustainable wild collection of medicinal and aromatic plants (MAPs).[1] The groups involved in developing this "International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants" (ISSC-MAP) have argued that such standards are needed because current unsustainable wild collection practices, as well as land conversion and habitat loss, threaten the populations of some species of these plants.

The purpose of the ISSC-MAP standard is to ensure the long-term survival of MAP populations in their habitats while respecting the traditions, cultures, and livelihoods of all stakeholders. ISSC-MAP's objectives are to provide a framework of principles and criteria that can be applied to the management of MAP species and their ecosystems, serve as a basis for monitoring and reporting on these species, and recommend requirements for certification of sustainable wild collection of MAP resources.[2]

ISSC-MAP intends to engage local, regional, and international markets and collection businesses with much-needed specific guidance on sustainable sourcing practices. This guidance will include a list of criteria, verifiers, and indicators to help prove the sustainability of wild collection.[1]

According to the latest working draft of the ISSC-MAP, released in June 2006 by the Medicinal Plant Specialist Group, an estimated 50,000 to 70,000 different plant species are used in traditional and modern medicine around the world.[2] A large percentage of these species are harvested by wild collection practices, and the ISSC-MAP collaborators predict that this trend is likely to continue over the long term because of the relatively high cost of cultivation and domestication.

Some experts believe that cultivation will never completely replace wildcrafting because some species do not readily lend themselves to cultivation. Edward Fletcher of Strategic Sourcing, Inc. of Banner Elk, NC, has helped start many herb cultivation programs around the world. In most cases, says Fletcher, practical problems are not related to the characteristics of plant growth but to economic considerations (oral communication to N. Dennis, February 2006). An example might be seen in devil's claw (*Harpagophytum procumbens* [Burch.] DC. ex Meisn., Pedaliaceae), where cultivation is possible, but there have been questions as to whether it can be produced in an economically feasible manner.[3*] Even with careful attention to duplicating the conditions of natural habitats, some species, e.g., *Echinacea angustifolia* (DC, Asteraceae), when cultivated, do not generally contain as high a concentration of certain sought-after constituents as specimens harvested in the wild. "It has been my experience that wild grown *Echinacea angustifolia* is higher in echinacosides and cultivated *E. angusifolia* is higher in alkymides," wrote Fletcher (e-mail to C. Cavaliere, October 24, 2006). Fletcher acknowledges that sometimes it is possible to create specific agronomic conditions that can influence the increase/decrease of the levels of various desired/undesirable compounds.

"The development of an international standard for sustainable harvesting of wild-collected MAPs is a very complex undertaking. Issues such as sustainable yields that are species-specific, market influences, fair trade, and quality specifications all will need to be considered," Fletcher wrote (e-mail to N. Dennis, March 7, 2006). According to a concept paper outlining the purposes of ISSC-MAP, such issues will be taken into account under ISSC-MAP, which is intended to build upon existing standards and

*According to a representative of the Germany-based company Martin Bauer GmbH & Co., which specializes in producing teas and other botanical natural products, Martin Bauer is currently cultivating devil's claw in Africa and believes that this will ultimately become a successful operation, despite initial challenges (V. Wypyszyk, e-mail to M. Blumenthal, December 11, 2006).

guidelines. In particular, ISSC-MAP is designed to elaborate the recommendations of the 1993 WHO/IUNC/WWF Guidelines on the Conservation of Medicinal Plants (an updated version of which is expected to be published in 2007) and the 2003 WHO Guidelines on Good Agricultural and Collection Practices for Medicinal Plants,[4] both of which provide general recommendations addressed primarily to governments and other political and business stakeholders. The ISSC-MAP will expand upon such recommendations by supplying detailed management plans that must be developed for particular species and specific situations. "This could be an intimidating task," Fletcher said, "but the need is concrete and immediate." A principal goal of the herb cultivation programs that Fletcher and consultants like him organize is to take pressure off of wild populations.

The German Federal Agency for Nature Conservation (Bundesamt fur Naturschutz, or BfN) provided startup funding for ISSC-MAP, and the Medicinal Plant Specialist Group has been implementing the project through the IUCN-Canada and WWF/TRAFFIC-Germany. They have also created an international advisory group, which includes non-government organizations, conservation and certification programs, small-scale collection enterprises, and the medicinal plant and herbal products industry, to offer input on the development of ISSC-MAP.[1]

The advisory group helped revise the first draft of ISSC-MAP in December 2004, and the second draft was completed in April 2005. Comments on the second draft were gathered from the advisory group and from an "expert workshop" held on the Isle of Vilm in December 2005. The Draft 2 revision based on those comments was published in April of 2005[5] and a Working Draft 3 of the standard was published in June 2006.[2] Both drafts can be downloaded at the ISSC-MAP project Web site,[6] as can the agenda for a recently held workshop that was part of the first International Federation of Organic Agriculture Movements (IFOAM) Conference on Organic Wild Production, held May 5, 2006, in Bosnia and Herzegovina, titled "Sustainable Wild Collection of Medicinal and Aromatic Plants: workshop on potential implementation strategies for the International Standard."[7]

Most medicinal plant experts consider the new standards to be significant and a positive contribution to environmental, economic, and cultural preservation and development. Mathias Schmidt, PhD, a European medicinal plant researcher and consultant, has stated, "Bringing transparency to wildcrafting and shifting the collection practice towards cultivation has not only ecologic implications, but rather practical and positive consequences on the economical situation in situ (sustainability not only of the herb, but also of long-term income of the population) and on the quality of the raw material" (e-mail to C. Cavaliere, July 28, 2006). HG

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NYBG Opens Pfizer Plant Research Laboratory

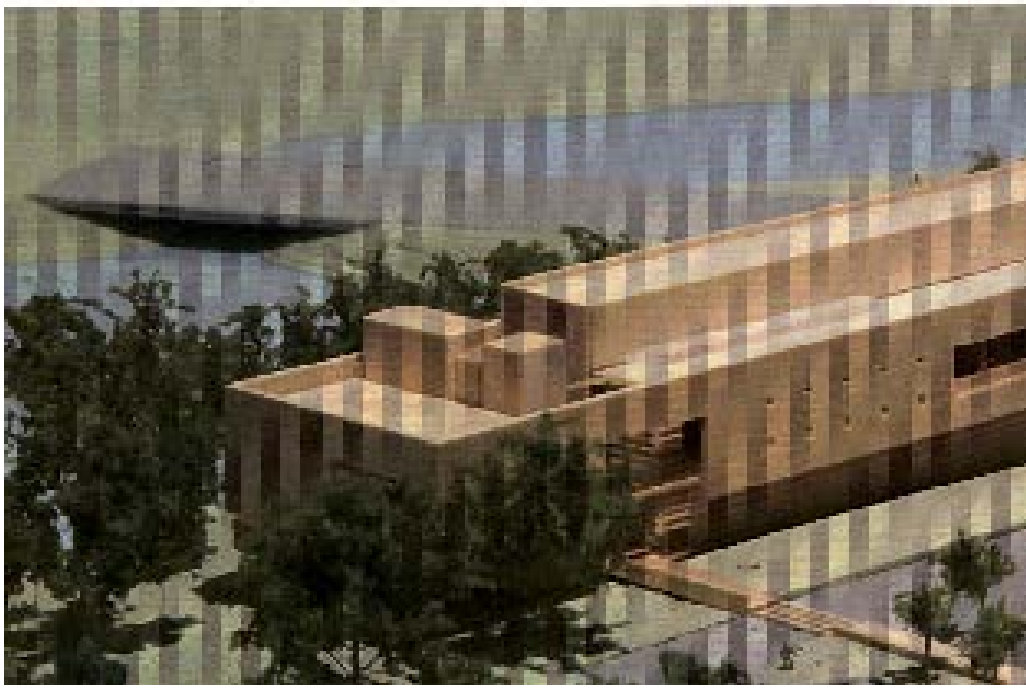
By Nancy Dennis and Madeline Hollern

The New York Botanical Garden (NYBG), a 250-acre botanical science center and plant museum in the Bronx, NY, unveiled its anticipated Pfizer Plant Research Laboratory on May 16, 2006.[1] Designed to "discover, decipher, document, and defend Earth's vast biodiversity," the state-of-the-art, 28,000 square-foot facility is the largest laboratory research facility in any US botanical garden. Its addition has tripled NYBG's previous research capabilities.

By providing advanced scientific research facilities such as robotic workstations and a high-throughput DNA sequencer, the laboratory enables plant and fungal culture media and specimen preparation, slide storage, microscopic analysis, photography, and DNA sequencing. Millions of specimens—including rare, endangered, and extinct species—can be stored in the 20 freezers of the 768 square-foot DNA storage room. A 300-kilowatt electric backup generator protects the precious contents during winter power outages.[2] The new facilities support biodiversity prospecting, chemical analysis, mycology, morphology, anatomy, ethnobotany, and graduate training.[1] In addition, the spacious interior of the laboratory houses the Lewis B. and Dorothy Cullman Program for Molecular Systematics Studies and the NYBG's Genomics Program.

The new facility is called the Pfizer Plant Research Laboratory after the pharmaceutical company Pfizer, its largest donor.[2] It was built with additional funding from other sources, including the National Oceanographic and Atmospheric Administration, New York State, and New York City. The new facilities enable the most modern techniques of molecular and genomic studies, leading to a more complete understanding of Earth's biodiversity.[1] Michael J. Donoghue, PhD, a Yale University professor of ecology and evolutionary biology, told *The New York Times* that the laboratory's research would add to scientific knowledge about conservation, biodiversity, climate change, and the interaction of plants and humans.[2]

At the May 16 ribbon-cutting ceremony, NYBG President Gregory Long noted that the science taking place in the new laboratory "is a continuation of our traditional interest in the naming of plants and the study of their evolutionary history, their ecology, their usefulness to humankind, and their conservation. But



we are also moving in new directions with the study of plant genomics . . . . We are the first botanical garden in the world to be undertaking this kind of investigation in a botanical garden setting."[3]

Plant scientists study the structure, chemical composition, and molecular makeup of plants and fungi, using such powerful instruments as the automated DNA sequencer and the low-vacuum scanning electron microscope. They can combine the data with evidence gleaned from the field and NYBG's other resources to formulate hypotheses of evolutionary relationships, a key to biodiversity studies.[1] A recent study of black cohosh (*Actaea racemosa* L., Ranunculaceae, syn. *Cimicifuga racemosa* [L.] Nutt.), co-funded by NYBG's Lewis B. and Dorothy Cullman Program for Molecular Systematics Studies and co-authored by one of the program's researchers, illustrates the value of this type of research. Comparing many genes and sequences within one species led to better understanding the composition of herbal medicines in analysis of genetic variation within populations of black cohosh, a popular herbal remedy for menopausal symptoms.[4]

According to Michael Balick, PhD, director of the Institute of Economic Botany at NYBG (and member of the ABC Board of Trustees), "Our graduate students in ethnobotany and systematics now have world-class laboratory facilities, which brings a new level of excitement and potential to the Graduate Studies Program. The state-of the-art research laboratory extends the scope of the program and complements the students' extensive opportunities for world-wide fieldwork" (G. Shakespear, e-mail to M. Hollern, September 6, 2006).

Established in 1896, the Botanical Garden Graduate Studies Program has granted 246 advanced degrees in conjunction with 5 premier universities in the Northeast.[1] The integrated efforts of NYBG's 200 scientists, graduate students, and technical staff working in the laboratory, the herbarium, the library, and the field lead to a rich educational environment and significant botanical discoveries. The new laboratory serves as home base for NYBG's large doctorate program and provides meeting rooms for visiting scholars. It forms a center for collaborative research in molecular systematics (exploring the relationships and history of plant species) and plant genomics (how genes function and their influence on plant growth and structure), serving scientists and graduate students not just from NYBG but also from around the world. More information on the Pfizer Plant Research Laboratory is available at the NYBG Web site at www.nybg.org. HG

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Model of Pfizer Plant Research Laboratory

Potential Therapeutic Effects of Pomegranate Juice on Prostate Cancer

Reviewed: Pantuck AJ, Leppert JT, Zomorodian N, et al. Phase II study of pomegranate juice for men with rising prostate-specific antigen following surgery or radiation for prostate cancer. *Clin Cancer Res.* 2006;12(13):4018-4026.

Although the 5-year survival rate for men with prostate cancer has increased dramatically, from a 67% survival rate in the 1970s to over 90% in recent years when caught and treated early, prostate cancer is still the most common cancer (excluding skin cancer) and the second leading cause of cancer-related death in men in the United States.

Primary management of the disease for most men is either radical surgery or radiation therapy. In a significant number of men, the disease metastasizes. According to the authors, patients who have undergone primary management to cure the disease and who have progressive elevation of their prostate-specific antigen (PSA) without documented evidence of metastatic disease have limited treatment options.

In this study, the authors sought to determine the effects of pomegranate juice consumption on PSA progression in those patients. The pomegranate (*Punica granatum* L., Punicaceae) fruit has been used for centuries in ancient cultures for its medicinal purposes.[1] Commercial pomegranate juice shows potent antioxidant[2,3] and antiatherosclerotic[4] properties attributed to its high content of polyphenols, including ellagic acid in its free and bound forms and other flavonoids.

To study the possible therapeutic effects of pomegranate juice on prostate cancer, the authors conducted a 2-year, single-center, phase II, Simon two-stage clinical trial at the Clark Urologic Center, David Geffen School of Medicine at the University of California at Los Angeles. Eligible patients had a detectable PSA > 0.2 and < 5 ng/mL that was documented as raising enough pretreatment PSA time points to calculate a baseline PSA doubling time (PSADT), no hormonal therapy before entering the study, no evidence of metastatic disease, and Gleason score (test used to grade the severity of prostate cancer, based on the 5 distinct patterns that prostate tumor cells go through as they change from normal cells) ≤ 7 (lower scores indicate less dangerous tumors).

PSA is an antigen in the blood that is measured and used to track the progression of prostate cancer. Elevated PSA (usually over 4 points) usually signifies presence or growth of cancer. The time required for the PSA level to double is the indicator of the rate of growth of the cancer. In general, PSA rises slowly, matching the fact that prostate cancer is a slow-growing cancer—so slow growing, in fact, that many older men with prostate cancer will die of other causes first. When the amount of time required to double the PSA level decreases, this can indicate that the rate of disease progression is slowing; it could theoretically slow down enough to become non-threatening, or to prolong the life of the patient.

Each patient had a minimum of 3 pretreatment PSA values measured over a minimum of 6 months before entering the study. Patients were treated with 8 ounces of pomegranate juice by mouth daily (Wonderful variety, POM Wonderful 100% pomegranate juice, Los Angeles, CA; equivalent to 570 mg total polyphenol gallic acid equivalents daily) until their disease progressed. A posi-

Pomegranate *Punica granatum* Photo ©2007 stevenfoster.com

tive response was defined as a ≥ 50% decrease in measured serum PSA levels. Progressive disease was defined as either a >100% increase in PSA (with a minimum value of 1.0 ng/mL) compared with the best response observed (nadir) or any documentation of metastatic or recurrent disease. Patients were followed in 3-month intervals for serum PSA, and blood and urine were collected for laboratory studies. Clinical end points included safety, effect on serum PSA, effect on serum hormone levels, exploratory laboratory studies, and the ellagic acid level in urine was tested for compliance.

According to the authors, the study was fully accrued to 48 patients during a period of 13 months in 2 stages after efficacy criteria were met. Two patients withdrew before their first evaluation. Of the 46 remaining patients, 68% were originally treated by radical prostatectomy, 10% by external beam radiotherapy, 10% by brachytherapy (a type of radiation therapy in which the radioactive material is placed inside or near a tumor, either temporarily or permanently), 7% by surgery and radiation, and 5% by cryotherapy (freezing of local tissues). The original Gleason scores were read as intermediate (5-7) in 94% of patients, whereas 6% had Gleason 4 cancers. Of the 46 patients, 63% were clinically or pathologically staged with organ-confined disease, whereas 37% had locally advanced metastatic cancers extending into the periprostatic or seminal vesicle tissues. At the beginning of the study, median PSA for the cohort was 1.05 ng/mL.

In this trial, treatment with pomegranate juice significantly lengthened the PSADT in these men: Mean PSADT increased from 15 months at baseline to 54 months post-treatment (P<0.001). Also reported by the authors were a durable prolongation of disease stabilization and significant effects on exploratory laboratory assays, such as the patients' serum antioxidant status: Patients' serum showed a significant 40% (P<0.02) reduction in the basal oxidative state and a significant 15% reduction (P<0.02) in the resistance of their serum samples to AAPH-induced lipid peroxidation after pomegranate juice consumption. In vitro assays comparing pretreatment and post-treatment patient serum on the growth of LNCaP (prostate cancer cells) showed a 12% decrease in cell proliferation (P=0.0048) and a 17% increase in apoptosis (programmed cell death, P=0.0004), as well as significant (P<0.02) reductions in oxidative state and sensitivity to oxidation of serum lipids after vs. before pomegranate juice consumption. A 23% increase in serum nitric oxide (P = 0.0085) was also reported, which would suggest a possible vasodilating effect resulting in lowered blood pressure. No serious adverse events were reported and the treatment was well tolerated.

The authors conclude that "this study shows statistically significant effects [of pomegranate juice] on PSADT coupled with corresponding effects on prostate cancer in vitro cell growth and apoptosis," but that the "proposed benefits shown in this study are in assays that are as yet unvalidated, and further research is needed to prove the validity of these tests and to determine whether improvements in such biomarkers (including PSADT) are likely to serve as surrogates for clinical benefit." Their results are being further tested in a randomized, double-blind, three-arm, placebo-controlled study (begun in April 2006), in which the ability of two pomegranate juice doses to produce a predefined alternation in PSA kinetics is being compared with the change observed in a control group. If the results of that study are positive, "a strong rationale would exist for research on other plant polyphenols that might mediate similar effects," say the authors. HG

—Shari Henson

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Study Finds No Link between Cannabis Use and Lung, Head, or Neck Cancer

Reviewed: Hashibe M, Morgenstern H, Cui Y, et al. Marijuana use and the risk of lung and upper aerodigestive tract cancers: results of a population-based case-control study. *Cancer Epidemiol Biomarkers Prev.* 2006;15(10):1829-1834.

This recent study conducted by researchers at the University of California, Los Angeles (UCLA), indicates that smoking cannabis (*Cannabis sativa* L., Cannabaceae)—aka marijuana—does not increase a person's risk of developing lung, head, or neck cancer. Results of the study, which was funded by the National Institutes of Health's (NIH) National Institute on Drug Abuse, were also presented at the American Thoracic Society International Conference in San Diego, CA, on May 23, 2006.[1]

The study was based on survey results from 611 Los Angeles County residents with lung cancer, 601 with cancer of the head or neck regions (oral, pharyngeal, laryngeal, or esophageal cancer), and 1,040 residents without cancer. All respondents were between the ages of 18 and 65, and they supplied information on their lifetime uses of cannabis, tobacco, and alcohol, as well as their diet, occupation, family cancer history, and socioeconomic status.

Cannabis *Cannabis sativa* Photo ©2007 stevenfoster.com

Cumulative cannabis use was measured in "joint-years," wherein 1 joint-year was equivalent to smoking one joint (a marijuana cigarette) or one pipe of hashish per day for 1 year. The heaviest cannabis smokers were those who claimed to have smoked at a rate of 60 or more joint-years. "Sixty joint-years is a lifetime measure, which is equivalent to smoking one joint a day for 60 years, i.e., nearly 22,000 joints in one's lifetime," said Hal Morgenstern, PhD, professor of epidemiology at the University of Michigan and a co-author of the study (e-mail, November 28, 2006). "Among the controls, who are representative of the source population at risk in Los Angeles County, we found that 3% or 35 subjects had accumulated 60 or more joint-years. That frequency is consistent with other estimates of marijuana use in California and the U.S." Cumulative tobacco use was calculated as "pack-years" and alcohol use was calculated as "drink-years."

Preliminary analyses indicated that cannabis smoking was positively associated with oral and laryngeal cancers and weakly associated with esophageal and lung cancers, but after the results were adjusted for potential confounders such as cigarette smoking, positive associations were no longer observed. The study ultimately found that smoking cannabis, at any level, does not seem to increase the smoker's risk of developing certain cancers. Even the heaviest smokers (i.e., those who claimed to use cannabis at a rate of 60 or more joint-years) did not have an increased risk of developing cancer.[2]

The connection between smoking tobacco cigarettes and cancer, however, was readily apparent. The study found that

The study found that around 80% of lung cancer patients and approximately 70% of head and neck cancer patients had smoked tobacco, while only about 50% of patients with either type of cancer had smoked cannabis.

around 80% of lung cancer patients and approximately 70% of head and neck cancer patients had smoked tobacco, while only about 50% of patients with either type of cancer had smoked cannabis. Similarly, 54% of the surveyed group without cancer had smoked cannabis to some extent. Results further indicated a 20-fold increased risk of lung cancer in people who had smoked 2 or more packs of tobacco cigarettes a day.[2] According to the published study, selection bias and participants' miscalculation or concealment of personal cannabis use may have affected the study's results.

Even the researchers claimed to be surprised by the results, as previous laboratory studies have found higher percentages of carcinogens in cannabis than in tobacco.[2] Moreover, smoking cannabis has been thought to deposit more tar and fine particles within the lungs, but in light of the recent research and other findings, such concerns are highly questionable. Although some past reports claimed that there is higher tar exposure from cannabis than tobacco, such data was generated from what some experts have considered the relatively poor quality cannabis previously supplied by the National Institute on Drug Abuse, which has reportedly also included major proportions of stems and seeds. Additionally, almost no one smokes as much cannabis (either for medicinal or recreational purposes) as the exposure to tobacco from tobacco cigarettes. There have been claims that unit per unit cannabis has more tar than tobacco when smoked, but there is relatively less exposure to such tars compared to the higher frequency of exposure in tobacco smokers.

According to a press release from the American Thoracic Society, Donald Tashkin, MD, professor of medicine at the David Geffen School of Medicine at UCLA and the study's lead researcher, theorized that the psychoactive chemical tetrahydrocannabinol (THC) from cannabis smoke may encourage aging cells to die early and thereby prevent a cancerous transformation,[2] a process called apoptosis or programmed cell death. THC and other cannabinoids have been shown to promote apoptosis in various cancer cell lines, but there is little evidence of any toxicity to normal cells. This is a rather unique property. Dr. Tashkin has studied cannabis for 30 years, and much of his previous work on the subject has been used by federal health and drug enforcement officials to support the case that marijuana is dangerous.[1]

Mariann Garner-Wizard, a science writer who covers recent research and regulatory developments concerning cannabis, offered another possible explanation, based in part on Dr. Tashkin's previous research. "Marijuana smoke dilates small air passages in the lungs, rather than constricting them, as tobacco does. It eases asthma through its anti-spasmodic effect. Moreover, it is believed that marijuana smoke, by irritating the bronchioles and stimulating the 'chronic' cough reflex characteristic of marijuana inhalation, reduces adhesion of tars and other smoke-borne particles to lung surfaces, whereas tobacco smoke numbs the bronchioles, allowing adhesion" (M. Garner-Wizard, e-mail, June 9, 2006).

There has been much disagreement over the years regarding health effects of cannabis. A study publicized in 2000 by a researcher at Johns Hopkins Medical School in Baltimore, MD, arrived at the same conclusion as the recent UCLA study.[3] Results from that study also demonstrated that cannabis is not associated with head, neck, or lung cancer, based on data from a smaller set of 164 cancer patients and 526 healthy volunteers. HG

—Courtney Cavaliere

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High Green Tea Consumption Associated with Less Cognitive Impairment in Older Adults

Reviewed: Kuriyama S, Hozawa A, Ohmori K, et al. Green tea consumption and cognitive function: a cross-sectional study from the Tsurugaya Project. *Am J Clin Nutr.* 2006;83:355-361.

Green tea (*Camellia sinensis* [L.] Kuntze, Theaceae) contains high levels of polyphenols including EGCG that protect the brain against damage associated with neurological disorders through a variety of mechanisms.[1] This epidemiological study examines the effect of green tea on cognitive impairment in older adults.

As part of the Tsurugaya Project, a cross-sectional community-based Comprehensive Geriatric Assessment was carried out in the Tsurugaya District, a suburban area near Sendai City, Japan. Data was taken from 1,003 subjects over the age of 70. The subjects were interviewed during July-October 2002. They answered a questionnaire about green tea, black tea, oolong tea, coffee, cola, and vegetable juice consumption. Frequency of green tea consumption was divided into 8 categories ranging from never to more than 4 cups per day. The questionnaire also included sections on alcohol consumption, smoking, social factors, demographic factors, and physical health. Cognitive function was tested by using the Japanese language version of the 30-point Mini-Mental State Exam (MMSE).

The results show a higher frequency of green tea consumption than is seen in the general North American population: 72.3% of subjects consumed 2 or more cups per day; 10.8% consumed 1 cup per day or 4-6 cups per week; and 16.9% of the subjects consumed 3 cups or less per week.

The prevalence of cognitive impairment decreased with increasing frequency of green tea consumption. Using a cut-off point of MMSE score of less than 26, the odds ratio (OR) for developing cognitive impairment decreased with increasing green tea consumption:

- 3 cups or less per week: OR=1 (reference);
- 4-6 cups per week or 1 cup per day: OR= 0.62 (95% CI: 0.33, 1.19); and
- 2 cups or more per day: OR = 0.46 (95% CI: 0.30, 0.72) (P for trend = 0.0006)

This inverse relationship between green tea consumption and cognitive impairment was stable across a variety of statistical models and analyses performed by the authors, using different MMSE score cut-off points and other adjustments. In contrast, there was no significant relationship between coffee, black tea, or oolong tea consumption and cognitive impairment.

This study demonstrates that "higher consumption of green tea is associated with lower prevalence of cognitive impairment in humans."* The relationship is dose-responsive, so the subjects who drank the most green tea (more than 2 cups per day) had the lowest risk of developing cognitive impairment. The mechanism of action for this association is not entirely clear, but the high levels of green tea polyphenols, especially EGCG, might be implicated. Further study on the mechanism of action is needed. Future studies on green tea consumption and cognitive impairment are warranted in Western populations, where green tea consumption is generally lower. HG

—Marissa Oppel, MS

Tea *Camellia sinensis* Photo ©2007 stevenfoster.com

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* Note: "The limitation of this type of study is that it cannot show causality. It could be that, for example, individuals with greater impairment are less likely to participate in traditional activities of daily living such as drinking green tea. A similar correlation would likely be found with an activity such as reading the daily newspaper—does reading prevent cognitive decline or do impaired individuals lose interest in the daily paper?" (J. Cott e-mail to M. Finney, November 16, 2006).

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Kudzu Extract Trial Shows Effective Levels for Reducing Alcohol Consumption

Reviewed: Penetar D, Teter C, Ma Z, Tracy M, Lee D, Lukas SE. Pharmacokinetic profile of the isoflavone peurarin after acute and repeated administration of a novel kudzu extract to human volunteers. *J Altern Complement Med.* 2006;12(6):543-548.

Kudzu (*Pueraria montana* [Lour.] Merr. var. *lobata* [Willd.] Maesen & S.M. Almeida, Fabaceae) has been used for centuries as a treatment for "alcohol related diseases." The vine is considered an invasive noxious weed in the Southern United States, but it is a prized medicinal plant in Asian countries.[1] Several animal studies have demonstrated anti-alcohol effects for kudzu. Recently, the authors of the present study have shown in a small clinical trial that an extract of kudzu reduces alcohol consumption in heavy drinkers.[1] A second study by the authors (currently unpublished) has shown that subjects receiving kudzu extract for 4 weeks significantly reduced their alcohol consumption. These anti-alcohol effects are attributed to isoflavones found in kudzu extracts, specifically puerarin, daidzin, and daidzein. In the present study, the authors examine the pharmacokinetic profile of puerarin "after acute and repeated administration of kudzu extract."

The authors recruited 10 healthy male subjects from the Boston area for this study, which was conducted at McLean Hospital (Belmont, MA). The subjects were paid for their participation. Subjects were required to consume less than 8 drinks per week and to have a body mass index (BMI) in the range of 18-25 kg/m^2.

Patients received 500 mg capsules of a kudzu extract standardized to contain 125 mg of isoflavones: 19% puerarin, 4% daidzein, and 2% daidzein (NPI-031, Natural Pharmacia, Belmont, MA).

The subjects were randomly assigned to 2 studies. Participants in Study A received an acute 1 g dose of the kudzu extract (2 capsules) in 1 session and came back for a second session after receiving the 1 g dose for 3 consecutive days. Patients in Study B received an acute 2 g dose (4 capsules) of kudzu extract. For both studies, blood was drawn from the patients at regular intervals. For the acute 1 g dose, the subjects' puerarin concentrations peaked about 2 hours after consumption, and puerarin was completely eliminated within 24 hours. Doubling the acute dose resulted in a significant increase in the time to maximum concentration (Tmax) (P=0.048), but did not significantly affect the maximum concentration (Cmax), area under the curve (AUC), absorption half-life (A1/2), or elimination half-life (E1/2). In contrast, both Cmax and the AUC were significantly increased when the subjects took the 1 g dose for 3 days (P=0.016 and P=0.031, respectively). But, Tmax, A1/2, and E1/2 were not significantly changed.

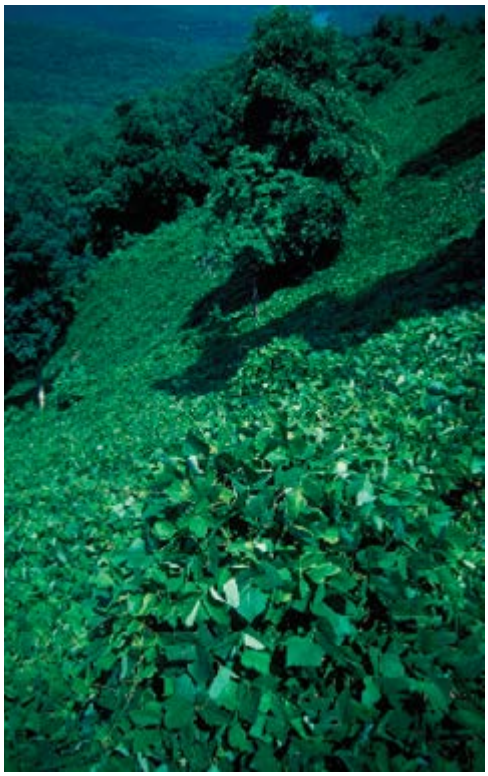
These results indicate that puerarin is probably absorbed principally in the small intestine and that a rate-limiting factor may control the maximum amount of puerarin that enters the body at one time. From the small intestine, puerarin travels in the blood to the brain without being metabolized. Most of the puerarin eliminated is unchanged, but a small amount is metabolized in the liver by an enzyme in the cytochrome p450 system and through conjugation to daidzein.

The authors speculate that a delay in gastric emptying due to the increased bulk of the 4 capsules taken in the acute 2 g dose study may explain the unusual increase in Tmax, compared with the acute 1 g dose. The results also indicate a one-compartment pharmacokinetic profile for puerarin. A daily 1 g dose of the standardized kudzu extract NPI-031 is enough to maintain steady-state levels of puerarin without accumulation of excess puerarin.

The authors state that puerarin blood levels between 25 and 60 mg/ml is an effective therapeutic range for decreasing alcohol consumption. However, these levels may be difficult to attain using many commercially-available kudzu dietary supplements because they have varying ranges of puerarin levels. The levels of isoflavones in commercially available extracts examined by the authors ranged from less than 1% to 2%. These levels may be too low to be biologically active. This underscores the need for adequate chemical characterization and quality control of herbal dietary supplements. In general, concentrated kudzu extracts with higher levels of puerarin are needed to achieve a therapeutic effect. Future research is needed to determine how higher or lower puerarin blood levels affect the behavior of heavy drinkers.

The authors conclude that a kudzu extract dose of up to 2 g/ daily is safe and effective for "chronically" reducing alcohol intake. However, a clinical trial of a longer duration and enrolling more subjects, including women, is needed to confirm these promising initial results. Based on this study and previous studies, a daily dose of 1 g of standardized concentrated kudzu extract is advisable. A future article on the authors' 4-week clinical trial on a kudzu extract and alcohol consumption is in progress. HG

—Marissa Oppel, MS



Kudzu *Pueraria montana* Photo ©2007 stevenfoster.com

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Green Tea and Mortality Due to Cardiovascular Disease, Cancer, and All Causes

Reviewed: Kuriyama S, Shimazu T, Ohmori K, et al. Green tea consumption and mortality due to cardiovascular disease, cancer, and all causes in Japan. The Ohsaki study. *JAMA*. 2006;296(10):1255-1265.

Tea ranks second to water as the most consumed beverage worldwide. Forms of tea include green, oolong, and black (depending on the level of processing), all of which originate from the leaves of the tea plant (*Camellia sinensis* L., Theaceae). Green tea polyphenols have been studied in vitro and in animals as a protectant against cardiovascular disease (CVD) and cancer. However, according to the authors of this large-scale epidemiological study, the effects of green tea consumption in humans remains unclear. They examined the association between green tea consumption and mortality due to all causes, to CVD, and to cancer within a large population-based cohort study in northeastern Japan.

In the Ohsaki National Health Insurance Cohort Study, the authors delivered a self-administered questionnaire, including items on dietary intake, between October and December 1994 to all national health insurance beneficiaries aged 40 to 79 years living in the catchment area of Ohsaki Public Health Center, Miyagi Prefecture, Japan.

The questionnaire included items about the frequency of consumption of 4 beverages (green tea, oolong tea, black tea, and coffee), and 36 items about food, as well as items regarding the consumption of alcohol and tobacco, personal and family history of disease, job status, level of education, body weight, height, amount of time participating in sports or exercise, and time spent walking every day. The frequency of green tea consumption was divided into 5 categories.

Of 54,996 eligible persons, 52,029 (95%) responded. Of those, 40,530 were included in the study analysis. Participants received follow up for as many as 11 years for all-cause mortality and for as many as 7 years for cause-specific mortality (i.e., CVD and cancer).

At baseline, participants who consumed green tea more often tended to be older and were more likely to be unemployed, to engage in sports or exercise, or to have a history of hypertension and diabetes mellitus, and were less likely to spend time walking. Men were more likely to have a history of a gastric ulcer condition and women to be obese. No apparent associations between smoking status or alcohol drinking and green tea consumption were noted.

A follow up was conducted for participants regarding migration and mortality. Participants who withdrew because of emigration could not be reached for subsequent information and were therefore withdrawn from the study. For those who died, the authors investigated cause of death by reviewing the death certificates filed at Ohsaki Public Health Center. Cause of death was coded according to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10).

During 11 years of follow-up (1995-2005), 4,209 participants died. The authors found that green tea consumption was inversely associated with mortality due to all causes and that the inverse association was more pronounced in women (P=0.03 for interaction with sex).

Green tea consumption is associated with reduced mortality due to all causes and due to cardiovascular disease but not with reduced mortality due to cancer.

Table 1. Green Tea Consumption and Multivariate Hazard Ratios for All Causes of Mortality

Green Tea Consumption	Multivariate Hazard Ratio
Less than 1 cup/day	1.00 (reference)
1-2 cups/day	0.96 (95% confidence interval, 0.87-1.05)
3-4 cups/day	0.90 (95% CI, 0.82-0.98)
5 or more cups/day	0.84 (95% CI, 0.77-0.92)

The multivariate hazard ratios of mortality due to all causes associated with different frequencies of green tea consumptions are shown in Table 1 (above).

During 7 years of follow-up (1995-2001), the authors report that 892 participants died of CVD and 1,134 died of cancer. The inverse association with CVD mortality was stronger than that with all-cause mortality (with the strongest inverse association observed for stroke mortality). The association appeared to be more pronounced in participants who had never smoked. Again, the inverse association was stronger in women (P=0.004 for trend).

The multivariate hazard ratios of mortality due to CVD associated with different frequencies of green tea consumptions are shown in Table 2 (below).

The participants who consumed 5 or more cups per day of green tea had a risk of all-cause mortality that was 16% lower (during 11 years of follow-up) and a CVD mortality that was 26% lower (during 7 years of follow-up) than those who consumed less than 1 cup per day.

The authors report that the hazard ratios of cancer mortality were not significantly different from 1.00 in all green tea consumption categories compared with the lowest-consumption category. Thus, the authors conclude that "green tea consumption is associated with reduced mortality due to all causes and due to cardiovascular disease but not with reduced mortality due to cancer." HG

— Shari Henson

Table 2. Green Tea Consumption and Multivariate Hazard Ratios for Cardiovascular Disease as Cause of Mortality

Green Tea Consumption	Multivariate Hazard Ratio
Less than 1 cup/day	1.00 (reference)
1-2 cups/day	0.87 (95% CI, 0.72-1.06)
3-4 cups/day	0.77 (95% CI, 0.63-0.93)
5 or more cups/day	0.74 (95% CI, 0.62-0.89)

First Annual Herb Day Celebrated Widely with Resounding Success

by Courtney Cavaliere

photos by Wayne Silverman

Above photo: One of many bromeliads in the USBG Conservatory Jungle exhibit.

Left photo: Newly remodeled "East Orangerie" classroom at the USBG where speakers presented throughout the national events on HerbDay.

Herb enthusiasts in cities across the United States, and in a few other countries, exhibited their support of herbal education and appreciation during the first annual HerbDay, a landmark occasion for the international herbal community held October 14, 2006, and in the weeks preceding and following that date. Participating organizations and the public alike have applauded the many HerbDay events, demonstrating the success of the first HerbDay celebration and prompting early planning of the next year's activities.

"National days of recognition bring awareness, education, and interest to any event, person, or idea celebrated. By creating HerbDay, we now have an annual opportunity to spotlight herbs in a positive way in our communities and in the media," said Lynda LeMole, executive director of United Plant Savers (UpS), one of the 5 organizations that initiated and coordinated HerbDay (e-mail, November 8, 2006). The other organizations, which comprised the HerbDay Coalition, were the American Botanical Council (ABC), American Herbal Pharmacopoeia (AHP), American Herbal Products Association (AHPA), and American Herbalists Guild (AHG).

"This was a first effort, and we're amazed and surprised by how well it did take off," said Wayne Silverman, PhD, ABC's chief administrative officer (oral communication, November 6, 2006). "I think that everyone who was involved would characterize it as an unqualified success."

HerbDay was celebrated nationally at the United States Botanic Garden (USBG) in Washington, DC, on October 13 and 14. The first day featured lectures from internationally-recognized herbal experts James A. Duke, PhD, Aviva Romm, Bevin Clare, and Robin DiPasquale, ND. The second day offered visitors numerous opportunities to learn about herbs through various booths, activities, garden walks, and lectures. Presentations and demonstrations included "Kitchen Herbs: Spice up your Health," "Herbal Medicine Making," "Herbs for your Pets," activities specifically designed for children, and presentations about particular plants, among many others.

According to the USBG, nearly 5,000 visitors attended the national HerbDay celebration—the number of attendees usually seen only at USBG's holiday events. "It was extremely exciting to have people here so engaged with plants in all of their different ways," said Holly Shimizu, executive director of the USBG (oral communication, November 7, 2006). "The general public was able to talk to herb experts about all different aspects of herbs—health, beauty, food, and on and on . . . It was superb to have this contact between the experts and the visitors. We think it was a huge success, and we look forward to doing it again!"

HerbDay was acknowledged through special events in many other cities and states, as well. In Ohio, 68 volunteers participated in a plant rescue as part of HerbDay, saving approximately 2,000 wild medicinal plants from future destruction at Wayne National Forest, where a state highway bypass is planned to soon cut through the area. Half of the plants were replanted in holding beds at the forest's headquarters for use in restoration and education projects. The remaining plants were relocated to other parks, botanical sanctuaries, and private properties. Subsequent plant rescues in this area are planned to take place through the spring of 2007 by members of UpS and the organizations Rural Action and Frontier Natural Products Co-op.

Another large HerbDay event, organized by the San Diego Herb Club and that city's AHG chapter, was held in San Diego's Balboa Park. Multiple booths featured information about herbs and national herbal organizations, and 20 booths enabled local herbalists to share their knowledge and promote their businesses directly with the public. Guided tours of the

Top photo: Robin DiPasquale, ND, Chair, Botanical Medicine Department at Bastyr University (third from right) leads a seminar called "Restoring the Sleep Cycle with Herbs" in the East Gallery at the USBG on HerbDay. This was one of 34 seminars offered on HerbDay.

Bottom photo: *Plumeria pudica*, a fragrant "New World" plant growing at the USBG. Some parts are used traditionally for salves and ointments.

park's newly expanded "Trees for Health" garden were also conducted. "Despite the morning rain, HerbDay afternoon was a huge success. In fact, the moist, fresh air seemed appropriate for such an event," said Cindy Christ, member of San Diego's AHG chapter and second vice-president of the San Diego Herb Club (e-mail, November 9, 2006). "I estimate approximately 300 folks showed up eager to explore the uses of herbs and to collect information from local businesses and national organizations. It really brought our local herbalists together and showed the public that San Diego has a thriving herbal community. A huge interest in all of the displays, lectures, and demonstrations proved the event to be even more of a success than the initial organizers anticipated. We are already looking forward to next year's HerbDay, and are anticipating an even bigger event."

ABC, meanwhile, also encouraged visitors to attend HerbDay lectures and demonstrations at its headquarters in Austin, TX. ABC Founder and Executive Director Mark Blumenthal delivered a lecture on clinical research on popular herbs in the United States and its coverage in the mainstream media. Other lecturers included Ayurvedic practitioner Charlotte Jernigan and William Morris, president of the Academy of Oriental Medicine at Austin. Volunteers provided demonstrations on tea-making, aromatherapy, and the production of herbal tinctures, while local herbalists led tours through the different herbal gardens of ABC's Case Mill Homestead.

HerbDay was further acknowledged and promoted through thousands of retail stores across the country. Several popular natural product retail chain stores, including Vitamin Cottage and Vitamin Shoppe, held events and publicized HerbDay in each of their many locations. The extensive GNC chain promoted HerbDay throughout the entire month of October through special signs and displays in its many stores, by distributing free samples of herbal formulas to consumers, and by including the HerbDay logo in the company's advertisements and catalogs and on its products. "We viewed HerbDay as an opportunity for consumers to learn the facts about herbs and their benefits in being incorporated and enjoyed in daily life, whether for their aesthetic beauty, flavoring in cooking, or health benefits," said Kim Kitko, GNC's senior brand director (oral communication, November 9, 2006). "Store associates from many of GNC's locations across the country have expressed their pride in being a sponsor of the first-ever HerbDay, and increased traffic and sales in the herbal category demonstrates that many consumers have a renewed interest in herbal remedies."

GNC, Nature's Resource, and Vitamin World all served as official corporate sponsors, providing financial support to the HerbDay Coalition to offset the organizations' direct expenses. The Coalition was further aided through the efforts and support of 6 HerbDay partners: Bastyr University, the Herb Society of America, the International Herb Association, the Natural Products Association, the Tai Sophia Institute, and USBG. Likewise, 6 publications/publishers made a concerted effort to raise awareness of HerbDay as media sponsors: *Health Supplement Retailer, Health Smart Today,* New Hope Natural Media, *Taste for Life, Vitamin Retailer,* and *Whole Foods Magazine*. New Hope Natural Media, for instance, promoted HerbDay through ads, articles, or blurbs in various issues of its publications *Delicious Living* and

Right: Carter Draves (left) and Dart Clancy, students of Tai Sophia, staff the herbal demonstration table in the West Gallery of USBG.

Below: The new National Garden (dedicated October 1, 2006) at the USBG. The US Capitol, The USBG West Gallery, and USBG Conservatory are visible in the background.

Natural Foods Merchandiser prior to the event, and the publication *Taste for Life* even published a special "Herbs for Life" 24-page pullout in its October issue, in addition to an overprint in honor of HerbDay.

Several HerbDay Coalition members stressed the value of this new annual event, both for the herbal community and the public at large. "Celebrating HerbDay will help to rebuild a cultural knowledge about plants and plant medicines that was lost because of the almost exclusive dependence on modern foods and drugs," said Roy Upton, executive director of AHP (e-mail, November 7, 2006). "Plants, in all their forms—as food, textiles, and medicines—have always been integral to human existence. Modern humans have divorced themselves from this reality and it is important, both for the preservation of plant and human species, that we as a species consciously acknowledge our absolute dependence on plants as gifts to humanity."

ABC's Silverman, meanwhile, remarked that HerbDay could potentially generate a shift in the mainstream media. "We've had to contend with quite a bit of negative media, misunderstandings about herbs, and misinterpretation and misreporting of clinical studies. By expanding and making HerbDay a permanent fixture, we will diminish some of the misunderstandings, increase some of the positive views of herbs and supplements, and hopefully reduce the knee-jerk reactions that often seem to take place in the media," he said.

Members of the HerbDay Coalition anticipate that future HerbDays will feature even greater participation and larger events, both across the United States and internationally. UpS's LeMole expressed her desire to see increased participation among schools, as HerbDay could be a particularly valuable learning event for children. Members of the Coalition are already encouraging the herbal community to begin planning their events for the second annual HerbDay, scheduled for Saturday, October 13, 2007. Future HerbDays will be celebrated on the second Saturday in October and the weeks leading up to and following that date.

The Herb Society of America (HSA), founded in 1933, will also become more involved in future celebrations. According to HSA President Anne Abbott, the HSA board has already approved continued official participation in HerbDay for 2007, with many local HSA chapters already starting to plan their events (e-mail, November 15, 2006).

The overwhelmingly positive responses to HerbDay from those involved certainly bode well for future engagements. "HerbDay is a chance to see herbs as what they are: a beautiful, positive part of all our lives," said Bevin Clare, faculty member of the Tai Sophia Institute (e-mail, November 9, 2006). "It is a time for the public to celebrate the origins of their own cultural traditions around herbs, no matter where they are from, and as awareness around this event continues, we will offer an outlet for the many cultures in this country to come together to celebrate something fun, important, and integral to our society." HG

Right photo: Star anise (*Illicium verum*) an Asian plant traditionally used for digestion and rheumatism, and turmeric (*Curcuma longa*) (on the right), another Asian plant used in Ayurvedic medicine for digestive disorders, with more recent use as an anti-inflammatory, both growing at the USBG on HerbDay.

Left at top: Canopy Walk in the Jungle observatory, 50 feet in the air, at the USBG on HerbDay.

Left at bottom: James A. Duke, PhD, gives one of four main HerbDay lectures called The Amazon Farmacy, in the East Orangerie classroom at the USBG.

Sho-saiko-to

A Clinically Documented Herbal Preparation for Treating Chronic Liver Disease

by Jipu (Dan) Wen, MS, MD

Photos by Steven Foster

Bupleurum *Bupleurum falcatum*

Chronic liver disease is the 12th leading cause of death in the United States. Traditional Kampo medicine in Japan is a scientific and highly regulated, prescription-filled system based on the tenets of traditional Chinese medicine. One of the best known herbal medicines for liver support in Japan is called Sho-saiko-to (SST). The herbal formula is also called Minor Bupleurum Formula or Xiao Chai Hu Tang in Chinese. This seven-herb ancient formulation has anti-inflammatory, anti-fibrotic, and chemopreventive properties that both pre-clinical and clinical research suggest are effective for various forms of liver diseases, including chronic hepatitis.

Introduction—The Prevalence of Liver Diseases

Chronic liver disease (CLD) is a significant public health concern in the United States and worldwide. CLD ranks 12th in the causes of mortality in the United States and is responsible for the deaths of more than 25,000 Americans annually. CLD covers several conditions from hepatitis B and C to fibrosis and cirrhosis. An estimated 350 million persons worldwide, mostly in Asia, are chronically infected with the hepatitis B virus (HBV). In the United States, there are an estimated 1.25 million hepatitis B infections. HBV infections produce an increased risk of developing cirrhosis, hepatic decompensation, and hepatocellular carcinoma (HCC).[1] Two therapeutic agents are commonly used for the treatment of chronic hepatitis B: interferon-alpha and lamivudine.

An estimated 3% of the world's population, or almost 200 million individuals, have chronic hepatitis C virus (HCV) infection. This has become a significant public health problem in the United States in recent years, where approximately 5 million individuals have been infected with HCV.[2] Hepatitis C infection is a major risk factor for HCC. It has been estimated from a number of prospective studies that 80% of patients exposed to HCV will develop chronic hepatitis C, of which 15% develop cirrhosis and approximately 5% will progress to HCC.[3-6] Further, chronic hepatitis C infection is the leading cause of liver transplantation in the United States.[7] The current treatment regimen for chronic hepatitis C consists of therapy based on pegylated interferon-α[alpha] with or without ribavirin (a synthetic broad-spectrum antiviral agent used to inhibit DNA and RNA replication). However, interferon-based therapy is only effective for approximately 40% of treated patients with HCV genotype 1, the most difficult type of the virus to treat when infected. The combination therapy of pegylated interferon and ribavirin offers a 50-55% sustained response rate for HCV genotype 1.[8-10]

Adverse effects are frequently encountered during interferon treatment.[11] More than half of all patients experience flu-like symptoms. Other frequently reported events include nausea, vomiting, anorexia, dizziness, dyspnea (difficult breathing), insomnia, irritability, alopecia (hair loss), rash, and pruritus (itching). Interferon commonly causes leukopenia (abnormally low white blood cell count) and occasionally thrombocytopenia (low platelet count), and the addition of ribavirin frequently leads to anemia with significant changes in hemoglobin, the oxygen-carrying protein in the blood. Patients may discontinue therapy due to intolerance to adverse side effects, experience a specific contraindication to therapy, or they may simply not respond to therapy. Such patients have no other treatment options approved by conventional Western medicine.

Sho-saiko-to: A Traditional Asian Herbal Formula for Liver Function

Kampo had been popular in Japan until around 1880 and then regained popularity in the 1970s. The Japanese Society of Oriental Medicine, founded in 1950, was largely responsible for the resurgence of Kampo's popularity. Traditional Chinese medicine of the Han dynasty was brought into Japan through Korea in the 4th to 5th century CE and consequently through the Japanese Buddhist priests who learned about the medicine in China in the Nara Era (710-794 CE).[12]

The Kampo herbal combination Sho-saiko-to (SST) has been used extensively in China and Japan to treat CLD and other inflammatory diseases. In Japan, Kampo formulas are registered with unique numbers. For example, SST is listed as formula 9. A different combination of letters with the formula numbers identifies the manufacturer. This is why in the Japanese medical literature the formula is often seen as TJ-9 or H09, in reference to the code names from Tsumura & Co (Tokyo, Japan) and Honso Pharmaceutical Co., Ltd. (Nagoya, Japan), respectively. An herbal formula produced by different manufacturers usually contains a similar amount of ingredients with exactly the same herbal combination.

To ensure consistency of product quality, the Pharmaceutical and Food Safety Bureau of the Japanese Ministry of Health, Labor, and Welfare (the equivalent federal government body as the US Food and Drug Administration, which regulates pharmaceutical manufacturers) requires that all prescription herbal formulas be assayed qualitatively by thin layer chromatography and quantitatively by high performance liquid chromatography. In most of the SST formulas, the phytochemical markers such as

glycyrrhizin (from licorice root), baicalin (from baikal skullcap root), and saikosaponin (from bupleurum root) are routinely tested to meet the specification of each manufacturer approved by the government agency.

The 7-herb SST formulation (see Table 1) was first described in the ancient Chinese classical textbook *Shang Han Lun*, written by Zhang Zhong Jing in the Han Dynasty (around 200 CE).[13] In China, this herbal formula has been used widely in a diagnostic stage. In Chinese medicinal terminology, this is referred to as *shao yang etiologies*, which can be applied to many Western diseases such as late stage cold, infectious diseases, and chronic hepatitis.

SST was only one of many classical herbal formulas used by several herbal medicine schools in Japan. Throughout ancient history, Japanese Kampo was developed under the influence of Chinese medicine with emphasis on local practice. In 1967, the Japanese Ministry of Health, Labor, and Welfare approved the herbal formula as one of the first few ethical drugs under prescription by physicians. Since 1986, the formula has been listed for reimbursement by the National Health Insurance. By the end of the 20th century, an estimated 1.5 million hepatitis patients had used SST in Japan.

During the last several decades, SST has been the most extensively researched Chinese herbal formula in Japanese scientific and pharmaceutical communities. Besides a large body of publications in Japanese, there have been over 100 English publications on SST documenting its anti-inflammatory, antifibrotic, and chemopreventive effects that may provide the foundation of therapeutic benefits for CLD.

An article published in *Science* magazine has praised several Chinese herbal formulas including SST; they were described as having "worked effectively in some instances in which conventional Western therapies failed or proved to be insufficient to provide a palliative cure."[14] SST is beginning to become noticed in the alternative medicine community in the United States. Preliminary data from the first phase II clinical study on SST in the United States for treatment of hepatitis C under an Investigative New Drug status has been reported.[15] Therefore, an extensive review of the pharmacological and clinical literature will be instructive to the growing interests in the United States on this most popular herbal formula used in Japan.

The Pharmacology and Mechanisms of Action of SST

Individual chemical constituents of the herbs in the SST formula have demonstrated the ability to prevent hepatic fibrosis. For example, glycyrrhizin, a triterpenoid saponin extract from licorice root, displays in vitro and in vivo ability to reduce serum aminotransferases, including aspartate aminotransferase (AST) and alanine aminotransferase (ALT), and it has been shown to improve hepatic fibrosis.[16] Baicalein, a major flavonoid in baical skullcap, has antiproliferative and anti-fibrotic effects when tested in rats hepatic stellate cells in vitro.[17] Baicalin, another flavonoid in baical skullcap, induces apoptosis (programmed cell death) via a mitochondrial pathway in a leukemia-derived T-cell line but shows little toxic effect on peripheral blood mononuclear cells from healthy volunteers. Apoptosis inhibits the growth of cancer cells.[18]

In rats with dimethylnitrosamine-induced liver injury, oral administration of SST displayed inhibition of collagen formation, increased retinoid level, decreased the levels of AST and ALT, inhibited activation of Ito cells, and prevented liver fibrosis.[19-22] In acute hepatic injury induced by carbon tetrachloride (CCl4), SST and its chemical constituents baicalin, baicalein, glycyrrhizin,

Table 1. Herbs in Sho-saiko-to

English Name	Latin Name	Family	Chinese (Pinyin)	Japanese	Active Compound(s)*	Plant Part
Bupleurum	*Bupleurum falcatum* L.	Apiaceae	*chai hu*	*saiko*	saikosaponin a, b, c, d	root
Pinellia	*Pinellia ternata* (Thunb.) Makino	Araceae	*ban xia*	*hange*	homogentisic acid, choline	tuber w/ cork layer removed
Baical skullcap	*Scutellaria baicalensis* Georgi	Lamiaceae	*huang qin*	*ougan*	baicalin, baicalein	root w/ periderm removed
Asian ginseng	*Panax ginseng* C.A. Meyer	Araliaceae	*ren shen*	*ninjin*	ginsenoside, panaxic acid	root w/ rootlets removed
Licorice	*Glycyrrhiza uralensis* Fisch.	Fabaceae	*gan cao*	*kanzou*	glycyrrhizin	root/stolon
Ginger	*Zingiber officinale* Rosc.	Zingiberaceae	*sheng jiang*	*shokyo*	gingerol, shogaol	root/rhizome
Jujube	*Ziziphus jujuba* Mill.	Rhamnaceae	*da zao*	*daiso*	cyclic AMP	fruit

*Active compounds are presumed as primary; in many cases, multiple compounds and/or groups of compounds are believed to exert pharmacological activity in plants and/or plant extracts.

and glycyrrhetic acid were shown to suppress acute hepatic injury, and to bring about an early recovery in liver function.[23]

Liver fibrosis is an over-accumulation of extra-cellular matrix, and the hepatic stellate cells play a central role in the pathogenesis of liver fibrosis. There are many growth factors and cytokines involved in the activation of hepatic stellate cells, including transforming growth factor (TGF-alpha, TGF-beta1), platelet-derived growth factor, interleukin (IL-1alpha and beta, IL-6), and tumor necrosis factor (TNF-alpha). The antifibrotic effect of SST is associated with the down-regulation of the mRNA expression of procollagen alpha1 types (I and III), and with tissue inhibitors of metalloproteinase TIMP-1 in liver tissue.[24] It also increases the matrix metalloproteinases MMP-2 and MMP-13 activities with reduced TIMP-1,2 activities on hepatic stellate cells, possibly via the P38 pathway.[25] SST also stimulates the production of TNF-alpha to inhibit Ito cell proliferation and collagen formation.[26]

SST has also experimentally demonstrated significant immunomodulatory activity. In vitro studies demonstrate that SST can induce production of interleukin-1β, interleukin-6, interferon-γ, tumor necrosis factor-α, and granulocyte-macrophage colony-stimulating factor.[27,28] In cultured splenocytes and hepatic mononuclear cells, SST increased CD4/CD8 ratio via a decrease of CD8+ T-cell counts with no effect on CD4+ T-cell counts.[29]

The increased level of mRNA expression of cytochrome P-450 enzymes in the liver was observed in association with SST administration.[30] In animal models, SST was shown to prevent liver injury and promote liver regeneration. Sakaida et al induced fibrosis in rats by a choline-deficient L-amino acid-defined diet. Using this model, the fibrotic rats treated with SST showed less fibrosis as indicated by reduced liver hydroxyproline and a smaller increase in serum hyaluronic acid compared with control animals.[31] Moreover, SST-treated rats developed fewer preneoplastic lesions. Similar findings have been reported using CCl_4,[21,32] N-nitroso morpholine,[33] and D-galactosamine[34] models of liver injury. The high and low molecular mass fractions of SST extract have been studied in a murine immunologically induced liver injury model. It was shown that both fractions reduced aminotransferase (AST and ALT) levels and the nitric oxide level in serum caused by the liver injury.[35]

The chemopreventive (anti-cancer) effect of the liver by SST has been demonstrated in animal studies. 8-Hydroxy-2'-deoxyguanosine (8-OHdG), a DNA adduct by reactive oxygen species, is known as a parameter of genetic risk for hepatocarcinogenesis (liver cancer). In a diethylnitrosamine-induced hepatocarcinogenesis model of rats, SST prevented hepatocarcinogenesis in association with inhibition of 8-OHdG formation.[36]

SST also plays a role in the process of liver regeneration. In a rat model of 70% partial hepatectomized and dimethylnitrosamine-induced liver-injury, SST was shown to induce liver regeneration by increasing the production of hepatocyte growth factor (HGF) and suppressing the production of transforming growth factor-beta (TGF-beta) in the liver and spleen of partial hepatectomized rats.[37]

Pinellia *Pinellia ternata*

Treatment of Chronic Liver Disease

CLD encompasses several diseases, including hepatitis, fibrosis, and cirrhosis. SST has been used primarily for treating chronic hepatitis B patients in Japan. In a randomized trial conducted in Japan in the 1980s, 222 patients with chronic active hepatitis B diagnosed by biopsy received either SST or placebo for 12 weeks. All patients were off other therapies for at least 3 months before starting treatment. There were statistically significant differences between groups in AST and ALT though not gamma-glutamyl transpeptidase (γ-GTP) or cholesterol. There was an increase in Anti-HBeAg antibody (HBeAb) during treatment with SST but not in the placebo group, although this difference did not reach statistical significance.[38] A follow-up study of 5 years treatment with SST on 98 hepatitis patients (59 with hepatitis B and the rest non-A non-B) revealed similar results.[39] Serum level of AST, ALT, and γ-GTP were significantly reduced. An improvement of liver function was observed in 78% of the hepatitis B patients and 67% of the non-A non-B hepatitis. An uncontrolled trial of SST for hepatitis B in children reported that 7 of 14 became hepatitis 'e' antigen (HBeAg) negative at the end of one year. This was reported to compare favorably with the expected clearance rate of 22%.[40] The presence of HBeAg in chronic infection is generally considered indicative that hepatitis B virus is actively reproducing and there is a higher probability of liver damage.

The therapeutic effect of SST in combination with hepatitis B vaccination on hepatitis B carrier has been evaluated in HBV-transgenic mice that expressed similar levels of HBV-related antigens and HBV DNA. The animals received either a SST-enriched diet or a monthly injection of vaccine containing hepatitis B surface antigen (HBsAg), or both, for 12 consecutive months. The combination therapy induced the completely negative testing for HBsAg on all tested animals after 12 months of treatment with increased levels of IgM, IgG, and antibodies in the spleen lymphocytes. These data confirmed the therapeutic role of SST during HBV infection and inspired optimism of a widespread use of SST during immune therapies.[41]

Immunomodulation of SST seems to have played a key role in the therapeutic effect on hepatitis B. The

peripheral blood mononuclear cells from 8 patients with chronic active hepatitis B were used with the presence of recombinant HBcAg and purified HBeAg. In vitro administration of SST (50, 100, and 300 micrograms/ml) was found to enhance both IFN-gamma and antibody production dose-dependently. SST was able to modulate both cellular and humoral immune responses specific for HBV-associated antigens.[42]

Currently, an SST preparation (Honso Pharmaceutical Co., Ltd., Nagoya, Japan, H09) is being investigated in 3 phase II clinical trials in the United States. The first one was for treatment of hepatocellular carcinoma (the Memorial Sloan-Kettering Cancer Center, MSKCC, www.ClinicalTrials.gov), which is no longer recruiting patients after only 4 patients enrolled (due to difficulty of enrolling). The second one is designed for treating hepatitis C (also at MSKCC).[15] The third trial is for treating liver cirrhosis caused by hepatitis C (University of California at San Diego).

The initial result of the hepatitis C trial was reported by MSKCC in November 2005. According to the design of the trial, 31 hepatitis C patients who are non-responders to interferon therapy received SST granules at 2.5 grams 3 times daily for 52 weeks. Among the 15 patients who completed the study, reductions in ALT were observed in 11 patients and AST in 10 patients (see Figure 1). This is consistent with the findings by Japanese researchers for SST's anti-inflammatory effect. The reduction of viral load was observed in 5 out of 10 detectable patients.

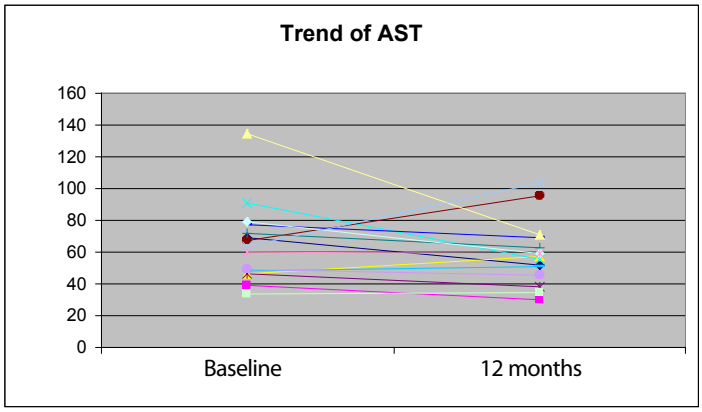
Baical skullcap *Scutellaria baicalensis*

The reduction of viral load clinically suggested that SST may also possess direct anti-viral effects. Further studies are needed to confirm these suggested findings. Nine of the detectable 10 patients were genotype 1 infection, which does not respond well to interferon therapies. No serious adverse events have been attributed to SST among all 21 patients who enrolled in the trial.[15]

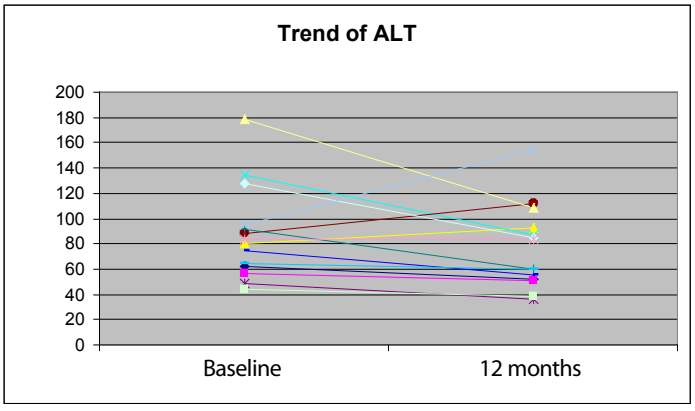
In a controlled study, 80 patients with interferon-resistant hepatitis C were treated with SST plus unspecified "conventional medicine" or conventional medicine alone. The patients were followed for 7 years. During this time, 5 patients on SST experienced normalization of liver enzymes in full. Enzymes normalized in only one control patient and none of the controls seroconverted. Conversely, 5 controls progressed to hepatocellular carcinoma versus one on SST therapy.[43]

In an in vitro study on human cells, the effect of SST on production of Interleukin-12 (IL-12, an important regulatory cytokine that initiates and regulates cellular immune responses) in circulating mononuclear cells from 11 HCV-positive liver cirrhosis patients and 12 healthy subjects was studied. The levels of IL-12 produced by the patients' fractions were significantly lower than those produced by healthy subjects. However, when SST was added to the cultures, the IL-12 production levels in both cell fractions increased approximately 3-fold, and the levels from the monocyte/macrophage fraction were almost the same as those from healthy subjects. Furthermore, this effect of SST was found

Figure 1. Liver Function Tests at Baseline and after 12 Months of SST Treatment



Note: AST improved in 10 patients and worsened in 5 patients.



Note: ALT improved in 11 patients and worsened in 4 patients.

to be attributable to baical skullcap root and licorice root of its 7 herb constituents.[44] Similar findings were reported on adjusting the decreased IL-10 production and the increased IL-4 and IL-5 production of mononuclear cells from hepatitis C patients by SST. This research suggests that regulation of the cytokine production in patients with hepatitis C by using SST may be useful in the prevention of disease progression.[45]

There is evidence that SST might benefit hepatitis patients by preventing progression to HCC, a therapeutic action that is often referred to as chemoprevention. A large prospective study was conducted in Japan in the late 1980s and published in *Cancer* in 1995, "the first completed randomized controlled trial of chemoprevention of HCC."[46] In this trial 260 patients with cirrhosis were randomized by age, sex, hepatitis B antigen status, and liver function to treatment with SST or control. HCC was the primary endpoint and was confirmed by angiography, computed tomography, and biopsy. Patients were followed for 5 years with bimonthly alpha-fetoprotein measurements and quarterly ultrasonography. SST led to a one-third reduction in the incidence of HCC (23% vs. 34%, P = 0.071) and 40% reduction in deaths (24% vs. 40%, P = 0.053). The 5-year cumulative incidence of HCC was significantly lowered (22% vs. 39%, P = 0.024, SST group, n = 111, control group, n = 106) by SST among patients without HBsAg, most of which had anti-C-100-3 antibodies; therefore, it was suggested that SST was particularly effective for patients with hepatitis C infection.[46] See Table 2 on page 40 for a summary of Sho-saiko-to clinical trials.

Asian ginseng *Panax ginseng*

Reported Side Effect of Sho-saiko-to

SST has been used in China and Japan for hundreds of years without reported major side effects. The only serious adverse event reported in the literature in the past 2 decades has been pneumonitis (inflammation of the lungs), which was reported only in Japan. However, a rational perspective recognizes that SST is mostly used in severe chronic diseases in a large scale in Japan. The percentage of reported pneumonitis has been relatively small, but worthy of note, as described below.

The first case of the side effect of pneumonitis was reported in Japan in 1989. A 71-year-old woman was admitted to a hospital because of pneumonia. The patient complained of dry cough, fever, and severe dyspnea (difficult breathing). Fine crepitation (crackling sound) was heard on physical examination of the chest and a chest X-ray film revealed diffuse reticulonodular shadows in both lung fields. After ceasing all medications, including SST, findings markedly improved regarding patient complaints, laboratory data, and chest X-ray. Microscopic examination of transbronchial lung biopsy specimens showed interstitial pneumonitis. The results of a lymphocyte stimulation test were positive for SST. The patient received the challenge test with 2.5 g SST twice and developed high fever and dyspnea with hypoxia (low oxygen levels), while the chest X-ray film also revealed diffuse infiltrative shadows similar to that on admission. It was confirmed that this was the first reported pneumonitis due to SST.[47]

In an analysis of a major manufacturer's drug monitoring system, SST related pneumonitis when used in hepatitis patients was reported in 74 patients, which is approximately 1 in 20,000, leading to 8 deaths.[48] The patients who died were mostly complicated with an underlying lung disease, had been elderly, had been taking SST longer after the onset of pneumonitis, and had more severe hypoxemia (a condition with low oxygen levels in the blood).

Interstitial pneumonia has been a side effect of treatment with interferon, and SST may enhance this side effect. Interferon causes neutrophils, important cellular mediators of pulmonary fibrosis, to accumulate in the lung. SST alone may not injure lung tissue, but it increases the effect of interferon. Interestingly, in an early study, intraperitoneal administration of SST in mice induced endogenous secretion of interferon alpha/beta.[49]

When stimulated by some antigen, SST may over stimulate the neutrophils. Granulocyte elastase and oxygen radicals released from activated neutrophils may damage lung tissue.[50] In another report of 5 cases, combination therapy of SST with interferon has been reported in causing pneumonitis more likely than each given alone.[51]

Regulation of Kampo Medicines in Japan

Today in Japan, Kampo is integrated into the national health care system. Since 1967 the Japanese Ministry of Health, Labor, and Welfare has approved 148 Kampo formulas for coverage and reimbursement in the national health insurance plan. The formulas are therefore prepared under strict manufacturing conditions that rival those of conventional pharmaceutical companies. The Japanese drug monitoring system reports all production and usage of the formulas in the health care system. Safety issues and possible herb-drug interactions are surveyed and reported regularly. This is what happened when cases of interstitial pneumonia developed after treatment of SST during the late 1980s.

As a result of the reported side effect, in 1992 the Japanese Ministry of Health, Labor, and Welfare mandated all SST manufacturers to add a precautionary sentence on the product insert to reflect the potential pneumoni-

Table 2. Summary of Clinical Trials on Sho-saiko-to

Author/Year	Subject	Design	Duration	Dosage	Preparation	Results
Hassanein, 2006 (UCSD, San Diego)	Liver cirhhosis	R, DB, P, n=40	52 weeks	3 x 700 mg capsules, twice daily (4.2 g of SST extract)	H09 (Honso)	Pending (not yet published)
Lau, 2005 (MSKCC, New York)	Hep C nonresponders	U, n=31	52 weeks	7.5 g/d (contains 4.2 g of SST extract)	H09	Preliminary: ALT reduction in 11 of 15 pts, viral load reduction in 5 of 10 pts, histological improved in 2 of 10 pts
DeMatteo, 2002 (MSKCC, New York)	Hepatocellular carcinoma	U, n=80	15 months	7.5 g/d	H09	Trial stopped after recruiting 4 pts due to difficulty of enrolling.
Oka, 1995 (Osaka, Japan)	Hepatocellular carcinoma	R, non-blind controlled, n=260	5 years	7.5 g/d	TJ-9 (Tsumura)	The cumulative incidence curve lowered (P = 0.071) significantly in patients without HBs antigen (P = 0.024). The survival curve elevated (P = 0.053) significantly in the patients without HBs antigen (P = 0.043).
Yamamoto, 1995 (Japan)	Chronic hepatitis (Hep B and non-A non-B)	U, n=98	5 years	7.5 g/d	TJ-9	AST, ALT, and gamma-glutamyl transpeptidase significantly reduced. Liver function improved in 78% of the hep B and 67% of the non-A non-B hepatitis.
Gibo, 1994 (Japan)	Hep C	R, n=80	6 months	7.5 g/d	TJ-9	AST and ALT markedly reduced in 12.5% of SST group, 2.5% in control group. Number of patients developed HCC: SST group – 1 pt, control group – 5 pts.
Tajiri, 1991 (Osaka, Japan)	Hep B (children)	U, n=14	12 months	7.5 g/d adjusted to age	TJ-9	Seven of 14 patients (50%) became HBeAg negative in the treatment group.
Hirayama, 1989 (Yonago, Japan)	Hep B	R, DB, P, MC, n=222	3 months	6.0 g/d	EK 9 (Kanebo)	AST and ALT decreased significantly; HBeAg decreases and Anti-HBe antibodies increased, but not significantly after 3 months treatment.
Yaginuma, 1989 (Tokyo, Japan)	Danasol induced liver injury	U, n=24	4 months	7.5 g/d	TJ-9	Significantly reduced the elevated levels of AST and ALT induced by danasol administrations.

Key: DB = double-blind; MC = multi-center; P = placebo-controlled; R = randomized; U = uncontrolled

Figure 2. Warning and Contraindication for a Sho-saiko-to Product*

WARNING

1. Treatment with this product may cause interstitial pneumonia which may result in serious outcomes such as death unless appropriate measures are taken in the early phase. The patient should be carefully monitored, and if fever, cough, dyspnea, abnormal pulmonary sound (fine crepitation), X-ray abnormalities, etc. are observed, administration of this product should be discontinued immediately.

2. The patient should be advised to discontinue this product and to contact the physician in the event of fever, cough, dyspnea, etc.

CONTRAINDICATIONS

(Sho-saiko-to is contraindicated in the following patients.)

1. Patients receiving treatment with interferon preparations.

2. Patients with liver cirrhosis or hepatoma [Interstitial pneumonia may occur and cause serious outcomes such as death.]

3. Patients with liver dysfunction in chronic hepatitis with a platelet count of 100,000/mm3 or below [Liver cirrhosis is suspected.]

*Source: Label of H09 Sho-saiko-to product produced by Honso Pharmaceutical Co. Ltd., Nagoya, Japan

tis side effect. It was revised in 1994 to include the contraindication of SST with interferon.[52] Figure 2 is an example of the SST warning and contraindication information translated from the drug insert of H09, the SST preparation manufactured and marketed in Japan by Honso Pharmaceutical Co., Ltd.

Conclusion

Clinical, animal, and in-vitro studies on various SST preparations have clearly suggested its anti-inflammatory, anti-fibrosis, and chemopreventive effects. The clinical studies have shown benefits of the herbal formula for CLD such as hepatitis B and C and cirrhosis. The prevention of progression of hepatitis to HCC by SST is even more intriguing as this is the end stage for both hepatitis B and C and other liver diseases for which treatment options are limited and of limited efficacy. Clearly, the usage of prescription SST (7.5 grams of granules) should be monitored by practitioners for its possible effect on lung function. Patients who are undergoing interferon therapy or have underlying lung disorders should be particularly cautious when taking SST as interferon itself can cause severe side effects such as pneumonitis. However, the increasingly well-documented treatment benefits can outweigh the potential adverse effects as the formula is much better understood now for its potential efficacy and how to reduce the risk of pneumonitis than it was 10 years ago. The warning and contraindication mandated by the Japanese Ministry of Health, Labor, and Welfare were designed to protect the general public. With the cost of the national health insurance increasing dramatically in Japan, fueled in part by reimbursement of Kampo products, further conservative restriction on herbal preparations is under way. However, when the totality of the pharmacological and clinical evidence is reviewed, it becomes increasingly clear that the balance between the documented benefits and the potential risks strongly supports the use of SST in treating CLD. HG

Licorice *Glycyrrhiza uralensis*

Jipu (Dan) Wen, MS, MD (China), has nearly 20-years of experience in clinical and laboratory research in China and America in the integration of Chinese and Western medicines, including 4-years as a faculty member at Guangzhou University of Traditional Chinese Medicine, and a 3-year postdoctoral fellowship in gastroenterology at Mayo Clinic. His research at Washington University School of Medicine on absorption of vitamin B_{12} has been supported by a research grant from NIH. Since 2000, Dr. Wen has developed his career within the dietary supplement industry. He is the former vice-

Table 3. List of Abbreviations and Acronyms

ALT	alanine aminotransferase	HBsAg	hepatitis B surface antigen
AST	aspartate aminotransferase	HBV	hepatitis B virus
CCl4	carbon tetrachloride	HCC	hepatocellular carcinoma
CLD	chronic liver disease	HCV	hepatitis C virus
HBcAg	hepatitis B core antigen	HGF	hepatocyte growth factor
HBeAb	Anti-HBeAg antibody	SST	Sho-saiko-to
HBeAg	hepatitis B 'e' antigen		

president of World Nutrition Corp. of Phoenix, AZ, and the current president of Honso USA Inc., headquartered in Phoenix, AZ. Honso is the first company established in the United States to distribute Kampo herbal formulas. Dr. Wen has been actively involved with the business development of Chinese herbal medicine in North America in areas such as clinical trials, FDA regulatory issues, marketing, lecturing, and education. He can be reached through e-mail at wen@honso.com.

Ginger *Zingiber officinale*

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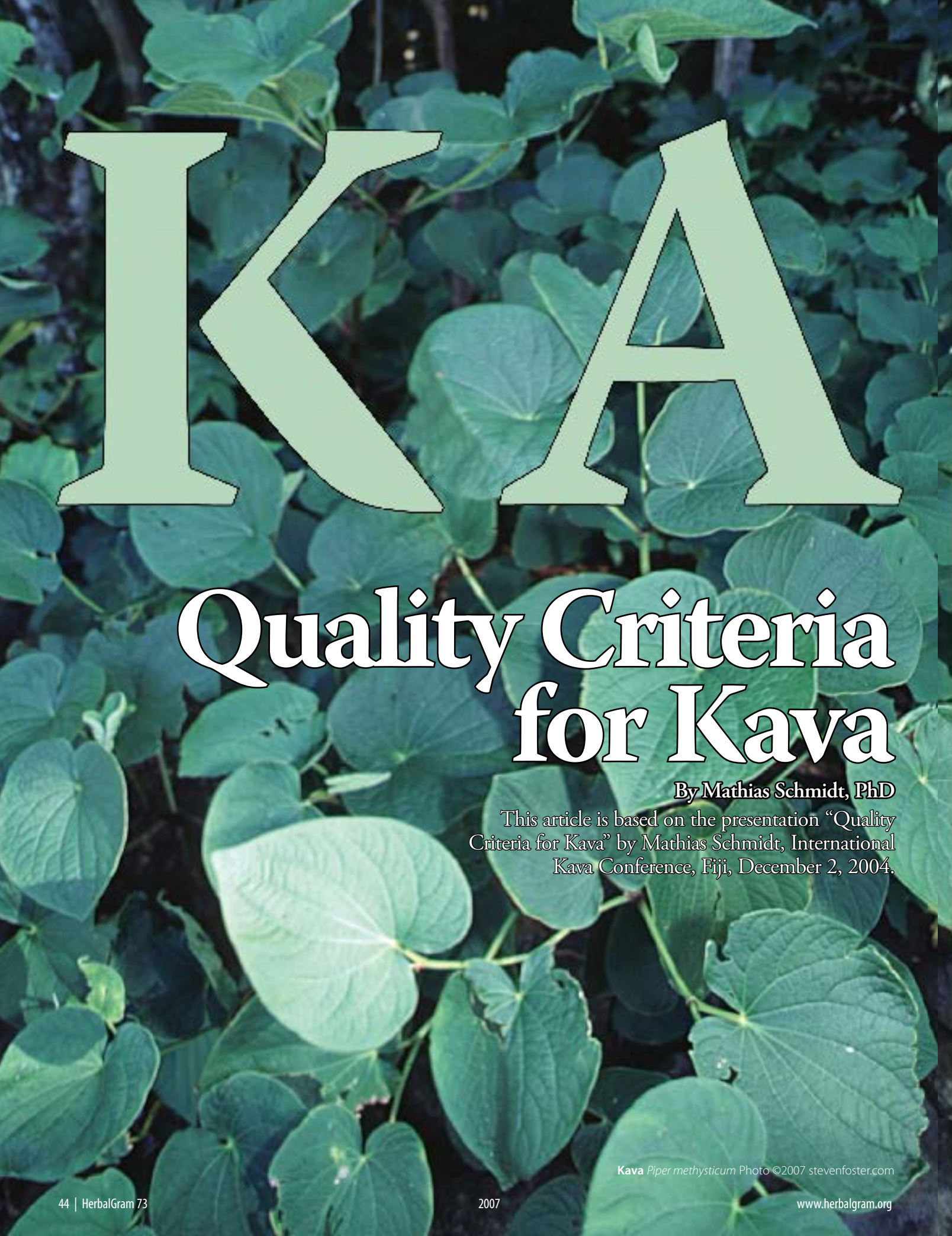
Jujube *Ziziphus jujuba*



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Quality Criteria for Kava

By Mathias Schmidt, PhD

This article is based on the presentation "Quality Criteria for Kava" by Mathias Schmidt, International Kava Conference, Fiji, December 2, 2004.

Kava *Piper methysticum* Photo ©2007 stevenfoster.com

During the past few years, pharmaceutical and dietary supplement products made from kava (*Piper methysticum* Forst., Piperaceae) have been banned from sale in many countries based on the suspicion of severe hepatic adverse effects. In 1999/2000, 8 spontaneous case reports of liver adverse events reached the Swiss regulatory authorities within just 6 months, all with an acetonic kava extract,[1] followed by a number of rather poorly documented case reports on other kava preparations, mostly from Germany.[2] This sudden appearance of a potential problem was not backed by traditional experience of kava drinking in the South Pacific, nor with the broad clinical experience with kava products in Europe.

Despite a large number of pharmacological and toxicological studies, and even new clinical trials published since the ban,[3-10] no convincing proof of an inherent toxicity of kava exists.[11] Recent toxicological results apparently pointing to a potential toxicity were in fact not obtained with the typical "noble" kava cultivars regularly used for daily kava drinking in the South Pacific. The "noble" cultivar is used for extract production in Europe, but the toxic reactions are traceable to unusual kava qualities such as the cultivar "Isa" (for which the history in Hawaii can be traced back to a relatively recent introduction from Papua New Guinea planted in Hawaii for research purposes). Isa would have to be considered an unacceptable quality for daily drinking, at least according to results from recent in vitro testing.[12] Another recent study on in vitro effects of kava described some potential mechanisms of kava toxicity, but again, the kavalactone signature of the study material points to kava material unacceptable for daily kava drinking.[13] In addition, some of the models of this study have been applied to the kava material used in European extract production, with no hints to toxic effects.[14,15]

Further, in a recently published study to evaluate potential repeat-dose toxicity, no deviation in histological, biochemical, and hematological parameters was found in feeding rats with up to 73 mg/kg of body weight of ethanolic kava extract daily for 3 months.[16] Until 1999, kava was considered an efficacious and exceptionally safe herb for the treatment of stress disorders and mild states of anxiety.[17] Meta-analyses of randomized, double-blind, placebo-controlled clinical trials conducted on the leading European acetonic and ethanolic extract support the phytomedicine's safe and effective use for anxiety.[17-20] The relatively sudden development of reports of alleged hepatotoxicity several years ago might point to a problem with raw material quality associated with some of the implicated kava preparations.

Quality issues with the raw material from the point of view of the South Pacific producers are presented in *HerbalGram* 71, "The Quality of Kava Consumed in the South Pacific" by V. Lebot.[21] In the text below, differences in kava quality shall be discussed as seen from the point of view of Western extract production. Indeed, there are striking differences in the quality of the raw material used for extraction, which have not been taken into account when the case reports of alleged liver toxicity were discussed. The potential toxicological impact of these differences in kava raw materials used for extraction needs to be clarified in future research.

Cultivars Used in German-Produced Kava Preparations

According to German Kava extraction companies, the raw material had to correspond to the definitions of the kava monograph in the German Drug Codex (DAC 86), which does not allow the use of aerial (above-ground) parts (F. Gaedcke [Finzelberg] and K-H Sensch [Gehrlicher Pharmazeutische Extrakte], personal communication, November 2006). The rules of drug registration in the EU require detailed batch analyses of the raw material; thus, deviations from the raw material quality as defined in the registration dossiers would immediately be recognized. However, as there is no definition of the cultivar quality to be used, the choice of the cultivars was based on established trading relationships rather than a consciously-made and deliberate decision.

The situation may be different in countries where kava is sold as a dietary or food supplement without strict controls. However, the original case reports of hepatotoxicity arose from the use of well-controlled Swiss/German preparations manufactured under drug regulations and related Good Manufacturing Practices, not

Table 1. Analytical profiles of some German kava products commercially available in 1999/2000 (Source: Gehrlicher Pharmaceutical Extracts, data from an HPLC screening of commercial samples of German registered kava products).

Brand (Manufacturer, City)	Solvent	Lot	Relative content of kavalactones [% (m/m)]						Signature
			DMY (1)	DHK (2)	Y (3)	K (4)	DHM (5)	M (6)	
Antares® (Krewel-Meuselbach, Eitorf)	Ethanol	924019	6.64	20.32	14.81	22.60	16.30	19.35	426531
Jakava® (Queisser, Flensburg)	Ethanol	8001060	6.40	21.49	14.55	22.08	17.33	18.12	426531
Kavacur® (Biocur, Holzkirchen)	Ethanol	12PX92	6.54	21.08	14.64	22.31	17.50	17.71	426531
Kava ratiopharm® (ratiopharm, Ulm)	Ethanol	1313020	4.51	26.58	11.48	16.88	25.70	14.85	254631
Kavasedon® (Harras Pharma Curarina, Munich)	Ethanol	000429	4.81	26.56	13.69	15.56	25.00	14.38	254631
Kavosporal® (Müller-Göppingen, Göppingen)	Ethanol	9901	5.40	23.58	12.92	18.60	22.09	17.38	254631
Maoni® (Lichtwer, Berlin)	Ethanol	00040101	5.97	22.20	14.08	19.97	18.77	19.01	246531
Laitan® (Schwabe, Karlsruhe)	Acetone	0531000	7.10	18.52	10.51	26.41	12.58	25.01	462531
Laitan®	Acetone	0541200	6.92	17.97	10.39	24.97	14.97	24.78	462531
Laitan®	Acetone	0450299	5.87	20.58	13.26	18.96	22.00	19.33	526431

Key: DMY = desmethoxyyangonin ; DHK = dihydrokavain; Y = yangonin; K = kavain; DHM = dihydromethysticin; M = methysticin

with products produced as food or dietary supplements. In view of the high degree of batch documentation, the argument of inferior quality (e.g., through the use of aerial parts as proposed by some South Pacific scientists) is thus clearly wrong when it comes to the extracts ingested by the patients suffering from liver disorders. However, even though the use of aerial parts can be excluded, the choice of an adequate cultivar is a completely different and unregulated topic.

An analytical screening of commercial samples of kava products by high-performance liquid chromatography (HPLC) in the year 2000 (see Table 1) reflected a rather constant quality, with obviously only few kava cultivars being used for extraction. A mixture of various cultivars, of course, cannot be excluded; however, the extraction

companies producing ethanolic kava extracts for German registered drugs did not usually buy from the open market, but rather from identifiable sources (K-H Sensch, personal communication, July 2001). The method used corresponded to the analytical conditions described by Grazca and Ruff,[22] and it was applied by Lebot and Levesque[23] for a phytochemical screening of kava cultivars (normal phase, dioxan/hexane as mobile phase). Lebot and Levesque introduced the system of kavalactone signatures, attributing to each lactone a number in the sequence of its elution from the HPLC column: desmethoxyyangonin = 1; dihydrokavain = 2; yangonin = 3; kavain = 4; dihydromethysticin = 5; methysticin = 6. A signature is formed when the figures are sorted in the sequence of decreasing quantities of individual lactones in the sample. With the relative composition of kavalactones being genetically defined, this method of assigning a kavalactone signature not only allows one to draw conclusions regarding the migration of related kava cultivars throughout the South Pacific islands, but also to correlate the phytochemical composition to the local experience with preferences or dislikes for certain kava cultivars.[23-26] Of course, the preference for certain cultivars must not necessarily correlate with pharmacological or clinical effects; however, the dislikes for certain cultivars are mostly connected to the observation of adverse effects from kava drinking such as headache, nausea, vomiting, and hangover,[26] and are thus directly relevant to a form of direct, observational pharmacovigilance.

The HPLC method was adapted to the use of kava extract in drug or supplement dosage forms, such as tablets or extracts. The use of an accepted literature method was justified by the fact that the official monograph in DAC 86 does not have an HPLC method, but a thin-layer chromatography (TLC) determination with colorimetric quantification, based on the method published by Csupor.[27] This TLC method does not allow the detection of all 6 major lactones, but only of kavain, methysticin, and yangonin. The normal phase HPLC method—the one also used for the analytical screening of commercial kava products—was standard up to the year 2000, when a new reversed-phase method became known.[28,29] However, the 2 HPLC methods yield very similar results (changing to an RP column allows for a simpler analytical routine setup), in contrast to the comparison between the DAC TLC method and the HPLC methods.[29] There is a factor of 1.6 between the HPLC and the TLC methods,[29] which also explains the differences encountered in the declaration of kavalactone contents in various preparations, and even in clinical trials. Some of these preparations declared kavalactone contents according to the DAC method, whereas others referred to the HPLC method. This difference must be taken into consideration when the risk-benefit ratio of various preparations is compared.

Despite a large number of pharmacological and toxicological studies, and even new clinical trials published since the ban, no convincing proof of an inherent toxicity of kava exists.

Despite the large number of brands with different galenical formulations (i.e., methods and types of preparations), the majority of the extracts used in German-registered kava products were produced by only 4 extraction companies, among them a producer of an acetonic extract. This is reflected in the similarity of kavalactone signatures of the various brands. As some degree of shift in the composition of the kavalactones is to be expected through the extraction process with organic solvents, the exact cultivar cannot be determined retrospectively. However, our experience shows that the general proportions of the single kavalactones do not vary considerably before and after extraction. Thus, the approximate origin and overall quality of the raw material can still be detected in the extract preparation.

With the possibility of the use of a mixture of cultivars (which was, however, excluded by at least one extraction company), the question arises whether the analysis of kava extracts can yield meaningful hints on the raw material used for production. However, an extract signature pointing to a cultivar favored for daily kava drinking would not be a cause for concern from the toxicological point of view even if cultivars were mixed. Conversely, a signature pointing to a bad kava quality (one for which adverse effects are known) is a potential problem for the assessment of drug safety.

With some caution, the available analytical data partially presented in Table 1 point to the use of kava cultivars preferred for daily drinking in Samoa and Vanuatu—with one exception. Obviously, two very different cultivars were used for the preparation of the acetonic extract in 1999/2000—the time when the first relatively well-documented kava liver case reports came up in Switzerland. The finding of signatures typical for a preferred Samoan cultivar in one batch, and a typical Tudey signature in another batch is not an analytical artifact. In fact, it correlates with the reports of the suppliers in Samoa and Vanuatu stating that they delivered the raw material (Eddie Wilson, personal communication, October 2000). With the sources

of the cultivars used in the production of the acetonic kava extract known, one cultivar could be identified as the Samoan "noble" kava cultivar Ava Laau; the other was the "no-drink" type Palisi from Vanuatu. Material from both cultivars was obtained and submitted to phytochemical analyses, for which the results were presented on the International kava conference in Fiji.[30] From the toxicological point of view, the fact that there were 2 essentially different qualities of the acetonic extract on the market may be a mere coincidence, yet still a point to consider for the interpretation of the liver case reports.

The signatures 426531 and 462531 correspond to a preferred quality typically found in Samoa, 254631 and 246531 are cultivars typically used in Vanuatu, whereas the signature 526431 corresponds to a typical "Tudey" quality, a "no-drink" kava type from Vanuatu.

Inadequate Kava Cultivars

The use of a "no-drink" kava in the preparation of the acetonic kava extract is not circumstantial. The cultivar Palisi is a very proliferative and fast-growing cultivar with a high yield of kavalactones already after one year of cultivation. Palisi was avoided for traditional kava drinking prior to the selection as a raw material for cultivation. The reason for the avoidance of Palisi in traditional kava drinking is that Palisi is known for various adverse effects, such as hangover, scaly skin, or watery eyes. There is no hint of adverse effects on the liver; however, this is probably the case because the material was never used regularly enough to gain corresponding experience.

Unfortunately, the traditional experience is vanishing in the South Pacific, and with the cultivation of Palisi still existing, the local kava market is now flooded with material of doubtful quality. Already, hitherto unknown adverse effects such as scaly skin or watery eyes are becoming more common in Vanuatu. If kava is ever to return on the world market, the quality must be assured in a reproducible way. Clearly attributable serious adverse events from kava drinking in any state of the South Pacific would most likely be the ultimate end of kava.

Proposals for Kava Quality Control

With the new regulations for the registration of drugs or the production of food supplements in Europe, there is now an increasing awareness of quality matters and traceability in the supply of herbal raw material. Should kava come back to the European market as a registered drug or even under food status, the new rules asking for traceable raw material (EU directive 178/2002/EC) already apply. Appropriate quality specifications of kava must therefore be defined to prevent foreseeable future problems.

The big question is how to define kava quality. The question might seem more complicated than it is. The South Pacific states can look back on a wealth of traditional experience. The most logical approach would be to orient the definition at the local experience and support this experience with a scientifically-based screening. Much work was already done by the CIRAD (Centre de Cooperation Internationale en Recherche Agronomique pour le Développement; Center for International Cooperation in Agricultural Research for Development) in the past,[23-26] and the consequences from this work can immediately be used. More than 200 cultivars of kava were identified throughout the South Pacific islands, and the genetic relationships partly examined.

With the new regulations for the registration of drugs or the production of food supplements in Europe, there is now an increasing awareness of quality matters and traceability in the supply of herbal raw material.

Kava *Piper methysticum*
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In conclusion, there are quality parameters that can already be defined and applied. The European pharmaceutical industry will set up standards for future kava quality. Kava raw material not meeting the standards will simply be rejected. These quality specifications will probably encompass the following:

- No use of stem peelings or chips from the aerial parts of kava stumps. A certain percentage of root chips from underground parts may be acceptable.
- Traceable origin of the roots as defined by the new regulations for drugs and food supplements in the EU. A method to ensure the traceability of the kava roots will have to be installed in cooperation with the farmers and traders, if possible analogous to the system of controlled origin as successfully done with wine, as proposed by V. Lebot.[21]
- Use of "noble" cultivars, preferentially with high relative kavain content and low contents of methysticin and desmethoxyyangonin. The control of this parameter is easily made by standard HPLC methods. Limits would have to be defined according to the identification of suitable cultivars. For practical reasons the extract producers should be able to select from a variety of suitable cultivars that might be compiled into a positive list, without being restricted to one single acceptable type. Natural variability in phytochemical composition must also be taken into account in the process of defining a suitable kava quality for use in herbal medicinal products.
- Use of healthy and fully matured plants of minimum 3 years of age. This parameter cannot be controlled by European producers and must be guaranteed by the farmers.

Quality control procedures are not a single-sided matter. They must start from the farmer's field by choice of plant variety and an appropriate cropping system, and must be implemented throughout the marketing channel down to the final recipient. It is not only in the best interest of all parties involved to produce the best possible kava quality, but it is also an investment in the future of kava. HG

Mathias Schmidt, PhD, is a pharmacist with long-term experience in kava research. He specializes in medicinal plant research with issues related to herbal safety and quality: pharmacovigilance, clinical studies, toxicology, and traceability projects for herbal raw material. He is affiliated with HerbResearch Germany, a consultancy company in the field of herbal medicines and food supplements. E-mail: Schmidt@herbresearch.de.

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SAVING wild ginseng, goldenseal, and other native plants from MOUNTAIN TOP REMOVAL

by Dean Myles

The Appalachian Mountains are renowned for their pristine hardwood forest, valuable low sulfur coal, and rugged way of life. For centuries, Appalachia has also had the reputation of being the ideal habitat of two economically significant medicinal plant species—wild American ginseng (*Panax quinquefolius* L., Araliaceae) and goldenseal (*Hydrastis canadensis* L., Ranunculaceae). Appalachian families have created a time-honored tradition out of harvesting these and many other medicinal plants for alternative income and medicine. Appalachian forests have been and continue to be a major source for herbs used in folkloric herbal remedies and phytomedicines.[1]

In recent years, the popularity of herbal medicines, both domestically and in foreign markets, has led to concerns on the part of wildlife biologists and other experts about the possible over-harvest of wild American ginseng and goldenseal, and about their future sustainability as wild-harvested secondary forest products. Unsustainable harvesting, coupled with habitat destruction from mining, timbering, and other industrial activities, as well as browsing by deer and other herbivores, is escalating the demise of many significant woodland species. It is estimated that more than 400,000 acres of rich Appalachian forest have been turned into infertile grasslands, with another 230,000 acres designated for the same fate.[2,3]

To protect wild ginseng from possible extinction, the West Virginia (WV) legislature has implemented new regulations concerning harvesting. The new law has delayed the harvesting season by two weeks, allowing significant time for the berries to fully ripen.[4] The new regulations also address the concerns of unlawful collection (poaching), planting ginseng on public land, cultivating ginseng on private land, and the introduction of exotic germplasm. However, neither the West Virginia legislature nor the federal government has dealt with the issue of habitat loss for ginseng and several other medicinal plants of value as a result of practices by the coal mining industry. It is illegal to dig ginseng out of season for any purpose, including its rescue from destruction, without the proper documentation.[4] Yet, the mining industry is currently permitted to completely and methodically obliterate ginseng and its entire habitat in the name of economic activity.

In the past coal has been the primary means of generating revenue for the citizens of West Virginia, but that income has come at a steep price. Many miners have lost their lives, and the ones who

survived a career in the mines have often developed black lung disease (silicosis) or some other type of physical impairment. Today, tourism is playing an increasingly important economic role, generating $34 billon to West Virginia yearly.[5] Tourism also supports 41,000 jobs and adds $536 million to tax revenues collected. The rivers and mountains of West Virginia attract individuals from all over the world to experience first class white-water rapids and to hike and bike the rugged mountains.

Meanwhile, due to the overwhelming demand for energy, the culture and landscape of Central Appalachia is being forever changed by the destruction of the very asset that makes this region so attractive—mountains.

I became aware of the seriousness of habitat destruction while serving as an intern with the Medicinal Botanicals Program (MBP) at Mountain State University (MSU) in Beckley, WV, during the 2003-2004 academic year. My assignment was to investigate goldenseal populations in Southern West Virginia. While conducting a literature review on goldenseal, I obtained a paper by James McGraw, professor of biology at West Virginia University, addressing the distribution of wild ginseng and goldenseal in central Appalachia. McGraw investigated 16 sites in West Virginia, Pennsylvania, Kentucky, Ohio, and Maryland, covering a total of 26 hectares. His investigation concluded that so few goldenseal patches were found that his team was unable to detect statistically significant effects of elevation, aspect, or vegetation on goldenseal's encounter probability.[6] (Encounter probability is a scientific/mathematical formula for determining the probability of encountering a specific plant or animal species while walking in a certain prescribed area of land.) McGraw's report asserts that goldenseal was "limited" in the region.

While investigating native goldenseal populations in the southern part of the state, I learned about the destruction of entire forests and goldenseal populations by the mining and timber industries. I have witnessed firsthand how fast plant populations and entire ecosystems can be destroyed. A native goldenseal population that I observed in a healthy forest in August 2003 was completely decimated by March 2004. The remaining forest is now a desolate mountain stripped of its trees and wildlife for a coal mining operation. This mountaintop and the surrounding area was once the habitat of not only goldenseal but other important medicinal plants such as wild ginseng, spikenard (*Aralia racemosa* L., Araliaceae), bethroot (*Trillium erectum* L., Liliaceae), lady's slipper (*Cypripedium pubescens* Willd, Orchidaceae), and Jack-in-the-pulpit (*Arisaema triphyllum* L. Araceae).

A second goldenseal population located during my initial investigation has also fallen victim to the energy resource extraction industry. This goldenseal population was destroyed by the construction of a gas line (see Figures 1 and 2). The site was also inhabited by various woodland species including the ones mentioned above at the previous site. This gas line was placed without regard to the plant life in the area. If the gas line would have been placed about 20 feet farther up or down the slope, it would have missed the goldenseal population. Gas line placement and the location of logging roads and skidder trails (trails left by logs dragged out of the woods) are habitually laid without regard to the plant communities. Timbering modifies the available sunlight in the forest and temperature regime, and it can be a factor in the demise of some species of both plants and animals. Even though the forest can rejuvenate itself eventually, rare and indigenous plant populations may not recover from road placement, logging, mining, and other human activity.

Mountain Top Removal (MTR)

Destruction of habitat is nothing new to West Virginia and the Appalachian Mountains, but with the advent of new earthmoving technology, the disturbance is far greater. Surface mining became popular in Appalachia after the Second World War, and the issue of environmental degradation soon began.[7] Today, the major threat to the local plant environment centers around a new

Figure 1. Goldenseal (*Hydrastis canadensis*) plant struggling to survive. Photo © Dean Myles 2004

type of surface mining operation called mountain top removal (MTR). Unfortunately, MTR is turning the most biologically diverse region in the United States into barren grasslands.

The MTR process begins by removing the salable timber from the selected area. Because this is not a registered timber operation, the Forest Service rules for timber extractions do not apply to mining activity, so there is no buffer zone for intermittent stream beds. Also, skidder trails are not designed to control water run-off, resulting in the pollution of debris into local streams. Once the timber is extracted, the drilling process begins. Holes are drilled and then filled with explosives that blast away hundreds of cubic feet of rock and forest soil. This allows the removal of what is in most cases a shallow coal seam. The MTR process reduces the elevation of the former mountain top by as much as 20%.[7]

Data from the Institute for Makers of Explosives shows that 67% of the 2.52 million metric tons (Mt) of explosives produced in the United States in 2004 were used by the mining industry.[8] In 2004, mining operations used 946,300 Mt of explosives in West Virginia, Kentucky, Virginia, Pennsylvania, and Tennessee. (States are listed in descending order according to the amount of explosives used.) Ninety-eight percent of the blasting agents used in mining are ammonium-nitrate based.[8] For comparison, the Oklahoma City bombing in 1995 used 1.8 Mt. (4000 lbs) of ammonium-nitrate.[9] This means it would take approximately 1140 Oklahoma City bombs to equal the amount of explosives unleashed every day in central Appalachia.

Once the over-burden (debris) is loosened and removed to expose the coal seam, the debris is dumped in the valleys lying between the ridge tops, creating "valley fills." These valley fills destroy areas rich in biodiversity. This loss of biodiversity can never be replaced. Not only does MTR impact the immediate habitat, it also affects the entire ecological and hydrological system. MTR mining processes are responsible for increasing the amounts of metals, sulfates, and dissolved and suspended solids in streams and ground water.[10] From 1992 to 2002, MTR has been responsible for the destruction of 1,208 miles of streams and the deforestation of 380,574 acres of pristine forest in the Appalachian region.[2] If current trends continue, a projected loss of 1.4 million acres of Appalachian forest will be lost by the end of the next decade.[3] The reclamation practices carried out by MTR and other strip mining operations cannot restore the rich biologically diverse forest that make Appalachia unique. The process of strip mining completely destroys the nutrient-holding topsoil of the affected area. As a "soil substitute" for the original topsoil, strip mining reclamation practices employ material made from brown sandstone to hold plant species selected for hydro-seeding.[10]

It would take approximately 1140 Oklahoma City bombs to equal the amount of explosives unleashed every day in central Appalachia.

Below: Figure 2. Goldenseal (*Hydrastis canadensis*) population destroyed by gas line construction in southern West Virginia. Photo © Dean Myles 2004

Another dilemma is the use of non-native grasses such as legumes and other species for reclamation. A 2003 Rutgers University technical study on MTR and valley fills suggests relatively low numbers of woody species were present in mined areas compared to intact forests.[11] The study also reports that the native woody species that do manage to invade mine sites are very close to the remaining forest edge and are less than 2.54 cm in diameter at the base. The combination of poor substrate quality and interfer-

ence by inappropriate grass cover restricts the ability of native plant communities to return to these extensive grasslands. The study concludes that the presence and composition of the forest herb stratum is critical for forest health, as the herbs maintain soil structure, add nutrients, and offer habitat and forage to many animal species. The report also suggests that herbaceous woodland species will not reestablish in mining areas due to loss of critical micro-habitat provided by the intact forest canopy. The Office of Surface Mining's goal is to reclaim areas to a green and stable environment, but it does not reclaim the ecology or land use capability as required by law (see Figures 3 and 4).

Between 1980 and 1999, 200,000 acres of land were permitted for MTR in West Virginia.[12] As of 1999 there were 11,500 permitted valley fills encompassing another 100,000 acres in the region. The majority of the mining activity occurs in the mountainous regions of southern West Virginia and eastern Kentucky. MTR occurs in 60% of the watersheds within this region. This also happens to be primary habitat for wild ginseng and goldenseal. The harvesting records for ginseng in West Virginia show a definite decline in harvest amounts (see Figure 5 on page 54).

The harvesting record is broken down by county. Ginseng is harvested from each of the 55 counties, but the southern counties have historically been the major wild ginseng producers. Over a 28-year period, the 7 highest ginseng-producing counties in West Virginia are Wyoming (34,166 lbs.), McDowell (32,167 lbs.), Logan (31,769 lbs.), Mingo (27,281 lbs.), Boone (25,638 lbs.), Raleigh (24,672 lbs.), and Kanawha (22,458 lbs.). Collectively, these counties have produced over 202,000 lbs. of wild ginseng. These same counties are now undergoing extensive MTR operations, with Boone, Logan, and Mingo counties being the top producers of surfaced coal tonnage.[13]

McGraw reports that decreased harvests of wild ginseng also correlate with unemployment in Appalachia.[14] In 1980 the unemployment rate was 9.6%, up from 6.9% the previous year.[15] In 1983 unemployment was 17.4% and in 1984 it was 14.7%. During this period, West Virginia experienced the highest unemployment rate in its history. In 1997, the MTR removal process became the preferred coal extraction process in the southern counties.[14] As MTR increases across the southern West Virginia coal fields, the wild ginseng harvesting rate decreases. Despite the increase in coal mining operations, the number of employed miners has decreases. In 1984, during the peak harvesting, 39,950 coal miners were employed in the state.[16] In 1997 when the decline in harvesting became evident, only 18,165 coal miners were employed in the state. Today fewer than 15,000 are working in West Virginia.

Below: Figure 3. View of Kayford Mountain site, West Virginia, on October 19, 2003. This is becoming a familiar scene in Appalachian coal country with over 380,000 acres of rugged mountains being altered into level, grassy plateaus by mountain top removal operations. Photo © Vivian Stockmen www.ohvec.org.

Above: Figure 4. View of Kayford Mountain site, West Virginia, on June 15, 2005. This mountain top removal (MTR) site comprises nearly 10,000 acres of land and is located less than 30 miles from Beckley, West Virginia. Note the expansion of the MTR site compared to Figure 3. Photo © Vivian Stockmen/www.ohvec.org.

More than 15 medicinal species, including ginseng and goldenseal, have been documented and moved to safe locations.

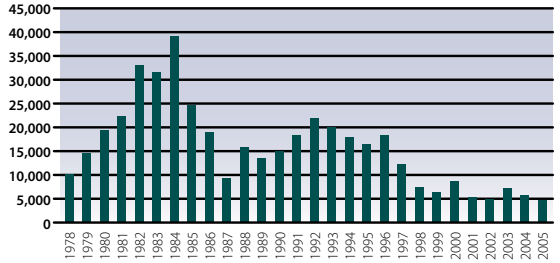

Figure 5. West Virginia Ginseng Harvest 1978–2005: A 28 Year History. Source: West Virginia Division of Forestry.

Conservation of Appalachian Medicinal Plants (CAMP)

In response to this loss of native woodland flora, I initiated the Conservation of Appalachian Medicinal Plants (CAMP) to rescue plants of medicinal and ornamental value from destructive industrial activity (see Table 1). Rescued plants are relocated to areas where they will be used for education and research. Since the fall of 2004, CAMP has been involved with locating and rescuing plants from a 4000-acre property in the Coal River Basin that was scheduled to become a MTR operation. More than 15 medicinal species, including ginseng and goldenseal, have been documented and moved to safe locations.

Rescued plants have been placed in the new Medicinal Botanicals Garden and Walking Trail at Mountain State University (MSU). The Medicinal Botanicals Program (MBP) at MSU is working with other organizations to educate and develop similar trails in the area. In addition, plants have been placed in research plots to evaluate how the environment may affect medicinal chemical constituents. Studies are also being conducted on growth rates, yields, and chemical diversity among native medicinal plant populations. As of fall 2005, 26 native goldenseal populations in 5 southern West Virginia counties have been located and characterized in an effort to select elite germplasm for the medicinal market. Efforts are being made to communicate with local coal company owners to allow sufficient time for rescue operations by CAMP and other organizations and to persuade mining companies to conduct their own salvage operations for reestablishment of remnant forests surrounding their valley fills. The MBP is continuing work to promote the establishment of the herbal industry in Appalachia. With the collaboration of educators, researchers, environmental groups and concerned citizens, MPB is dedicated to preserving the rich heritage of biodiversity for future generations of Appalachian children. HG

Dean Myles is a native of Southern West Virginia. Dean graduated Magna Cum Laude from Mountain State University in Beckley, WV, with a Bachelors of Science degree in Ecology in 2004. He is currently working to complete a Masters Degree in Plant Science and is the Coordinator of the Medicinal Botanicals Program at MSU. He can be contacted via e-mail at dmyles@mountainstate.edu.

Table 1. Plants Rescued from Mining in Southern West Virginia

American ginseng	*Panax quinquefolius* L., Araliaceae
Goldenseal	*Hydrastis canadensis* L., Ranunculaceae
Black cohosh	*Actaea racemosa* L., syn. *Cimicifuga racemosa* L. (Nutt.) Ranunculaceae
Blue cohosh	*Caulophyllum thalictroides* (L.) Michx., Berberidaceae
Bloodroot	*Sanguinaria canadensis* L., Papaveraceae
Jack-in-the-pulpit	*Arisaema triphyllum* (L.) Schott., Araceae
Spikenard	*Aralia racemosa* L., Araliaceae
Bethroot	*Trillium erectum* L., Liliaceae
Pink lady's slippers	*Cypripedium acaule* Aiton, Orchidaceae
Yellow lady's slippers	*Cypripedium calceolus* L. var. pubescens (Willd.) Correll, Orchidaceae
Solomon's-seal	*Polygonatum biflorum* (Walter) Elliott, Polygonaceae
Ramps	*Allium tricoccum* Aiton, Liliaceae
May-apple	*Podophyllum peltatum* L., Berberidaceae
Wild ginger	*Asarum canadense* L., Aristolochiaceae
Wild yam	*Dioscorea villosa* L., Dioscoreaceae

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Brazilian Women Promote Sustainable Harvesting of ENDANGERED ROSEWOODS

by Courtney Cavaliere

For the past several years, a group of women in Brazil have struggled to promote and perform sustainable harvesting of endangered rosewood trees.[1] The group, called AVIVE for its acronym in Portuguese (meaning "Green Life Association of Amazonia" in English), was founded in 1999 and is composed of 43 women from the Silves district of the northern Amazonas state of Brazil. These women manufacture and sell soaps and products scented with rosewood oil and other natural aromas, while tending rosewood plantations for future sustainable use. Such practices aim to both reduce local poverty and improve the survival of a species sadly depleted over the years.

Top photo: Scented candles produced by the women of AVIVE. © Barbara Schmal 2004.

Left photo: Rosewood (*Aniba rosaeodora*) growing in AVIVE's protected forest area. © Barbara Schmal 2004.

Production of soaps with distilled essential oils from plants of the Amazon river floodplain. AVIVE headquarters in Silves, state of Amazonas, Brazil. ProVárzea/Ibama Image Data Bank – L. C. Marigo ©2004

The Brazilian rosewood (*Aniba rosaeodora* Ducke, Lauraceae), called *pau rosa* in Brazil, which once grew in abundance throughout the Amazon region, was added to the World Conservation Union's Red List of Threatened Species in 1997.[2] Manufacturers of perfumes and other aromatic products began demanding huge amounts of rosewood oil in the early 1900s, due to its appealing fragrance.[1] According to the *New York Times,* the oil was used most notably as a key ingredient of the popular perfume Chanel No. 5. For several decades, industry exploitation generated severe deforestation of rosewood trees, which were destroyed for the oil found in their heartwood and roots. International recognition of the scarcity of rosewoods, as well as the introduction of synthetic linalool (a chemical of rosewood oil that contributes to its scent), has greatly reduced the demand for natural rosewood oil over the past few decades.[3] However, the exact concentration of linalool from rosewood oil has proven difficult to duplicate synthetically, leading some perfume companies to consider rosewood essential oil irreplaceable for their needs, whereas the manufacturers of other household products and lower quality perfumes have been satisfied with the synthetic linalool (E. Elisabetsky, e-mail, July 7, 2006).* A lingering black market trade of rosewood oil still contributes to the decimation of these endangered trees.[1]

David Hircock, herbalist and environmental watchdog for the cosmetic company Aveda, said the history and current predicament of the rosewood tree is shared by many plants around the world (D. Hircock, personal communication, October 25, 2005). "You just have to look in our own backyard," Hircock explained, pointing to the severe exploitation and present scarcity of wild American ginseng (*Panax quinquefolius* L., Araliaceae), which is valued for its medicinal qualities. "This problem is extremely common, which is very worrying."

Some scientists, meanwhile, have noted that natural rosewood oil can be obtained through sustainable means. Stems and leaves of rosewood trees also produce an oil rich in linalool, meaning that distillation of these regenerative tree parts can derive the fragrant oil previously extracted only from the destruction of full rosewood trees.[3] AVIVE plans to employ just such methods in the production of its own rosewood-scented products (B. Schmal, e-mail, March 13, 2006). For this purpose, the women of AVIVE have planted and are tending a plantation of 2,000 young rose-

* There have been numerous efforts to find alternative sources of linalool. Many have been found which are suitable for various consumer products; however, the linalool from rosewood is irreplaceable for perfumery, at least with respect to efforts to maintain the original formula for some market leaders like Chanel No. 5. This is due to the unique combination of percentages of (+) and (-) linalool. A major part of linalool used commercially for various purposes (home products, some lower-cost perfumes) is synthetic, and a racemic mixture of (+) and (-) isomers. What gives rosewood essential oil its unique smell is the unique combination of the percentages of the (+) and (–) isomers, which are difficult to obtain via commercial synthesis or from alternative plant sources. This means that in terms of conservation, major commercial users need to use the synthetic and alternative natural sources, while those that for whatever reason still must use the original essential oil must invest in sustainable management of existing rosewood trees as well as reforestation of new trees. (E. Elisabetsky, e-mail, July 7, 2006.)

Members of AVIVE selecting tento seeds to use in decorating handmade baskets that will contain mini candles and soaps for sale. © Barbara Schmal 2004.

woods. They have further engaged in partnerships with Precious Woods Amazon, a supplier of sustainably sourced exotic wood, and with land owners in their district, which has resulted in cooperative management of forest areas and has enabled AVIVE's sustainable use of those areas' non-wood forest products.

"There are currently 43 women in the association, the majority of whom were without jobs until the project began," said Barbara Schmal, a leader of the organization. "The success of the project has shown that economic activities can be environmentally sustainable in addition to strengthening perceptions of the role of women in a local context." Schmal explained that AVIVE has not yet been able to produce rosewood oil from leaves and stems, as most of the trees in their plantation have not sufficiently matured. She said the group may be able to attempt such distillation in 2007. In the meantime, AVIVE has been using rosewood oil donated by the government's environmental enforcement agency, the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), in its rosewood-scented products. Such oil was confiscated by IBAMA from an illegal distillation unit.

The women of AVIVE manufacture aromatic soaps, candles, and products from the oils of many tree species, in addition to rosewoods (B. Schmal, e-mail, March 13, 2006). For instance, they employ oils from andiroba seeds (*Carapa guianensis* Aubl., Meliaceae) and cumaru seeds (aka tonka beans, *Dipteryx odorata* [Aubl.] Willd., Fabaceae), as well as copaiba resin/oil (*Copaifera* spp. L., Fabaceae), breu oil (*Protium* spp., Burseraceae), and puxuri oil (*Licaria pucheri* [Ruiz & Pavon] Kosterm., Lauraceae). All of these oils are aromatic, and several of them contain healing properties or work as insect repellants. Like the rosewood, many of the trees that produce the oils are threatened. According to Schmal, all of those oils are harvested in a sustainable manner for AVIVE's use. The women use a vegetal glycerin base for the production of soaps and a paraffin base for candles, and they do not employ synthetic dyes or aromas. The products are sold in local shops to area residents and tourists, in the larger stores of some nearby cities, and to a small number of international customers in Germany, the United Kingdom, France, and the United States.

According to Aveda's Hircock, consumers and companies need to protect groups like AVIVE, which combine indigenous knowledge with conservation efforts. Hircock has worked extensively with entrepreneurial conservation groups similar to AVIVE—particularly the Asia Network for Sustainable Agriculture and Bioresources, based in Nepal, and the Songman Circle of Wisdom, in Australia. Aveda is a partner of both organizations, providing the groups with long-term sustainable distribution of their products and technical assistance, while promoting local socio-economic developments and maintaining respect of the indigenous peoples' cultural protocols. Finding such distribution can be one of the greatest challenges for groups like AVIVE, according to Hircock. "We will not have these plants around unless we look after the collectors, who in turn will look after the environment if they get a fair return," he said.

However, not all responses to AVIVE's efforts have been positive. Chrissie Wildwood, an author of several books on aromatherapy and natural medicine, argued that the organization's use of IBAMA-donated rosewood oil from heartwood inadvertently promotes the decimation of the species (C. Wildwood, e-mail, January 15, 2006). "I'm relieved that the women have a market for their products as I know they need the income. I only wish they would drop the rosewood oil from their products until such time as the sustainable version of the oil becomes a reality," she explained. Moreover, she pointed out that there is no true ethnobotanical history of rosewood oil distillation by indigenous peoples. According to Wildwood, rosewood oil was never used as a healing oil by indigenous forest peoples, and distillation technology was only introduced by modern industries.

Wildwood stressed that any exploitation or destruction of ancient rainforest trees, either legally or illegally, for commercial ends should be opposed. "The tree may not die out as a species. Indeed, stands of Aniba trees can still be found in inaccessible high places far from the Amazon river, which is necessary for floating the

huge and heavy logs downstream to the distilleries. However, the genetic diversity of the species must have weakened considerably due to aggressive harvesting of trees from the Amazon Basin where the species is now regarded as critically endangered," she said.

Selective logging in Brazil, in general, has been a subject of harsh scrutiny lately. Reports in October 2005 stated that human logging of the Brazilian rainforest had been severely underestimated, as determined by improved satellite imagery.[4] This heavy logging was also blamed for severe wildfires and natural disasters in the region.

Meanwhile, AVIVE's own rosewood plantation has been periodically threatened by illegal logging activities. In early 2006, trees located approximately 12 kilometers from the AVIVE plantation were illegally removed for harvesting. According to Schmal, the women of AVIVE are sometimes threatened by illegal loggers, who argue that it should be their right to cut down and sell trees. "They know the environmental laws and determinations, but they incriminate the state and federal governments for preventing them to work as forest people," Schmal explained. "But real forest people do not damage the environment they need for their livelihood; they only use the trees they need for constructing their house or boat, not more than this. The rosewood cutters are not from Silves. They come from other Brazilian states in the south with the idea to become rich. This is normal for Amazonia."

To help curb illegal logging and address sustainability issues of rosewoods, AVIVE has encouraged the development of certain local projects. According to Schmal, the group sent a proposal to the Brazilian government for the development of a small education and training program to teach local landowners and tree cutters about the importance of rosewood preservation. "These people need to learn that cutting trees can bring you some good money—for awhile—then you need a lot of creativity to survive," said Schmal. She added that most of the money from illegal rosewood harvesting is gained by distillery owners, not the tree cutters. Schmal has said that a few meetings have recently been conducted between state government officials, academic experts, and rosewood oil producers to facilitate discussion of rosewood conservation issues. Members of AVIVE, however, have not been invited to participate, she lamented (B. Schmal, e-mail, July 2, 2006). HG

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Women in the arboretum tending reforestation seedlings at AVIVE in Silves, state of Amazonas, Brazil. Photo ©2004 ProVárzea/ Ibama Image Data Bank – L. C. Marigo

President Signs New Law to Require Reporting of Serious Adverse Events of Dietary Supplements and OTC Drugs

Industry, Consumer, and Bipartisan Groups Voice Their Support of New Consumer Protection Measure

by Courtney Cavaliere

The Dietary Supplement and Nonprescription Drug Consumer Protection Act (the "AER bill"), a bill requiring manufacturers of dietary supplements and over-the-counter (OTC) products to submit serious adverse event reports (SAERs) to the Food and Drug Administration (FDA), was signed into law by President George W. Bush on December 22, 2006 (Law No. 109-462). The Act was passed by the US Senate on December 6, 2006, and by the US House of Representatives on December 9, 2006.[1]

This bill was the last act passed by the 109th Congress before it adjourned, winning unanimous consent within the Senate and approved by a two-thirds majority in the House.[2] The Act was introduced to the Senate (S. 3546) in June and to the House of Representatives (H.R. 6168) in September. It was approved by committees in both legislative bodies, leading to its recent consideration by the full Senate and House.

This Act, which amends the Federal Food, Drug, and Cosmetic Act, will become effective within one year of the date it was signed into law. Once effective, companies will be required to include contact information on their products' labels for consumers to use in reporting adverse events.[3] Companies must further notify the FDA of any serious adverse event reports within 15 business days of receiving such reports. Under this Act, a "serious adverse event" would be defined as any adverse event resulting in death, a life-threatening experience, inpatient hospitalization, a persistent or significant disability or incapacity, or a congenital anomaly or birth defect, as well as any adverse event requiring a medical or surgical intervention to prevent one of the aforementioned conditions, based on reasonable medical judgment.[1] Further, any AERs submitted to the FDA will not be considered an admission from a company that its product caused or contributed to the reported event, and the privacy of individuals reporting adverse events will also be protected.

In his statement to the Senate floor on December 6, which preceded the Senate's vote on the Act, Senator Orrin Hatch (R-Utah, one of the bill's sponsors) stated that "the Dietary Supplement and Nonprescription Drug Consumer Protection Act represents a too-rare-but-productive alliance between Democrats and Republicans and between consumer groups and FDA-regulated products manufacturers. This is a significant consumer protection measure."[4] He also said, "Many have unfairly criticized the industry over media reports that supplements are unsafe because there is no pre-market approval. While I can never support any system that requires premarket approval for supplements, I have become convinced that having a system in place to identify problems quickly can only enhance the authorities we gave the FDA with DSHEA (the Dietary Supplement Health and Education Act of 1994). It is also good policy. As the industry matures, we need to separate out the good actors from the bad. This is one way to show that this industry is a respectable mainstream industry."[4]

In his "Dear Reader" column in *HerbalGram* 71, the American Botanical Council's Founder and Executive Director Mark Blumenthal also noted that the development of this legislation (which had just been introduced at the time of that writing) reflects the maturation of the dietary supplement industry.[5] Blumenthal also cited an article he co-authored in *HerbalGram* 60 with Richard Kingston, Pharm D, president of regulatory and scientific affairs at SafetyCall International and clinical professor at the College of Pharmacy at the University of Minnesota: "Collection of spontaneously reported botanical AERs in a systematic and consistent manner is a vital part of product stewardship and safety assurance. Defining and monitoring the safety of dietary supplements is a dynamic process, and cooperation among multiple stakeholders using reliable methods of surveillance and analyzing collected data in proper context will aid in this process."[6]

The bill has been widely supported by dietary supplement and pharmaceutical trade groups, as well as consumer groups, and many of these organizations have applauded the recent decision by Congress to pass the bill. "We have long said passing this legislation is the responsible, right thing to do for both the industry and consumers," said David Seckman, executive director and CEO of the Natural Products Association (NPA), a trade association representing the natural foods industry.[7]

The Dietary Supplement and Nonprescription Drug Consumer Protection Act represents a too-rare-but-productive alliance between Democrats and Republicans and between consumer groups and FDA-regulated products manufacturers.

"We would like to thank our members, who have overwhelmingly supported this legislation. We would also like to thank all those grassroots supporters who sent thousands upon thousands of messages to Congress urging their legislators to pass this bill."

Steven Mister, president and CEO of the Council for Responsible Nutrition (CRN), a leading dietary supplement trade association, has also expressed his approval of the recent legislative actions. "This law is something responsible industry has supported for a long time and we greatly appreciate the hard work of Congress to make it a reality," he said in a press statement.[8] "We are confident that ultimately the AER system will highlight the strong safety record of dietary supplements and allow consumers to feel increased confidence about the choices they make when taking dietary supplements."

Michael McGuffin, president of the American Herbal Products Association (AHPA), the leading trade association in the United States dealing with herbal products, applauded the widespread support of the bill among legislators.[2] "The bill was passed by unanimous consent in the Senate and by more than a 2 to 1 majority in the House," he said in an AHPA press release.[2] "Such broad and bipartisan support for this important legislation is significant."

Loren Israelsen, founder and executive director of the United Natural Products Alliance (UNPA), pointed out that the bill was the result of much consideration and compromise among various groups and politicians. "As a response to critics of the bill, it should be noted that this legislation required 24 months and 21 drafts. All interested parties had opportunities to present their views and to offer proposed amendments to the bill's language. I expect that criticism of the bill will continue from some quarters of the industry. The democratic process has been respected, opinions were listened to, and the bill reflects a wide range of input and advice. This is an affirmation of how the system is supposed to work," he said (e-mail to M. Blumenthal, December 12, 2006).

Linda A. Suydam, president of the Consumer Healthcare Products Association (CHPA), an association that represents the leading manufacturers and distributors of nonprescription (OTC) medicines and dietary supplements, released the following statement: "Despite the industry's strong safety record, the Association has always believed that more can be done to further enhance consumer confidence in OTCs and supplements. As a strong and consistent supporter of mandatory reporting of all serious adverse events associated with dietary supplements and OTCs, CHPA was pleased to see recent progress made on the bill, and looks forward to seeing mandatory adverse event reporting for all OTC medicines and nutritional supplements become a reality. In addition to bolstering public confidence, the establishment of a mandatory system also will benefit manufacturers by standardizing the scope and extent of reporting to FDA."[9]

The Center for Science in the Public Interest (CSPI), a consumer-based nonprofit organization that has been a longtime critic of many dietary supplements and the supplement industry, was likewise supportive of the bill and the recent decision by

Continues on page 75

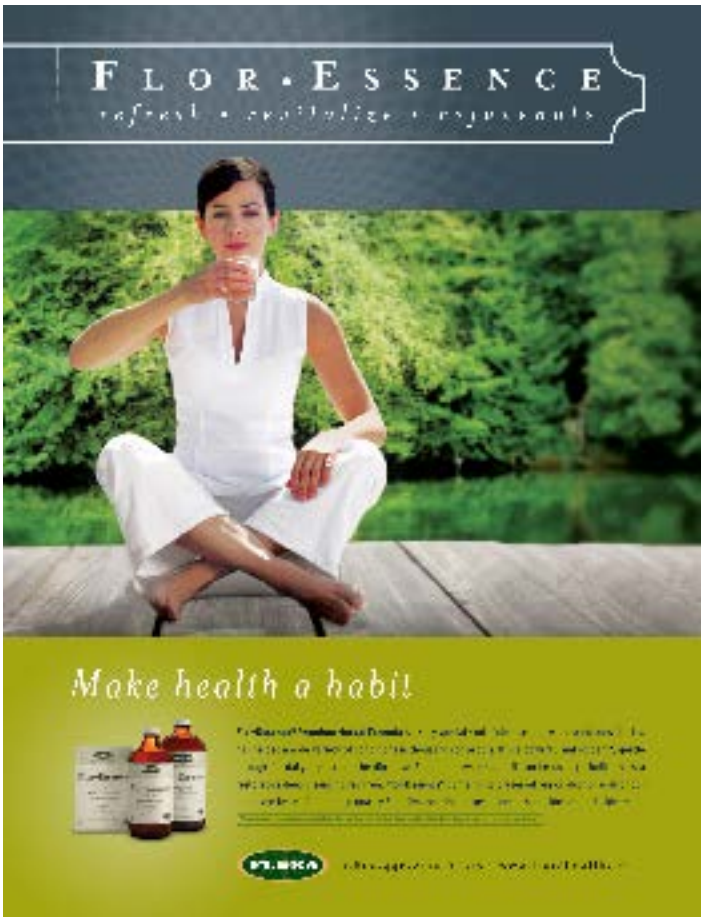
Canada's NHPD Inducts New Expert Members

by Courtney Cavaliere

The Natural Health Products Directorate (NHPD), Canada's regulating authority for the assessment of safety and efficacy of natural health products (NHPs) marketed in that country, announced the selection of 6 new members to its Expert Advisory Committee (EAC) on Natural Health Products in October of 2006.[1] The EAC is an external group composed of 10 to 14 non-government scientists and professionals with expertise in various areas of science or medicine. It provides the NHPD's director general with advice and guidance on issues related to the safety, quality, efficacy, and regulation of NHPs.

NHPs are defined under Canadian law as those products that contain the specific substances set out in Schedule 1 of the NHP Regulations (i.e., plant, bacterial, algal, fungal, and animal materials, vitamins, minerals, amino acids, essential fatty acids, and probiotics, including extracts, isolates, and synthetic duplicates) and must be sold or represented for use in the treatment or prevention of a disease or disorder, for restoring or correcting organic functions in humans, or for modifying organic functions in humans in a manner that maintains or promotes health.[2]

The 6 new members of the EAC are Traditional Chinese Medicine practitioner Michael Chung, PhD; nutrition expert Leonard Piché, PhD, RD, associate professor in the Department of Human Ecology at Brescia University College in Ontario; homeopathic practitioner David Brulé, DHMS; pharmacologist/toxicologist Francis Law, PhD, professor of environmental toxicology at Simon Fraser University in British Columbia; biochemist Fereidoon Shahidi, PhD, professor in the Department of Biochemistry at Memorial University of Newfoundland; and natural products formulation and process chemistry expert Colin Barrow, PhD, executive director of research and development of Ocean Nutrition Canada. NHPD issued an open call for nominations to the EAC in July of 2006, and more than 50 nominations were submitted for consideration.[1]



The new members join current EAC members: pharmacist and CAM practice researcher Heather Boon, PhD, BScPhm, professor in the Faculty of Pharmacy at the University of Toronto; Gillian Leverkus, PhD, RHP, an herbalist and alternative medicine practitioner at the Integrated Complementary Medicine Clinic on Vancouver Island; Joseph Betz, PhD, program director for Dietary Supplements Methods and Reference Materials at the National Institutes of Health's Office of Dietary Supplements; natural products chemistry and bioassay expert John Thor Arnason, PhD, professor of biology at the University of Ottawa; David Lescheid, PhD, ND, professor of basic sciences at the Canadian College of Naturopathic Medicine in Ontario; Andrew Macnab, MD, professor of pediatrics at the University of British Columbia; Ikhlas Khan, PhD, professor of pharmacognosy and research professor in the Research Institute of Pharmaceutical Sciences at the University of Mississippi; and Mary Hardy, MD, medical director of the Cedars-Sinai Medical Center program in Integrative Medicine and former associate director of the Center for Dietary Supplement Research in Botanicals at the University of California in Los Angeles.

Seven EAC members recently departed the committee: Frank Chandler, PhD, retired professor from the College of Pharmacy at Dalhousie University in Nova Scotia; Paul Saunders, PhD, ND, DHANP, adjunct faculty member of the Canadian College of Naturopathic Medicine in Ontario; Ron Harris, HD, homeopathic practitioner and founder of the Canadian Institute of Homeopathic Medicine; Mark Goldberg, PhD, president and CEO of the toxicology firm GlobalTox; Patrick Choy, PhD, MD, associate dean of research in the Faculty of Medicine at the University of Manitoba; Chinese botanist Albert Fok; and Henry Lu, PhD, DTCM, Lac, principal of the International College of Traditional Chinese Medicine in British Columbia.

The NHPD was created in 1999 to evaluate and regulate the growing body of NHPs being sold in the Canadian market. The NHPD is considered at the same level of the 2 other main divisions of Health Canada, the Food Directorate and the Therapeutic Products Directorate. HG

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European Legislation on Food Supplement Claims and Fortification Becomes Effective in 2007

Food Supplement Manufacturers Prepare to Safeguard the European Market

by Patrick Coppens

On May 17, 2006, the European Parliament (EP) voted in favor of 2 pieces of legislation: (1) the "Nutrition and Health Claims Regulation" and (2) the "Regulation on the Addition of Vitamins and Minerals and of Certain Other Substances to Foods." These measures tighten the rules for functional foods and food supplements manufacturers in Europe and for those exporting to Europe.

The adoption of these 2 measures by the EP did not come as a surprise. In the course of the previous week, compromise packages had been negotiated between the EP and the European Union's Member States (Council). During the first reading of the claims proposal, the EP rejected the concept of nutrient profiles and premarketing authorization procedure, but the proposals by the Council were later accepted with only slight modifications.

The EP amendments were adopted by the Council on October 12, 2006, after a procedural hiccup delayed the adoption process and necessitated the European Commission to issue a formal amendment. The cause was that the procedure involving the Standing Committee on the Food Chain and Animal Health had been outdated by the publication of a new procedure on July 22, 2006 (Council Decision 513/2006). This new procedure involves the EP in the decision-making process. The appropriate amendments were submitted on October 17, 2006, and are scheduled to be adopted by March 2007. The texts without the amendments were published in the official journal on December 30, 2006, as Regulations 1924/2006 (claims)[1] and 1925/2006 (fortification)[2] and enter into force on January 19, 2007. Several transition periods are foreseen, ranging from 3 years for nutrition and health claims to 15 years for non-complying trademark.

With the texts approved and published, one can make a good analysis of the challenges that await food supplements on the European market, especially those containing botanicals. (In the United States, food supplements are known as dietary supplements.)

Nutrition and Health Claims Regulation

The main observations that one could make regarding the Claims Regulation are that the rules are tight and that the text is far from complete. Many aspects still have to be clarified or filled in. The only concrete part of the Regulation concerns the annex with nutrition claims. The development of nutrient profiles may take 2 years. Three years are foreseen for the finalization of the list with so-called "generic" claims. And more fundamentally, it is not even clear what level of evidence will be acceptable for the substantiation of a claim or what will be the criteria to approve or disapprove a claim.

Companies therefore need to become aware of the consequences for their product portfolio and start working to get their claims and products introduced and accepted under the new rules.

Companies need to become aware of the consequences for their product portfolio and start working to get their claims and products introduced and accepted under the new rules.

Nutrition Claims

The Regulation's annex contains the criteria for 23 nutrition claims. These relate to energy, fat, sodium/salt, sugar, fiber, protein, minerals and vitamins, and other substances. Some nutrition claims that are widely used today are not included; for example, those relating to omega-3 fatty acids and glycemic index. This means that, after the transition period, these claims will no longer be allowed on the product label or in advertising, unless a dossier supporting the claim is introduced and accepted for inclusion in the annex.

"Generic" Health Claims

This concerns health claims that describe or reference (1) the role of a nutrient or other substance in the growth, development, and functions of the body, (2) psychological and behavioral functions, or (3) slimming or weight-control. The Regulation specifies that all the claims should be based on generally accepted scientific evidence and be well understood by the average consumer. This includes the bulk of the health claims currently used. All health claims will need to be included in a list or they will disappear from the market. Work to compile the list is being shared by industry. EHPM (European Federation of Associations of Health Product Manufacturers, www.ehpm.org), ERNA (Euro-

pean Responsible Nutrition Alliance, www.erna.org), and CIAA (Confederation of the Food and Drink Industries of the EU, www.ciaa.be) have joined forces to compile a list of such claims, which will be based upon submissions from their members. They have also developed a joint methodology regarding how to make submissions for inclusion in the list and established a deadline of December 15, 2006, for submissions to the list. A first list will be available by the beginning of February 2007. This work will include claims for botanicals.

Other Health Claims

Health claims based on newly-developed scientific evidence and/or which include a request for the protection of proprietary data shall be adopted following an accelerated or fast-track procedure. This procedure is the result of a compromise to have a more speedy procedure for approving new claims. If applied, a new claim could be approved within 7 months. It remains to be seen if and how this will work in practice.

Reduction of disease risk claims and claims relating to children's development and health will need to follow the full procedure, which is estimated to take at least 9-12 months.

Regulation on the Addition of Vitamins and Minerals and of Certain Other Substances to Foods

This Regulation deals with the addition of nutrients to foodstuffs. In parallel with the Food Supplements Directive[3] in place since 2002, the Regulation specifies the conditions and requirements for the addition of vitamins and minerals to conventional foods. An important element is that maximum levels will be established, as will be the case for food (dietary) supplements. In order to facilitate this exercise, the European Commission published a discussion paper and asked for public comment by September 30, 2006.[4] In view of the diverging opinions between the Member States with UK and The Netherlands as the most liberal (safety approach) and between France and Germany (recommended daily allowance-based approach) as the most restrictive, the setting of maximum levels will prove to be a very political exercise.

A second part of the addition of nutrients Regulation deals with other substances. It contains the so-called "scrutiny list," a mechanism to control the use of certain other substances. These substances include botanicals added to foods or used in the manufacture of foods under conditions that would result in the ingestion of these substances at levels greatly exceeding those reasonably expected to be ingested under normal conditions of consumption of a balanced and varied diet. The Regulation also applies to the use of substances that would otherwise represent a potential risk to consumers. The use of such substances could be prohibited, restricted, or made subject to certain conditions of use.

The European Botanical Forum

The European Botanical Forum, a joint forum created by ERNA and EHPM, has proposed a model for the substantiation of claims for botanicals. Using this methodology, associations and companies (health practitioner groups are not involved) have been invited to introduce claims for botanicals. A key element in this process is the acceptance of traditional use and establishment of evidence levels for efficacy. Under the recently adopted Traditional Herbal Medicinal Product (THMP) legislation,[5] proof of efficacy would not need to be submitted for THMPs if manufacturers can document traditional use. However, this principle is not foreseen under the claims Regulation for food supplements. This means that botanical food supplements would likely need more proof than THMPs before they can be put on the market, i.e., if the product carries a claim. (This legislation is a claims approval procedure, not a product approval procedure. But of course, without a claim, many products would appear meaningless to those consumers who lack the necessary background knowledge of the activity or benefits of the ingredient.)

The European Botanical Forum will be instrumental for the development of the claims list for botanicals, the application of the scrutiny list, and the novel food revision that is scheduled to start by mid 2007. With the claims legislation now published, companies should start analyzing the consequences of this new legislation for their product portfolio and start the necessary work to safeguard their claims and/or products for the European Market. This is especially relevant for manufacturers of botanical food/dietary supplements. HG

—Patrick Coppens is the Manager of Food Law at European Advisory Services in Brussels, Belgium, and Secretary General of the European Responsible Nutrition Alliance. He provides advice to a number of trade bodies in the nutritional products industry and has spoken at numerous international conferences on topics of European food law, health claims, and nutritional issues.

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Ninth International Congress of Ethnopharmacology Held in China

By Peter Houghton, PhD

More than 500 people from over 30 different countries attended the Ninth International Congress of Ethnopharmacology, held under the auspices of the International Society for Ethnopharmacology (ISE) and co-sponsored by the State Administration of Traditional Chinese Medicine, People's Republic of China, and the People's Government of Guangxi Zhuang Autonomous Region. The meeting took place August 22-25, 2006.

This was the second time that an ISE congress was held in China, the first being in 1994, and the hospitality and facilities were excellent, including the use of a new conference center. The Congress was held on the outskirts of the fast-growing city Nanning, which has a sub-tropical climate conducive to the growth of many medicinal plant species that do not grow further north.

The Congress attracted significant coverage in local and national television, radio, and newspapers. Many interviewers asked how traditional Chinese medicine (TCM) could be modernized. But what was really being asked was, "How can TCM be marketable for use in mainstream medicine in the West?" My standard replies were (1) "Make sure that its quality and composition are well standardized and controlled" and (2) "Well-designed and conducted clinical trials are needed to make an impact on the majority of Western mainstream medical practitioners."

State Administration of Traditional Chinese Medicine Conference Center. Photo © 2007 Peter Houghton

There was a large presence from manufacturers and suppliers of TCM herbs and herb-derived products at the Congress. One such supplier subsidized a spectacular cultural evening that represented the ethnic diversity of Guangxi, which is home to several cultural groups such as the Zhao and Miao. These groups include millions of people, and each group has its own distinctive system of traditional medicine.

Possibly the greatest distinguishing feature from similar conferences held in the West were the stories of how modern scientific research has led to herbal products being used successfully in clinical situations throughout China. The usefulness of ephedra (*Ephedra sinica* Stapf., Ephedraceae) in relieving some respiratory conditions is well-known, and the introduction of artemisinin as a modern antimalarial is one of the most impressive pharmacognostical success stories of the last 15 years (artemisinin is derived from the ancient Chinese herb *qing hao, Artemisia annua* L., Asteraceae). Other herbal materials were less well-known to me, such as the use of an extract of *huang qi* (*Astragalus membranaceus* [Fisch. ex Link] Bunge, Fabaceae) root to ameliorate the side effects of cancer chemotherapy and the use of yi yi ren (aka yi yi jen), the extract from the oil of the seeds of job's tears (*Coix lacryma-jobi* [Roman.] Stapf., Poaceae), as the active component of Kanglaite Injection, which is now used widely as an anticancer drug in China and Japan and is in the early stages of clinical trials to treat some symptoms experienced by cancer patients.

Possibly the greatest distinguishing feature from similar conferences held in the West were the stories of how modern scientific research has led to herbal products being used successfully in clinical situations throughout China.

Many interesting and well-presented plenary lectures were given on a wide range of topics covering pharmacology, aspects of conservation, commercialization, intellectual property rights, education of young people about medicinal plants, and new analytical methods. These were supplemented by a large number of fascinating short talks and posters covering a large variety of ethnopharmacological topics.

Professor Gustavo Gonzales of the Instituo de Investigaciones de la Altura, Universidad Peruana Cayetano Heredia, Lima, Peru, discussed recent studies on the pharmacology and clinical effects of maca, the root (technically the hypocotyle) of a Cruciferous plant (*Lepidium meyenii* Walp, Brassicaceae) that has been cultivated for many centuries in the Andean highlands in Peru. This has become a major export over the last 20 years and is incorporated into a variety of preparations sold throughout the world, mainly for its effect on male fertility. Different varieties of maca exist, the most common being "yellow maca" and others known as "black" and "red" maca, the different varieties having demonstrated different effects. The black maca is the best at increas-

ing sperm production, and the red variety has produced the best reduction in prostate hyperplasia in rats. Randomized placebo-controlled clinical studies in men carried out in 2000 and 2001 showed an increase in sperm count, sexual desire, and a decrease in anxiety in the group treated with yellow maca. Toxicity studies showed little adverse effects when maca was given at doses up to 10g/kg in rats.

Several papers were presented on the application of fatty acid synthase inhibitors from plants used traditionally in China for hundreds of years for weight reduction. Wei-xi Tian, PhD, from Graduate University, Chinese Academy of Sciences in Beijing, singled out the strong activity of extracts from mistletoe species (in the family Loranthaceae) and discussed how extracts of these plants might act and how they could be applied to the reduction of obesity.

Managing resources of medicinal plants was covered by several speakers but highlighted by Jian-hua Miao, PhD, the director of the Guangxi Botanical Garden of Medicinal Plants in Nanning. Dr. Miao described the cultivation of *Spatholobus suberectus* (Dunn, Fabaceae), the dried rhizome of which is used for menstrual problems. Sales are now equivalent to over one million US dollars a year, and the pressure of ensuring adequate supplies has entailed a detailed cultivation program to protect the plants growing wild from over-collection. Extensive chemical and pharmacological investigations are also being conducted so that standardized material of good quality can be made available.

Peter Hylands, PhD, of Pharmaceutical Sciences Research Division, King's College London, and Rudi Bauer, PhD, of the Karl-Franzens Universität in Graz, Austria, were among those who discussed ways in which complexity of traditional medicines, especially those from China, could be adequately covered by analytical methods to guarantee standardization. Professor Hylands described how the application of Principal Component Analysis of nuclear magnetic resonance (NMR) spectra of total crude extracts could differentiate and characterize extracts of one species grown in a particular place and under specified conditions.

On the last morning, a visit was made to the Guangxi Botanic Garden of Medicinal Plants, just outside Nanning. This beautiful garden covers several acres, and its plants are arranged according to their therapeutic indications, with both Chinese and Western classifications being covered. A large new research center is being built on the site. The most touching event of the Congress occurred when delegates and local schoolchildren planted a grove of at least 100 small trees to commemorate the Congress.

The co-chairman (with myself) of the Congress was Professor Xiao Peigen, director of IMPLAD, the Institute for Medicinal Plant Development in Beijing, who over the last 20 years has been a key figure in making scientific research into TCM plants known in the West. During one of the opening keynote addresses, he stressed how ethnopharmacology was a key factor in the development of new conventional pharmaceutical drugs in China.

All agreed that the Congress was a success and look forward to the next ISE Congress, which is being planned for 2008 in Brazil. HG

Peter Houghton, PhD, is a professor in pharmacognosy at King's College in London, England.

London Pharmacovigilance Conference

By Thomas Brendler

A 2 1/2 day international symposium on the current situation and future directions of pharmacovigilance of herbal medicines was held from April 26-28, 2006, in London.

The meeting was organized by the conference chair Joanne Barnes, PhD, associate professor in herbal medicines at the School of Pharmacy, University of Auckland, Auckland, New Zealand. Numerous prestigious organizations and institutions cooperatively sponsored the conference: the Royal Pharmaceutical Society of Great Britain (RPSGB); the World Health Organization Uppsala Monitoring Centre (WHO-UMC); the International Society of Pharmacovigilance (ISoP); the Gesellschaft für Arzneipflanzenforschung (GA; Society for Medicinal Plant Research); the European Scientific Cooperative on Phytotherapy (ESCOP); the School of Pharmacy, University of London, UK; the School of Pharmacy, University of Auckland, New Zealand; and the Academy of Pharmaceutical Sciences, UK.

Herbal medicines are widely used in self-care and healthcare in both developed and developing countries. However, in recent years, there have been several high-profile herbal safety concerns that have had an impact on public health, and there is increased recognition of the need to develop safety monitoring systems for herbal medicines. Pharmacovigilance for herbal medicines is, in many respects, in its infancy (relative to systems in place for monitoring adverse effects of conventional medicines) and presents unique challenges.

This meeting provided a comprehensive and critical overview of the current state of pharmacovigilance activities for herbal medicines at national and global levels. It considered the challenges, relevant emerging issues, and steps that could and should be taken to improve safety monitoring for herbal medicines in the future.

The symposium was attended by some 120 individuals working in the field of medicine regulation, various national pharmacovigilance centers, the herbal medicine and conventional pharmaceutical industries, or academia, as well as complementary and conventional healthcare providers, including medical herbalists,* physicians, pharmacists, and nurses.

The program included lectures by 36 distinguished speakers from 11 countries, covering the following topics, among many others:

- Nomenclature, authentication, and quality of herbs
- Adverse effects, interactions of herbal medicines
- National and international reporting systems
- Industry, practitioners' and regulatory perspectives
- Detection, assessment, and risk management strategies for herbal ADRs (adverse drug reactions, synonymous with AERs, adverse event reports)
- Science behind herbal ADRs
- Communication of herbal safety concerns

Of particular interest to this writer, to name just a few, were a presentation on the chemical and molecular basis of herbs in the genus *Aristolochia* and other herbal toxicities by H.H. Schmeiser, PhD, of the Division of Molecular Toxicology, German Cancer Research Centre, in Heidelberg, Germany; a talk on risk modification (an important principle in herbal safety) by Prof. Peter A.G.M. de Smet, PhD, PharmD, of the Scientific Institute of Dutch Pharmacists, The Hague, Netherlands; a presentation of an herbal Anatomical Therapeutic Chemical (ATC) classification system by Mohamed Farah, PhD, of the World Health Organization Drug Monitoring Centre in Uppsala, Sweden; and finally, the presentation from Bruce Hugman, MA, of EQUUS International, Chiang Rai, Thailand, on issues of communication of herbal safety concerns. Also, there was an important presentation by June M. Raine, MD, of the Medicines and Healthcare products Regulatory Agency (MHRA) in London on implications of safety and pharmacovigilance of herbal remedies within the context of the new European regulatory framework.

The great importance of the subject matter was reflected in the high quality of the presentations throughout. The presence of a proportionately large number of attendees from countries where ADR reporting systems are in their infancy was reassuring and in stark contrast to the virtual absence of American delegates from the meeting, both on the speakers list and in the audience.

Dr. Barnes and her team are to be congratulated for masterminding this meeting on a very important yet so far publicly underrepresented aspect of phytotherapy, as well as for bringing together such a distinguished selection of speakers and attendees. It is all-the-more surprising that such an important meeting received little attention from the media, which usually revels in conveying "news" about safety issues related to herbs and related natural medicines.

A book based largely on material presented at the conference is planned to be published by the Pharmaceutical Press (the publishing arm of the Royal Pharmaceutical Society of Great Britain), edited by Joanne Barnes and 2 expert co-authors specializing in herbal medicines and/or pharmacovigilance: Prof. Peter de Smet and Prof. Ralph Edwards. HG

* The term 'medical herbalist' is used by most practitioners of western herbal traditions in the United Kingdom. Under the principles of common law that still prevail in that country, it is legal to practice most complementary or alternative therapies (e.g., acupuncture, homeopathy) without a licence or even without minimum training standards. Moves to statutorily regulate (license) 'herbal practitioners' and distinguish them from western, Chinese, Ayurvedic, and other traditions, are now well advanced and will require university-level training for all.

Desk Reference to Nature's Medicine by Steven Foster and Rebecca Johnson. Washington, DC: National Geographic; 2006. Hardcover, 416 pages, photographs and illustrations. ISBN: 0-7922-3666-1. $40.00.

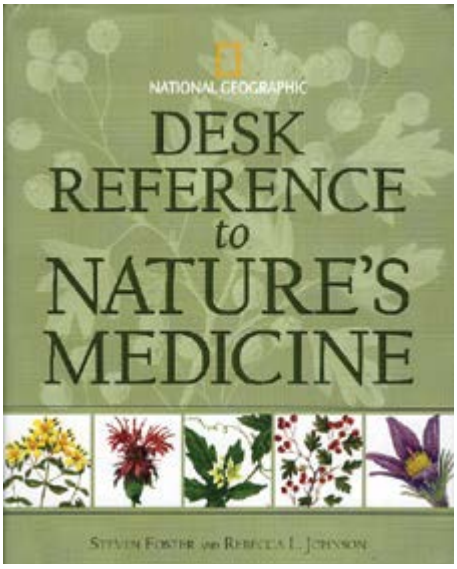
It's nice to pick up a well-illustrated book that contains more than just bare-boned folk medicine and well-documented scientifically supported herbal medicines. This book also includes interesting herbal history. Working through another book by another author, a boring fact-dense, prose-poor compilation on Ayurvedic herbs, I was delighted to learn more in *Desk Reference to Nature's Medicine*—some fact, some myth, both interesting—than I ever knew about one of the world's first leprosy cures, the chaulmoogra (*Hydnocarpus kurzii*). All of this within two pages, which is the number of pages devoted to each of the 150 species that Foster and Johnson detail so skillfully.

These 2-page sections are arranged alphabetically according to common names that range from Alfalfa to Yohimbe. The sections have a consistent format that includes scientific and common names, traditional and current uses, plant description, habitat, cultivation and preparation, and recent research. Each section also includes a photo and illustration of the plant, a range map, and a sidebar with interesting information about biology, history, and folklore. Interspersed among these 150 concise sections are 9 short essays that address the healing plants of a particular geographic region: Healing Plants of Africa, Healing Plants of Australia and New Zealand, Healing Plants of Central and South America, and so on. All this followed by a glossary, illustrated plant index, and detailed word index.

In the section on chaulmoogra, for example, the authors give an interesting historical account of leprosy, a disease known as early as 1350 BCE. Only chaulmoogra oil, first used by Indian and Chinese practitioners, was of real value until sulfa drugs were introduced in the 1900s. Since then chaulmoogra has not been much used, at least in the western world. According to one Burmese myth, the gods advised a leprous prince to withdraw into seclusion in the forest for meditation. Finally, the gods directed him to the chaulmoogra tree. He ate the fruit and was cured.

In their short essay on "Healing Plants of India," the authors present a synopsis that would be a useful introductory material for someone giving a talk on Ayurvedic medicine (Sanskrit for life [ayu] + knowledge [veda]). Of the 45,000 plant species in India, they say, some 3000 are used formally. Traditional medicine there dates back some 6,500 years (humans have been there about a million years, self medicating, and learning empirically via trial and error). Unlike the reductionistic system of conventional medicine in the United States, Ayurvedic medicine "follows a broad-based integration of life, health, and disease." One of the classic texts of Ayurvedic medicine, the *Caraka Samhita*, reportedly declares that it is not possible or necessary to name every disease. Each patient is considered unique. So the one billion Asian Indians are each considered unique in Ayurvedic medicine. In America we 300 million individuals are each assumed to be average.

The authors are rather adamant in saying "Ayurvedic medicine is the oldest medical system in the world, predating traditional Chinese medicine, according to some estimates, by 2,000 years." It emphasizes preventing disease and promoting health by strengthening mind, spirit, and body to withstand stresses. Of the 3000 herbs described in ancient Ayurvedic texts, "between 250 and 300 are commonly used" by modern Indians today. Ayurvedic is not the only system used. There's also the traditional Islamic medicine (Unani), the Siddha (limited mostly to Tamil Nadu and adjacent regions of south India), not to mention Yoga and Homeopathy. With some 50 million humans collecting plants in the Himalayas, conservation measures are needed. As ABC has also communicated in a recent feature article in *HerbalGram* 71, the authors of this book emphasize that "World supplies of Ayurvedic herbs will depend on cultivation of plants now collected from the wild."



The authors have done a great job of separating the wheat from the chaff, pulling the more salient from the many facts and dropping in many trivial bits of lore. Foster and Johnson tell us that licorice (presumably *Glycyrrhiza uralensis*) is the most commonly used herb in Chinese medicine. Historically in China it was a rejuvenator, imparting strength and life. Roman legionnaires chewed the roots on the battlefield. So did Napoleon, claiming it settled his nerves. Native Americans used licorice (presumably a different species) to "create a strong voice for singing." In many languages, the common names relate to its sweetness, e.g., "sweet stalk" in Sanskrit, "sweet herb" in Chinese, "sweet root" in Greek. "...[L]icorice may work as well in treating ulcers as prescription antacids and as well in calming coughs as codeine." All in all, in their 2 pages devoted to licorice, the authors list more than 50 activities and indications.

Regarding fennel (*Foeniculum vulgare*), they'll no doubt whet the curiosity, if not the appetites, of some obese readers with their interpretation of 17th century writer William Coles' comment, "[F]ennel used in broths and drinks could help slenderize people who were overweight. Indeed one ancient Greek name for fennel is marathon, meaning to grow thin." That sent me scurrying to my green farmacy garden to sample some fall fennel tea. I like the taste of the tea, sweetened with stevia and spiced up with poncirus (an orange-like citrus that is hardy here in Maryland). I may include this combination in the obesity chapter of my forthcoming updated version of *The Green Pharmacy* (Rodale Press). Foster and Johnson note that Pliny the Elder listed fennel as a remedy for more than 20 specific complaints. Foster and Johnson list more than 30, including several that I had missed in my own compilations, including aging, congestion, gingivitis, and stimulating peristalsis, respiration, and the uterus.

Other interesting tidbits regarding fennel include the following:

- One of 9 herbs revered by the Anglo Saxons for curing disease.

- Hippocrates and Dioscorides recommended the herb for stimulating the flow of breast milk.
- It seems to have aided weight loss, by deadening hunger pangs (eaten during Lent to allay hunger).

Regarding forskohlii (*Plectranthus barbatus*), Foster and Johnson claim that this herb has a long history in Indian and Asian folk medicine as a treatment for heart and lung condition (including asthma), intestinal spasms, convulsions, skin problems, and insomnia. They specify, "Ancient Sanskrit texts mention forskohlii as a traditional remedy for digestive complaints." I had yet to find a Sanskrit name for the herb, or for that matter, published folk medicinal use, until I read this book. Having great faith in the scholarly research of Steven Foster and the staff of the National Geographic, I assume they uncovered ancient folklore for the plant.

There are some glitzy innovations in the presentation. Some I like and some I don't. My 77-year-old eyes, even with my reading glasses, have trouble reading the caution captions (small white letters on a green background.) It took me a while to recognize the Scientific Name Index. Indeed the index is illustrated with reduced versions of the figures that accompany the species sections. Startled at first by this pictorial index, I rather like it after all. I had trouble finding the copyright page to make sure which year it came out. (It's on page 416.) Mrs. Duke had trouble finding the illustration credits. (They are on pages 414-415.)

The book is interestingly written and generously illustrated. This book is worth the $40.00 for Steven Foster's beautiful photographs alone, but it is packed full of useful data on 150 of the world's most important medicinal plants, selectively providing the more salient data and deleting some of the trivia that more trifling authors like me tend to generate. This would make a super seasonal gift, one of the best books of 2006. HG

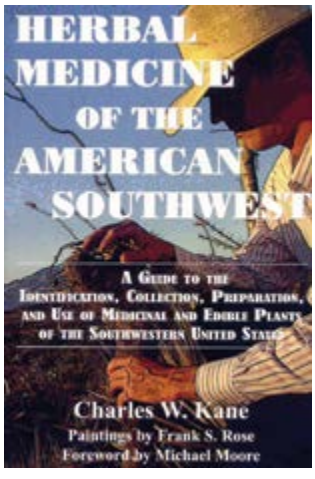
— James A. Duke, PhD
Green Farmacy Garden
Fulton, MD

Herbal Medicine of the American Southwest: A Guide to the Identification, Collection, Preparation, and Use of Medicinal and Edible Plants of the Southwestern United States by Charles W. Kane. Tucson, AZ: Lincoln Town Press; 2006. Paperback, 416 pages, color photos, paintings by Frank S. Rose, foreword by Michael Moore. ISBN 0-9771333-0-3. $29.95.

Herbalists of the Southwestern United States will be pleased to see this valuable addition to the region's materia medica. *Herbal Medicine of the American Southwest* combines the comprehensive information of a reference book with the confidence and practical knowledge of an experienced clinical herbal practitioner.

Charles Kane has written a handsome, user-friendly guide that details the description and distribution, chemistry, medicinal uses, indications, preparations, dosages, contraindications, and comparative cultural and historical information for over 210 western plants within 100 profiles. The bulk of the plants mentioned are found within the American Southwest, while others have an expanded western range and can often be found growing across the continental United States. Some of the plants are native to the region, while others, like the showy, red flowered Bird of Paradise (*Caesalpinia pulcherrima* [L.] Sw. Fabaceae), escaped cultivation when brought into this region from subtropical or tropical America and were planted in desert landscapes as ornamentals, and somehow were able to survive.

Charles Kane was auspiciously introduced to plant use as a young boy by his grandfather, an experienced backwoodsman, who would take him and his brother on outings to collect wild cresses and onions. The elder's favorite plant for treating the young boys, who would occasionally get rashes from tromping around in the vicinity of poison ivy, was jewel weed (*Impatiens* spp. Balsaminaceae). Later as a young adult Kane discovered for himself how plants could be powerful tools of healing. Through self-study and learning from experienced regional herbalists, including the legendary Michael Moore at the Southwest School of Botanical Medicine in historic Bisbee, Arizona, Charles developed a unique, eclectic style of herbalism. Kane combines traditional and modern herbal uses, western physiology, and constitutional diagnosis in his private practice through the Tucson Clinic of Botanical Medicine. He also personally collects and prepares most of the herbs he dispenses.



Kane addresses the controversial issues of wildcrafting practices with a light-handed, sustainable approach, abiding by 6 sensible guidelines in which he explains to the reader that the respectful wildcrafter takes only what he or she needs and should never collect more than 10% of any stand of plants.

The majority of the plants Charles has chosen to profile, such as acacia (*Acacia greggii* Gray, Fabaceae), mesquite (*Prosopis velutina* Wooton, Fabaceae), creosote bush [aka chaparral] (*Larrea tridentata* [Sessé & Moç. ex DC.] Coville, Zygophyllaceae), and prickly pear (*Opuntia engelmannii* Salm-Dyck ex Engelm, Cactaceae) are some of the best-known medicinal plants of the region, while others, such as trixis (*Trixis californica* Kellogg, Asteraceae), deerweed (*Porophyllum ruderale* ssp. *Macrocephalum* [DC.] R.R. Johnson, Asteraceae), chinchweed (*Pectis papposa* Harvey & Gray, Asteraceae), and hopbush (*Dodonaea viscose* [L.] Jacq., Sapindaceae) are used by the indigenous healers of the Southwest region but rarely, if ever, are discussed in medicinal herb guides.

Common and scientific names are given for the plant and the plant family, as well as the Spanish name, when applicable. The book includes a glossary of medicinal terms and a general index. A therapeutic index, which cross-references plants included in the book according to the various ailments for which they are used, will undoubtedly be advantageous to those unfamiliar with materia medica of the Southwest.

In the format explanation Kane gives the reader clear and precise directions on how to prepare herbal infusions, decoctions, and cold infusions, as well as how to make fresh and dry plant tinctures. This section also gives succinct recipes for making a cough syrup, eyewash, douche, fluid extract, fomentation, liniment, herbal oil, poultice, powder, salve, and sitz bath. He cautions the reader that, when using herbs, less is probably better. "A little will help, a lot may harm. Any plant properly dosed in small amounts can be medici-

nal. The same plant may be toxic in larger amounts." His wise and practical advice for using herbs in pregnancy is, "If an herb is affecting the mother-to-be then it is affecting the fetus. The herb's activity is usually delivered to the baby through the breast milk as well. While pregnant or nursing, limit herbs that have strong physiologic activities. In these times think of food as medicine."

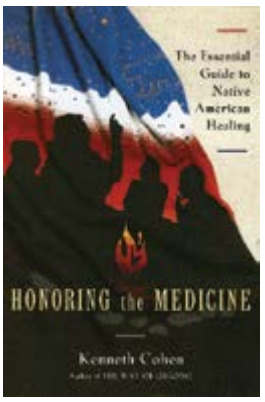
The plant monographs are a combination of folk medicine, well-researched scientific findings, and conclusions found in the latest scientific journals. The bibliography is arranged clearly and neatly. I particularly like the way in which the author lists references separately for each plant, making it easy and accessible for the reader who may choose to do further research on an individual plant. The author's photography is also commendable. Included in this compilation are 252 excellent color photos, which will make field identification of the plants nearly effortless. As an extra special bonus, the book is additionally illustrated with mesmerizing watercolor prints painted by Frank S. Rose, a veteran artist and signature member of the Southern Arizona Watercolor Guild and Western Federation of Watercolor Societies.

I have one criticism of this book, intended more for the editor who may not be versed in the rules of scientific nomenclature. Whenever a scientific binomial is written it must either be italicized or underlined. Granted, the rule is abided by at the beginning of each monograph, but it is ignored throughout the rest of the discussion. This may seem trivial to some; however, I view this book as a valuable resource and this type of neglectful editing detracts from the scholarly piece of research it is intended to be. Typos aside, I will personally consult this book and recommend it to my own students and clientele. HG

— Phyllis Hogan
Southwest Herbalist
Executive Director, Arizona
Ethnobotanical Research Association
Flagstaff, AZ

Honoring the Medicine: The Essential Guide to Native American Healing by Kenneth Cohen. New York, NY: One World, Ballantine Books; 2003. 428 pages, hardcover. ISBN: 0-345-39530-1. $29.95.

This is not a book about anthropology, nor is it a scientific approach to medical modalities, nor is it a book about any one healing tradition in particular. Rather, Kenneth Cohen explores the philosophical, spiritual, and theoretical worldviews that underlie the qualities inherent in the Native American healing landscape. As such, it does not delineate ethnobotanical concepts born of an anthropological approach but strives more to inspire than inform. The book embraces the concept that "peoples have their own cultural explanations for beliefs and behaviors that do not have to be justified or objectified from another cultural point of view." Those already familiar with various Native American medical and spiritual practices might ask how such a diverse and often divergent subject can be covered in a single volume, as if a single topic. The author acknowledges this limitation, recognizing that in the year 2000 there were over 4 million Native Americans in 700 tribes with over 225 distinct languages. Cohen instead seeks to amalgamate common practices and shared beliefs, such as the interrelatedness and sacredness of life.



Honoring the Medicine is divided into 2 parts. Part I explores the principles and values of Native American philosophy of life as understood by the author. Chapters include conceptual topics such as the "power of silence," "the four winds," "the cycles of truth," "the vision and the vision quest," "where healing dwells" (on sacred space), and "asking for help" (finding and paying a healer). In exploring these concepts and explaining topics that most readers have inevitably heard of but not fully understood, Cohen artfully draws upon experience, science, and literature, using short quotes from diverse sources ranging from William Blake to the *Koran* to make his point. Of course, there is liberal quoting and commentary from Native American sources as well. And it works—creating readable, often inspiring and believable tapestries of the healing landscape, in what could easily have digressed into New Age white-guy Indian-wannabe speak. Instead, Cohen provides the non-Native American with an understanding of Native American philosophical underpinnings through a non-Native cultural context.

In Part II of the book, Cohen explores "methods of healing" in chapters such as "What is Involved in a Native American Healing? (Traditions, Protocols, and Moontime Power)" [Whoops! Slipping into a little New Age speak?], "The Principles of Native American Counseling," "Cultivating the Good Mind," "Massage and Energy Therapies," "The Paleolithic Posture," "Unfolding the Mystery: Sweat Lodge and Sacred Pipe," "Tobacco: Wicked Weed or Gift of the Gods?" and "Plant People: The Healing Power of Herbs." The latter chapter contains the predictable allusions to willow (*Salix* spp. L. Salicaceae) and aspirin, explores various gathering traditions and rituals associated with them, and includes case study-type stories with abundant quotes from various herbal authors. Here the reader will find little depth, but once again, the author's points are coherently presented in a cultural context that readers unfamiliar with the subject matter can easily understand.

The book includes 2 appendices. One is a "Comparison of Western and Native American Medicine," and the other is titled "Meetings with Remarkable Elders." The book contains copious footnotes, with references cited at the back of the book, along with a relatively extensive select bibliography. Cohen ultimately attempts to place Native American healing traditions alongside Ayurveda or Traditional Chinese Medicine as a comprehensive, systematic, holistic approach to healing. He has provided an entertaining, readable and believable introduction to a subject that many readers will find both useful and inspiring. HG

—Steven Foster,
President of Steven Foster Group, Inc.,
Eureka Springs, AR

Encyclopedia of Dietary Supplements edited by Paul M. Coates, Marc R. Blackman, Gordon M. Cragg, Mark Levine, Joel Moss, and Jeffrey D. White. New York: Marcel Dekker; 2005. 819 pages. ISBN: 0-8247-5504-9. $499.95.

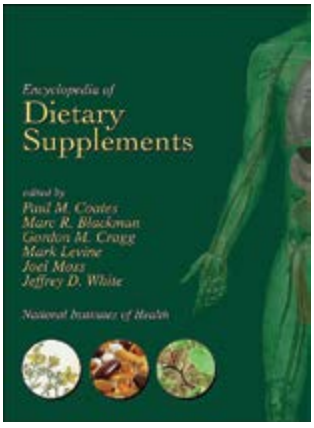
It is unclear whether anyone needs or wants another book of monographs on the therapeutic information on the most popular herbs and dietary supplement ingredi-

ents in the market in the United States, but if one were pressed to make a choice of those that are on the market, this impressive volume certainly merits consideration.

Consideration, yes. Purchase, well, that depends on one's disposable income or excess budget funds at a government agency at the end of the year when a spend-it-or-lose-it mentality may be present. At the significantly over-the-top price of a nickel less than $500, this book is probably accessible only to the most well-financed company libraries.

This hefty volume contains a total of 76 monographs, at least 31 of which deal with herbs (not including various other plant-derived ingredients, e.g., lutein and lycopene). The total represent many of the most popular supplement ingredients in the US market (including androstenedione and ephedra, both banned from use in supplements after monographs for this volume had already been commissioned).

Focusing on the botanical monographs, one of the strongest features of this book is that many of them, unfortunately not all, are written by people who are experts in the clinical literature on the respective herb. Examples are numerous: Daniel Fabricant and Norman R. Farnsworth wrote the black cohosh monograph; they have been extensively involved in researching this herb as part of the National Center for Complementary and Alternative Medicine (NCCAM) and Office of Dietary Supplements (ODS) grant to study herbs for women's health at the University of Illinois at Chicago (UIC). Gail Mahady, another member of the UIC research group, wrote the chasteberry (*Vitex agnus-castus*) monograph. Echinacea was co-written by Prof. Rudolf Bauer at the Karl-Franzen University of Graz, Austria, acknowledged as the world's premier expert in this genus. The feverfew monograph was co-authored by Dennis Awang, clearly one of the most knowledgeable people in this field. Garlic was written by John Milner at NIH, while ginger was written by Tieraona Lowdog, an expert on herbs, especially those used in women's health (in the case of ginger, for morning sickness). Asian ginseng was written by Fabio Soldati of Pharmaton in Switzerland, manufacturer of Ginsana®, the world's most clinically researched ginseng product. Hawthorn was written by Werner Busse of W. Schwabe Pharmaceuticals in Germany (which produces one of the world's most clinically-tested hawthorn leaf with flower extracts, as well as the world's premier ginkgo extracts [he should have authored the ginkgo monograph too!]). Saw palmetto was written by Ed Croom, an experienced pharmacognosist who consults with Indena, one of the world's leading producers of saw palmetto extract. And Solomon Wasser, the internationally known Israeli mycologist, wrote both the reishi and the shiitake monographs. Mark Messina, a widely acknowledged soy expert, wrote that section. Jerry Cott, a psychopharmacologist at FDA, generally regarded as one of North America's top experts on St. John's wort, wrote this monograph. Joe Betz, of the NIH's Office of Dietary Supplements, wrote the Yohimbe monograph, presumably because he had conducted some analyses on commercial yohimbe products when he previously worked at the Food and Drug Administration and was thus highly familiar with much of the published literature. There are many more such examples.



This book was subject to fairly extensive peer review,

New Book Profiles

What to Eat. Marion Nestle. New York: North Point Press; 2006. 611 pages, contents, tables, appendixes, notes, index. $30.00. ISBN 0-86547-704-3.

A leading outspoken nutritionist's guide to grocery shopping in American supermarkets. Discusses healthy foods in all the food groups and the tricks to shopping for a healthy meal. Covers organic foods, preservatives and additives, portion sizes, nutrition claims, and food labels.

Essence of Traditional Chinese Medicine. 3rd ed. Compiled by Asiapac Editorial. Translated by YN Han. Illustrated by Fu Chunjiang. Singapore: Chung Printing, Asiapac Books; 2003. 183 pages, contents, color and b&w illustrations, tables. $5.98. ISBN 981-229-364-7.

Compiles illustrations and graphics to explain the theory, history, and practice of traditional Chinese medicine. Includes the concepts of the 8 principle syndromes, the 5 elements, the 4 diagnoses, acupuncture, moxibustion, and diet therapy. Also contains diagnosis charts that relate the presenting sign and symptoms to the potential cause.

The Illustrated Yellow Emperor's Canon of Medicine. Compiled and illustrated by Zhou Chuncai and Han Yazhou. Beijing: Dolphin Books; 2002. 209 pages, b&w descriptive illustrations, simplified Chinese/English. $15.45. ISBN 7-80051-817-5.

Illustrates the philosophical ideas and history of Chinese medicine contained in *The Yellow Emperor's Canon of Medicine*. Explains through illustration the common questions and problems of everyday life and the appropriate measures needed for resolution. All narrative is written in both English and Chinese characters.

Total Heart Health: How to Prevent and Reverse Heart Disease with the Maharishi Vedic Approach to Health. Robert H. Schneider, MD, and Jeremy Fields, PhD. Laguna Beach, CA: Basic Health Publications, Inc.; 2006. 262 pages, softcover, contents, b&w figures, tables & illustrations, glossary, resources, references, index. $18.95. ISBN 1-59120-087-3.

This book encompasses the holistic healing principles of the ancient Vedic system of medical knowledge from India to prevent, treat, and even reverse heart disease. Focusing on mind, body, and environmental approaches rather than modern drugs and surgery to heal the body, the author provides ways to help patients change their lifestyles, including techniques such as meditation and recipes for healthy eating.

with each monograph sent to 2 or 3 expert reviewers (I was one of them). Reviewers' names (i.e., all but two who chose to remain anonymous) are listed in general, but the names of the monographs they reviewed are not revealed.

Unfortunately, despite the relative authority and reliability of the information in this book, there are some gross inconsistencies among the monographs, possibly as a result from what appears to be a lack of a coherent style guide and presumed process of having various monographs reviewed by individual members compared with one member acting as a senior editor. An effective managing editor at the publisher appears to have been lacking.

For example, although the monographs tend to follow a similar organization and structure, they are highly variable, both in structure and content, and this variability does not seem to depend on the type of ingredient. For example, the astragalus monograph starts with a brief one-paragraph Introduction followed by Biochemistry and Function with numerous subheadings, e.g., Pharmacodynamics, Immunomodulatory Effects, Cardiovascular Effects, and Hepatoprotective Effects, and then additional major sections on Conclusions, Indications, Dosages, Safety Profile, Regulatory Status, and References. But the chasteberry starts with Introduction and then Chemistry (not Biochemistry and Function, like astragalus), then Therapeutic Indications, then Clinical Studies (with subsections on the endpoints tested, e.g., Premenstrual Syndrome, Mastalgia, etc.) and then Mechanism of Action (not found in the astragalus monograph), Adverse Effects, and Products and Dosage, with no section on Regulation (as with astragalus).

Additional inconsistencies abound from one monograph to another. For example, some monographs contain a significant number of references (e.g., Vitamin B6 has 200!), while ginkgo, one of the most extensively researched phytomedicines, contains only 26! American ginseng has 72 references but the much more pharmacologically and clinically researched Asian ginseng has 54. By comparison, garlic, another extensively researched herb, has 100 references.

Another inconsistency is the length of each monograph. For example, compare the heavily researched ginkgo at 7.5 pages to Wasser's Reishi or Ling Zhi (*Ganoderma lucidum*) at 20, including references. Does this suggest that there is more relevant clinical data published on reishi than ginkgo extract? This certainly cannot be the case. (FYI, Wasser's Shiitake monograph is almost half that of Reishi, 12 pages.) There are 16 pages for grape seed extract compared to 10.5 for Echinacea.

If the variability in length and referencing were the only inconsistency, it may not merit mention here. But it appears to be symptomatic of additional problematic inconsistencies. For example, Wasser's Reishi monograph contains several pages of diagrams showing mechanistic pathways based on pharmacological research, but such diagrams are absent in most of the other monographs. And a few of the herbal monographs contain photos (black and white), some of which are of dubious value, e.g., the photo of a ginkgo tree in the ginkgo monograph, in addition to other photos in this monograph, while most of the other botanical monographs are lacking any photography at all. (Curiously, few of the photos are given any attribution to their source; the reader is instructed to go to the publisher's Web site for a color version.)

Then there are the tables of clinical studies, found in some monographs (milk thistle, valerian, et al) but missing in most. But these do not follow the same format. Dennis Awang's table of clinical trials in the valerian monograph (3 pages) is much more extensive and almost totally reversed in column headings compared to the format of the table of clinical trials in the milk thistle monograph, which is different from the clinical tables in the

Human Impacts on Amazonia: The Role of Traditional Ecological Knowledge in Conservation and Development. Darrell Addison Posey and Michael J. Balick, eds. New York: Columbia University Press; 2006. 366 pages, softcover, contents, appendices, index, references. $34.50. ISBN 0-231-10589-4.

Compiled by a cultural anthropologist (Posey) and a leading ethnobotanist (Balick), this book exposes the disruption of the Amazonians' livelihood due to the desire for modernization and development among non-natives. Multiple contributors share insights and opinions concerning the Amazon's unique environmental and economic importance. The contributors stress the significance of collaboration with the native Amazonians in order to preserve their native customs.

The Yellow Emperor's Medicine Classic: Treatise on Health and Long Life 4th ed. Zhou Chuncai. Singapore: Asiapac Books PTE LTD; 2005. 213 pages, softcover, b&w illustrations, illustrative stories, Chinese characters translated to English. $10.00. ISBN 981-3068-28-0.

Applies the medical knowledge of the Yellow Emperor, the ancient mythical icon of Chinese culture, with comic book style illustrations to explain the road to a more healthy and balanced life through the ways of traditional Chinese medicine.

Maya Medicine: Traditional Healing in Yucatán. Marianna Appel Kunow. Albuquerque, NM: University of New Mexico Press; 2003. 152 pages, hardcover, b&w photos, contents, tables, illustrations, glossary, references, index. $29.95. ISBN 0-8263-2864-4.

Examines the techniques of healers in Pisté, Mexico, near the ancient Mayan city of Chichén Itzá on the Yucatán Peninsula, including prayer, massage, plant medicine, western medicine, and ritual practices. Discusses more than 100 plants used by traditional Mayan healers over generations for various medicinal purposes. Includes many plant drawings as well as a plant catalog.

Complementary and Alternative Medicine Sourcebook 3rd ed. Sandra J. Judd. Detroit, MI: Omnigraphics; 2006. 657 pages, hardcover, contents, charts, glossary, resource list, index, references. $87.00. ISBN 0-7808-0864-9.

Explains the most-used CAM therapies, procedures, techniques, and healing systems that developed separately from conventional western medicine. Helps the consumer assess the safety and efficacy of each therapy and provides a complete detailed discussion on specific chronic conditions like pain management, headaches, and cancer.

hawthorn monographs.

And, a minor comment: As an editor and publisher of monographs and books, a word to the book designer at Marcel Dekker: It's not necessary to maintain the same font size in the references as found in the text. This book appears to use a 12-point font for most of the text in the monographs. I know of no one who would not be satisfied with a smaller font size, say 10 point for references. Depending on the size of the press run, a tree might have been saved!

The editors and publisher are to be congratulated for assembling an august group of authors and peer reviewers for this volume. Bottom line: Although it contains much useful information for researchers and clinicians, this book could have been more useful and consistent if one of the editors, or the publisher, had ensured that all the submissions from each of the writers or groups of writers (many monographs are co-authored), met a consistent format. Nevertheless, despite this format-oriented weakness, when one considers the quality of the information, the book still acquits itself and would warrant inclusion in any serious library of clinicians, researchers, industry members, and others, if only it were accessibly priced. Revisions to the monographs and new monographs are reportedly forthcoming on the publisher's Web site. Access to the current version is also available electronically by subscription at http://www.dekker.com/sdek/issues~content=t713172966~db=enc. HG

— Mark Blumenthal

Chinese Herbal Medicine: Comparisons and Characteristics by Yang Yifan, Edinburgh, Scotland, UK: Churchill Livingstone; 2002. Hardcover, illustrated, 223 pages. ISBN: 0443071667. $56.95.

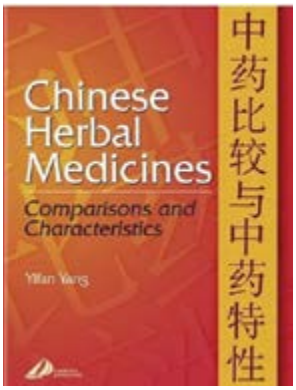
This is a valuable book for practitioners of Chinese medicine and students about to graduate into that field of practice; it would be quite difficult for others to utilize due to the assumption that readers are familiar with Chinese medical jargon and Chinese herbs.

As the title of this book suggests, its purpose is to provide comparisons between herbs in each of the therapeutic categories covered; it is not intended to include a comprehensive presentation of the materia medica. Generally, Dr. Yang has picked out herbs that are commonly used in China and likely to be included in formulas prescribed by Western practitioners of Chinese medicine. There are about 200 herbs that are the focus of her comments.

The book is laid out in the same manner as the modern versions of the Chinese materia medica; that is, by standard therapeutic categories, such as "Herbs that release the exterior," "Herbs that clear heat," "Herbs that drain downward," and Herbs that expel wind-dampness" for the first four groups. All together, there are 16 such categories presented after a chapter introducing the basic theory and concept of Chinese herbal medicine.

To present the information, the author has arranged the details she has to offer via questions.

Typically, there are about 9-18 questions per chapter, with the exception of the chapter on "Herbs that tonify" which has 36 questions, because she included questions that help define the nature of the essences that are tonified—qi and blood, yin and yang. In most cases, the answer involves 3-6 paragraphs, first listing the herbs to be described, and then describing each of the herbs, and finally making a summary of the similarities and differences.



The answers offer a good analysis of the herbs and what makes them unique when they are compared to others that fall into the same basic category, but not neglecting what similarities there might be. For example, in the Materia Medica category of "herbs that regulate the blood," there is this question (for which I've simplified the terminology for the herbs): "What are the differences between frankincense (*Boswellia sacra* Flueck., Burseraceae) and myrrh (a [A. Rich.] Engl., Burseraceae)?" Her answer follows:

> Frankincense and myrrh are aromatic herbs. They are very bitter and pungent, and move quickly. They can strongly disperse congealed blood, and direct it to descend, open up the meridians and collaterals, and are very effective for relieving pain. The two herbs are often used together to enhance the therapeutic effect. In clinical practice, they are often applied to reduce pain and swelling in trauma, arthritis, and fractures.
>
> Frankincense is warm and pungent, and enters the heart and lung meridians. Compared with myrrh, it promotes not only the blood circulation, but also the qi movement. It can also relax tendons. Frankincense is especially suitable for conditions where the joints and muscles are very stiff, swollen, and painful. It is also often used topically more than myrrh.
>
> Myrrh is neutral and it enters the liver meridians. Compared with frankincense, it is more bitter and its dispersing action is also stronger. This herb is stronger than frankincense for breaking up congealed blood and is used not only in trauma and fracture, but also for hard masses, such as tumors.
>
> Both of the herbs have a strong smell and may easily cause nausea and vomiting, and overdose may injure the stomach, so they are better used in pills and capsules.

For those who are familiar with this terminology, the answer she has offered is quite helpful. A practitioner frequently sees traditional formulas and patent remedies in which the two herbs are combined together, so that aspect is reasonably well understood, but the differences are not necessarily made clear during their training. Some practitioners would be concerned, for certain patients, about an herb that is very strong in dispersing action and breaking up congealed blood. Since this entry of the book indicates that myrrh is the one that has this potent action, the practitioner might make up the formula without it. On the other hand, in some other patients, such an action would be deemed critical to success, so myrrh would be included and, perhaps, used at a higher dosage to emphasize that effect. Similarly, if a practitioner wants to address "stagnation of both qi and blood," then it is made clear in Yang's statement that frankincense is the key herb, rather than myrrh.

The book includes some bar graphs of relative herbal potency related to a certain therapeutic effect (each herb can have several therapeutic actions, even though it may be included under only the one head-

ing in the Materia Medica). This is a rather unique approach: it is an attempt to illustrate concretely whether an herb is mild or strong in a certain action. Thus, among herbs that nourish "lung yin," she rates American ginseng (*Panax quinquefolius* L., Araliaceae) highest, with ophiopogon (*Ophiopogon japonicus* [L. f.] Ker Gawl., Liliaceae) below that, and then presents 9 other herbs with declining potency, the last being schisandra (*Schisandra chinensis* [Turcz.] Baill., Schisandraceae), an herb categorized with the astringents, but which also has a slight yin nourishing quality. Although the relative values are necessarily guess work, I find that the ratings she has applied are very often reasonable, so they are instructive to the practitioner.

In writing articles about Chinese herbs, I often find it helpful to distinguish among herbs that are in the same category, and when I turn to Dr. Yang's book, I frequently find a cogent explanation that I can quote. Her descriptions are consistent with the current understanding of Chinese herb actions as described in standard TCM publications in China; she has not gone off into any strange territory (a risk that is especially prevalent with Western writers of TCM books). Rather, she has organized the information in such a way that it is a new compilation.

I would recommend this book to students of TCM who are involved in their herb studies (which is often in the second year of the training program) as well as practitioners at various levels of experience. For students it will help them organize the vast quantity of information they are receiving and put it in a good perspective; for practitioners it can refresh the mind about the various issues of herbal prescribing that might have been lost along the way, as well as adding some new details.

Dr. Yang studied traditional and modern medicine at the Beijing University of Traditional Chinese Medicine from 1977 to 1982. After graduation, she worked there as a teacher and doctor in the Chinese Herbs department while she completed her master's degree in Chinese Herbal Medicines. In 1990 she moved to the Netherlands and works there in a TCM clinic. Dr. Yang also lectures on Chinese herbal medicine in colleges in the Netherlands and Belgium. HG

— Subhuti Dharmananda, PhD
Director, Institute for Traditional Medicine Portland, Oregon

President signs bill *Continued from page 61*

Congress.[10] "Making it simple for consumers to report adverse reactions and requiring companies to turn those reports over to the FDA will make it easier for the FDA to protect the public from hazards," said Bruce Silverglade, CSPI's director of legal affairs.[10] "Under the previous voluntary system, the FDA received less than 1% of all reports of adverse reactions to dietary supplements."

James S. Turner, an attorney and the chairman of the board of the consumer advocacy group Citizens for Health, described the Act as "a very important piece of legislation that advances consumer interests within a safe, credible dietary supplement marketplace."[11]

Dr. Rick Kingston has been a longtime advocate for post market surveillance in the dietary supplement industry. Dr. Kingston encouraged companies to begin the process of assessing their ability to comply with the legislation. "Fortunately there are very few serious AERs in this industry, but companies will need systems in place to monitor all AERs to ensure that incidents meeting the appropriate criteria are identified, screened (using reasonable medical judgment), and reported to FDA within the prescribed 15 day reporting period. There is a lot at stake for companies here and critics will be watching to make sure the legislation works as intended. If done right, AE reporting will result in a tremendous boost in consumer, and health professional, confidence in this industry" (e-mail to M. Blumenthal, December 12, 2006).

The bill was originally sponsored by Senators Orrin Hatch (R-Utah), Tom Harkin (D-Iowa), Dick Durbin (D-Illinois), Michael Enzi (R-Wyoming), and Edward Kennedy (D-Massachusetts), thus bringing together legislators who historically had voiced opposing views of the dietary supplement industry.[3] Senators Hatch and Harkin have been longtime supporters of the dietary supplement industry, and they sponsored DSHEA in 1994. Senator Durbin, on the other hand, has been one of the most outspoken opponents of the 1994 law, and he was a key figure in the FDA's banning of the controversial herb ephedra (*Ephedra sinica* Stapf, Ephedraceae) in 2004. HG

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Fikrat Abdullaev
1943–2006

Fikrat Abdullaev, PhD, head and founder of the Experimental Oncology Laboratory at the National Institute of Pediatrics in Mexico City and a tireless proponent of saffron (*Crocus sativus* L., Iridaceae) as a dietary agent for cancer prevention, passed away on July 17, 2006, at the age of 62. His death was sudden and unexpected. Dr. Abdullaev was an innovative and free-minded scientist who inspired other researchers in their pursuit of plant-based biopharmaceuticals and nutraceuticals.

Fikrat Abdullaev was born on October 18, 1943, in Baku, Azerbaijan. He received his bachelor's degree in chemistry at Baku State University in 1965, with a focus in biochemistry and molecular biology. In 1970, he obtained his doctorate from the Institute of Botany at the Azerbaijan Academy of Sciences, and in 1989, he earned a doctorate in biological sciences from the Ukrainian Academy of Sciences in Kiev.

His professional and scientific career began in the former Soviet Union, first at the Institute of Genetics (1966-1970) and later at the Institute of Botany (1970-1973) at the Azerbaijan Academy of Sciences in Baku. He then worked at the Institute of Molecular Biology of the USSR Academy of Sciences in Moscow from 1973-1976. From 1976 to 1986, he was associate professor and head of the Molecular Enzymology Laboratory at the Institute of Physics of the USSR Academy of Sciences. In 1986, he became head of the Genome Biochemistry Laboratory in the Institute of Botany at Baku. At that institution, Dr. Abdullaev conducted several experiments with saffron extract, investigating its abilities for preventing the development of diseases such as cancer.

He was a visiting scientist in the Department of Biochemistry of Stockholm University in 1979 and at the Institute of Biochemistry at the University of Munich in 1982. Dr. Abdullaev traveled to Rutgers University in New Jersey to further his research in 1990, joining Gerald Frenkel and his team in the Department of Biological Sciences and co-authoring 3 pioneer papers, which together with those of S.C. Nair and co-workers in India first described the antitumor effects of saffron extracts. This research initiated a search for the responsible saffron constituents, saffron's mechanism of action, the specificity on different cell lines, and its in vivo effects in animal models, leading to about 40 experimental and review articles with various research groups in Greece, Spain, Hungary, India, Iran, Japan, Azerbaijan, Mexico, the United States, and other countries.

In 1995, Dr. Abdullaev moved to Mexico as a researcher in the Department of Research and Postgraduate in Food Science at the Autonomous University of Querétaro. Since 1997, he was head and founder of the Experimental Oncology Laboratory at the National Institute of Pediatrics in Mexico City. His research in Mexico focused on nucleic acid and protein biochemistry, selenium and saffron biochemistry, chemical toxicity and cytotoxicity in vivo and in vitro, and mechanism of antitumor effects of chemical and naturally occurring agents. He was a tireless proponent of the virtues of saffron as a chemopreventive element of the diet and one of the engines of saffron research all around the world.

Dr. Abdullaev co-chaired the 1st International Symposium on Saffron Biology and Biotechnology, held in Albacete, Spain, in October of 2003, and he planned to co-chair the second such symposium in Masshad, Iran, in October 2006 under the auspices of the International Society for Horticultural Science. He was author of over 120 scientific papers and abstracts, and several patents.

Dr. Abdullaev was married to Zemfira Nagieva and is survived by his two daughters and four grandchildren. He was a loving husband, caring father and grandfather, and an excellent person, full of compassion and acceptance of others. He delighted everyone with his scientific sharpness, experience, kindness, and excellent sense of humor. Those who had the privilege of being his friends are devastated by his loss.

Allah rahmat elasin. (May God rest his soul.) HG

—Jose-Antonio Fernandez, PhD, University of Castilla-La Mancha, Spain

June C.H. McDermott
1954–2006

June Celeste Hall McDermott, MS, RPh, dedicated professor and practitioner of complementary and alternative medicine (CAM), died in her home on July 30, 2006, of metastatic breast cancer at age 51.[1,2]

Ms. McDermott grew up in Winterville, North Carolina. She received her master's degree in pharmacy from the University of North Carolina at Chapel Hill (UNC) and later earned a master of business administration from Meredith College.[1]

Among her many roles in the CAM community, Ms. McDermott was a pharmacist, professor, and speaker and organizer of many educational conferences.

McDermott began her career at UNC as a clinical assistant professor in the School of Pharmacy, where she worked for 13 years, and later, returned as an adjunct assistant professor in the School of Medicine's Department of Physical Medicine and Rehabilitation. She spent an additional four years teaching in the pharmacy care labs, helping her students develop their patient-monitoring and counseling skills.

As a clinical pharmacist practitioner with the North Carolina Association of Pharmacists, she was able to meet with patients in the integrative medicine and breast cancer clinics of UNC's Program on Integrative Medicine.[3]

"I think a major contribution of June's was her enthusiasm and open-minded[ness] about any alternative of treating the patient…She believed in the tremendous healing power of the body if given the correct stimulus," said pharmacist and close friend Tony Welder (e-mail, September 25, 2006).

Following her clinical assistant professorship, McDermott joined Clinical Tools, Inc. where she worked as a research scientist and director of the continuing education program.

McDermott passed along the knowledge she obtained from her research to other professionals through organizing and giving presentations in several professional conferences, many of which were based on nutrition, herbs, and the complementary and alternative options for cancer treatment. She helped to organize several such conferences co-sponsored by Duke University and UNC, as well as the National Community Pharmacists Association's Annual Convention's National Institute for Pharmacist Care Outcomes, among other professional conferences.

Throughout her career, she also used her knowledge of CAM to write a regular column on supplements for "Natural Pharmacy," a monthly newsletter for pharmacists. She also peer-reviewed and edited for several professional publications, including the *Journal of the American Pharmacists Association*, the *Journal of the American Society of Health-Systems Pharmacists*, and the complementary medicine section of the *American Pharmacists Association's Handbook of Non-Prescription Drugs*, 14th ed. Ms. McDermott also served on the advisory board of the Association of Natural Medicine Pharmacists.

"She strongly believed that complementary and alternative medicine was most important in optimal health," said McDermott's twin sister, pharmacist Jane Diehl (e-mail, October 4, 2006). Diehl described her sister as an objective evaluator of alternative medicines, always looking for scientific support to help treat patients and educate other professionals so they could do the same.

McDermott began exploring these alternatives on a more personal level in the fall of 1998 when she was first diagnosed with cancer. She also underwent chemotherapy followed by radiation.

McDermott had a lumpectomy and lymphectomy of the right breast and lymph nodes, but five years later, in 2003, the cancer resurfaced. For a year and a half, she successfully used a rigorous program of herbs to improve her quality of life before returning to additional chemo and radiation therapy, according to her sister.

"June [had] recognized for years that traditional [i.e., conventional] medicine does not supply all of the answers," Diehl said.

According to Diehl, McDermott entered the University of North Carolina as an undergraduate student with aspirations of being a math major and basketball coach. But after some encouragement from her mother and roommate, she went into pharmacy school. She left that experience puzzled by the misuse and overuse of conventional medicines (prescription and over-the-counter drugs).

June's mission was to forge new paths. In her career as a pharmacist, she passionately researched and embraced alternative ways of treating the whole patient. Her influence in complementary and alternative medicines was felt nationwide.[1]

McDermott is survived by her husband Bill, her two children Lauren and Alex, her mother Jennie, and her two sisters Jane Diehl and Lynda (Zoltan) Falushy. HG

—Dana Donalson

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2007

February 1: BRIT Distinguished Lecturer Series. Fort Worth, TX. "A Lifetime of Collecting in the World's Tropics—Or How I Got to Know the Diversity of Plants by Collecting Them." This lecture will be delivered by Thomas Croat, PhD, PA, Schulze Curator of Botany at the Missouri Botanical Garden, St. Louis. Dr. Croat will discuss how a botanist develops a research project, gathers materials, and brings back living collections for horticulture and science, based on his 40 years of experience. For more information please visit the Web site: www.brit.org.

February 10-16: Society for Range Management 60th Annual Meeting and Trade Show. Reno-Sparks, NV. One half day will be dedicated to a symposium on ethnobotany, featuring speakers from around the country. Topics will include the cultivation of native plants for rehabilitation projects, traditional knowledge of native plants and ethnobotanical materials, endangered traditional foods, and medicinal plant knowledge and conservation, among others. For more information on the symposium contact the co-chairs: Dr. Catherine S. Fowler at 775-784-6704 ext. 2014 or Cub Wolfe at 775-782-3661 ext. 109. For more information about the meeting and trade show, visit the Web site: http://www.ag.unr.edu/srm2007/.

February 15-18: BioFach World Trade Fair for Organic Food and Natural Products. Nuremberg, Germany. This event, sponsored by the International Federation of Organic Agriculture Movements (IFOAM), expects to have 2,100 exhibitors and over 37,000 buyers from all over the world in attendance. Phone: +49 (0)9 11 8606 0. Fax: +49 (0)9 11 86 06-82-28. E-mail: biofach@nuernbergmesse.de. Web site: http://www.biofach.de/.

February 21-23: 2nd Annual Day Spa Expo. Las Vegas, NV. This event, intended specifically for day spa owners, operators, directors, and technicians, introduces professionals to new and existing products, services, and equipment and provides an overview of the most up-to-date industry information and trends for overall business success. The event's education forum will be presented by the Day Spa Association. Phone: 800-859-9247 or 702-893-9090. Web site: www.dayspaexpo.com.

March 1: BRIT Distinguished Lecturer Series. Fort Worth, TX. "Exploring the New Guinea Highlands: the Magical World of the Birds of Paradise." This lecture will be delivered by Bruce Beehler, PhD, vice president of the Melanesia Center for Biodiversity Conservation, Conservation International, Washington, DC. Dr. Beehler will discuss his work exploring and performing conservation management of the Foja Mountains of New Guinea. For more information please visit the Web site: www.brit.org.

March 8-11: Natural Products Expo West. Anaheim, CA. This expo invites participants to experience the entire natural and organic industry conveniently packaged to the attendees' specifications. The expo will feature various seminars and enable participants to test thousands of new and staple products from over 2,600 exhibits. Web site: www.expowest.com.

March 9: Cultivating The Herbal Medicine Woman Within. Vacaville, CA. This 125-hour year-long course is taught by herbal teacher and author Kami McBride at the Living Awareness Institute. This course offers in-depth, hands-on experience with plants and is intended for women interested in exploring herbology as a relationship with the Earth, our bodies, and a way of life. The curriculum offers a balance between indoor lab and class time, inner exploration, and outdoor field experience. Phone: 707-446-1290. Web site: www.livingawareness.com.

March 16-18: Holistic World Expo. Toronto, Canada. The Holistic World Expo invites the public and professionals to come together to learn more about complementary and alternative modalities. It will feature international leaders and speakers, hundred(s) of exhibitors, and countless hands-on demonstrations that present attendees with a well-rounded view of holistic health benefits. It will provide information for individuals who want to enhance their health, de-stress their lives, and focus on their spiritual well-being. For more details visit the Web site: www.holisticworld.org.

March 19-23: International Symposium on Medicinal & Nutraceutical Plants. Fort Valley, GA. This symposium encourages anyone associated with medicinal/nutraceutical plants production, research, and marketing to come together for meaningful discussions and networking on contemporary innovations and developments. ABC's Mark Blumenthal will be one of the guest speakers. For more information contact: Anand K. Yadav, PhD, at 478-825-6830. Web site: http://www.ag.fvsu.edu/Conferences/ishsmanp/participants.htm.

March 25-29: Society of Toxicology 46th Annual Meeting. Charlotte, NC. This event is the largest toxicology meeting and exhibition in the world, attracting approximately 6,000 scientists from industry, academia, and government. The program includes a plenary and other special lectures, symposia, workshops, roundtable discussions, and platform and poster presentations. ABC's Mark Blumenthal will be one of the guest speakers. Web site: http://www.toxicology.org/ai/meet/am2007/index.asp.

March 28-30: Tokyo Health Industry Show (THIS). Tokyo, Japan. This is Asia's biggest and longest running health-related products exhibition, which has continued to increase in size and importance over the last 24 years. THIS 2007 will be its 25th anniversary, and it is planned to have 1,200 booths and participation from over 650 companies. For more details visit the Web site: www.this.ne.jp.

April 5: BRIT Distinguished Lecturer Series. Fort Worth, TX. "Exploring the Ethiopian Highlands for Old Plants and Very Old Bones." This lecture will be delivered by Bonnie Jacobs, PhD, director of the Environmental Science Program and associate professor, Department of Geological Sciences, Southern Methodist University, Dallas. This presentation will include a review of plant fossils from the Ethiopian Plateau, upon which a climate reconstruction is based, and will address the ecology of communities from this area. For more information please visit the Web site: www.brit.org.

April 14 & 15: Southwest Conference on Botanical Medicine. Tempe, Arizona. The twelfth annual conference. Speakers: Paul Bergner, Mark Blumenthal, Tori Hudson, ND, Cascade Anderson Geller, Phyllis Hogan, Mimi Kamp, Tieraona Low Dog, MD, Michael Moore, Pam Hyde Nakai, Rhonda Pallas-Downey, Kenneth Proefrock, ND, JoAnn Sanchez, Jill Stansbury, ND, David Winston, and Donald Yance. Topics include botanical therapies for women's health, sleep disorders, depression, anxiety, chronic back pain, aging, and dementia. Herb walks at the Desert Botanical Garden. CE credits for health professionals. More information at 800-252-0688 or www.botanicalmedicine.org.

April 29–May 4: 1st International Medicinal and Aromatic Plants Conference On Culinary Herbs. Antalya, Turkey. Main topics of this conference include cultivation and propagation, molecular genetics and breeding, essential oils, culinary usage, biodiversity and conservation, biological activities, analytical studies, and processing and trading (sterilization, drying, standardization). For more information contact Prof. Ibrahim Baktir or Prof. Kenan Trugut. Phone: (90) 2423102469 / (90) 2423102414. Fax: (90) 2422274564. E-mail: ibaktir@akdeniz.edu.tr. Web site: http://www.mapc2007ant.org/.

April 30–May 2: SupplySide East International Trade Show and Conference. Secaucus, NJ. Stay ahead of the "innovation" curve by learning about the latest healthy and innovative ingredients. Meet new vendors and formulators in the sold-out exhibit hall. Source ingredients, packaging, labeling, private-label manufacturing services and much more to create new products. For attendee information, call Marsha-Gail Henderson at 1-800-454-5760. For exhibits/sponsorships, call Todd Wills at 480-990-1101, ext 1171. For advertising, call Peggy Jackson at 480-990-1101. Web site: www.supplysideshow.com.

April 30–May 3: 6th Oxford International Conference on the Science of Botanicals (ICSB). Oxford, MS. Learn about quality, safety, and processing of botanical products at the National Center for Natural Products Research at the University of Mississippi; cosponsored by FDA/CFSAN. For more information contact Ikhlas Khan, PhD, at 662-915-7821. Fax: 662-915-7989. E-mail: ikhan@olemiss.edu. Web site: http://www.outreach.olemiss.edu/depts/pharmacy/botanical.

May 3: BRIT Distinguished Lecturer Series. Fort Worth, TX. "Saving the Wild Places of Earth for the Unicorn and the Tiger: Assuring the Future for Young Explorers." This lecture will be delivered by Eric Dinerstein, PhD, chief scientist and vice president for science, World Wildlife Fund, Washington, DC. Dr. Dinerstein will relate stories of his work in some of the most remote, beautiful, and threatened places on the planet, emphasizing the need for conservation and restoration of threatened species. For more information please visit the Web site: www.brit.org.

May 8–10: Vitafoods International 2007. Geneva, Switzerland. This conference covers the hottest topics and themes in food ingredients and attracts some of the leading industry figures to share their latest findings and discoveries. For more information please contact Nicola Mason at +44 (0)20 7915 5656; Fax: +44 (0)20 7915 5021; E-mail: nmason@iirx.co.uk or Contact Vicky Coope at +44 (0)20 7915 5133; Fax: +44 (0)20 7915 5021; E-mail: vcoope@iirx.co.uk. Web site: http://www.vitafoods.eu.com.

May 10–13: Tradition to Technology. Saskatchewan, Canada. The Natural Health Products Research Society of Canada and the Canadian Herb, Spice and Natural Health

Product Coalition invite you to attend their joint international conference. The conference will feature topics on non timber forest products and natural health products, including issues of processing, research, and technology. For more information contact Alister Muir at muira@agr.gc.ca or Connie Kehler at shsa@imagewireless.ca. Web site: www.saskherbspice.org.

May 14–16: Nutrition & Health Conference: State of the Science and Clinical Applications. San Diego, CA. This 4th annual conference, sponsored by the University of Arizona Program in Integrative Medicine and Columbia University's Rosenthal Center, and directed by health expert and best-selling author Dr. Andrew Weil, will again assemble an outstanding faculty of internationally known scientific researchers, skilled clinicians, innovative chefs, and best-selling authors, to discuss the interface between nutrition and healthful living. The conference also includes a public forum, which allows members of the public to pose questions directly to Dr. Weil and other experts in nutrition and health. For more information visit the Web site: www.integrativemedicine.arizona.edu.

June 2–4: Medicines from the Earth Herb Symposium. Black Mountain, North Carolina. Annual symposium on herbal medicine at Blue Ridge Assembly near Asheville, NC. Workshops include botanicals for childhood metabolic disorders; vascular inflammation; dopamine and the female endocrine system; sleep disturbances; prostate cancer; Parkinson's disease; estrogen metabolism and breast cancer; Ayurvedic medicine for women's health, Artemisia for cancer and malaria; botanical alternatives to pharmaceutical drugs; interactions between botanicals; and conventional cancer treatments. CE credits for health professionals. More information at 800-252-0688 or www.botanicalmedicne.org.

June 4–7: Society for Economic Botany 48th Annual Meeting. Chicago, IL. This meeting will feature a symposium titled "The Search for New Plant-based Therapies." Keynote Speaker: Dr. Norman Farnsworth. The event is hosted by Lake Forest College, Chicago Botanic Garden, Northwestern University, University of Illinois at Chicago, and the Field Museum. For more information, visit the Web site: www.seb2007.com.

June 5–9: Annual Meeting of the Council on Botanical and Horticultural Librarians. Cincinnati, OH. This meeting will be hosted by the Lloyd Library and Museum, the Cincinnati Museum Center, and the Civic Garden Center of Greater Cincinnati. It will feature keynote speakers, presentations, and tours. ABC's Mark Blumenthal will be one of the guest speakers. For more details visit the Web site: http://www.cbhl.net/meetings/meetings.htm.

June 9–11: World Tea Expo. Atlanta, GA. This expo is the largest trade-only conference in the world showcasing tea and tea-related products. The goal of the expo is to add value to the rapidly growing tea industry by providing a true marketplace for commerce and education. This event will feature the most comprehensive products and resources necessary to serve the tea industry and facilitate its growth. ABC's Mark Blumenthal will be one of the guest speakers. For more details visit the Web site: www.worldteaexpo.com.

June 11–15: VI International Symposium on New Floricultural Crops. Madeira, Portugal. This symposium will include sessions on the sustainable use of biodiversity for floriculture and landscapes, strategies for plant introduction and market trends, propagation and production, stress physiology, and native plants and genetic resources, as well as various tours. Phone: 351 291 920 125. Fax: 351 291 922 511. E-mail: nfc2007@gov-madeira.pt. Web site: http://www.sra.pt/nfc2007/.

July 21–22: NW Herb Fest. Pleasant Hill, OR. This annual symposium on herbal medicine will be held at Wise Acres Educational Farm. Presenters for this event include Susun Weed, Donald Yance, Deborah Frances, Kenneth Proefrock, and Heather Nic an Fhleisdeir, as well as others. Beginning and advanced classes will be offered. Herb walks are available throughout the conference. CE credits available for some health professionals. Cost of attendance is $145 prior to May 1st. Phone: 541-736-0164. E-mail: class@herbaltransitions.com. Web site: www.herbaltransitions.com.

More calendar listings at
www.HerbalGram.org

In this department of *HerbalGram*, we list resources such as publications, organizations, seminars, and networking for our readers. A listing in this section does not constitute any endorsement or approval by *HerbalGram*, ABC, or its Advisory Board.

Like the Moosni Turtle, the Comcáac Can Endure—a 20-minute documentary that explores the rise of diabetes within the indigenous Comcáac (or Seri) community of Northwestern Mexico and their treatment of diabetes through traditional foods. Discusses the causes of diabetes, its symptoms, prevention methods, thrifty gene theory, the health benefits of traditional native culture, and the use of native desert foods for maintaining diabetes control. Explains how the consumption of Western packaged foods led to high incidences of diabetes in the Comcáac community and how a return to traditional foods—e.g., red mangrove, prickly pear, agave, and saltwort—is helping to manage the situation. DVD costs $30 (including shipping and handling charges) and is available by contacting producers Jessie Emerson at osoherbalsjessie@yahoo.com or 550-424-8809 or Peter Blystone at echofilms@aol.com or 928-214-1090.

Global Invasive Species Database—new Web site interface launched in September 2006. Searchable database contains information about plants, animals, fungi, and microorganisms that negatively affect native biodiversity in places they are introduced. Web site was originally launched in 2000 and now has improved features and new content, including new articles on invasive species written by members of the Invasive Species Specialist Group. Database is also available in CD-ROM format, and a Japanese version of the database is being developed. Free access to the database is available at: http://www.issg.org/database/welcome/.

Important Conversations: Complementary Therapies . . . What You must Ask and Why is an award-winning CD-ROM meant to promote conversations about complementary and alternative medicine (CAM) between cancer patients and healthcare professionals. Contains sections on legal and ethical issues, as well as guidelines for initiating and maintaining a patient-doctor dialog about CAM use. Produced by the University of Texas MD Anderson Cancer Center and winner of the 2005 International Health and Medical Media (FREDDIE) Award. CD-ROM order form available online at http://www.mdanderson.org/pdf/order_form.pdf. This video and other videos in the series also available for free download at http:www.mdanderson.org/cimer.

Encyclopedia of Earth (EoE)—new Web site launched in September 2006. A comprehensive information source about the environment, emphasizing the interactions between Earth and society. Contains a collection of articles written for a lay audience by scholars, professionals, educators, and experts who collaborate and review each other's work. Policies and guidelines for the EoE are developed and governed by the Stewardship Committee of the Environmental Information Coalition (EIC, a partnership of diverse environmental scientists, educators, professionals, and the organizations for which they work) and by an International Advisory Board. Interested professionals are invited to join the EoE's community of experts. More information about contributing to EoE is available from Alejandra Roman at eoe@earthportal.net or 202-207-0015. The free searchable Web site is accessible at www.eoearth.org.

Functional Foods for Chronic Diseases, new book published in July 2006 by the Functional Foods Center at D&A Inc. in Richardson, TX. Features contributions from numerous scientists regarding new approaches to the prevention and treatment of chronic diseases through dietary supplements, botanicals, and other functional food products. Includes articles based on presentations from the 2005 conference "Functional Foods for the Prevention and treatment of Chronic Diseases," covered in *HerbalGram* 72. Available through Amazon.com for $59. For more information, contact Functional Foods Center at ffc_usa@sbcglobal.net or 866-464-6955.

Employment

Family owned medicinal herb company seeks highly skilled, compassionate Manager of our Herbal Department. We have been experiencing consistent growth and want someone who desires to share in our vision. The ideal candidate must be an active listener and able to take direction from our founders.

Blessed Herbs prides itself on integrity and authenticity so we are looking for expertise in:

- Anatomy & Physiology
- Clinical and/or personal Healing Experience
- Energetics
- Herb Identification & Quality
- Manufacture of Herbal Medicine
- Research Skills
- Scientific Understanding

If you are intuitively motivated, environmentally aware, and committed to a healthy lifestyle, we would like to speak with you.

Please email your resume with salary requirements to scott@blessedherbs.com

We are located in Oakham, MA.

Publications

American Herb Association Quarterly Newsletter: $20/yr. AHA, P.O. Box 1673, Nevada City, CA 95959.

Australian Journal of Medical Herbalism: quarterly publication of the National Herbalists Association of Australia (founded in 1920). Deals with all aspects of Medical Herbalism, including latest medicinal plant research findings. Regular features include Australian medicinal plants, conferences, conference reports, book reviews, rare books, case studies, and medicinal plant reviews. AUD/$95 plus AUD/$15 if required by airmail. National Herbalists Association of Australia, 33 Reserve Street, Annandale, NSW 2038, Australia.

HerbalGram: Quarterly journal published by the American Botanical Council. A benefit at all levels of membership in ABC. See page 2 for membership information or join online at www.herbalgram.org. P.O. Box 144345, Austin, TX 78714. 800-373-7105 or fax 512-926-2345. E-mail abc@herbalgram.org.

Medical Herbalism: Subtitled "A Clinical Newsletter for the Herbal Practitioner." Edited by Paul Bergner. $36/yr, $60/2 yrs. Canada $39/yr. Overseas $45/yr. Sample/$6. Medical Herbalism, P. O. Box 20512, Boulder, CO 80308.

Other

BUSINESS FOR SALE Beautiful retail herb store for sale in the heart of the Northern Rocky Mountains. In business 10+ years. Work for yourself and love what you do! Send inquiries to P.F. PO Box 7002 Missoula, MT 59807 or email herbbiz@montana.com.

Get Certified with ABC's Herbal Information Course. This self-paced online course is designed to help retail employees and multi-level distributors communicate knowledgably with customers about herbs and dietary supplements. After successfully completing the course, you'll receive an Herbal Information Specialist Certificate and a window decal announcing "Herbal Information Specialist On Staff." Renewable annually. $69.95 Bulk pricing available. www.herbtraining.com.

Interns, Get hands-on experience before you graduate! If you're a future pharmacist or dietitian, you can choose a rotation through ABC's internship program. You'll get a comprehensive introduction to phytomedicines, researching the medicinal, culinary and cosmetic uses of herbs, answering ABC members' questions, working with medicinal plants in ABC's 2.5 acres of herbal gardens, and preparing herbal salves, tinctures or meals. For more information, call Gayle at 512-926-4900 or email Gayle@herbalgram.org.

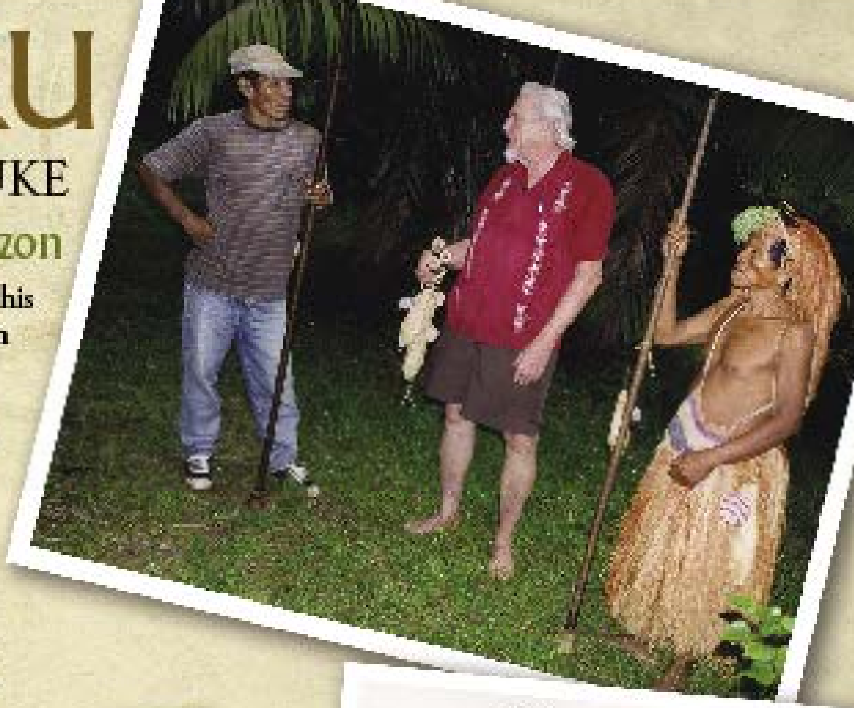
Stock Photography that doesn't look like Stock: Steven Foster Group, Inc. Photography, Consulting, Publications. Specializing in medicinal and aromatic plants, along with the places they grow, our stock photo files include more than 120,000 images shot around the world for over 30 years. Contact us at our NEW location in the heart of the Ozarks in Eureka Springs, Arkansas. Visit our website: www.stevenfoster.com or email: sfoster@stevenfoster.com

Not enough time to read all of the latest journal articles? ABC makes it easier for you to stay up-to-date. Twice monthly, ABC publishes 13 summaries and critical reviews of important articles drawn from mainstream media, scientific journals, newsletters, government documents and special reports. Receive hard copies of these reviews, accompanied by the original article (when permission is granted), through the HerbClip™ Educational Mailing Service. Available when you join as an HerbClip Service Member. Or access more than 2800 reviews through HerbClip™ Online, a searchable database updated twice monthly. Available when you join at designated Membership levels. To receive the full service, contact Wayne Silverman, PhD, at 512/926-4900 ext. 120, or via e-mail at wayne@herbalgram.org.

EXPLORE PERU

WITH DR. JAMES A. DUKE

Botanical Medicines from the Amazon

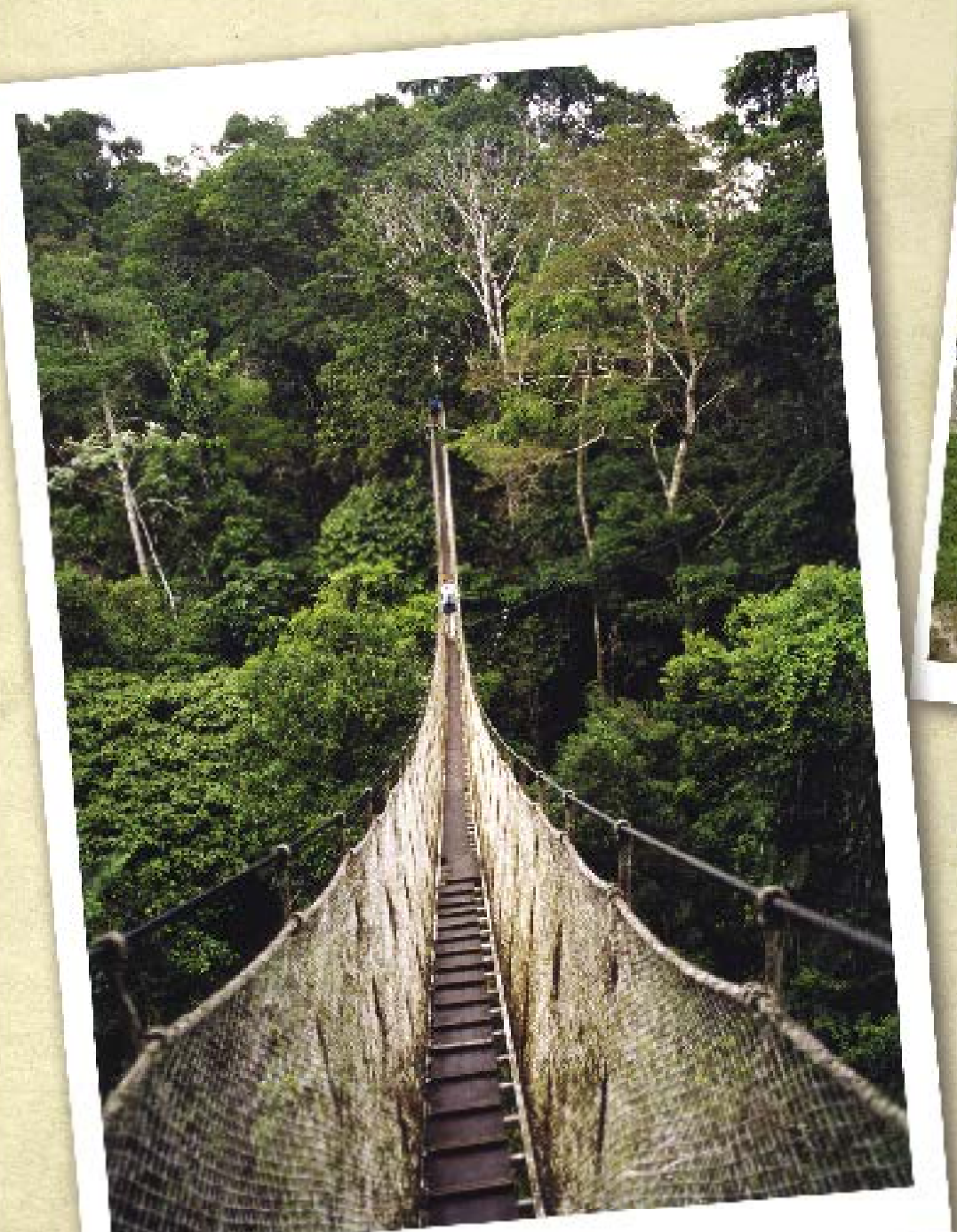


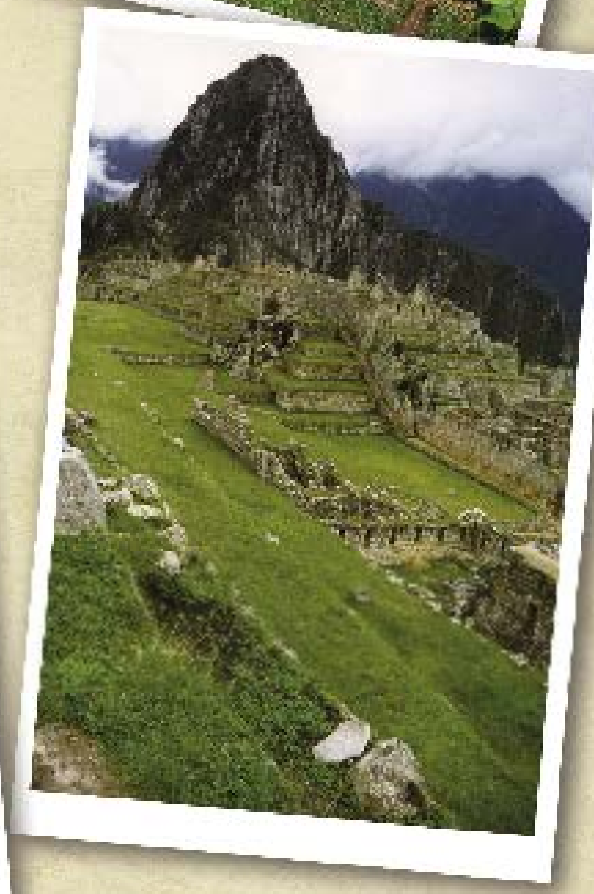
Jim keeps threatening that the next trip to Peru may be his last, so don't miss this chance to learn about **Amazonian** medicinal plants from the **herbal master!** CME and CEU credits available. Noted herbal expert and veteran **botanical photographer Steven Foster** will accompany Dr. Duke.

JULY 30TH - AUGUST 6TH, 2007

$3,394* all inclusive from Miami

*Costs include international airfare, domestic airfare in Peru, meals, lodging, ground transportation, baggage handling and workshops.





Optional extension to

MACHU PICCHU

AUGUST 5th – 9th, 2007

$930

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