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Hops

Humulus lupulus L.

Family: Cannabaceae

INTRODUCTION

Hops is a perennial vine growing vertically to 33 feet with dark green, heart-shaped leaves.^{1,2,3} The male and female flowers grow on separate vines.^{1,3} Hops are the dried yellowish-green, cone-like female flowers or fruits (technically referred to as strobiles).^{1,4} Originally native to Europe, Asia, and North America,⁵ several varieties of hops are now cultivated in Germany, the United States, the British Isles, the Czech Republic, South America, and Australia.^{4,6} Although still wild in Europe and North America, commercial hops come exclusively from cultivated plants.^{1,7} The leaves, shoots, female flowers (hops), and oil are the parts of the plant used commercially.⁸

HISTORY AND CULTURAL SIGNIFICANCE

The name *hops* is derived from the Anglo-Saxon word *hoppan* meaning to climb.^{5,9} The species name *lupulus* is Latin for small wolf, referring to the plant's habit of "wolfing" or climbing on other plants, as a wolf would climb on a sheep.^{2,9} The beer brewing industry accounts for 98% of the world use of hops.^{1,3} Originally used as a preservative, hops were later additionally used to add a bitter flavor to beer.¹⁰ The earliest record of hopped beer is in 822 CE.³ The cultivation of hops spread in Europe during the Middle Ages because beer was served with every meal.³

Hops have been used as a food and for flavoring food and as a perfume scent for over 2500 years.¹¹ Pliny the Elder (circa 23-79 CE) mentions Romans eating young hop shoots.⁹ The young spring shoots are still eaten in Belgium, France, and England in the same ways that asparagus is eaten.^{2,12} The flowers are a natural source of food flavoring.^{2,13} They have flavored cereal, beverages, mineral waters, spices, sauces, tobacco, and alcoholic beverages other than beer.^{10,11,14} Hops have been used in perfume, especially the spicy or oriental types,^{10,14} to give body to dry hair, and in skin creams and lotions.^{10,15}

Medicinally, hops are mainly used as a sedative.¹ With other herbal sedatives, hops can be beneficial for sleeplessness and nervousness.^{6,16} Efficacy has long been established, but the exact mechanism for sedation is still unknown.⁷ Hops also contain antispasmodic, diuretic, calming, sleep promoting, hypnotic, and antimicrobial properties.^{4,8,10,16,17}

The sedative constituents are believed to be in the aromatic oils, hence the rationale behind the traditional use of "sleep" pillows made of hops.¹⁴ The aromatic oils may also have estrogenic effects

as noted from observations of young women who reportedly often experienced early menstrual periods after harvesting the strobiles in hops fields.¹⁸

Traditionally hops were used for nervousness, insomnia, excitability, ulcers, indigestion, and restlessness associated with tension headache.¹³ Additional folk medicine uses include pain relief, improved appetite, and as a tonic.⁹ A tea made of hops was ingested for inflammation of the bladder.⁷ Native American tribes used hops for insomnia and pain.^{5,8} Hops are employed in Ayurvedic (Indian) medicine for restlessness and in traditional Chinese medicine for insomnia, stomach upset and cramping, and lack of appetite.⁵ Clinical studies in China report promise for the treatment of tuberculosis, leprosy, acute bacterial dysentery, silicosis (respiratory condition caused by the inhalation of silica dust), and asbestosis (respiratory condition caused by the prolonged inhalation of asbestos particles).^{5,10} Externally, it has been applied to treat dandruff, ringworm, sores, ulcers, skin injuries, acne, and to alleviate pain and itching.^{6,7} In aromatherapy, hops have been used for skin care, breathing conditions, nervousness, nerve pain, and stress-related conditions.¹⁴

Hops are approved in various monographs and pharmacopeias as a treatment for excitability, lack of appetite, mood disturbances (restlessness, anxiety), sleep disturbances, sleeplessness, and tenseness.^{2,16,17,19}

MODERN RESEARCH

One laboratory study has demonstrated antimicrobial activity in hops and has suggested that hops constituents may be useful in mouthwash.²⁰ Several clinical trials have supported the efficacy of a combination of hops with valerian root (*Valeriana officinalis* L., Valerianaceae) for

improving sleep.^{21,22,23,24,25} No published clinical studies to date have examined the effectiveness of hops alone for any traditional use.

FUTURE OUTLOOK

There is a fixed worldwide demand for hops, dependent on beer consumption, with variable supply, which results in shortages and surpluses in any given year.²⁶ World production of hops is cyclical and typically peaks every 7-10 years followed by several years of surpluses and depressed market prices. A relatively consistent supply of hops is assured by the fact that they are grown in numerous places for specific markets.²⁶ HG

—Gayle Engels and Joyce Juan



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HOPS

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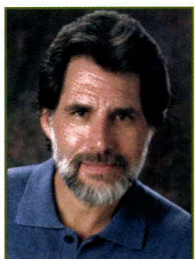
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dear reader

New AER Bill for Supplements and OTC DRUGS

The maturation of the modern herb and dietary supplement (DS) movement is evidenced by the introduction in June of a bill in the United States Senate, the Dietary Supplement and Nonprescription Drug Consumer Protection Act (S. 3546). The new bill, if passed into law, would require manufacturers of DS and nonprescription (over-the-counter, OTC) drugs to include contact information on their products' labels for consumers to use in reporting serious adverse events (AEs). Also, companies would be required to report all *serious* adverse event reports (AERs) to the Food and Drug Administration (FDA) within 15 days.



The bill's terms also provide that any AERs submitted to the FDA would not be construed as an admission of liability that a company's product caused or contributed to the reported event. The bill also provides for protection of the identity of individuals reporting adverse events.

Support of the bill comes from both sides of the aisle and both sides of the dietary supplement debate: Senators Orrin Hatch (R-UT), Tom Harkin (D-IA), Dick Durbin (D-IL), Ted Kennedy (D-MA), and Mike Enzi (R-WY), Chairman of the Senate HELP committee.

It appears that most of the DS industry has lined up in support of the bill, as has the Consumer Healthcare Products Association, the organization representing the OTC industry, as well as the Center for Science in the Public Interest, a large consumer group that has historically taken adversarial positions against the DS industry.

One key industry figure, Loren Israelsen, founder and executive director of the Utah-based United Natural Products Alliance and one of the primary architects of the Dietary Supplement Health and Education Act of 1994, summed up his group's position: "We believe dietary supplements are exceptionally safe products and that this legislation will in future years confirm this fact. We also recognize that should a safety problem arise, we as an industry have a responsibility to quickly identify and resolve such situations and to do so in cooperation with FDA in those cases where the adverse event is serious." He also noted that, "It will also be incumbent on FDA to administer this legislation in such a way that all parties have full confidence that the intent and spirit of this bill is fully respected, which is to work with industry to resolve serious adverse events reports, rare as they may be, quickly and judiciously."

Past concerns voiced by critics of the DS industry were that the industry was being either irresponsible by not reporting serious AERs or it was perceived that the industry was not adequately regulated by virtue of its not having to report AERs. The makers of OTC drugs have not had such a requirement, so it was a good move politically, and a reasonable proposal, to include serious AERs for OTC drugs in this bill. It helps to level the playing field for all consumer-selected health products (prescription drugs have had this responsibility for many years).

The genesis of this new bill goes back several years to the public debate on the safety of the controversial herb ephedra (*Ephedra sinica*), when media and legislators were highly vocal about their criticisms that the DS industry was not required to report AERs related to the controversial herb. This issue was particularly exacerbated after revelations that a major ephedra supplement manufacturer, Metabolife International, had withheld from the FDA the thousands of reports from consumers (the company called them mere "incident reports," but they were perceived as potentially adverse by regulator critics and the media); eventually a much smaller number of reports were deemed "serious."

If this bill becomes law, the major challenge will be setting up a reporting system for serious AERs—one properly designed to ensure adequate and accurate collection of information with the ability to determine potential associations between the events and the dietary supplement ingredients or the OTC drugs.

As Prof. Rick Kingston and I wrote in our *HerbalGram* 60 article on the deficiencies of the American Association of Poison Control Centers Toxic Event Surveillance System, "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." [For more information, see the July issue of *HerbalEGram* at www.herbalgram.org.] HG

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¹ *Journal of Clinical Pharmacy and Therapeutics*, 29:75-83, 2004

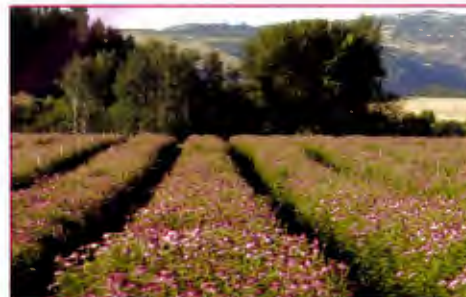
² *International Immunopharmacology* 2002; 2 :381-387

³ *Journal of Nutritional Biochemistry* 2002; 13 : 487-492

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The small town of Litang, capital of the Litang County. The authors conducted extensive fieldwork in this region (Sichuan, China), 4000 meters altitude, June 1999.

Photo ©2006 Alessandro Boesi

The Quality of Kava Consumed in the South Pacific

by Vincent Lebot

34 The medicinal and ritual plant kava remains an important crop within various South Pacific countries, both for its economic value and its local use. Despite bans on the sale of kava in some European nations starting in 2001, kava is still exported to other countries and is widely sold within the region to satisfy the local kava-drinking market. This article examines the many factors that can affect the quality and safety of kava preparations, including differences in kava chemotype and kavalactone content, the selection of plant parts used, and the methods of preparing kava. It further explores trends and practices of kava preparations and consumption in South Pacific communities.

Tibetan Herbal Medicine: Traditional Classification and Utilization of Natural Products in Tibetan *Materia Medica*

by Alessandro Boesi, PhD, and Francesca Cardì, PhD

38 Tibetan traditional medicine is a complex and heterogeneous system of healing, based upon the blending of several traditions from prominent Asian medical sciences. The authors of this article conducted fieldwork over a period of 16 months, analyzing how medicinal substances are identified and used by Tibetan medical practitioners. They found that these practitioners typically distinguish medicinal plants through such factors as plants' minute morphological features, plants' taste and scent, and environmental indicators. The authors further explain the inter-related influences of Tibetan medical texts, doctors' individual knowledge and traditions, and common categories of Tibetan materia medica in the classification and use of medicinal plants.

Improving the Quality of Reporting Randomized Controlled Trials Evaluating Herbal Interventions: Implementing the CONSORT Statement

by Joel J. Gagnier, ND, MSc, PhD (Candidate); Heather Boon, PhD; Paula Rochon, MD, MPH; David Moher, PhD; Joanne Barnes, PhD, MRPharmS, FLS; and Claire Bombardier, MD

50 The CONSORT Statement, first published 10 years ago and endorsed by many leading medical journals, helps guide authors and researchers in their reporting of randomized controlled trials (RCTs). The authors of this article provide recommendations for elaborating certain items of the CONSORT Statement to assist researchers in giving more complete reports of RCTs featuring herbal medicine interventions. These recommendations, achieved through a collaboration of experts, are intended to further improve the quality and coherence of reported RCTs on herbal preparations and their results.

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Government Increases Restrictions on Wild American Ginseng Export by Mark Blumenthal, published in *HerbalGram* 70; correction appears on page 26.

Jimson Weed: History, Perceptions, Traditional Uses, and Potential Therapeutic Benefits of the Genus *Datura* by Kofi Busia and Fiona Heckels, published in *HerbalGram* 69; correction appears on page 77.



On the Cover

A Tibetan traditional doctor evaluates the taste of 'dzin pa zla bral (pronounced: zin pa da drel), *Aconitum gymnandrum*, in the mountains surrounding the town of Litang, Litang County (Sichuan, China), 4090 meters altitude, July 2000. Photo 2006 © Alessandro Boesi.



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Neil Blomquist Joins ABC Board of Trustees

The American Botanical Council (ABC) is pleased to announce the addition of Neil Blomquist to its Board of Trustees. Mr. Blomquist brings over 30 years experience in the natural products industry as a business owner and manager. He is intimately familiar with the challenges that manufacturers face in ensuring a supply of quality ingredients as well as understanding the workings of the organic products industry.

For the past twelve years, Mr. Blomquist has been an executive of Spectrum Organic Products, Inc. in Petaluma, California, the nation's largest marketer of organically-produced vegetable oils for cooking, salad dressings, dietary supplements, and related food uses. With the recent acquisition of Spectrum by the Hain-Celestial Group in 2005, Mr. Blomquist will be leaving Spectrum to pursue other business and personal interests. He will be working with the new management team as a strategic consultant through 2006 to help with the transition of the brand.



Blomquist

"I am honored to have been asked to join the ABC Board," said Blomquist. "I firmly believe that the work of ABC has played an important role in helping grow the role of herbs in our society and also to help maintain the values that have been the driving force behind this movement. I look forward to helping ABC in moving its agenda into the future."

Originally from Montana and South Dakota roots, Neil Blomquist has been involved in the natural foods industry since its early days in the 1970s. After earning a bachelor's degree in management and economics from the University of South Dakota, School of Business, Neil and his wife Monica, opened a natural foods market in Montana where they both learned the invaluable retailer's perspective firsthand. In 1985 they moved to Sonoma, California. Neil began working for the natural foods distributor Landstrom-Phoenix, where he learned the wholesaler's perspective. Remaining true to his natural foods and whole health roots, Neil sought a career path that would keep him working in a values-driven business environment. He joined Spectrum in 1989 as director of sales and marketing and continued his career in learning the natural products production chain from retail to wholesale to manufacturing and sourcing.

Drawing upon his prior experience to develop new logos, product lines and marketing strategies, Neil's management experience and commitment to natural foods helped catapult Spectrum to a higher level of sales and wider distribution. At Spectrum, Neil exhibited his passion for and commitment to sourcing premium-quality oils and ingredients, including the development of Spectrum's premium quality flaxseed oil line, organic seed oils, organic apple cider vinegar, and organic dressings and mayonnaise.

In 1994, Neil became Spectrum's President and Chief Operating Officer. The acquisition of Organic Food Products in 1998 led Spectrum to its status as a public company. In 2002, Neil became Chief Executive Officer and President of Spectrum.

"We at ABC are honored and grateful for Neil's decision to join us in guiding ABC over the coming years," said ABC Founder and Executive Director Mark Blumenthal. "Neil brings with him a wealth of experience in business management on the food side of the natural products and organic industries, which will benefit ABC in many important ways."

"Neil's experience running a publicly-traded company is a welcome addition to our Board," said Wayne Silverman, PhD, Chief Administrative Officer of ABC. "His background will help improve ABC's future from the management and finance perspectives."

Blomquist's tenure on the ABC Board began at the March board meeting. He participated at the board's recent meeting in Anaheim, California, during the Nutracon education conference and the Natural Products Expo West conference and trade show. HG



Nate Sponseller (ABC Gardener), Gayle Engels, and Mark Blumenthal.
Photo ©2006 ABC.

ABC Dedicates Trees to Alfred Blumenthal

The American Botanical Council (ABC) expanded its tree garden in June when ABC Board of Trustees and staff dedicated 2 trees in memory of Founder and Executive Director Mark Blumenthal's father, Alfred A. Blumenthal, a watercolorist, who died in May at age 94. The trees chosen to honor Mr. Blumenthal's full, creative life are a bur oak (*Quercus macrocarpa*) and a southern magnolia (*Magnolia grandiflora*). The bur oak is a slow-growing native Texas oak that could ultimately reach 100 feet in height and spread. The southern magnolia, which has fragrant white flowers that bloom in May, will serve as a reminder of Mr. Blumenthal's life through the Jewish tradition of *Yahrzeit*, in which the deceased person's life is celebrated each year at the anniversary of his passing. HG

—Gayle Engels

ABC Employee Profile: Aileen Truax

Aileen Truax, the Development and Marketing Coordinator of ABC, is a shining example of the great value in our society of the tireless nonprofit manager. The nonprofit world is different from the commercial, for-profit sector of society in numerous ways. One of the main aspects that characterizes this difference is the fact that nonprofit organizations are essentially committed to enhancing the greater good in some measurable manner, without any real direct or financial benefit accruing to those who work for the nonprofit other than a modicum of remuneration. There are no stock options, big bonuses, or huge salaries involved in the nonprofit world. The primary benefit is that nice warm feeling one gets when he or she recognizes the personal and professional contribution that improves people's lives, the social order, the environment, etc.

What distinguishes Aileen Truax is her total commitment to the nonprofit culture. Aileen is no stranger to the nonprofit world. It's been part of her life's passion since high school in Houston, where she braved leading a fund raising campaign at her school for an Ethiopian relief effort, to the chagrin of the school administration. Aileen continued to volunteer with various nonprofit groups throughout college. After working in the for-profit sector for several years, she made a decision to seek a career with nonprofit organizations, using the experience she had gained as a volunteer. She later worked as the development director at the *High Country News*, a biweekly environmental newspaper in Colorado covering the environmental issues in the intermountain West, before becoming development director for over two years of the Lone Star Chapter of the Sierra Club in Austin, Texas—a legislation-oriented chapter focused on Texas-specific issues.

Since arriving at ABC late in 2004, she has dedicated herself to increasing benefits to ABC members, especially to ABC's "core" members, the individuals like the consumers, academics, health professionals, and others who comprise the vast majority of ABC's membership.

At ABC, Aileen shares responsibility for all aspects of donor and member cultivation, acquisition, retention, management, and communication. She not only supervises staff members who comprise the membership services team, but she also has taken charge of a major overhaul of ABC's Internet site to enhance the user-friendliness of the access to ABC's online presence. Her additional duties include helping to create development goals and implement strategies for achieving them; coordinating development, communication, and distribution of annual member bene-

fits; overseeing member/donor communication including prospecting, soliciting, invoicing, recognition, acknowledgement, and renewal; developing and executing media/marketing activities for membership programs and initiatives; researching and writing grant proposals to fund ABC's educational projects; developing public relations activities; overseeing ABC's vast web-based educational content licensing program, including online content sales, set-up, and maintenance; budgeting of marketing and membership departments; and creating the donor management process.

ABC is obviously a much richer and well-functioning organization due to Aileen's tireless efforts, and ABC's members are also richer as she propels ABC's nonprofit mission to enhance everyone's health, naturally. HG

—Mark Blumenthal



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Sponsors and Participants Build Momentum for HerbDay

HerbDay 2006 is just a few months away and numerous sponsors and participants are already planning an exciting array of events to celebrate herbs and herbalism at sites all across America. Reports of events and offers to become involved are increasing as people and companies are beginning to register at the event's Web site: www.herbdlay.org. There are three HerbDay Corporate Sponsors: General Nutrition Centers (GNC), a global retailer of nutritional supplements; Nature's Resource Herbal Supplements, sold in food and drug stores nationwide; and Vitamin World, a seller of nutritional and herbal supplements direct from the manufacturer. All will promote activities in key cities across the country. Several retailers, large and small, will participate as HerbDay hosts, either on HerbDay itself (October 14) or on the days just before and after. The extensive GNC chain is planning a variety of store-based activities all month and special offers to honor the day. Vitamin World will promote and publicize the day at its 480 stores and through its publications, and another retail chain, Vitamin Shoppe, will hold events in all of its 280 stores to highlight the value of herbs. Herbs Etc., a manufacturer, will host HerbDay activities in its Santa Fe, NM, store and community. Great Earth Vitamins, another retail chain, based in Ontario, CA, and Nature's Sunshine, a large manufacturer of herb products based in Provo, UT, will also host HerbDay activities.

Beyond the retailer arena, the San Diego Herb Club and that city's chapter of the American Herbalists Guild (AHG) are joining together to plan an informational fair in Balboa Park, including tours of the newly expanded "Trees for Health" medicinal tree grove and garden. In Ben Lomond, CA, the East-West School of Herbology will also participate. Further east, Herbalists Without Borders (based in State College, PA) will host an "Herb-alSlam"—a poetry contest on the theme of "all things herbal." Renowned herbal experts Aviva Romm, James Duke, PhD,

Robin DiPasquale, and Bevin Clare are scheduled to offer free classes to the public on herbal topics at the United States Botanic Garden in Washington, DC, from October 13-14. Twenty students from the Tai Sophia Institute in Columbia, MD, are planning to set up discovery stations on their campus, with 6 students delivering lectures on various herb-related topics. The National Nutritional Foods Association (NNFA), the Herb Society of America, Bastyr University, Tai Sophia Institute, and the International Herb Association will also participate in

HerbDay. NNFA has created an HerbDay committee to help inform retailers of the event, and the organization provided an HerbDay booth at its 70th anniversary annual trade show in Las Vegas in July.

The herb trade media, meanwhile, have expressed support for HerbDay through their plans to promote the event to readers. Ads and editorials will be run well in advance of the event and up to October by the following Media Sponsors: *Health Supplement Retailer*, *Remedies*, *Vitamin Retailer*, *Health Smart Today*, *Whole Foods Magazine*, and *Natural Foods Merchandiser*. In addition, *Taste for Life* will publish a special edition in October that includes a 24-page pullout section with articles by respected herbalists. This special edition will offer leading manufacturers an excellent opportunity to support consumer education through advertisements.

Five national nonprofit organizations—American Botanical Council (ABC); American Herbalists Guild (AHG); American Herbal Pharmacopoeia (AHP); American Herbal Products Association (AHPA); and United Plant Savers (UpS)—have been working together as the HerbDay Coalition to launch this event. The entire herbal community is invited to participate actively in HerbDay 2006, either by hosting an event or providing sponsorship in the form of financial support. More information about HerbDay activities and resources, including a menu of ideas for individual events and registration forms for prospective participants, is available at the Web site: www.herbdlay.org. HG

—Gayle Engels
and Courtney Cavaliere



www.herbdlay.org

HerbDay 2006 at the US Botanic Garden
Friday, October 13, 2006 thru Saturday, October 14, 2006

Amazon Food Farmacy – Jim Duke

Herbs for Women's Health: A Primer on Taking Care of Yourself Through Life's Changing Seasons – Aviva Romm

What You Need to Know about the Top 10 Herbs Sold in the US – Robin DiPasquale

Walking Tour Exploring the Medicinal Uses of Plants in the Medicinal Garden, and Their Related Species – Bevin Clare

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John Weeks Writes Integrator Blog News and Reports

The herbal medicine movement is part of a much larger social trend in self-care and healthcare that includes many other natural and traditional medicine modalities. The inclusion of these complementary and alternative medicine (CAM) modalities into standard practice or conventional medicine has become known as Integrative Medicine, a term originally coined by noted author and spokesperson Andrew Weil, MD.

One of the key people involved in moving the integration process forward has been John Weeks, an advocate and catalyst for increased communication and collaboration among various individuals and organizations involved in CAM. His former publication, *Integrator for the Business of Alternative Medicine*, was viewed by many as the journal of record for the emerging field of integration. After several years of sabbatical with his family in Costa Rica, Weeks is back in the United States and has re-entered the CAM dialog, this time with a web log (blog).

"The Integrator Blog News and Reports" is a new online newsletter (www.theintegratorblog.com) and discussion forum which focuses on building the community of interests among all who are involved in the fields of integrative medicine, CAM,

and natural products. Among the contents of the premier issue, for example, are articles and comments on the following: efforts to reform the chiropractic profession, the Bravewell Collaborative-backed PBS show *The New Medicine*, two new professional training programs, an interview with the chair of the Consortium of Academic Health Centers for Integrative Medicine, an initiative to explore CAM in reducing health disparities, and the multi-disciplinary traditional and alternative medicine practitioners' project to develop a proposed new strategy for regulating herbs as "traditional medicines" in the United States (i.e., the Traditional Medicines Congress).

Weeks is no stranger to the herb community. While serving as a vice president at Bastyr University in the late 1980s, Weeks

was involved with the early maturation of the American Herbal Products Association, serving on its board for a period. From the 1990s until 2002, he was a writer, organizer, consultant, and speaker on the business of integration, engaged in diverse projects that informed his reporting and commentary.

Weeks writes in his blog: "In default mode, most of us focus on the particular challenges of our own disciplines or stakeholder groups. We return to the known. Integration, by nature, asks us to open our peripheral visions. We are served to look at the whole of the field. We need to develop new fascia, new connectivity. Opportunities crop up in new places. These News and Reports are meant to be a kind of one-stop shopping to help you in your efforts to enhance integrated care in the environment you serve."

The Integrator Blog also includes forums and a poll. Weeks said he plans to "work with our networks to bring as many of the leaders in the field to the site as possible to stimulate the cross-pollination of ideas and action."

Weeks acknowledges that the most read section of the site to date is his brief report on his 3-year (2002-2005) working sabbatical with his family in Central America. He started The Integrator Blog upon his return. (It wasn't all sabbatical. From home offices in Monteverde, Costa Rica, then Granada, Nicaragua, he directed the National Education Dialogue to Advance Integrated Health Care: Creating Common Ground, an initiative which involves educators from 12 disciplines.) Other useful resources on the site are back-issues of Weeks' electronic News Files, 2 reports on Integrative Medicine Industry Leadership Summits, a progress report from the National Education Dialogue, and papers he was asked to write on coverage issues by the White House Commission on CAM Policy and the National Institutes of Health. The News and Reports are offered for free, although Weeks asks readers to consider a voluntary subscription. HG

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NAPRALERT Herbal Database Available on Internet

Researchers, clinicians, journalists, and others wishing to access extensive scientific and clinical literature about herbal medicine and related subjects now have access to one of the best research tools available. The University of Illinois at Chicago (UIC) has announced the availability of its highly respected NAPRALERT database on the Internet effective April 26, 2006. The site is available at www.napralert.org.

NAPRALERT, the world's largest database on herbs and medicinal plant research, contains information from over 200,000 published studies in the field of natural products, covering numerous related scientific disciplines. These papers represent research on plants and animals from all countries of the world, including marine organisms, plus the geographic origin from where they were obtained.

The name NAPRALERT is an acronym for "Natural Products Alert." The original intention of the database was to compile a collection of the world's scientific literature on natural products used for health purposes and the development of new medications. Most, but not all, of the natural products included in the database are herbs and botanically-derived ingredients and phytochemicals.

According to Professor Norman R. Farnsworth, PhD, Research Professor of Pharmacognosy and Senior University Scholar at UIC, "NAPRALERT is a relational database of all natural products, including a wide range of research on ethnomedical information, and pharmacological and biochemical information of extracts of animal and plant organisms. The research includes in vitro (experimental laboratory) studies, in vivo (animal studies), human case reports and non-clinical trials related to human use, and controlled and uncontrolled human clinical trials. Similar information is available for secondary metabolites [naturally occurring chemicals in plants and animals] from natural sources."

In 1975 Professor Farnsworth and his colleagues at UIC began a systematic search of the scientific and clinical literature by examining every journal pertinent to natural products in the UIC Health Science Library. Years later they began viewing the table of contents of a large number of journals from the Internet on a regular (monthly) basis. These journals were selected from a list of journals that historically the UIC researchers knew contained pertinent data for the NAPRALERT system. In addition, relevant sections of *Chemical Abstracts*, particularly the Biochemistry Section, were examined for articles not found in the UIC Library sources and original articles were obtained via interlibrary loans.

Professor Farnsworth added, "We are fortunate also to have many foreign journals in which articles are rarely found through the usually accessible natural product scientific literature sources."

According to Farnsworth, NAPRALERT's coverage of the literature is comprehensive from at least 1975 through and including 2003. Due to budget restrictions, the researchers were able to include only about 15% of the relevant botanical and natural product literature from 2004 and 2005. Articles are currently being collected, and it is hoped that they eventually will be included in the revised database.

"This is a real bonus to the herb research community," said Mark Blumenthal, Founder and Executive Director of the American Botanical Council. "For many years, we have relied on the NAPRALERT database for many of our research needs. It has been a unique and most valuable educational and research

resource, often pointing us to papers that were not available anywhere else. Now that NAPRALERT is available on the Internet, the world of medicinal plant research just became bigger and easier."

During the past 30 years, NAPRALERT's primary clients have been universities, the Food and Drug Administration, the World Health Organization, foreign governments, and other research and educational institutions. The new Internet accessibility will allow individuals enhanced access to the data in the unique database.

About 25% of the NAPRALERT database is derived from abstracts (short summaries of research) and 75% from original articles. In the past, the UIC researchers have had the occasion to acquire complete literature on about 250 genera of plants and these data appear in NAPRALERT. The earliest papers date as far back as the late 1800s.

NAPRALERT's coverage of the scientific literature is extremely comprehensive, especially in the following areas of research:

- Clinical studies of natural products (including safety)
- Natural products that affect sugar metabolism
- Natural products that affect mammalian reproduction
- Extracts and compounds that affect cancer growth
- Natural products and antiviral (including HIV/AIDS) activity
- Natural products and antitubercular activity
- Natural products and tropical diseases
- Ethnomedical information on more than 20,000 species of plants
- Metabolism and pharmacokinetics
- Natural products that affect plant growth
- Biosynthesis of natural products
- Review articles on organisms at the genus and/or species levels and reviews of secondary metabolites (citations only)
- Chemoprevention (cancer prevention) with natural products
- Natural insecticides
- Anti-inflammatory activity of natural products
- Analgesic activity of natural products

The UIC notes that when a visitor to the NAPRALERT site is seeking information on biological activity categories, there are many closely related biological targets that might relate to a single endpoint. If visitors cannot retrieve biological data on an activity that they desire, they are urged to contact the NAPRALERT team by e-mail (ushab@uic.edu), and someone will attempt to provide assistance.

Free sample searches are available on the NAPRALERT site on the Internet to show the types of information available. HG

Libster Honored with Lavinia L. Dock Award for Herbal Nursing Book

The American Association for the History of Nursing (AAHN) has named Martha Libster, PhD, RN, a recipient of the organization's 2005 Lavinia L. Dock Award for her book, *Herbal Diplomats: the Contribution of Early American Nurses (1830-1860) to 19th Century Health Care Reform and the Botanical Medical Movement*.¹ The award was presented at AAHN's annual conference in Atlanta, GA, September 23-25, 2005.² Dr. Libster is an associate professor of nursing and history at Purdue University, an experienced herbalist, and a newly-appointed member of the American Botanical Council Advisory Board.

Herbal Diplomats explores the healing procedures and histories of 3 groups of female nurses who practiced herbalism in America during the mid-19th century: the Shaker infirmiry nurses, the Latter-day Saints (Mormon) pioneer nurses and midwives, and the Sisters of Charity hospital nurses.¹ The book initially served as Dr. Libster's doctoral thesis, which she completed at Oxford Brookes University in Oxford, England, graduating in July 2004 (M. Libster, oral communication, January 2006).



Libster

Dr. Libster decided to pursue such research after she discovered that pre-existing scholarly works regarding the botanical medical movement gave little or no mention of women's role within herbalism of that period. "I found a gaping hole in our history of herbal medicine," she explained. "Being a woman historian and an herbalist, I really wanted to fill that gap."

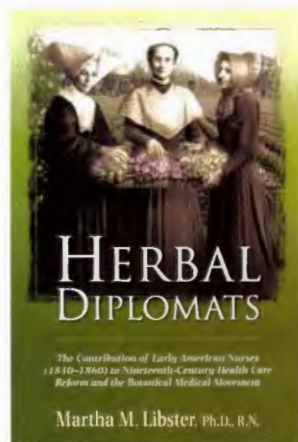
She had some prior knowledge of the histories of the 3 groups she chose to study and had a hunch that further data could be uncovered. She ultimately pieced together community records, nurses' instruction manuals, recipe books, letters, and archival records to present cohesive case-studies of the 3 groups of nurses.³ "I was told by some scholars that it would be a needle in a haystack, and that I wouldn't find anything," Dr. Libster said. "I actually found so much data that I never reached a point of saturation. I could be working for 3 lifetimes on what I found. It was like finding buried treasure!"

AAHN is the United States' national organization for nurse historians. From 2001 to 2005, the organization has presented 2 Dock Awards annually to researchers whose manuscripts demonstrated exceptional, original research within the historical nursing field—one awarded for a book and the other for an article or relatively short manuscript.⁴ Beginning in 2006, the Dock Award will only be given to the author of a book. All future article-length

manuscripts will be honored through the newly created Mary Adelaide Nutting Award.

Dr. Libster is currently working on 2 books that will further address women's early contributions to healthcare, including their work with botanicals. One manuscript will expand upon the profile of the 19th century Sisters of Charity (now referred to as the Daughters of Charity) contained within *Herbal Diplomats*. This new book will highlight the group's work within holistic psychiatric nursing and moral therapy. She is also compiling an oral history of a Mohawk medicine woman. HG

—Courtney Cavaliere



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Rutgers University Receives Grant for Germplasm Developments in Africa

The New Use Agriculture and Natural Plant Products Program at Rutgers University has received a major grant to foster agricultural development in southern Africa. The Program was allotted \$880,000 over a 2-year period by the Association Liaison Office for University Cooperation in Development (ALO) to study genetic materials of native nontraditional south African crops—including teas, herbs, medicinal plants, and vegetables—as well as the development of a germplasm (seed) database and pilot germplasm banks. Additionally, the program will promote advances for farmers and seed companies through training and advocacy efforts and identify specialty vegetables and herbs for introduction into other countries.¹

The principle leaders of this project are James E. Simon, PhD, and Hisham Moharram, PhD, of Rutgers. Co-principle investigators include H. Rodolfo



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Juliani, PhD, and Mingfu Wang, PhD, of Rutgers, along with Petrus Langenhoven, PhD, of the University of Stellenbosch in South Africa, and Prof. Davies Lungu of the University of Zambia.

This is the second major grant that the Rutgers program received within a year for herbal medicine development work in Africa. Only a few months before the ALO grant was announced in January 2005, Rutgers was awarded a major grant of \$2.5 million from the United States Agency for International Development (USAID), a partner of ALO.² The USAID grant was made to develop value-added food products and establish safety and quality standards for food products in African and international markets. HG

—Courtney Cavaliere

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Two Island Conservationists Receive Seacology Awards

by Courtney Cavaliere

Two dedicated environmental advocates were recently honored by the nonprofit organization Seacology for their work preserving island ecosystems.¹ Patrick Danaya Pate of Papua New Guinea was awarded the organization's 2005 Seacology Prize and Felix Sugirtharaj, PhD, of India received a special Seacology Lifetime Achievement Award at a ceremony held October 25, 2005, in San Francisco, California.

Pate is vice president of the Kosua Orogo Resource Holders Association (KORA), an environmental organization of Papua New Guinea's Mt. Bosavi region. He was honored with the Seacology Prize for his work in organizing indigenous communities against industrial logging. The forests

"Mr. Danaya Pate has courageously fought logging of the primeval rain forests of Papua New Guinea by journeying alone from village to village to inform the people of the devastation that logging will bring," said Paul Cox, PhD, chairman of the Seacology Board (e-mail, February 7, 2006). "His efforts originate from his heart, with no hope of recognition or outside approval." Pate also serves as community facilitator of the Sulamesi Resource Development Foundation—an organization that promotes sustainable development and livelihood improvement in the Mt. Bosavi region.¹

Dr. Sugirtharaj, director of the Coastal Poor Development Action Network, received the Lifetime Achievement Award for his efforts in protecting mangrove forests of the Andaman Islands. Mangroves are woody trees or shrubs that grow in tropical coastal habitats, which often protect coastlines from erosion and support marine life. He recently coordinated the establishment of a Seacology-funded mangrove resource center in the village of Kadakachang, near the Andaman capital of Port Blair.² Construction of the center was completed in late 2005. "Born as an untouchable, [Dr. Sugirtharaj] has achieved against great



Paul Alan Cox and Dr. Felix Sugirtharaj, who was awarded a special Lifetime Achievement Award. Photo ©2006 Seacology.

odds an extremely high level of education, and he has used his education to benefit his own people by teaching them to protect their environment," said Dr. Cox.

Dr. Sugirtharaj was also recognized for his charitable actions following the December 2004 tsunami.¹ He helped assess local damage to nearby communities, distributed resources to suffering families, and supervised the rebuilding of local homes. "His efforts to help the victims of the recent tsunami were heroic," said Dr. Cox.

Both award recipients were given monetary prizes of \$7,500. The Seacology Prize has been awarded annually since 1992 to an indigenous islander committed to protecting his or her culture and environment. Dr. Sugirtharaj's Lifetime Achievement Award, which is not an annual Seacology award, was sponsored by Nu Skin Enterprises of Provo, Utah (P. Cox, e-mail, February 7, 2006). HG

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2005 Seacology Prize ceremony. At left is Seacology President Ken Murdock, center is 2005 Seacology Prize recipient Patrick Pate, and at right is Seacology Founder and Chairman Dr. Paul Alan Cox. Photo ©2006 Seacology.

of Papua New Guinea have been increasingly threatened in recent years by logging proposals, and KORA's advocacy efforts have led many community members to reject proposals from the logging industry. Indigenous communities recently set aside a total of 1.25 million acres of pristine forest as 5 Wildlife Management Areas (WMAs), for which Seacology funded the construction of 3 local resource centers in 2003. Pate has coordinated that building project and helped ensure continued protection of the WMAs. Seacology regularly initiates and sponsors projects that preserve the environments and cultures of islands throughout the globe.



Patrick Pate (in headress) speaks with Seacology Executive Director Duane Silverstein (right) and Musala Villagers during the 2004 Seacology expedition to Papua New Guinea. Photo ©2004 Jon Stansbury

NCCAM Funds New African and Chinese Herbal Research Programs

The National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health (NIH) has announced the funding of 3 new Centers of Excellence and 2 International Centers for the study of traditional herbal medicines and other forms of complementary and alternative medicine (CAM).

Both traditional African and Chinese herbal medicines, particularly traditional herbal combinations, will be included in the research being funded in the new centers. Other modalities include acupuncture and a type of energy medicine (millimeter wave therapy).

According to an NCCAM press release dated October 14, 2005, with these new awards "NCCAM continues to enhance CAM research capacity by funding centers at leading US institutions and by establishing new global partnerships."¹

Stephen E. Straus, MD, NCCAM director, stated, "We are excited by the addition of these centers to our research program and the unique collaborations and approaches they bring to studies of CAM practices. All 5 centers will strengthen our research portfolio for major health problems—HIV/AIDS, arthritis, asthma, and pain. Plus, the new international centers will conduct basic and clinical studies of promising CAM interventions drawn from traditional medicine indigenous to the locations of international partners."¹

According to Chris Thomsen, NCCAM's director of communications, the funding of these new centers also reflects the recent implementation of NCCAM's 2005-2009 Strategic Plan, "Expanding Horizons of Health Care" (e-mail, October 16, 2005). The largest set of goals and objectives in the new plan (available online at www.nccam.nih.gov/about/plans/2005/) regards the organization's investment in research.² "These centers and their activities will directly address our goals for international health research," Thomsen wrote. International Health Research is one of 8 areas of research explained in the strategic plan. Other key areas of the strategic plan include training CAM investigators, expanding outreach, and advancing the organization.

US Centers of Excellence for Research on CAM

The 3 new Centers of Excellence provide 5 years of financial support for experienced researchers at some of the leading universities in the United States. NCCAM states

that these researchers apply "cutting-edge technologies" to identify the potential benefits and underlying mechanisms of CAM practices. The 3 new centers are described below.

**NCCAM states
that these researchers
apply "cutting-edge
technologies" to identify
the potential benefits
and underlying
mechanisms of
CAM practices.**

1. Center for Arthritis and Traditional Chinese Medicine

First-year funding: \$1,197,651
Principal Investigator: Brian Berman, MD
Institution: University of Maryland, Baltimore, MD

This center will study traditional

Chinese medicine (TCM) approaches (i.e., acupuncture and herbs) for the treatment of arthritis. Researchers will conduct a clinical trial of the 11-herb Chinese formula *Huo-Luo-Xiao-Ling Dan* (known as HLXL) for osteoarthritis of the knee, as well as assess acupuncture's effect on inflammatory pain in an animal model, and study the efficacy of HLXL in an animal model of autoimmune arthritis. The herbal components of HLXL are shown in Table 1. HLXL was developed by David Lee, PhD, of Harvard University as a modified version of another TCM formula, used primarily to treat Bi Syndrome (a syndrome that overlaps with the Western diagnosis of arthritis and inflammation) (M. Bahr-Robertson e-mail to C. Cavaliere, December 14, 2005).

2. Center for Chinese Herbal Therapy

First-year funding: \$1,144,274
Principal Investigator: Xiu-Min Li, MD
Institution: Mount Sinai School of Medicine, New York, NY

Center researchers will investigate a 3-herb Chinese formula, known as antiasthma herbal medicine intervention (ASHMI), as a therapy for allergic

Table 1: Chinese Herbs in the HLXL Formula (Huo-Luo-Xiao-Ling Dan)

Chinese (Pinyin) Name	Latin Name & Authority*	Family
<i>Ruxiang</i>	<i>Boswellia carterii</i> Birdw.	Burseraceae
<i>Qianghuo</i>	<i>Notopterygium incisum</i> Ting ex H.T. Chang	Apiaceae
<i>Danggui</i>	<i>Angelica sinensis</i> (Oliv.) Diels.	Apiaceae
<i>Baishao</i>	<i>Paeonia lactiflora</i> Pall.	Paeoniaceae
<i>Gancao</i>	<i>Glycyrrhiza uralensis</i> Fisch.	Fabaceae
<i>Yanhusuo</i>	<i>Corydalis yanhusuo</i> W.T. Wang	Papaveraceae
<i>Danshen</i>	<i>Salvia miltiorrhiza</i> Bge.	Lamiaceae
<i>Chuanxiong</i>	<i>Ligusticum chuanxiong</i> S.H. Qiu	Apiaceae
<i>Qinjiao</i>	<i>Gentiana macrophylla</i> Pall.	Gentianaceae
<i>Guizhi</i>	<i>Cinnamomum cassia</i> Presl.	Lauraceae
<i>Duhuo</i>	<i>Angelica pubescens</i> Maxim.	Apiaceae

* The Latin name for Chinese herbs is sometimes based on the presumed genus and species used. It is a frequent practice in traditional Chinese medicine to substitute another herb for one that is commonly used, the substitute herb having the same "energetic properties" as the herb for which it is being substituted.

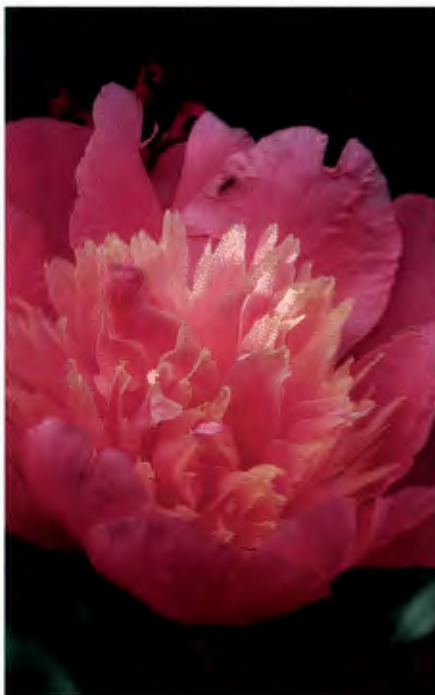
asthma. The herbs that comprise ASHMI are shown in Table 2. The formula recently demonstrated efficacy in treating asthma in a double-blind, placebo-controlled clinical trial.³ Unlike many traditional Chinese herbal formulations designed for treating symptoms associated with asthma, ASHMI does not contain ephedra (ma huang, *Ephedra sinica* Stapf., Ephedraceae), a well-known and controversial source of ephedrine, which has been associated with adverse effects on the cardiovascular and central nervous system when used in various dietary supplements used for enhanced athletic performance and weight loss. However, there are few, if any, adverse reports on the safety of ma huang when it is used in traditional Chinese herbal formulations used for respiratory/pulmonary complaints. All 3 herbs in ASHMI have a long history of use in China, and a body of clinical evidence testifies to their use and safety in traditional herbal medicine. Studies of the herbal formula at the Center for Chinese Herbal Therapy will look at mechanism of action in an animal model, characterize the herbs' active components, and investigate the formula's use in asthma patients.

3. Center for Mechanisms Underlying Millimeter Wave Therapy

First-year funding: \$1,025,895
Principal Investigator: Marvin Ziskin, MD
Institution: Temple University School of Medicine, Philadelphia, PA

This center will study the mechanisms of action of millimeter wave therapy (use of low-intensity millimeter wavelength electromagnetic waves) for a variety of diseases and conditions, as well as look at the therapy's use in animal models of

chronic neuropathic pain and pruritis (itching).



Baishao *Paeonia lactiflora*. Photo ©2006 stevenfoster.com

International Centers for Research on CAM

The 2 International Centers for Research on CAM are the outgrowth of planning grants awarded by NCCAM to 11 international teams in 2003. Each of these teams was given 2 years to develop a research collaboration and infrastructure that could compete for 4-year centers grants. The recipients of these international centers grants will now conduct research on CAM and traditional medicine practices in countries where the specific practices are indigenous. These partnerships between researchers in the United States and foreign institutions will address whether the traditional practices can aid in health care locally and globally and build CAM research capacity internationally. Co-funders for these centers include NIH's Office of Dietary Supplements, Office of AIDS Research, and Fogarty International Center (the International division of NIH).

The 2 NCCAM recipients are described below.

1. Functional Bowel Disorders in Chinese Medicine

First-year funding: \$807,253

Principal Investigator: Brian Berman, MD
Partner Institutions: University of Maryland, Baltimore, MD; Chinese University of Hong Kong, China; University of Illinois, Chicago, IL; University of Western Sydney, Sydney, Australia

This center will conduct multidisciplinary research on TCM practices (acupuncture and herbal medicine) for the treatment of irritable bowel syndrome (IBS). Researchers will study effects of acupuncture and a 20-herb TCM preparation in an animal model of IBS and conduct a preliminary study of the herbal preparation with IBS patients. The herbal formula was developed by Alan Bensousan, PhD, of the University of Western Sydney. A clinical trial in 1998 based on this formula resulted in positive outcomes in patients with IBS.⁴ The formula's contents are shown in Table 3.

2. The International Center for Indigenous Phytotherapy Studies: HIV/AIDS, Secondary Infections and Immune Modulation

First-year funding: \$1,100,000
Principal Investigator: William Folk, PhD
Partner Institutions: University of Missouri, Columbia, MO; University of the Western Cape, Bellville, Republic of South Africa; along with University of KwaZulu-Natal, University of Cape Town, and the South African Medical Research Council

This center will study the safety and efficacy of traditional African plant-based therapies already in wide-spread use for HIV/AIDS and some of its secondary infections. Researchers will conduct a small clinical trial using sutherlandia (*Sutherlandia frutescens*, syn. *Lessertia frutescens* (L.) Goldblatt & J.C. Manning, Fabaceae) leaf in adults with HIV and conduct preclinical and clinical research with African wormwood (*Artemisia afra* Jacq. ex. Willd., Asteraceae) aerial parts, which are used by traditional healers for treatment of many conditions seen in people with HIV/AIDS.

In addition, the National Cancer Institute (NCI) will fund a third international center:

International Center of Traditional Chinese Medicine for Cancer
Principal Investigator: Lorenzo Cohen, PhD
Partner Institutions: M.D. Anderson Cancer Center, Houston, TX; Fudan University Cancer Hospital, Shanghai, China

Table 2: Chinese Herbs in the Antiasthma Herbal Medicine Intervention (ASHMI) Formula

Chinese (Pinyin) Name	Latin Name & Authority	Family
Ling-zhi	<i>Ganoderma lucidum</i> (Curtiss:Fr) P. Karst	Ganodermataceae
Ku-shen	<i>Sophora flavescens</i> Aiton	Fabaceae
Gancao	<i>Glycyrrhiza uralensis</i> Fisch ex. DC.	Fabaceae

This center will conduct preclinical and clinical studies of 3 TCM approaches (herbs, acupuncture, and qi gong) for treating cancer and its symptoms, as well as treatment-related side effects. "The collaboration we have with Fudan University Cancer Hospital is mutually advantageous [and] ultimately we believe that together we can make an impact on cancer patients worldwide," said Lorenzo Cohen, PhD, principal investigator of the center and director of the Integrative Medicine Program at M.D. Anderson. "Traditional Chinese medicine has a remarkable history and by applying western research standards to traditional Chinese medicine, we can better understand possible new applications. Likewise, our collaborators in China are learning a great deal about the structure and design of clinical trials, new diagnostic imaging

technology, population studies, and prognostic markers."⁵ HG

—Mark Blumenthal
and Courtney Cavaliere

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Table 3: Chinese Herbs in Formula for Treatment of IBS*

Chinese (Pinyin) Name	Latin Name & Authority†	Family
Dangshen	<i>Codonopsis pilosula</i> (Franch.) Nannf.	Campanulaceae
Huoxiang	<i>Agastache rugosa</i> (Fisch. & C.A. Mey.) Kuntze <i>Pogostemon cablin</i> (Blanco) Benth.‡	Lamiaceae Lamiaceae
Fangfeng	<i>Ledebouriella seseloides</i> (Hoffm.) H. Wolff.	Apiaceae
Yiyiren	<i>Coix lacryma-jobi</i> L.	Poaceae
Chaihu	<i>Bupleurum chinense</i> DC.	Apiaceae
Yinchen	<i>Artemisia capillaris</i> Thunb.	Asteraceae
Baizhu	<i>Atractylodes macrocephala</i> Koidz.	Asteraceae
Houpo	<i>Magnolia officinalis</i> Rehder & E.H. Wilson	Magnoliaceae
Chenpi	<i>Citrus reticulata</i> Blanco	Rutaceae
Paojiang	<i>Zingiber officinale</i> Roscoe	Zingiberaceae
Qinpi	<i>Fraxinus chinensis</i> Roxb.	Oleaceae
Fuling	<i>Poria cocos</i> F.A. Wolf	Polyporaceae
Baizhi	<i>Angelica dahurica</i> (Fisch. Ex Hoffm.) Benth. & Hook. F. ex Franch. & Sav.	Apiaceae
Cheqian zi	<i>Plantago asiatica</i> L.	Plantaginaceae
Huangbai	<i>Phellodendron</i> spp. Rupr.	Rutaceae
Zhigancao	<i>Glycyrrhiza uralensis</i> Fisch. Ex DC.	Fabaceae
Baishao	<i>Paeonia lactiflora</i> Pall.	Paeoniaceae
Muxiang	<i>Saussurea</i> spp. DC.	Asteraceae
Huanglian	<i>Coptis chinensis</i> Franch.	Ranunculaceae
Wuweizi	<i>Schisandra chinensis</i> Michaux	Schisandraceae

* The list of herbs in this formulation is based on those used in a formula tested in a clinical trial for IBS.⁴

† The Latin name for Chinese herbs is sometimes based on the presumed genus and species used. It is a frequent practice in traditional Chinese medicine to substitute another herb for one that is commonly used, the substitute herb having the same "energetic properties" as the herb for which it is being substituted.

‡ The Chinese herb huo xiang has often been noted as being derived from the genus *Agastache*; however, recently it has also been derived from the genus *Pogostemon* (S. Dharmananda e-mail to C. Cavaliere, March 16, 2006).

Global Horticulture Initiative to Improve Health and Economies of Developing Countries

by Courtney Cavaliere

An international network of agricultural and nutrition research organizations and experts launched the Global Horticulture Initiative (GHI) in March of 2006.¹ This initiative is intended to mobilize research and development of resources for the improvement of horticulture in developing countries, allowing inhabitants to grow fruits and vegetables for domestic consumption and to export in an environmentally sustainable manner.

Over 74 participants from 23 countries have joined the initiative, which was co-organized by the following: AVRDC—The World Vegetable Center, the International Center for Cooperation in Agro-nomic Research for Development (Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement, CIRAD), and the International Society for Horticultural Sciences (ISHS). The main goals of the initiative are to foster economic growth and improve health and nutrition within developing countries. The GHI will initiate output-oriented research and development projects designed to improve production and marketing of horticulture in certain countries, and it will promote the formulation of policies and programs that support small-scale farmers and horticultural commerce both domestically and worldwide.² Such efforts will focus primarily on sub-Saharan Africa and South Asia, with secondary emphasis in Central Asia, Southeast Asia, and Latin America.

Over \$2.5 million has already been raised to fund the initiative's activities and projects.¹ The GHI is further seeking \$5 million per year for base funding over a 5-year period.² Various funding agencies will be enlisted to sustain and increase the GHI.

The horticultural systems proposed by the GHI are expected to generate higher incomes for farmers and those working within food processing industries. Women, in particular, are expected to benefit from these projects, for they often comprise the dominant workforce of horticultural production and related industries. The GHI has expressed its commitment to empowering such female workers. Resource-poor households outside the production sector, meanwhile, will benefit through improved access to affordable vegetables and fruits, which should provide nutrients often lacking in inhabitants' diets. Inadequate diet frequently results

in malnutrition and lowered resistance to diseases, which are endemic within many developing countries.

Further information regarding the GHI and its goals are available at the Web site www.globalhort.org. HG

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Gum Arabic Industry Members Commit to Sustainability

by Katherine Purcell and Nancy Dennis

International members of the gum Arabic industry have reached a consensus on future development and trade of the lucrative tree resin,¹ which is used as an emulsifying agent in many commercial products.² The resin is derived from the gum Arabic tree (*Acacia senegal* [L.] Willd., Fabaceae). Gum Arabic industry representatives from Chad, Nigeria, Sudan, the Association for the International Promotion of Gums (AIPG), Food and Agricultural Organization of the United Nations (FAO), Network for Natural Gums and Resins in Africa (NGARA), and the World Bank met on June 8, 2005, in Khartoum, Sudan, and committed to work together to promote and preserve this natural resource.³

Industry members explored ways to maintain the gum supply at fair prices for the international market. "This meeting will be remembered as historic if the participants make good on their promises to do the necessary and doable to put gum Arabic business and public relations on a stronger footing," said Paul Flowerman, president of P.L. Thomas (PLT), a Morristown, NJ-based importer and supplier of gum Arabic and other natural ingredients.¹

Industry members agreed that worldwide consumption of gum Arabic could potentially increase and that the future development of gum Arabic depends on product availability, clear communication on current and future market conditions, quality standards, information-sharing among gum distributors and suppliers, and reasonable prices.³

"I am confident that we are going the right way in joining forces to create credibility and trust among gum Arabic users, while securing all stages of the supply chain, from the Acacia tree to the processing unit of the worldwide industry," said Hinrich Wolff, president of the AIPG, in a press release statement about the Khartoum meeting. Participants agreed

to build up "a security stock amounting to one year's crop quantity in each of the main three exporting countries."⁴ In an effort to help with the environmental and socio-economic impact of producing gum Arabic, the industry members agreed that gum farmers should be encouraged to maintain and increase their supply of the product by assuring them a reasonable profit and a continuous market.³

Flowerman explained that changing conditions have affected gum Arabic supplies:

The recent peace treaty between the Khartoum government (the national Sudan regime) and the Sudan People's Liberation Army (representing the Southern Sudan resistance) has ended north-south hostilities and finally opened up important stands of gum Arabic trees for tapping and collection. This additional crop should make up for declines in the traditional producing regions, where old trees, decreasing village populations, and what is called 'oil fever' are reducing the size of the collections. Further, the displacement of nearly 2 million Darfur inhabitants has virtually eliminated that state as a source of supplies. Darfur previously accounted for about 5% of total



Illustration of *Acacia senegal* (gum Arabic) from Köhler's *Medizinal-Pflanzen in naturgetreuen Abbildungen mit kurz erläuterndem Texte: Atlas zur Pharmacopoea germanica*, by Köhler, F. E. (Franz Eugen) Volume 2 of 3 © 1995-2004 Missouri Botanical Garden (<http://ridgwaydb.mobot.org/mobot/rarebooks/>)

Correction

An article in *HerbalGram* 70, "Preserving Ayurvedic Herbal Formulations by Vaidyas" by Chandra Prakash Kala, contains 3 errors: (1) the human population of Uttaranchal, India, is about 8.5 million, not 805 million as stated (a typographical error converted the period to a zero); (2) according to the World Health Organization (2003), the global market for herbal medicines is over \$60 billion annually, not \$120 billion as stated in the article, and (3) the article incorrectly states that medicinal plants used in Ayurvedic preparations represent \$60 billion in annual sales; while definitive statistics to measure this market are somewhat elusive, some estimates range from \$550 million to \$1 billion (USD). The American Botanical Council regrets these errors and apologizes for any inconvenience they may have caused.

supplies (P. Flowerman, e-mail, August 22, 2005).

According to Flowerman, industry participants from the 3 major African producing countries held a follow-up meeting on October 3-4, 2005, in Ndjamena, Chad, and another on March 9-10, 2006, in Nigeria to discuss implementation of the plans agreed to in previous meetings (P. Flowerman, e-mail, March 9, 2006). At the October meeting, participants agreed to a proposal by AIPG to create a task-force of representatives from Chad, Nigeria, Sudan, AIPG, and NGARA (P. Flowerman, e-mail, March

2, 2006). The world's largest producers of gum Arabic are Sudan, Chad, and Nigeria, producing respectively 25,000 metric tons (MT), 10,000 MT, and 3,000 to 5,000 MT annually.⁵

In January 2006, the BBC reported that "millions of Sudanese still live in fear of violence, a year after the peace deal ended 21 years of war between north and south."⁶ Meanwhile conflict in the western province of Darfur continues. Nevertheless, 500,000 southern Sudanese are expected to return home this year,⁶ and a February 2006 FAO Special Report on Sudan stated that "increased security and favorable prices" has led to "an upsurge in the collection of gum Arabic."⁷

Gum Arabic is also called acacia, acacia gum, or Senegal gum. Materials sold as gum Arabic are derived from the resin of several species of acacia trees. According to the FAO, the term gum Arabic is used differently by different groups of people. For example, in Sudan the name gum Arabic represents two different types of gum which are produced and marketed similarly but are traded differently. These include *hashad*, from *A. senegal*, and *talha*, from *A. seyal*. The FAO clarified that most internationally traded gum Arabic comes from *A. senegal*, but that the term

"gum Arabic" does not imply a particular botanical source.⁸

For more information on gum Arabic, its uses, and the political problems impacting its production, please refer to the *HerbalGram* article, Sudan War Impacts Availability of Gum Arabic, A Key Ingredient for Many Commercial Products.² HG

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Trial Suggests Saffron's Potential to Treat Mild to Moderate Depression

Reviewed: Akhondzadeh S, Tahmacebi-Pour N, Noorbala A, et al. *Crocus sativus* L. in the treatment of mild to moderate depression: a double-blind, randomized and placebo-controlled trial. *Phytother Res.* 2005;19(2):148-151.

The dried stigmas of saffron (*Crocus sativus* L., Iridaceae) flowers are highly valued and the most expensive spice worldwide. In Persian traditional medicine, saffron is used as an antispasmodic, an appetite stimulant, and as a treatment for depression. Many healthcare consumers are turning to alternative therapies for the treatment of minor to moderate cases of depression as concerns over the adverse effects and safety of conventional pharmaceutical antidepressants have grown.

This relatively small (n = 40) randomized, double-blind, placebo-controlled trial, conducted in the Roozbeh Psychiatric Hospital in Tehran, Iran, was designed to evaluate the efficacy of a proprietary extract of saffron stigmas in the treatment of mild to moderate depression as defined by the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV).¹ The trial covered a relatively short period of 6 weeks. All subjects had a baseline Hamilton depression rating of at least 18 and were between the ages of 18-55. Patients taking psychotropic medication or patients with diagnoses of schizophrenia, bipolar disorder (current or past), or schizotypal personality disorder and patients in danger of committing suicide were excluded from the trial.

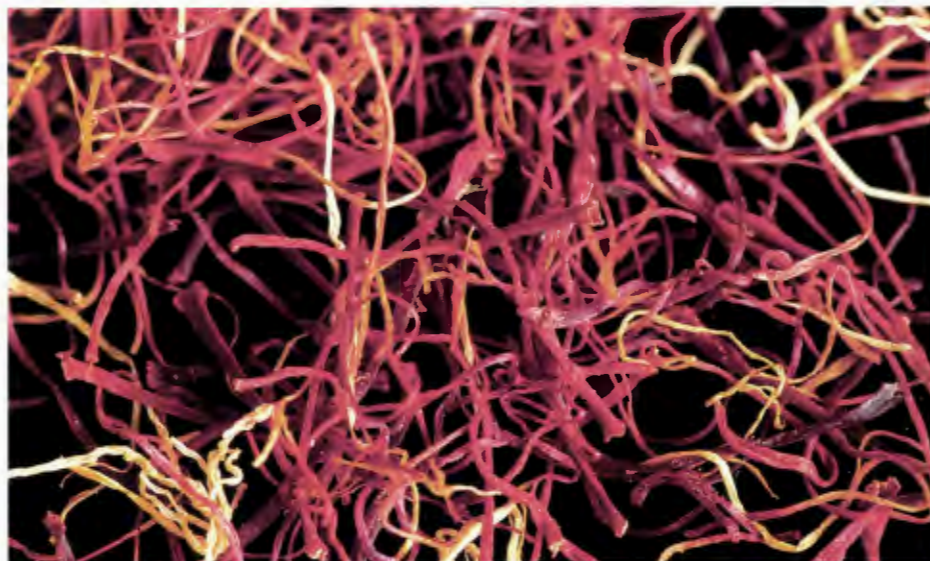
Saffron stigmas (Novin Zaferan Co., Mashhad, Iran) were extracted by percolation in 80% ethanol, and the dried extract (15 mg) was made into capsules of 15 mg extract compounded with lactose as filler,

magnesium stearate as "lubricant" (used as a flowing agent in the manufacturing process), and sodium starch glycolate as a disintegrant. The extracts were not chemically standardized to a particular chemical marker. Subjects were randomized at a 1:1 ratio (i.e., 20 subjects in each group) to receive either 30 mg per day of the saffron extract or a placebo for 6 weeks.

Out of 40 subjects, 35 completed the trial. Although the number of dropouts was small (1 saffron group and 4 placebo group), no significant difference was

between the saffron and placebo groups was not significant (P = 0.18-1.39).

Although this clinical trial was relatively short (6 weeks) and the saffron extract was not chemically standardized, this trial demonstrates the potential of saffron as a treatment for mild to moderate depression, consistent with some of its traditional use in Persian traditional medicine. In addition, the results of this trial also demonstrate a relatively rapid onset of antidepressant action and lower incidence of side effects of saffron capsules



Saffron *Crocus sativus* Photo ©2006 stevenfoster.com

Correction

The following article in *HerbalGram* 70 (page 52) contains an error: "Government Increases Restrictions on Wild American Ginseng Export." Patricia Ford, a botanist with the US Fish and Wildlife Service, was incorrectly referred to as a "wildlife biologist." The American Botanical Council regrets this error and apologizes for any inconvenience this may have caused.

observed between the placebo and saffron group drop-out rates (P = 0.34). There was also no significant difference between the Hamilton depression scale ratings of the 2 groups at baseline (P = 0.73). However, at week 6, the change in Hamilton depression rating scores compared with baseline scores was significantly different between the 2 groups (P < 0.0001). At the end point (week 6), the mean Hamilton depression rating scores had decreased by -12.20 ± 4.67 for the saffron group and -5.10 ± 4.71 for the placebo group when compared with baseline scores. Adverse side effects noted were anxiety, decreased appetite, increased appetite, sedation, nausea, headache, and hypomania. However the difference in frequency and rate of side effects

when compared to conventional pharmaceutical antidepressants. Notably, at the fixed dose of saffron used in this study, no abnormal bleeding was observed, one of the notable reported side effects of saffron. Determination of the active constituent or constituents responsible for this activity and a larger clinical trial using standardized extracts are needed to validate these results. HG

—Marissa Oppel, MS

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Andrographis, Asian Ginseng, and Valerian Extracts Tested in Small Trial on Male Fertility

Reviewed: Mkrtchyan A, Panosyan V, Panossian A, Wikman G, Wagner H. A phase I clinical study of *Andrographis paniculata* fixed combination Kan Jang versus ginseng and valerian on the semen quality of healthy male subjects. *Phytomed.* 2005;12:403-409.

Extracts from the leaves of andrographis (*Andrographis paniculata* [Burm. f.] Nees, Acanthaceae) are becoming more popular in the United States as an increasing amount of published research strongly supports the benefits of this traditional Chinese and Ayurvedic herb for treating symptoms of upper respiratory tract infections, usually secondary to colds and flu.¹ This trial attempts to study the safety of andrographis in a fixed combination extract (Kan Jang™, Swedish Herbal Institute, Gothenburg, Sweden) on male fertility compared to 2 commonly used herbs: Asian ginseng (*Panax ginseng* C.A. Meyer, Araliaceae) and valerian root (*Valeriana officinalis* L., Valerianaceae).

Kan Jang is a fixed combination of andrographis leaf special extract SHA-10 and eleuthero (*Eleutherococcus senticosus* [Rupr. & Maxim.] Maxim., Araliaceae) special extract SHE-3 employed in the treatment of various conditions associated with the common cold.

The authors conducted an open randomized parallel study (Republican Medical Centre of Dermatology and Diseases Disseminated by Sexual Contacts; Yerevan, Armenia) designed to ascertain the effects of valerian root and Asian ginseng on parameters of male fertility.

The study subjects were healthy males, aged 18-35, with normal semen quality. Subjects were divided into five groups. Group 1 (n=5) received Kan Jang mixture I standardized for 10.0 mg/ml andrographolide at the daily therapeutic dose of 6ml/day. Group 2 (n=5) received 6ml/day of Kan Jang mixture II, standardized to 20 mg/ml andrographolide, equivalent to double the daily therapeutic dose. Group 3 (n=6) received 9ml/day of Kan Jang mixture II, equivalent to triple the daily therapeutic dose. Group 4 (n=5) received 40 ml/day of Asian ginseng root extract (Finzelberg GmbH, Andernach, Germany) standardized to 10.5% total

ginsenosides. Group 5 (n=5) received 5 tablets/day of a valerian extract (Finzelberg GmbH, Andernach, Germany) standardized to 0.43% valerenic acid. The duration of the study was 13 days; the study medications were administered for 10 days. Semen analysis was conducted throughout the study and a global assessment of the subjects' health was carried out on day 13.



Andrographis *Andrographis paniculata*. Photo © 2006 Swedish Herbal Institute.

The male fertility parameters measured included the Farris Fertility index, volume of ejaculate, number of spermatozooids in 1 ml of ejaculate, total number of spermatozooids in whole ejaculate, and percentage of active (normokinetic; i.e., normal movement) spermatozooids. Statistical comparisons at 95% confidence intervals were carried out between study groups using unpaired t-tests and Mann-Whitney tests,

and comparisons within the groups were carried out with paired t-tests and one-way ANNOVA tests.

The study medications were well tolerated and the subjects reported no adverse events resulting from the study medications. No significant changes in the testicles of the subjects were observed. The study medications did not reduce male fertility parameters in any of the subjects in the study. The authors found no significant differences in male fertility parameters between the Kan Jang groups and the valerian and ginseng groups. The authors conclude that Kan Jang is safe with regards to male fertility parameters at doses of up to 3 times the recommended daily dose for 10 days. In addition, Asian ginseng and valerian show no negative effects on male fertility when administered at 3 times the recommended daily dose for a duration of 10 days.

The authors note a positive trend in the number of spermatozooids in the whole ejaculate, an increase in the percentage of active forms of spermatozooids, a decrease in the percentage of inactive (diskinetic) forms of spermatozooids, and an increase in the Farris fertility indices of the subjects receiving Kan Jang. A decrease in the percentage of diskinetic forms of spermatozooids was observed for both Asian ginseng and valerian treatments; while, in addition, a temporary increase in the percentage of normokinetic spermatozooids was noted for valerian. However, this is a phase I clinical study, involving a small number of subjects. Future studies are necessary to confirm these results. HG

—Marissa Oppel, MS

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Trial Suggests Efficacy of Pomegranate Juice on Myocardial Perfusion

Reviewed: Sumner MD, Elliott-Eller M, Weidner G, et al. Effects of pomegranate juice consumption on myocardial perfusion in patients with coronary heart disease. *Am J Cardiol.* 2005;96:810-814.

Pomegranate (*Punica granatum* L., Punicaceae) juice is a rich source of antioxidants, such as soluble polyphenols, tannins, and anthocyanins, and it may have antiatherosclerotic properties. Animal studies have shown that dietary supplementation with polyphenolic antioxidants inhibits the oxidation of low-density lipoprotein (LDL, the “bad” cholesterol) and macrophage foam cell formation, and thus retards the development of atherosclerosis (the accumulation of plaque on arterial walls, which can increase the risk of cardiovascular problems such as heart attack, stroke, etc.). However, the effects of pomegranate juice in patients with ischemic coronary heart disease (CHD) have not been investigated. (CHD is characterized by reduced blood supply from blocked coronary arteries, typically caused by atherosclerosis.) The objective of this study was to evaluate the effects of pomegranate juice on myocardial perfusion (a test that uses low doses of radioactive agents to evaluate the heart’s blood flow and function) in patients with CHD.

Forty-five patients (age range: 69 ± 10) with stable CHD were enrolled in this randomized, placebo-controlled, double-blind study conducted by researchers at the University of California at San Francisco (UCSF), the California Pacific Medical Center (San Francisco, CA), and the Preventative Medicine Research Institute (PMRI, Sausalito, CA). All patients were confirmed to have stress-induced ischemia evidenced by at least one reversible myocardial perfusion. The patients were randomly assigned to receive either 240 mL/day (8 oz) of pomegranate juice (POM Wonderful, Los Angeles, CA) or a modified sports beverage similar to the pomegranate juice in taste, color, and caloric content (placebo) for 3 months. (The placebo did not contain any juice or fruit or bioactive compounds. It contained several flavors of Gatorade® [PepsiCo,

Purchase, NY] with added corn syrup to make it isocaloric with the pomegranate juice. The placebo was tested in an independent laboratory for polyphenols, and it was determined that it contained none.) Blood pressure and lipid, glucose, and hemoglobin A1c concentrations were measured at baseline and at 3 months. Additionally, the subjects underwent myocardial perfusion imaging at rest and under stress with the use

tions or revascularization in either group. No significant changes in body weight, blood pressure, or plasma lipid, glucose, or hemoglobin A1c concentrations were observed throughout the study. Episodes of angina decreased by 50% (from 0.26 to 0.13) in the pomegranate group but increased by 38% (from 0.53 to 0.75) in the placebo group, though this difference was not statistically significant.

The results suggest, for the first time, “that daily consumption of pomegranate juice for 3 months may decrease myocardial ischemia and improve myocardial perfusion in patients who have ischemic CHD as measured by the SDS.” The clinical significance of this finding was supported by the average improvement in myocardial perfusion of 17% in the pomegranate group and the average worsening in myocardial perfusion of 18% in the placebo group. These findings are consistent with the beneficial effects of polyphenol-containing beverages observed by other investigators. In a recent study conducted by de Nigris et al,¹

oral administration of pomegranate juice to mice at various stages of hypercholesterolemia reduced the progression of atherosclerosis significantly. The authors of the current study recommend that additional studies be conducted to determine the effects of pomegranate juice in a larger sample size and over a longer period of time. HG

—Brenda Milot, ELS



Pomegranate *Punica granatum* Photo ©2006 stevenfoster.com

of single-isotope (technetium-99m tetrofosmin) single-photon emission computed tomography at baseline and at 3 months. Technetium uptake was measured in 17 myocardial segments per subject with a semiquantitative 5-point scoring method, where 0 = normal uptake and 4 = absent uptake. A summed difference score (SDS), indicating the difference in blood flow under resting and stressed conditions was derived to indicate the level of inducible myocardial ischemia.

Inducible ischemia, determined on the basis of SDSs, was not significantly different between the pomegranate and placebo groups at baseline; however, it decreased in the pomegranate group (by 0.8 plus/minus 2.7) and increased in the placebo group (by 1.2 plus/minus 3.1) at 3 months ($P < 0.05$). This benefit was observed with no significant changes in cardiac medica-

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ABC Clarifies Recent Meta-analysis of Milk Thistle Clinical Trials

Reviewed: Rambaldi A, Jacobs BP, Iaquinto G, Gluud C. Milk Thistle for alcoholic and/or hepatitis B or C diseases—A systematic Cochrane hepato-biliary group review with meta-analyses of randomized clinical trials. *Am J Gastroenterol.* 2005;100:2583-2591.

In early January 2006 the American Botanical Council (ABC) received numerous requests from members for a response to a recently-published meta-analysis of milk thistle clinical trials. This popular herbal dietary supplement, the study concluded, is ineffective for various disorders of the liver. ABC issued a Media Alert to select Sponsor Members, the contents of which are contained in this article.¹

The meta-analysis of 13 clinical trials (11 published and 2 conference abstracts) on the concentrated and standardized extract of milk thistle seed (*Silybum marianum* [L.] Gaertn., Asteraceae) was published December 2005 in the *American Journal of Gastroenterology*. Milk thistle extract (MTE) is a popular herbal dietary supplement in the United States, used primarily for its reputed beneficial effect on the liver. (In 2004 MTE was the 10th largest-

selling herbal dietary supplement in mainstream retail markets.²)

ABC and some of its scientific colleagues and medical advisors reviewed the meta-analysis and found anomalies in its contents. ABC also noted that there are discrepancies in the published analysis and the publicity from the journal's publisher.

First, ABC emphasized that the published meta-analysis concluded that MTE is safe and was well tolerated in the clinical trials of various durations. Second, the ABC review determined that the conclusion questioning MTE's efficacy is based primarily on the results of only one of the 13 trials reviewed by the paper's authors. At least 2 of the 4 authors have previously conducted systematic reviews of the literature on MTE; thus they appear quite familiar with the

clinical and pharmacological literature on MTE.

Safety Obfuscated

A press release from Blackwell Publishing,³ publisher of the *American Journal of Gastroenterology*, resulted in a short Reuters' news report⁴ and other brief articles on various Web sites, although to date this article does not appear to have been reported in other major media.

Despite numerous positive statements made by the authors in the original paper about the safety and efficacy of MTE, the press release from Blackwell Publishers focuses primarily on the negative. The press release quotes Dr. Christian Gluud of the Copenhagen Trial Unit, Center for Clinical Intervention Research at the Copenhagen University Hospital, one of the study's authors, as saying, "The ironic

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fact is that even though milk thistle and milk thistle extracts have been widely examined, we are still not in a situation where we can exclude a potential beneficial or harmful effect."

Dr. Gluud's equivocation about the safety of MTE in the press release is directly at odds with the results of the paper itself where several statements regarding the lack of adverse effects of MTE are made. For example, the authors of the meta-analysis write, "...among the randomized clinical trials reporting adverse drug events, MT appeared safe and well tolerated."

Commenting on the meta-analysis, ABC Advisory Board member Mary Hardy, MD, the former associate director of the UCLA Center for Human Nutrition, stated, "This meta-analysis did not show that MTE had significant adverse events, nor did it increase all-cause mortality in the majority of trials." [M. Hardy e-mail to M. Blumenthal, January 6, 2006.]

Using authoritative reviewers, ABC previously published an extensive Safety Assessment Report on MT.⁵ This report found what most other authoritative reviewers have concluded: the safety of MTE is well established in extensive animal testing and human clinical trials, as well as a significant level of use in Germany and other parts of Europe where adverse events, if they occur, would have been reported to health authorities as part of the normal practice of pharmacovigilance for nonprescription medications. (ABC Sponsor Members and others are invited to contact ABC for information about licensing the MT Safety Assessment Report for labeling or use as educational content on Web sites.)

Efficacy Questions

"The methodology employed in this meta-analysis is sound," noted Dr. Hardy, "but, like all meta-analyses, it is limited by the material in the review. The medical conditions examined are widely varied—everything from alcoholic liver disease (primarily what appears to be end-stage cirrhosis) to steatosis (accumulation of fatty tissue in an organ) to viral disease (both Hepatitis B and C). These diseases have different etiologies [sources] and lots of confounding variables, such as whether or not patients stop drinking alcohol."

The primary outcome measured was all-cause mortality—a difficult variable to test in trials as short as 6 months (the

average length of treatment for the pooled studies) and which generally requires studies with a large number of subjects to show a difference.

There were only enough trials to make a comment in alcoholic liver disease (e.g., "Liver-related mortality *was significantly reduced* [emphasis added] by MT in ALL trials."). Dr. Hardy notes that "almost all of the deaths occur in only two studies. We don't have adequate details about the patients in these trials to comment about why so many deaths were reported here (were the patients more severely ill, still drinking, etc.?)."

Dr. Hardy added, "The more specific

this set of trials, and, in fact, the main negative conclusion ends up resting on the results of one trial. A second trial, which is smaller, older and of somewhat less quality, shows a benefit for MTE. Further, including all trials again shows a benefit for the more specific outcome, mortality related to liver disease. Also, the average duration of treatment is short for a mortality trial. Therefore, the authors' conclusion about the efficacy of MTE needs to be viewed with qualifications." It should be noted that the quality of some of the studies is relatively poor and additional studies, especially in the area of viral hepatitis, may be warranted.



Milk Thistle *Silybum marianum* Photo ©2006 stevenfoster.com

outcome, death related to liver disease, reportedly shows that MTE is protective if all trials are taken into account. The conclusion that this meta-analysis arrives at—"based on high quality trials, MT does not seem to significantly influence the course of patients with Alcoholic and/or Hepatitis B or C liver disease"—is therefore based on ONE article. Many of these patients also had Hepatitis C antibodies and may have been sicker."

Dr. Hardy also noted that the methodological quality of the trials reviewed were fair, especially since many of these were relatively older trials. She summarized her thoughts on this meta-analysis as follows:

"The meta-analysis employs a good methodology, but the primary outcome variable would be difficult to assess with

Other Considerations about Milk Thistle

MT has a long history of safe use in traditional folk medicine as an herbal remedy for the liver. There are an impressive number of experimental and animal pharmacology research studies, plus the body of clinical trial data, that suggest a positive benefit of MTE on liver function. The totality of all this evidence suggests the efficacy of MTE for various applications related to liver function. For example, the *ABC Clinical Guide to Herbs* reviews 21 clinical trials, most of which show some positive results for liver-related disorders.⁶ In addition, the German government's Commission E reviewed the available literature on MT and concluded that it is safe and effective for "toxic liver

damage and for supportive [i.e., adjunct, not primary] treatment in chronic inflammatory liver disease and hepatic cirrhosis.⁷ Additional therapeutic monographs have been published by the World Health Organization,⁸ recognizing the therapeutic value of MTE.

The bulk of scientific evidence shows that MTE concentrated extract is safely tolerated in both animals and humans, MTE has demonstrated strong antioxidant effects, and MTE increases RNA synthesis in helping to create new hepatocytes, i.e., helping to rebuild the liver tissue.^{6,7} In fact, the authors of the meta-analysis write, "...we found that MT significantly improved two liver biochemical variables, s-bilirubin and GGT."

Further, several recent clinical trials have attempted to determine whether MTE produces any adverse drug interactions. The clinical literature to date has shown that no interactions are known,^{9,10} and in one trial, MTE actually had a beneficial effect on a hepatotoxic psychopharmaceutical drug.¹¹

In summary, considering the prepon-

derance of scientific and medical evidence, it is the view of ABC and its advisors that some of the conclusions of the meta-analysis are flawed and have been misinterpreted and misreported in subsequent media reports. HG

—Mark Blumenthal

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Special Extract of Traditional African Herb Pelargonium Treats Bronchitis in Clinical Trial

Reviewed: Chuchalin AG, Berman B, Lehmacher W. Treatment of acute bronchitis in adults with a *Pelargonium sidoides* preparation (EPs 7630): a randomized, double-blind, placebo controlled trial. *Explore!* November 2005;1(6):437-445.

Acute bronchitis is a common upper respiratory tract infection caused primarily by the respiratory syncytial virus (RSV), but also by the coxsackie, influenza, parainfluenza, and ECHO viruses or adenoviruses. Conventional medical treatment is aimed primarily at reducing symptoms. Treatment with antibiotics does not substantially decrease the duration of the illness; however 70% of the cases of acute bronchitis continue to be treated in conventional medicine by prescribing antibiotics. This clinical trial evaluated the potential of an herbal medicinal preparation made of the roots of *Pelargonium sidoides* DC, Geraniaceae for the treatment of acute bronchitis. *P. sidoides* is an herb used traditionally in South Africa for its ability to treat various symptoms of upper respiratory tract infections.

This randomized, double-blind, placebo controlled clinical trial was conducted in Russia at 6 urban primary care outpatient clinics. Included in the study were 124 subjects (37 men, 87 women, mean age approximately 36 years) diagnosed with acute bronchitis and a Bronchitis Severity Score (BSS) ≥ 5 , and duration of symptoms of ≤ 48 hours. The BSS is a 5-point scale that scores bronchitis symptoms, namely cough, sputum, rales/rhonchi (a crackling sound during respiration related to congestion in the bronchi), chest pain during coughing, and dyspnea (difficult breathing).

Symptoms were assessed through interviews with the subjects, in which a score of 0 = the absence of symptoms, 1 = mild symptoms, 2 = moderate, 3 = severe, and 4 = very severe symptoms. Excluded from the study were people who should be receiving antibiotics (e.g., those with suspected pneumonia), people who had been treated with antibiotics within 4 weeks of the study, people with aller-

gic bronchial asthma, tendency to bleed, hypersensitivity or possible hypersensitivity to the medication, severe heart, renal, liver disease, and those on other medications that might impair the validity of the study results (e.g., antibiotics).

The primary outcome measure was the change in BSS compared to placebo. The secondary outcomes measured were BSS less than 5 at the conclusion of the study, a decrease of BSS ≥ 5 points compared to baseline, consumption of paracetamol (aka acetaminophen, a non-prescription analgesic), change in individual subjects'

determine their frequency, nature, and severity using a 4-point rating scale.

Subjects in the EPs 7630 group were prescribed a proprietary extract of *P. sidoides*, EPs 7630 (Dr. Willmar Schwabe GmbH & Co., Karlsruhe, Germany; a corresponding product is marketed in the US as Umcka® ColdCare by Nature's Way, Springville, UT). The dosage was 4.5 mL (30 drops) 3 times daily 30 minutes before or after meals for 7 days, or a matching placebo. (EPs 7630 is an ethanolic extract of the root of *P. sidoides* with a drug-extract ratio of 8-10:1. The

commercial product is a solution, consisting of 80% EPs 7630 and 20% glycerol.)

BSS significantly decreased from 7.2 ± 3.1 points in the EPs 7630 group compared to 4.9 ± 2.7 points in the placebo group ($P < 0.0001$). This showed "a highly significant superiority of EPs 7630 compared with placebo on day seven." Clinical superiority of EPs 7630 was detected as early as 3 days, with a mean BSS at that time of 4.4 ± 2.2 for the EPs 7630 group compared to 6.2 ± 2.5 points in the placebo

group from baseline to day 7 of treatment ($P < 0.0001$).

The results showed benefits in the EPs 7630 group based on several measurements. BSS of less than 5 points was noted in 61 of 64 subjects (95.3%) in the EPs 7630 group compared to 35 of 60 subjects (58.3%) in the placebo group ($P < 0.0001$). Similarly, a decrease in BSS of at least 5 points occurred in 58 of 64 subjects (90.6%) in the EPs 7630 group compared to 31 of 60 subjects (51.7%) in the placebo group from baseline to day 7 of treatment ($P < 0.0001$). These 2 criteria defined "rapid recovery," which was detected in 58 of 64 subjects (90.6%) in



Pelargonium sidoides Photo ©2006 Martin Fletcher, www.californiagardens.com.

symptoms of BSS, and the results of the SF-12 Health Survey and EQ-5D quality of life questionnaires. An additional outcome measure was the Integrative Medicine Outcome Scale (IMOS), which is a 5-point scale that rates whether a subject has achieved "complete recovery," "major improvement," "slight to moderate improvement," "no change," or "deterioration." Subject satisfaction with the treatment was also assessed by using the Integrative Medicine Patient Satisfaction Scale (IMPSS), a 5-point scale with the ratings of "very satisfied," "satisfied," "neutral," "dissatisfied," and "very dissatisfied." Adverse events were recorded to

the EPs 7630 group compared to 25 of 60 subjects (41.7%) in the placebo group ($P < 0.0001$). Symptomatic improvement of rales/rhonchi, chest pain during coughing, and dyspnea after 7 days of EPs 7630 administration exceeded 90% of that group, whereas less than 60% of the placebo group experienced recovery of these symptoms. Rales/rhonchi were absent in 55 of 60 subjects (91.7%) in the EPs 7630 group versus 29 of 59 subjects (49.2%) in the placebo group ($P < 0.0001$). Chest pain during coughing was absent in 55 of 58 subjects in the EPs 7630 group (94.8%) compared to 29 of 52 subjects (55.8%) in the placebo group ($P < 0.0001$). Cough was the symptom that showed the slowest rate of recovery in both groups. Cough disappeared in 20 of 64 subjects (31.3%) in the EPs 7630 group compared to 3 of 60 subjects (5.0%) in the placebo group ($P < 0.0001$). Similarly, hoarseness disappeared in 45 of 58 subjects (77.6%) in the EPs 7630 group compared to 20 of 52 subjects (38.5%) in the placebo group ($P < 0.0001$).

At the end of the study period, 54 of 64 subjects (84.4%) in the EPs 7630 group

compared to 18 of 60 subjects (30.0%) of the placebo group were assessed as "major improved or completely recovered" by the IMOS. This assessment was given to 43 of 64 subjects (67.2%) in the EPs 7630 group compared to 11 of 60 subjects (18.3%) of the placebo group by days 3-5 of treatment. A noticeable effect of EPs 7630 treatment was described within 2-5 hours by 2 of 64 subjects (3.1%) and within 1-2 days by 14 of 64 subjects (21.9%). The majority of subjects in the EPs 7630 group reported remission of their acute bronchitis symptoms by day 7, whereas "many patients" in the placebo group reported experiencing no change by day 7. Adverse events were not significantly different between the EPs 7630 and placebo groups. No serious adverse events were reported.

This clinical trial agrees with an earlier, larger study showing the superiority of EPs 7630 over placebo for the treatment of acute bronchitis in 468 subjects.¹ A comprehensive review of the traditional uses and modern research on *P. sidoides* was published in 2003,² and another recent paper reviews the clinical pharmacology of *P. sidoides* special extract.³

The safety and efficacy of this formula provides an alternative to the ineffective conventional treatments for acute bronchitis. HG

—John Neustadt, ND

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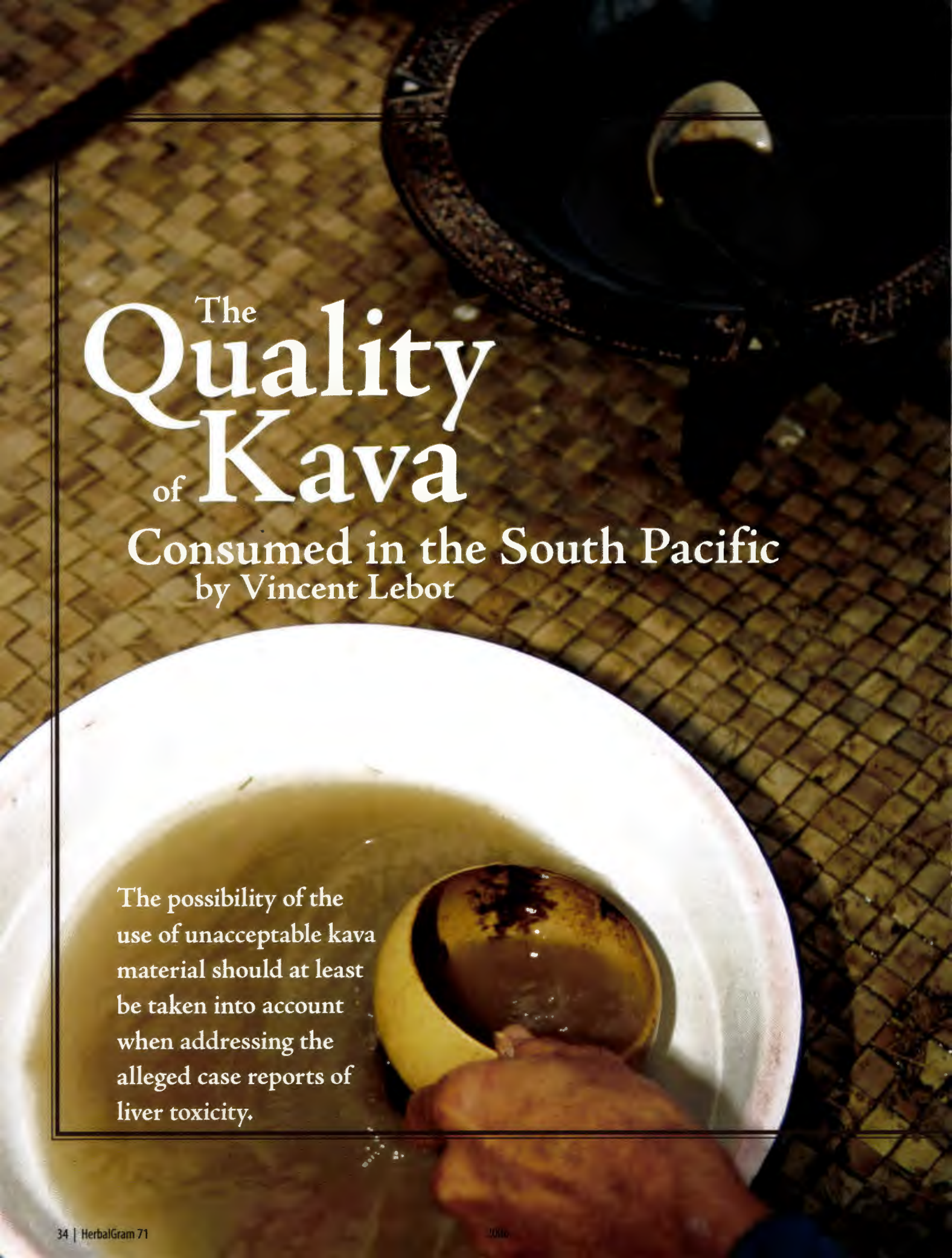


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The Quality of Kava

Consumed in the South Pacific
by Vincent Lebot

The possibility of the use of unacceptable kava material should at least be taken into account when addressing the alleged case reports of liver toxicity.

This article is based on the author's presentation "Kava-Kava: From a traditional beverage to a risky cash-crop" at the International Kava Conference, Fiji, December 1, 2004.

In its native areas of the South Pacific, the assessment of quality for the traditional and highly respected medicinal and ritual plant kava (*Piper methysticum* Forst., Piperaceae) is influenced by a number of complex factors. These include the choice of chemotype, the total kavalactone content, the plant parts used, the method of preparation, and the choice of fresh or dried plant material. As Western wholesalers are usually interested in optimal kavalactone contents, and not so much in traditional experience with a given cultivar, material unsuitable for daily kava drinking has entered into the commercial herb markets and has been exported. This situation might well be related to the observation of hepatic adverse events with the use of kava extract preparations. Clearly, a quality control system is needed to prevent unsuitable material from being exported.

In the Pacific, kava cultivation occupies approximately 15,000 hectares. Prior to the bans on the sales of kava preparations instituted by various countries, based on alleged liver toxicity, its export value from all kava-exporting countries in the South Pacific represented approximately \$82.5 million (US dollars, USD). As a major stronghold of the local economy, kava trading contributed directly to the economic stability of the region.

The kava bans caused significant damage to the South Pacific economies, with some regions recovering faster from the unexpected economical blow than others. In Vanuatu, kava is still a major cash crop due to the importance of the local kava-drinking market, which reaches \$7 million (USD) per year. Kava is the second export crop in value (\$4.5 million USD in 2004), after copra (dried coconut meat) but larger than cattle meat and cocoa (*Theobroma cacao* L., Sterculiaceae). Kava is providing higher returns of investment than other cash crops. Since the ban of sales in Europe in 2001, the present market consists essen-

tially of the countries within the region, including Fiji and New Caledonia. A part of the crop is still exported to the United States for use in herbal dietary supplements, and recently the Chinese market also showed interest in kava.

With the kava market slowly recovering, and the sources focused on few hot spots, the question of kava quality must be discussed. In fact, there are very distinct differences in kava quality, which may also contribute to the debate on kava safety.

The pharmacological properties of kava have been demonstrated to result from the kavalactone content and the chemotype (plants of the same species with genetically defined phytochemical characteristics).^{1,2}

Six major kavalactones account for approximately 96% of the lipid soluble extract. They have been shown to be pharmacologically effective. There are, however, qualitative and quantitative differences in their mode of action. With respect to kavain, one of these kavalactones, the greater the kavain content, the more agreeable the kava effect is generally felt. A clear correlation

appears between traditional use and chemotype: kava types favored for daily drinking in the South Pacific are generally chemotypes rich in kavain.¹ Correspondingly, changes in batch-to-batch reproducibility of kava effects can also be expected with kava extracts in drugs and supplements not standardized to a constant kavalactone composition, especially when the exact origin of the herbal raw material is unknown to Western companies.

The 6 major kavalactones are used to define a particular kava chemotype.¹ The kavalactones have been assigned numbers according to the sequence of elution from analyses by HPLC (high-performance liquid chromatography): 1= desmethoxy-yangonin, DMY; 2= dihydrokavain, DHK; 3= yangonin, Y; 4= kavain, K; 5= dihydromethysticin, DHM; and 6= methysticin, M. Chemotypes can be identified by listing the numbers of the corresponding kavalactones in decreasing order of their proportion in the sample. This method of chemotype coding allows the indication of a "signature" of the raw material and the comparison between kavalactone composition and effect experienced on ingestion.

Western wholesalers and buyers of herbal raw material are mostly unaware of the complex factors influencing kava quality.

Kava *Piper methysticum* Photo ©2006 stevenfoster.com

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As a sterile plant, kava reproduces by vegetative propagation. The kavalactone composition is genetically defined.³ Different cultivars planted on the same field and on the same day will reflect the kavalactone composition of the mother plant. The same is observed for cultivars planted in locations other than their original site. There is significant cultivar variation within and between islands for kavalactone content and composition. Correspondingly, the selection of favored kava cultivars was a result of traditional experience and replanting kava cultivars with the most agreeable effect.

Kavalactone content and internal composition also vary according to the part of the plant. These differences are independent of the age of the plant. The total kavalactone concentration is highest in the roots and stumps, and progressively decreases towards the aerial portions of the plant. The kavalactone signature may vary between roots, stumps, and basal stems, and these differences are maintained while the plant is aging. Thus, not only the selection of the cultivar, but also of the plant part and the geographical site of cultivation are major factors contributing to kava quality control.

Consumption of kava is nowadays common nearly everywhere in Vanuatu. In contrast to kava use in the Fijian islands, where kava is prepared from dried and pounded material, kava drinkers in the Vanuatu archipelago have preferred the consumption of fresh kava. Further local differences refer to the method of kava beverage preparation, e.g., the way it is diluted and filtered. Numerous chemotypes have been selected for diverse uses. Kava can be ingested for medicinal reasons, to treat particular symptoms, or for daily consumption as a recreational beverage. Some varieties are famous for the very subtle pharmacological effect they produce.¹

The local definition of kava quality in the South Pacific communities reflects distinct cultural backgrounds. It can refer to a sudden feeling of being "high" or to a very gentle relaxing effect; the beverage can have a very bitter taste or a slightly spicy flavor.

In conclusion, the quality of kava depends on 5 major conditions and on their complex combination:

1. Chemotype and thus the internal proportions of the major kavalactones;
2. Total kavalactone content and thus overall kavalactone quantity;
3. Plant part used for kava preparation;

4. Method of preparation and dilution; and

5. Use of fresh or dry plant material.

The local preferences for a given chemotype are influenced by the expectations of individual kava drinkers. Different communities may be looking for different pharmacological effects in traditional kava drinking and thus are very aware of quality differences. Sometimes an intoxicating effect is specifically looked for, whereas other users want to produce a state of happy unconcern and contentment, and facilitate conversation while staying fully alert (although this is not the intended purpose of kava-based supplements). However, with excessive quantities and especially with chemotypes too rich in DHM and DHK, drinkers can suffer from photophobia (light sensitivity), diplopia (double vision), and finally, nausea. They feel the urge to sleep; sometimes they can be found stretched out right at the place where they have drunk the kava.

For local use in kava drinking, various kava cultivars are never mixed. Likewise, ground powders from various parts of the plant (roots, stumps, and/or basal stems) were never traditionally mixed together. In fact, they represent different quality grades and are sold at different prices reflecting their total kavalactone content, the roots being more expensive than pieces of stumps and basal stems. The stumps are occasionally peeled to remove the bark rich in tannins and polyphenols responsible for the bitter taste.

From a phytochemical point of view, fresh and dry kava are also very different. The chemical composition of the fresh juice is much more complex than the composition of the dry powder, as numerous acidic, volatile or enzymatic compounds are lost during the drying process. Obviously, there are more components than just the kavalactones contributing to the overall effect. For a given cultivar, 2 very different brews can be prepared using dried or fresh roots of the same plant.

The subtle combination of parameters, factors, and conditions necessary to achieve a defined quality results in different local brews, similar to vintages of fine wines. The quality of kava could therefore be regulated by the use of geographical indicators to develop a quality system similar to the French "appellation d'origine" known for wine. This system could include the use of indicators relating to a specific village, island, or country, when the morphotypes (plant

types of the same species sharing the same shape features, but not necessarily the same phytochemical characteristics) and/or chemotypes are closely related to a particular geographical area.

The possibility of the use of unacceptable kava material should at least be taken into account when addressing the alleged case reports of liver toxicity. Western wholesalers and buyers of herbal raw material are mostly unaware of the complex factors influencing kava quality. The usual parameter here is kavalactone content only, regardless of kavalactone signature or traditional experience. Kava is exported as biomass (roots, stump, stem, and/or peelings), and the price of the raw material correlates with kavalactone quantity, not quality. This system is clearly inadequate for kava and leads to abuses and negative effects on the trade. Stem peelings are traditionally considered as by-products and may contain pipermethystine, an alkaloid known to be toxic to liver cells when applied in vitro.⁴ (However, the possible clinical significance, if any, of this finding is not yet determined; no pipermethystine was found in German-produced kava products and roots/peelings of noble kava and tudei-kava.)

Alkaloids in *P. methysticum* are found only in plant parts exposed to sunlight. This kind of plant material was never used traditionally by South Pacific communities unless thoroughly peeled—but is exported to Western wholesalers as “kava.” The former tremendous increase in kava trading led to the search for lower cost sources of raw kava material to satisfy demand, although that demand has obviously dropped considerably in recent years since the bans on kava in several countries. Kava growing is slow, with an average maturing time of 4-5 years prior to harvesting. Some farmers tend to respond to the market demands by planting fast-growing, robust, early-maturing varieties with high kavalactone contents to satisfy biomass buyers. Unfortunately, these chemotypes are not suitable for kava drinking because of potentially unpleasant and adverse effects. After the closure of the kava markets in Europe, this kind of raw material is now locally traded within the South Pacific. Already, local consumers are expressing their complaints about bad kava quality throughout the South Pacific region. There is also the possibility that the most recent case reports of liver adverse events from New Caledonia are related to this kind of unacceptable quality “kava.”⁵ HG

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Kava *Piper methysticum* Photo ©2006 stevenfoster.com

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Tibetan Herbal Medicine

Traditional Classification and Utilization of Natural Products in Tibetan *Materia Medica*

by Alessandro Boesi, PhD, and Francesca Cardi, PhD

The Project

Several studies on Tibetan civilization have been carried out up to now, yet some aspects of Tibetan traditional knowledge are still not well-known, such as the way local people conceive the environment, plants, and animals, and the way of practicing Tibetan medicine and exploiting medicinal substances. Previous research on Tibetan medicine has mainly provided information on theoretical aspects. Only recently have some scholars started to document the ongoing transformations of this science.^{1,2,3,4,5}

Between 1998 and 2004, a research project on Tibetan ethnobiology and pharmacopeia of traditional medicine was carried out by the authors in the context of a doctoral program in Biological Anthropology. The aim of the research was to study plant conception, classification, and exploitation among Tibetan populations, as well as to assess the Tibetan *materia medica* and medical practice, from the gathering of medicinal substances to the processing and administration of medicaments. Particular attention has been given to the evaluation of the knowledge of traditional doctors and to the contemporary evolutions of medical activities in Tibetan regions.

This study is interdisciplinary, involving several specialties such as anthropology, botany, ethnobotany, and tibetology. To obtain exhaustive information, the fieldwork was carried out for a period of 16 months in collaboration with traditional doctors of different educational levels who were located in different Tibetan regions: east Tibet (Litang County, Sichuan, China), Ladakh (India), and different areas of Nepal (Dhorpatan and Baragaon). The following anthropological methods were the most commonly used during the investigation: participant observation, open-ended conversations, and to a lesser extent, semi-structured interviews.

Excerpts of classical texts of Tibetan medicine^{6,7,8} and of some traditional and modern treatises of Tibetan *materia medica*^{9,10} were translated to analyze medicinal plant conception, classification, and identification systems. Comparisons with the field data were made. Plant and mineral specimens (approximately 350) were gathered and identified, their traditional classification and use documented. Medicinal plants were deposited at the Herbarium of the Muséum National d'Histoire Naturelle de Paris, France, and mineral samples were deposited at the Museo di Storia Naturale di Milano, Italy.



A medicament formula before the crushing, Dhorpatan Tibetan settlement (Central Nepal), June 1998. Photo 2006 ©Alessandro Boesi.



Potala Palace of Lhasa, Tibet, first erected in the seventh century, then reconstructed to its present state in 1645 under the reign of the fifth Dalai Lama. The palace has served as a residence for Dalai Lamas and the seat of Tibetan government. Photo © Qiangba Danzhen - FOTOLIA

Field data have shown that the traditional doctor's individual knowledge is crucial, influencing classification, identification, and use of the *materia medica*, and that the recent political, demographic, and socio-economic transformations of Tibetan societies directly affect medical knowledge and practice.¹¹ At the popular level, traditional botanical knowledge is unevenly spread according to profession and education and is rapidly disappearing.¹² Some of the research findings on the classification and identification of the *materia medica* are reported in this article.

Tibetan Medicine

Tibetan medicine is practiced over a vast area, which covers all the regions inhabited by populations of Tibetan language and culture, as well as other areas: the northern states of India (Jammu & Kashmir, Himachal Pradesh, West Bengal, and Sikkim), Bhutan, a large part of the northern regions of Nepal, and the Chinese Provinces of Tibet (Xizang), Qinghai, Gansu, Sichuan and Yunnan. It is also practiced in Mongolia, Buryat (Russia), and many other countries where Tibetans have settled.

The medical system is the result of the blending of different medical traditions and practices that come from the most important Asian medical sciences: Ayurveda, traditional Chinese medicine, and the middle-east tradition. These kinds of medical knowledge, introduced into Tibet from the 7th century onwards, were superimposed and integrated with the pre-existing medical tradition of Tibetan regions, which at first were probably scarcely developed and gave particular weight to magic and religious rituals. Gradually, a distinct system of medical theories and practices developed, rational and homogeneous, which gave origin to a new medical science, Tibetan medicine, completely independent from the traditions which had influenced its evolution. That entire various medical learning was gathered,

At the popular level, traditional botanical knowledge is unevenly spread according to profession and education and is rapidly disappearing.

probably between the 8th and the 12th centuries, in a text composed of 4 volumes, *The Four Tantras* (*Gyushi, rGyud bzhi*),⁶ nowadays still the fundamental reference for all students and practitioners of Tibetan medicine along with its famous commentary *The Blue Beryl* (*Vaidurya sngon po*),⁷ produced in the 17th century by the Regent Sangye Gyatso (1653-1705).¹³ Tibetan medicine is currently practiced in several forms such as private clinics, medical institutes, and dispensaries. It is taught at medical schools or transmitted by masters through a lineage of disciples and family lineages.

It is worth noting that, although practitioners employ the same Tibetan classical and modern texts devoted to

theory and practice, Tibetan medicine is a complex and heterogeneous system of thought whose presentation and practice is not standardized and uniform. Our field-work has shown that the way to practice this medical tradition is subject to variations according to several factors, e.g., environmental conditions, family medical lineages, local traditions, medical

schools, medical centers, the influence of religious institutions, and foreign influences both from other medical traditions and from modern western medicine.

Tibetan Materia Medica

According to the Tibetan “science of healing,” *sowa rigpa* (*gso ba rig pa*), medicinal substances, along with diet, behavioral rules, and external treatments, represent a means to eliminate sickness and re-establish the humoral balance of the body. In Tibetan medicine, most medicinal agents are not used separately, but are mixed and processed into complex medicines. Ingredients are chosen according to their individual therapeutic properties and to their capacity of performing a coordinate and synergetic action.

Tibetan *materia medica*, influenced mainly by Ayurveda after the translation of several treatises of Indian origin, has been enriched and modified during the centuries according to the needs of the Tibetan population and has been adapted to local environmental conditions. Even during the present time, in relation to recent transformations of the society and environmental changes, the *materia medica* is evolving.¹⁴

The most important traditional pharmacopeias employed today are the *Crystal Block* (*Shel gong*) and the complementary text of it, the *Crystal Rosary* (*Shel phreng*),⁸ both written in the first half of the 18th century. The general texts of Tibetan medicine, *The Four Tantras* and *The Blue Beryl*, also have a section devoted to describing the potency (*nus pa*) of medicinal substances. Although the above texts usually play a basic role in the education of doctors, our research has shown that oral information is crucial, in particular as far as practical activities and the use of medicinal substances are concerned.

Medicinal substances, *man dza* (*sman rdzas*), include drugs of plant, mineral, and animal origin. They are gathered directly on the Tibetan plateau or are imported

from the lower regions of India, Nepal, and China. Several medicinal plants grow in tropical and sub-tropical regions. Nowadays, these substances are available on local markets. The gathering of plants may be influenced by their availability and other factors, and practitioners organize them according to specific rules and timings. Medicinal substances may be classified on the basis of different criteria, e.g., their “hot” or “cold” properties, other therapeutic properties, as well as morphological, biological, and environmental features. One of the most common classifications of the *materia medica* reported by the informants (and also described in medical texts) points out the 9 categories shown in Table 1.

Medicinal substances may be assembled according to various criteria. The category of the woody medicines is worked out on the basis of the presence of woody organs. The categories of herbaceous medicines and medicines of the plains are worked out on the basis of several criteria: morphological, biological, and environmental. A single criterion, the healing properties of the medicines, is employed for the category of essence medicines. We emphasize that regarding the category of precious medicines, its construction is also inspired by religious beliefs.

Medicinal substances are commonly named according to Tibetan standard designations that are also reported in written sources, but practitioners may use regional names and synonyms. Several substances are designated with names of Sanskrit origin, in particular the ones imported from India and Nepal, which are also employed in Ayurvedic medicine.

Categories of Tibetan Materia Medica

Precious medicines include precious and semiprecious stones, such as emerald, diamond, and lapis lazuli; metals (gold, silver, iron); and mineral substances of animal origin such as coral, pearls, and conches. These substances are considered doubly precious according to their economic value and to their symbolic and religious importance, since Buddhism and medicine are inter-related. Although Tibetan doctors affirm that every element of the *materia medica* is equally important in the preparation of remedies, this category of medicines is generally considered to be very powerful. In fact, a type of medicament named Precious Pill, the therapeutic effect of which is particularly renowned, is mainly composed of substances that are included in this special category.

Table 1: Categories of Tibetan Materia Medica	
Medicinal Substances	Tibetan Names
precious medicines	rin po che'i sman
stone medicines	rdo'i sman
earth medicines (soils)	sa'i sman
salt medicines	tshwa sman
essence medicines	rtsi sman
woody medicines	shing sman
medicines of the plains	thang sman
herbaceous medicines	sngo sman
medicines coming from living beings	srog chags sman

The category of stone medicines includes several kinds of minerals, e.g., calcium carbonate, pyrite, and magnetite. Earth medicines and salt medicines are small categories: drugs such as *Vermiculitum* are included in the former, and sulphur in the latter. Both categories present a similar internal division in 2 sub-groups: natural (*rang byung ba*) and artificial (*bcos pa*).

The categories of stones and earths mentioned above include only elements of mineral origin, except one. Curiously, practitioners consider a particular lichen as an herbaceous plant, i.e., the one designated *dodreg* (*rdo dreg*, *Parmelia* spp., Parmeliaceae); the Tibetan name means “incrusted on the stone.” However, the majority of practitioners put this lichen in the group of medicinal stones because it appears to be growing directly on the rocks, while others place it among the medicinal earths category.

The category of essence medicines includes drugs apparently very dissimilar coming from plants, minerals, and animals, e.g., camphor (*ga bur*, *Cinammomum camphora* [L.] Nees & Eberm., Lauraceae), cardamom (*sug smel*, *Elettaria cardamomum* Maton, Zingiberaceae), saffron (*gur gum*, *Crocus sativus* L., Liliaceae), musk, bear bile, and bitumen. Why do Tibetan doctors classify them together? According to practitioners, the main characteristics they share are their strong potency and their particular fragrance. Due to this strength of potency and fragrance, they are employed in small amounts.

The woody medicines, the medicines of the plains, and the herbaceous medicines include only drugs of plant origin. The woody medicines include drugs coming from trees and shrubs. Among the few of them gathered directly on the Tibetan plateau, the most common are *shug pa* (*Juniperus* spp., *Cupressus* spp., *Platycladus orientalis* (L.) Franco, Cupressaceae); *dali* (*da lis*, *Rhododendron* spp., Ericaceae); and several types of honeysuckle such as *kishin* (*khnyi shing*, *Lonicera tibetica* Bur. & Franch., Caprifoliaceae) and *tarbu* (*star bu*, commonly called sea buckthorn in the West, *Hippophae* spp., Elaeagnaceae). Many come from tropical and sub-tropical regions, such as the Indian sandalwood *tsendenmarpo* (*tsan dan dmar po*, *Pterocarpus santalinus* L. Papilionaceae), different types of myrobalam (*a ru ra*, *Terminalia chebula* Retz., Combretaceae), and *ba ru ra* (*T. bellerica* C.B. Clarke, Combretaceae). The category is structured in 7 sub-groups; they correspond to the anatomical parts of plants used in medicine: seeds and fruits, flowers, leaves, stems, branches, barks, and resins.

The following 2 categories, medicines of the plains and herbaceous medicines, have a similar internal organization. While some informants report this classification, many of them do not differentiate the 2 groups, recognizing only a single category designated *tsa man* (*rtswa sman*, “herbaceous medicines”). Others, influenced by modern texts, name it by joining the 2 terms *sngo* (herbaceous) and *thang* (plains). However, many informants throughout different Tibetan regions affirm that the distinction of these 2 groups has no practical utility. The majority of the informants have little or no knowledge of the 2 categories or of the features that differentiate them. They generally report that the medicines of the plains grow in the area of the Tibetan plateau at lower and medium altitudes and that herbaceous medicines grow on high mountains.

In Tibetan traditional medicine, the term *thang sman* has 2 distinct meanings and utilizations. It is employed either to indicate the category of medicinal plants, as reported above, or to designate a kind of medicinal preparation, notably decoctions. In the first case the meaning of *thang* is “flat area”; in the second case it is “soup.” It



ug chos dmar po (pronounced: ugchö marpo) *Incarvillea grandiflora*. Xiangcheng County (Sichuan, China), 4120 meters altitude, May 1999. Photo 2006 © Alessandro Boesi.

comes from the Chinese language and particularly from the *thang* preparation employed in Chinese medicine. Several Tibetan informants mistakenly report that the term *thang sman* only designates medicinal plants that are used to prepare decoctions.

Detailed descriptions of the botanical characteristics of the plants included in the 2 categories are seldom reported. In this case, they correspond nearly to the ones reported in traditional texts such as the *Crystal Rosary*. The informants affirm that the medicines of the plains may be bulky herbaceous or sometimes tiny woody plants, whose stems and roots are more developed than those of the herbaceous medicines, such as *pashaka* (*ba sha ka*, *Adhatoda vasica* Nees, Acanthaceae), *thangdromnagpo* (*thang phrom nag po*, *Anisodus tanguticus* Pasher, Solanaceae), and *chum* (*lcum*, *Rheum palmatum* L., Polygonaceae). Conversely, plants belonging to the herbaceous medicines have an herbaceous aspect, with a slender stem and tiny underground organs such as *ugchö marpo* (*ug chos dmar po*, *Incarvillea grandiflora* Bur. Et Franch., Bignoniaceae) (see photo this page) and *tser nön* (*tsher ngon*, *Meconopsis horridula* Hook. F. & Thoms., Papaveraceae).

The last category reported by the informants is the one of medicinal substances coming from living beings. It includes substances that belong to the animal kingdom. Hence, the medicinal substances previously described, plants included, are not considered as living beings. Tibetans regard as living beings only the substances that have a conscious principle (*sems*).

Identification is complete only when specific features evaluated for each plant correspond to the ones known by the doctor, on the basis of his/her experience and education, and to the ones described in the treatises of Tibetan *materia medica*. Only then can the plant be gathered and employed in medicine.

Drugs are listed by anatomical parts and organs and are divided into numerous sub-groups such as horns, eyes, tongues, teeth, hearts, and lungs. Some insects and other small invertebrates may be included in another subgroup. The same living being may be repeatedly listed according to its different anatomical parts; for example, the stag, which appears both in the horn and in the blood sections. Although many substances of animal

origin are included in the *materia medica*, Tibetan doctors do not frequently use them. Some possible reasons are their rarity, high cost, and the recent promulgation of regulations protecting the fauna.

The Identification of Medicinal Plants

Owing to the great extension of the area over which Tibetan medicine is practiced, the *materia medica* shows differences according to the region, climate and vegetation, local traditions, the activities of medical institutes, and foreign influences. All these factors may influence plant identification. Hence, different plants (i.e., from different genera and species from the botanical perspective) may be designated by the same Tibetan name.

The ability to accurately identify medicinal plants can be acquired only after several years of study and practice with the guidance of a learned master. It involves not only the identification of plants from their morphological features and the recognition of the subtle differences between plant varieties, but also the ability of evaluating their therapeutic properties through the analysis of various plant and environmental features.

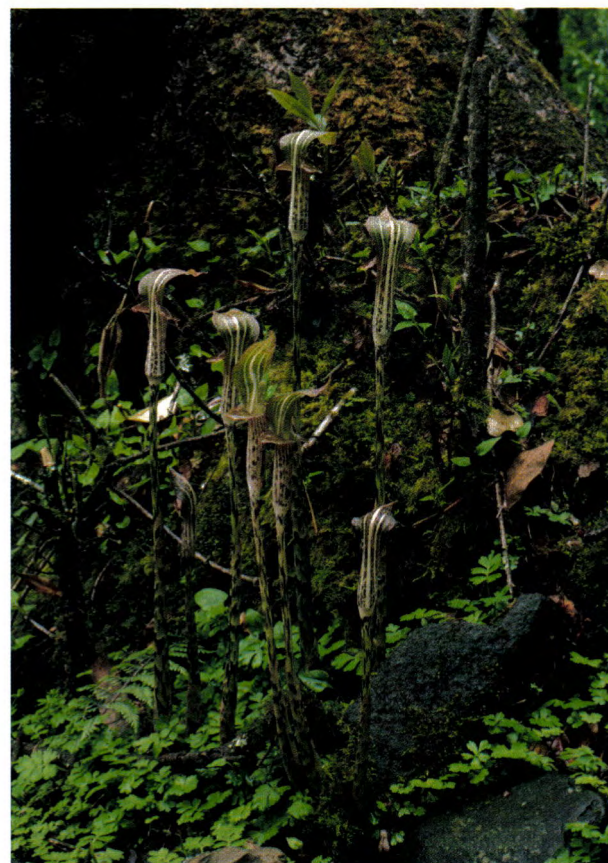
Two systems may be distinguished in the identification process employed by Tibetan practitioners: “prototypical” and “componential-conceptual.”^{15,16} The former allows the practitioner to recognize the plant and to attribute a name to it after the observation of its general features, employing an ideal model, which evokes and supports the botanical nomenclature. The latter is based on the evaluation of the presence of one or several characteristics, which represent the necessary condition to recognize the plant. Thus, this identification process implies the attentive analysis of specific features of the plant.

Many Tibetan doctors examine the general aspect of a plant without considering its minute features, and recognize it almost instantaneously, as in the case of *rechagpa* (*re lcag pa*, *Stellera chamaejasme* L., Thymelaeaceae) and *dawa* (*dwa ba*, *Arisaema nepenthoides* [Wallich] Martius ex Schott, Araceae) (see photo this page). The practitioner

bears in his/her mind one ideal model, which allows the immediate recognition of all the plants included in the same class. This model, based on his/her experience and region of origin, usually constitutes the most typical specimen of the category. Yet, in Tibetan medicine, the “prototypical” system seldom allows the precise recognition of medicinal plants, representing only the first stage of the identification process, i.e., the examination of the plant’s general aspect. Actually, the “componential-conceptual” identification system is essential to recognize and exactly designate medicinal plants. Identification is complete only when specific features evaluated for each plant correspond to the ones known by the doctor, on the basis of his/her experience and education, and to the ones described in the treatises of Tibetan *materia medica*. Only then can the plant be gathered and employed in medicine. A practitioner’s experience and education, along with text information, represent concurrent aspects of this task. Morphological features, taste, scent, and the environment where the plant grows—the most important plant characteristics examined—are analyzed below.

Morphological features

To describe the importance of the analysis of minute morphological features in plant identification, we take as an example 2 categories of medicinal plants: *lug ru* (*lug ru*, sheep’s horn, *Pedicularis* spp., Scrophulariaceae) and *lang na* (*glang sna*, elephant’s trunk, *Pedicularis* spp.). *Pedicularis* (lousewort) is a genus of semi-parasitic plants, often conspicuous in the alpine zone all over the Tibetan



dwa ba (pronounced: da wa) *Arisaema nepenthoides*. Dhorpatan (Central Nepal), 3120 meters altitude, May 1998. Photo ©2006 Alessandro Boesi.



One of the areas where the research fieldwork was carried out. The so-called Gomba easternmost camp of the Nordzinling Tibetan settlement of Dhorpatan Baglung District (Central Nepal), 2900 meters altitude, April 1995. Photo ©2006 Alessandro Boesi.

plateau and the Himalayan Mountains. According to the recent *Flora of China*,¹⁷ among the 352 species of *Pedicularis* present in China, 271 are endemic, and many thrive on the Tibetan plateau. The flower of the lousewort has a corolla, which is two-lipped. The upper lip is hooded and often prolonged into a beak, which may be slightly circular or trunk-shaped.

Tibetan practitioners of Litang County (East Tibet) and other Tibetan areas identify louseworts in the following manner. After a rapid evaluation of the general aspect of the plant, they attentively examine the morphology of the flower and in particular its beak, which may be called horn or nose, according to its shape. When the beak is slightly circular, it is called horn, and the plant is identified as *lug ru*. In this case, the beak of the flower is associated with the horn of a sheep. When the beak of the flower doesn't bend on one side, but it bends directly forward, looking like an elephant's trunk, the plant is called *lang na*, meaning "elephant's trunk." The plants included in the group called *lug ru* are mainly identified according to the color of their flowers (and to the features of the environment of growth), while the ones belonging to *lang na* are identified according to flower size and position, and leaf position.

Sometimes, the morphological identification parameters of the same plant may vary as in this example concerning the identification of *cha rkan* (*bya rkang*). The specimens of this plant that we gathered in Tibetan regions belong to the genus *Delphinium*: *Delphinium cashmerianum* Royle, Ranunculaceae in Ladakh; *D. caeruleum* in the Litang County (Sichuan, China); and *D. grandiflorum* L. in Baragaon. According to the majority of practitioners and texts,⁸ the flower of the *cha rkan* must be similar to the head of the hoopoe (*Upupa epops*), and they affirm that one of the *Delphinium* exhibits that characteristic. Conversely, a traditional doctor from Khyungbo, a region located in East Tibet, names *cha rkan* as a totally different plant, which has been identified by us as a fern (*Pteridium aquilinum* [L.] Kuhn var. *wightianum* (J. Agardh) Tryon, Dennstaedtiaceae). That practitioner refers directly to the plant name *cha rkan*, meaning "bird's feet," for the identification. Actually, he showed us that the not-fully-opened buds of that fern have a striking similarity to bird feet and constitute the element, which allows him to identify the plant as *cha rkan*.¹⁸

Taste

An important plant feature, which has to be carefully examined, is its taste (*ro*), because taste allows the practitioner to both recognize the plant and to assess its potency. In Tibetan medicine the 6 tastes (sweet, acid, salty, bitter, hot, astringent) are considered curative properties. They are produced by the dominant 2 of the 5 elements (the fundamental constituents of matter) of which each plant is formed. The 5 elements are the fundamental constituents of all substances and are responsible for all their features and qualities. Thus, most practitioners, as in the case of *dzinpa dadrel* ('*dzin pa zla bral*, *Aconitum gymnantrum* Maxim, Ranunculaceae), after observing plant morphology, crush with the teeth a portion of the plant and keep it for a while on the tongue (see photo on cover page). The taste has to correspond to the one indicated in the texts for that plant or according to the experience of the doctor.

In Tibetan medicine, examining the environment where the plant grows is crucial because it affects its potency: the hot power of the sun prevails on the sunny slopes, whereas the cold power of the moon prevails on the shady ones. In the same way, the altitude influences the cold nature or the hot nature of the plant, increasing or decreasing its potency.

Scent

A situation which took place on the field in East Tibet confirms the importance of the evaluation of scent for the identification of medicinal plants. We showed a Tibetan doctor a specimen of *Nardostachys grandiflora* DC., Valerianaceae that had been gathered a few hours previously on the mountains. The doctor, after examining the morphological features and taste of that specimen, identified it as *pang pö* (*spang spos*)—the Tibetan name of the plant mentioned above as *N. grandiflora*—but after evaluating the scent of its

underground part, changed his mind, because the scent did not correspond to the one proper to that plant. Therefore, he concluded that, as concerned the morphology and the taste, that plant was very similar to *pang pö*, but as to its scent, it was different. Hence, that plant could not be identified as *pang pö* and could not be used in medicine. After a few days, we climbed with the same informant to the place where we had gathered that plant. This time the practitioner, after analyzing the scent of a fresh specimen, identified it as *pang pö*. All the above is to demonstrate that without its scent this plant can't be exactly identified. We note that plant potency (i.e., as a medicine) may also be ascertained through the evaluation of its fragrance, which is also dependent upon the 5 elements: certain plants without their proper fragrance cannot be employed as medicines, since they would be deemed to be lacking in therapeutic properties.

Table 2: Traditional Tibetan Medicinal Plants Mentioned in this Article

Species	Family	Tibetan name
<i>Parmelia</i> spp.	Parmeliaceae	<i>rdo dreg</i>
<i>Platycladus orientalis</i> (L.) Franco	Cupressaceae	<i>shug pa</i>
<i>Juniperus</i> spp.	Cupressaceae	<i>shug pa</i>
<i>Cupressus</i> spp.	Cupressaceae	<i>shug pa</i>
<i>Elettaria cardamomum</i> Maton	Zingiberaceae	<i>sug smel</i>
<i>Crocus sativus</i> L.	Liliaceae	<i>gur gum</i>
<i>Cinammomum camphora</i> (L.) Nees & Eberm.	Lauraceae	<i>ga bur</i>
<i>Rhododendron</i> spp.	Ericaceae	<i>da lis</i>
<i>Lonicera thibetica</i> Bur. & Franch.	Caprifoliaceae	<i>khyi shing</i>
<i>Hippophae</i> spp.	Elaeagnaceae	<i>star bu</i>
<i>Pterocarpus santalinus</i> L.	Papilionaceae	<i>tsan dan dmar po</i>
<i>Terminalia chebula</i> Retz.	Combretaceae	<i>a ru ra</i>
<i>Terminalia bellerica</i> C.B. Clarke	Combretaceae	<i>ba ru ra</i>
<i>Anisodus tanguticus</i> Pasher	Solanaceae	<i>thang khrom nag po</i>
<i>Rheum palmatum</i> L.	Polygonaceae	<i>lcum</i>
<i>Adhatoda vasica</i> Nees	Acanthaceae	<i>ba sha ka</i>
<i>Incarvillea grandiflora</i> Bur. Et Franch.	Bignoniaceae	<i>ug chos dmar po</i>
<i>Meconopsis horridula</i> Hook. F. & Thoms.	Papaveraceae	<i>a byag tsher sngon</i>
<i>Arisaema nepenthoides</i> (Wallich) Martius ex Schott	Araceae	<i>dwa ba</i>
<i>Stellera chamaejasme</i> L.	Thymelaeaceae	<i>re lcag pa</i>
<i>Pedicularis</i> spp.	Scrophulariaceae	<i>lug ru</i>
<i>Pedicularis</i> spp.	Scrophulariaceae	<i>glang sna</i>
<i>Delphinium cashmerianum</i> Royle	Ranunculaceae	<i>bya rkang</i>
<i>Delphinium caeruleum</i>	Ranunculaceae	<i>bya rkang</i>
<i>Delphinium grandiflorum</i> L.	Ranunculaceae	<i>bya rkang</i>
<i>Pteridium aquilinum</i> (L.) Kuhn var. <i>wightianum</i> (J. Agardh) Tryon	Dennstaedtiaceae	<i>bya rkang</i>
<i>Aconitum gymnantrum</i> Maxim.	Ranunculaceae	<i>'dzin pa zla bral</i>
<i>Nardostachys grandiflora</i> DC.	Valerianaceae	<i>spang spos</i>
<i>Aconitum violaceum</i> Jacquem. ex Stapf.	Ranunculaceae	<i>bong nga nag po</i>

Environment

In the identification process, the observation of the environment where the plant grows is important, because it allows the practitioners to make a selection. Certain plants thrive only in particular ecological settings. The distinction between the shady side (*srib*) and the sunny side (*nyin*) of the mountains is fundamental. In fact, in the Tibetan perception of the environment in general and, in particular, in plant identification, that differentiation is a crucial factor because it denotes different growing areas, each one with specific characteristics, where only particular plants can grow.

Furthermore, in Tibetan medicine, examining the environment where the plant grows is crucial because it affects its potency: the hot power of the sun prevails on the sunny slopes, whereas the cold power of the moon prevails on the shady ones. In the same way, the altitude influences the cold nature or the hot nature of the plant, increasing or decreasing its potency. That is the case of a plant with a cold potency such as the *bon na nagpo* (*bong nga nag po*, *Aconitum violaceum* Jacquem. ex Stapf., Ranunculaceae).^{12,18} The informants do not pluck the individuals growing on the sunny side of the mountains because the hot nature of the sun dissipates their cold potency. On the contrary, the ones that grow in the highest places of the shady slopes are the most appreciated because the cold power of the spot is very strong. There are also plants whose properties are not particularly influenced by environmental features such as the *tsernön* (*Meconopsis horridula* Hook. F. & Thoms., Papaveraceae) (see photo this page), a type of Himalayan blue poppy. Interestingly, the doctor may decide to pluck the same plant in a different site according to the therapeutic properties required.

The role of literary sources in the identification process

Many traditional^{6,7,8} and modern texts^{9,10} describe and illustrate the *materia medica* of Tibetan medicine. They give general information about plant categories and very concise descriptions of plant morphology and of their environment of growth. The authors often use comparisons with other plants or metaphors, which describe the plant organ, using an animal or its organ as a model of similarity. These descriptions certainly cannot be employed to carry out the identification *a priori*, because they imply subjective interpretations. Actually, plant identification is not carried out employing these texts, but on the basis of the individual experience of the practitioner.

These treatises are used by practitioners who are already able to recognize medicinal plants and may use the information to distinguish the different varieties of a single plant. This may be very important because each type of plant often has distinct healing properties or a distinct technique of use. In this way written information in Tibetan texts and the oral information received by the teachers allow the practitioner to recognize the plant. The modern treatises of Tibetan *materia medica* published in Chinese Tibet in the last decades have been spreading increasingly all over Tibetan regions. We noticed the rapid diffusion all over Tibetan cultural regions of a recent text of Tibetan pharmacopeia,⁹ which also presents numerous

illustrations of plants and other medicinal substances. During gathering trips or at drug markets, many doctors employ it to identify plants using the illustrations.



a byag tsher sngon (pronounced: a ciag tser nön) *Meconopsis horridula*. Litang County (Sichuan, China), 3920 meters altitude, June 2000. Photo ©2006 Alessandro Boesi.

Conclusion

The knowledge of the *materia medica* is moderately diffused throughout Tibetan regions, and the disparity of competence among practitioners is significant. Modern generations of practitioners are principally skilled in the diagnosis and administration of the remedies. Only a limited number of highly educated and well-experienced Tibetan doctors have a deep knowledge of medicinal plant classification and identification criteria. One of the reasons explaining that phenomenon may be related to a recent trend, which is becoming increasingly important in the last decades—the recent standardization and industrialization of drug processing in Tibetan medical institutes, and the specialization of practitioners.¹¹

Medicinal substances are similarly conceived in the regions studied. Traditional doctors seem to attribute little importance to their classification in categories (as shown in Table 1) and prefer distinguishing drugs on the basis of their qualities and therapeutic properties.

A general tendency consists in simplifying the traditional classification according to practical evaluations. The same happens with modern Tibetan pharmacopeias (edited in Chinese Tibet), some of which may also include additional substances, probably under Chinese influence, that do not appear in classical Tibetan treatises.

As far as the identification of medicinal plants is concerned, it is not only based on the analysis of the morphology of the plant, but also takes into account other properties such as its taste and smell, and the features of the environment where it grows. Taste, smell, and environment are important features, which are employed both to recognize the plant and to assess its healing properties and quality at the same time.



thang khrom nag po (pronounced: tan drom nag po) *Anisodus tanguticus*. Litang County (Sichuan, China), 3930 meters altitude, July 1999. Photo ©2006 Alessandro Boesi.

Although based on the same medical texts, the knowledge related to the many substances of mineral, animal, and plant origin of the Tibetan pharmacopeia may vary according to the region, climate and vegetation, medical schools, local traditions, and foreign influences. Owing to the socio-economic, cultural, and political transformations of Tibetan societies, and to the standardization of medical knowledge and practice, it is important to document this unique local knowledge that may disappear in the near future. HG

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chu skyur (pronounced: ciu ghiur) *Rheum alexandrae*. Litang County (Sichuan, China), 4100 meters altitude, July 2000. Photo ©2006 Alessandro Boesi.

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Tibetan Medicinal Plant Conservation Airs on NPR's *Morning Edition*

On February 21, 2006, NPR's *Morning Edition* teamed with a National Geographic Radio Expedition to China to describe the work of Jan Salick, PhD, an ethnobotanist from the Missouri Botanical Garden. Dr. Salick is partnering with the Chinese Institute of Botany to study the problem of over-harvesting of mountain vegetation. The Chinese government hopes to develop a profitable pharmaceutical industry in the Yunnan province, but with a firm commitment to conservation to protect the source of potential new medicines. Many of these medicinal plants are threatened both by global warming and by increasing global demand. Fortunately, conservation is a value already built into the Tibetan culture. Because plants are considered to be both medicinal and spiritual, large "sacred" sites are left untouched by modern life. Dr. Salick has found that useful, endemic plant species are much more common in these sacred sites than in surrounding ones. Traditional Tibetan doctors travel high into the mountains to collect medicinal plants for their patients. This local use does not affect plant populations significantly, according to the NPR story. But the revival of Tibetan culture in China and the renewed interest in traditional medicine have created a growing international demand for these medicinal plants. More than half the species, nearly 6000 plants in the Yunnan province, are used for medicinal purposes and an estimated 4 billion people worldwide are buying them. HG

—Nancy Dennis

Source

Arnold E. Sacred Protection for Medicinal Plants [transcript]. NPR Morning Edition. February 21, 2006. Available in audio at: <http://www.npr.org/templates/story/story.php?storyId=5222424>. A written transcript of the NPR story can be obtained for \$3.95 at <http://www.npr.org/transcripts>.

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Himalayan Snow Lotus Threatened with Extinction

High in the Himalayas, well above 12,000 feet, a cottony-white flower called the Snow Lotus grows on steep, unstable slopes. Tibetans have traditionally used the blossoms to make medicine for high blood pressure and ailments associated with pregnancy and menstruation.¹ Tourists prize it as an ornamental souvenir because of its rarity and unusual appearance. Bags and boxes of dried snow lotus blossoms can be found in the markets of the Yunnan province where it is reportedly the biggest selling herb.²

Graduate student Wayne Law has spent the last 4 years studying the snow lotus through a National Science Foundation grant. Speaking to National Public Radio reporter Elizabeth Arnold, Law described the snow lotus as existing in the most extreme conditions possible for plant life and looking like it's wearing a big fur jacket.²

Snow lotus (*Saussurea* spp., Asteraceae) is an annual, monocarpic plant (it flowers only once in its life), with blooms lasting 3 to 4 weeks. A minimum of 7 years of vegetative growth is required before the snow lotus will bloom. The plant is collected only while flowering, when it has reached its maximum size (W. Law e-mail to C. Crimmons, February 28, 2006). Law has been closely watching the particular species that is the most prized, *S. laniceps*, and reports that in areas where harvesting has taken place, he can barely find any flowering plants. Also, the snow lotus plant itself has actually been decreasing in size because people tend to take the very biggest plants. The larger plants are easier for collectors to see in the wild

and are worth more money. But when the larger plants are preferentially harvested, only the smaller plants remain to sow seeds. The snow lotus has lost nearly 4 inches in height in a hundred years,³ which, according to Law and his advisor, Jan Salik, PhD, Curator of Ethnobotany at the Missouri Botanical Garden, is fairly rapid evolutionary change.²

Because smaller snow lotus plants may produce fewer seeds than taller ones, human preferences could be pushing the snow lotus toward extinction.⁴ Law and Salik hope to find out how much can be harvested without threatening the population. People have harvested only small amounts for use in traditional Tibetan medicine, but the modern pressure of large world markets now threatens the snow lotus. The extinction of this plant would represent not only a botanical loss but also a cultural loss as well. Documentation of the traditional medicinal use of snow lotus can be found in the oldest Tibetan and Chinese medicine books.² HG

—Nancy Dennis

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Snow lotus *Saussurea* spp. Photo ©2006 Wayne Law.

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Improving the Quality of Reporting Randomized Controlled Trials Evaluating Herbal Interventions: Implementing the CONSORT Statement

by Joel J. Gagnier, ND, MSc, PhD (Candidate); Heather Boon, PhD; Paula Rochon, MD, MPH; David Moher, PhD; Joanne Barnes, PhD, MRPharmS, FLS; and Claire Bombardier, MD

Abstract

Background: Given that herbal medicinal products are widely used, vary greatly in content and quality, and are actively tested in randomized controlled trials (RCTs), such RCTs must clearly report the specifics of the intervention. Our objective was to develop recommendations for reporting RCTs of herbal medicine interventions.

Methods: We identified and invited potential participants with expertise in clinical trial methodology, clinical trial reporting, pharmacognosy, herbal medicinal products, medical statistics, and/or herbal product manufacturing, to participate in phone calls and a consensus meeting. Three phases were conducted: (1) Pre-meeting item generation via phone calls, (2) Consensus meeting, and (3) Post-meeting feedback. Sixteen experts participated in pre-meeting phone calls for item generation, and 14 participants attended a consensus meeting in Toronto, Ontario, Canada, in June 2004. During the consensus meeting a modified Delphi technique was used to aid discussion and debate of information required for reporting RCTs of herbal medicines.

Results: After extensive discussion the group decided that 9 CONSORT items needed elaboration for relevance to RCTs of herbal medicines: Item 1 (Title and Abstract), 2 (Background), 3 (Participants), 4 (Interventions), 6 (Outcomes), 15 (Baseline data), 20 (Interpretation), 21 (Generalizability), 22 (Overall evidence).

Discussion: The elaboration of Item 4 of the CONSORT statement outlines specific information required for complete reporting of the herbal medicine intervention. The reporting suggestions presented will support clinical trialists, editors, and reviewers in reporting and reviewing RCTs of herbal medicines, and readers in interpreting the results.

Background

Randomized controlled trials (RCTs) provide the best evidence for efficacy of health-care interventions.¹ Low quality reports of RCTs, compared to higher quality ones, exaggerate the estimates of a treatment's effectiveness.² Hence, efforts have been made to improve the quality of reporting.^{3,4}

The Consolidated Standards of Reporting Trials (CONSORT) statement was first published in 1996 and revised in 2001.^{3,4} This statement comprises a 22-item checklist and flow diagram to guide authors, peer review-

ers, editors, and readers on the essential information required in reports of two-group parallel RCTs.^{3,4} The CONSORT statement is endorsed by leading medical journals, editorial groups, professional societies, and funding bodies.⁵ Since its inception, several extensions and context-specific applications of the CONSORT statement have been developed.^{6,7} This paper describes the application of the CONSORT checklist to RCTs of herbal medicinal products.*

Reports of controlled trials of herbal medicines must clearly document all aspects of implementation, analysis, results, and interpretation as recommended in the CONSORT Statement. Several studies suggest that reports of complementary and alternative medicine (CAM) RCTs inadequately describe important aspects of their methodology.⁸⁻¹² For example, a sample of pediatric CAM RCTs reported less than 40% of all necessary information outlined in the CONSORT checklist.¹⁰ By comparison, RCTs of conventional medicine interventions have been found to report between 40% and 60% of the information outlined in the CONSORT checklist.^{13,14} More specifically, one study showed that only 50% of CAM trials reported how random numbers were generated and 25% if allocation concealment was done.⁹ In herbal medicine trials, only 28% of the reports described if the person administering the intervention was blinded to group assignment or not, only 22% described the methods for implementing the allocation sequence, and just 21% the method for generating the allocation sequence.¹¹ Although the reporting quality of herbal medicine trials appears to be improving, these trial reports are still missing important information. Of particular importance is the reporting of the herbal intervention.

* *Herbal medicine:* The term herbal medicine and herbal medicinal product will be used synonymously throughout this manuscript. (This paper was authored by an international group. The term "herbal dietary supplement," common in the United States, is equivalent to the term "herbal medicine.") Herbal medicines include herbs, herbal materials, herbal preparations and finished herbal products that contain as active ingredients parts of plants, or other plant materials, or combinations used for medicinal purposes and taken by ingestion, injection or applied topically. This definition does not include single isolated compounds derived from plants, or compounds based upon specific constituents of plants. Source: General Guidelines for Methodologies on Research and Evaluation of Traditional Medicine (WHO, WHO MD; 2000; 80 pages).

Crude herbal drugs are natural products and their chemical composition, therefore, varies depending on several factors, such as geographical source of the plant material, climate in which it was grown, time of harvest, and so on. It follows that commercially available herbal medicinal products also vary in their content and concentration of chemical constituents from batch-to-batch and, when different products containing the same herbal ingredient are compared, from manufacturer-to-manufacturer.¹⁵⁻²² Even where herbal products are standardized for content of known active or marker compounds to achieve more consistent pharmaceutical quality, there is variation in the concentrations of other potentially active constituents. Further, although there may be lack of agreement and validation about some of the analytical methods utilized, the true chemical content of some commercially available herbal products has been demonstrated to be different from that stated on their labels.^{20,23,24} These variations can result in differences in pharmacological activity *in vitro*²⁵ and in bioavailability in humans,²⁶ which is of clinical relevance. Quantitative and qualitative variations in the content of herbal medicinal products are not limited to active or otherwise desirable constituents; variation in concentrations of toxic constituents has also been reported.²⁷ For these reasons, it should not be assumed that the results of an RCT of a particular herbal intervention (e.g., an extract of *Ginkgo biloba* leaf standardized to contain 24% ginkgo flavonol glycosides) can be generalized to all products containing or made from the same herb (e.g., all *Ginkgo biloba* products). Therefore, it is imperative that reports of RCTs of herbal medicine interventions provide clear and complete descriptions of the intervention, i.e., of the herbal material and/or preparation.²⁸⁻²⁹ Against this background, our objective was to develop reporting recommendations for RCTs of herbal medicine interventions by elaborating upon the 22-item checklist of the CONSORT statement to guide authors, peer reviewers, and editors on appropriate reporting for such studies. Here, we present recommendations regarding the checklist items for herbal interventions; further explanations and examples of good reporting will be published separately.

Methods

The process used to develop the reporting recommendations for RCTs of herbal medicine interventions consisted of 3 phases: (1) Pre-meeting item generation, (2) Consensus meeting, and (3) Post-meeting feedback. We identified and invited potential participants based on their international reputations and peer-reviewed publications with expertise in clinical trial methodology and/or reporting (n=5), pharmacognosy (n=4), herbal medicinal products (n=5), medical statistics (n=1), and herbal product manufacturing (n=1). Individuals who agreed to participate were mailed a selection of articles on herbal medicine interventions and reporting quality. During May and June of 2004, 16 participants were contacted by telephone by one investigator (Joel Gagnier) and asked to suggest necessary revisions to existing CONSORT items and additional/new items required for reporting herbal medicine RCTs. Participants were asked to consider items based upon empirical evidence that not reporting them would bias the estimates of treatment effect. Where no empirical evidence was available, common sense reasoning was acceptable. When all phone calls were completed, one individual (Joel Gagnier) thematically grouped items and circulated them for review by each participant.

The second phase took place in Toronto, Ontario, Canada on June 28 and 29, 2004, and was attended by 14 individuals from various countries including: Canada (n=7), England (n=3), United States (n=2), India (n=1), and Germany (n=1). In addition,

2 research assistants, the meeting coordinator (Joel Gagnier) and meeting chair (Claire Bombardier) attended. The meeting began with a review of the pre-meeting item suggestions generated from the phone calls. The meeting coordinator and chair emphasized the need to keep item extensions and additions to a minimum and that they be based on evidence, where possible. Participants agreed that rather than adding items to the existing CONSORT checklist, several items required context-specific elaborations for relevance to herbal medicine interventions.

We refined the suggestions using a modified Delphi technique.³⁰ Specifically, item suggestions were presented and followed by debate and presentation of empirical evidence or common sense reasoning for or against each. These were modified and deleted based upon these discussions and group consensus. The meeting took place over an evening session followed by a full day meeting of the assembled group. Within 8 weeks of the consensus meeting, a draft report was circulated to all participants to ensure that the report accurately represented the decisions made during the consensus meeting. The manuscript was then circulated to the wider CONSORT Group for their input. The report was revised in light of these suggestions.

Results

Rather than adding new items to the CONSORT statement, the group decided that 9 existing CONSORT items needed elaboration for relevance to RCTs of herbal medicine intervention. The recommendations are listed in Tables 1 and 2 and are intended to be used in conjunction with the 22 existing CONSORT items. In Table 1, CONSORT items appear in normal text and recommendations for reporting RCTs of herbal medicine in italicized text. Table 2 contains a detailed outline of recommendations for reporting the herbal medicine intervention, an elaboration upon CONSORT item 4.

CONSORT items requiring specific elaboration for relevance to RCTs of herbal medicine interventions were (see Tables 1 and 2): Item 1 (Title and Abstract), 2 (Background), 3 (Participants), 4 (Interventions), 6 (Outcomes), 15 (Baseline data), 20 (Interpretation), 21 (Generalizability), 22 (Overall evidence).

Recommendations

The title and/or abstract (Item 1) should include the Latin binomial for the plant species from which the herbal medicine(s) originated, the part(s) of the plant used in the preparation, and the type of preparation (e.g., dried crude herb, ethanolic extract). The background (Item 2) should include a statement explaining the rationale for investigation of the specific herbal medicinal product and whether the indication for which it is being tested is new or is based on traditional use. Participant eligibility criteria (Item 3) in a trial testing a traditional indication (e.g., in traditional Chinese herbal medicine, a trial may test the effects of an herbal medicine intervention for liver chi (Qi) deficiency) should describe the theories and concepts underlying this indication.

The description of the intervention (Item 4; Table 2) must include the herbal medicinal product name, manufacturer, plant part used, type of preparation, source and authentication of the herbal material, pharmaceutical quality (e.g., herbal drug-to-extract ratio, type and concentration of the extraction solvent, quantity of known active constituents per unit dose), and dosage regimen and qualitative testing (purity). Also, reporting of the rationale for the control/placebo used in the trial is recommended. For studies involving herbal medicine practitioners as part of the intervention, details of practitioners (e.g., training, registration status) should be reported. Not all recommendations are rele-

vant for all types of herbal medicine interventions. Therefore, we begin this section with the words “*where applicable*.” For example, a report of an RCT of an herbal medicinal product comprising crude herbal material (e.g., leaves, stems, root) prepared as a tea or decoction does not require reporting of the “*type and concentration of solvent used and the plant to plant extract ratio*” (Table 2, Item 4.B.3.). In addition, herbal interventions made by the investigators specifically for the study will not have a finished product or extract name or manufacturer (Table 2, Item 4.A.2.). For such products, all methods used in preparing and formulating the product must be reported. Similarly, item 4.F. (Table 2) is only relevant for studies in which the practitioner is a part of the intervention. In other studies, the practitioner may serve a more neutral role and thus their characteristics need not be reported. With these exceptions, all information outlined in these recommendations are suggested to be reported for all herbal medicine interventions.

Also, outcome measures (Item 6) should reflect the intervention and indications tested while considering their underlying theories and concepts. For the results section, it is recommended that in addition to other baseline data (Item 15), RCTs of herbal medicine interventions report any concomitant medication, herbal medicinal product, or other CAM use. It is recommended that when interpreting the results (Item 20) there be consideration of the specific herbal product and dosage regimen tested. This includes

an overview of evidence on this particular herbal medicinal product. When considering generalizability (Item 21), it is suggested that authors report how the product used in the trial generalizes to products used in self-care and/or in clinical practice. Finally, when interpreting the results in the context of the evidence (Item 22), it is recommended that a general discussion in relation to trials of other available products should be reported.

Discussion

The CONSORT Statement outlines information required in reports of any 2-group parallel RCT design.¹ We have developed and described recommendations (see Tables 1 and 2) to be used in conjunction with the existing CONSORT checklist when reporting RCTs of herbal medicine interventions. These recommendations were developed to guide clinical trialists, editors, and reviewers in reporting and reviewing RCTs of herbal medicine interventions. Beyond RCTs, these recommendations are relevant for reporting herbal interventions in other research designs, whether preclinical (e.g., in vivo, in vitro) or clinical (e.g., N of 1 trials).

The type of information required for a complete description of any intervention is relative to the type of intervention being tested. For trials of surgical interventions, for example, a complete description of the individual performing the surgery may be required.¹ For controlled trials of herbal medicines, the informa-

Standard CONSORT checklist: Paper Section and Topic	Standard CONSORT checklist: Item	Descriptor
TITLE & ABSTRACT	1	How participants were allocated to interventions (e.g., “random allocation,” “randomized” or “randomly assigned”). <i>Either the title, abstract, or both should state the herbal medicinal product’s Latin binomial, the part of the plant used, and the type of preparation.</i>
INTRODUCTION Background	2	Scientific background and explanation of the rationale. <i>Including a brief statement of reasons for the trial with reference to the specific herbal medicinal product being tested and, if applicable, whether new or traditional indications are being investigated.</i>
METHODS Participants	3	Eligibility criteria for participants and the settings and locations where the data were collected. <i>If a traditional indication is being tested, a description of how the traditional theories and concepts were maintained. For example, participant inclusion criteria should reflect the theories and concepts underlying the traditional indication.</i>
Interventions	4	Precise details of the interventions intended for each group and how and when they were actually administered. <i>A detailed description of this item appears in Table 2.</i>
Objectives	5	Specific objectives and hypotheses.
Outcomes	6	Clearly defined primary and secondary outcome measures and, when applicable, any methods used to enhance the quality of measurements (e.g., multiple observations, training of assessors). <i>Outcome measures should reflect the intervention and indications tested considering, where applicable, underlying theories and concepts.</i>
Sample size	7	How sample size was determined and, when applicable, explanation of any interim analyses and stopping rules.
Randomization Sequence allocation	8	Method used to generate the random allocation sequence, including details of any restriction (e.g., blocking, stratification).
Allocation concealment	9	Method used to implement the random allocation sequence (e.g., numbered containers or central telephone), clarifying whether the sequence was concealed until interventions were assigned.
Implementation	10	Who generated the allocation sequence, who enrolled participants, and who assigned participants to their groups.
*CONSORT items ^{1,4} are listed in normal text. Proposed implementations for relevance to reports of herbal medicine RCTs are listed in italicized text.		

tion recommended when reporting the herbal intervention (Item 4; Table 2) is essential to provide a complete description of the herbal product being tested. There is a wide variety of commercially available products containing herbal medicines. Unfortunately, there is great variability in the content of these products.¹⁵⁻²⁴ Products may not contain the amount (weight, volume, proportion) of individual constituents listed on their labels³¹ or any of the constituents at all. Also, products containing the same botanical species often contain varying amounts of the plant's marker/active[†] constituents.^{19,20} A thorough description of the product will allow for the valid and reliable determination of efficacy and safety of specific herbal products.

Since publication of the CONSORT Statement, data suggest

[†] *Active constituent(s)*: Those compounds that are proposed to be responsible for the therapeutic effect attributed to the herbal ingredient or product. This may be a single constituent or a group or groups of constituents. A *marker compound*, or group of marker compounds, is a plant constituent that may be used as a proxy measurement tool for the full spectrum of compounds in the botanical product. This can be a single compound or compounds that usually represent a group of constituents. Marker compounds are generally intended as in-process manufacturing controls and are generally unreliable as indicators of identity.

that there has been a significant increase in the quality of reports of RCTs in journals that endorse it, recognizing that this might not translate into journal adherence.^{32,33} In an effort to evaluate the impact of the recommendations for reporting herbal medicine interventions, we plan to evaluate their influence on the reporting of herbal medicine RCTs. To support this initiative we invite journal editors to include a reference to these recommendations³⁴ or a copy of the checklist (www.annals.org) in their journal's instructions to authors as this will likely support the improvement of reporting of RCTs of herbal medicine interventions.

In an effort to keep the checklist evidence based, incorporating emerging data, and up to date, we will periodically update the recommendations. The goal is improved reporting, which ultimately will support clear interpretation of trial methods and results, improving the validity of inferences derived from trial findings.³⁵⁻³⁶

In addition to this overview, an explanatory document has been produced that describes each recommendation in detail and provides examples of good reporting and empirical evidence for individual items where available.³⁷

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Table 1: Proposed Elaborations of CONSORT Items for Randomized Controlled Trials of Herbal Medicine Interventions*

Standard CONSORT checklist: Paper Section and Topic	Standard CONSORT checklist: Item	Descriptor
Blinding (Masking)	11	Whether or not participants, those administering the interventions, and those assessing the outcomes were blinded to group assignment. When relevant, how the success of blinding was evaluated.
Statistical methods	12	Statistical methods used to compare groups for primary outcome(s); methods for additional analyses, such as subgroup analyses and adjusted analyses.
RESULTS Participant flow	13	Flow of participants through each stage (a diagram is strongly recommended). Specifically, for each group, report the number of participants randomly assigned, receiving intended treatment, completing the study protocol, and analyzed for the primary outcome. Describe protocol deviations from study as planned, together with reasons.
Recruitment	14	Dates defining the periods of recruitment and follow-up.
Baseline data	15	Baseline demographic and clinical characteristics of each group. <i>Including concomitant medication, herbal and complementary medicine use.</i>
Numbers analyzed	16	Number of participants (denominator) in each group included in each analysis and whether the analysis was by "intention-to-treat." State the results in absolute numbers when feasible (e.g., 10/20, not 50%).
Outcomes and Estimation	17	For each primary and secondary outcome, a summary of results for each group, and the estimated effect size and its precision (e.g., 95% confidence interval).
Ancillary analyses	18	Address multiplicity by reporting any other analyses performed, including subgroup analyses and adjusted analyses, indicating those pre-specified and those exploratory.
Adverse events	19	All important adverse events or side effects in each intervention group.
DISCUSSION Interpretation	20	Interpretation of results, taking into account study hypotheses, sources of potential bias or imprecision, and the dangers associated with multiplicity of analyses and outcomes. <i>Interpretation of the results in light of the product and dosage regimen used.</i>
Generalizability	21	Generalizability (external validity) of trial results. <i>Where possible, discuss how the herbal product and dosage regimen used relate to what is used in self-care and/or practice.</i>
Overall evidence	22	General interpretation of the results in the context of current evidence. <i>Discussion of the trial results in relation to trials of other available products.</i>

*CONSORT items^{1,4} are listed in normal text. Proposed implementations for relevance to reports of herbal medicine RCTs are listed in italicized text.

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All researchers are independent of the funders.

Focus group participants

The individuals listed below participated in the pre-meeting phone calls or attended the consensus meeting and provided input towards the elaborations to existing CONSORT items.

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The members of the CONSORT Group are listed on the following website: <http://www.consort-statement.org/profiles/partners.html>. HG

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Table 2: Proposed Elaboration of CONSORT Item 4 for Reporting Randomized Controlled Trials of Herbal Medicine Interventions

Standard CONSORT check-list: Paper Section and Topic	Standard CONSORT checklist: Item	Descriptor
METHODS Interventions	4.	Where applicable, the description of an herbal intervention should include:
	4.A. Herbal medicinal product name	1. The Latin binomial name together with botanical authority and family name for each herbal ingredient; common name(s) should also be included.
		2. The proprietary product name (i.e. brand name) or the extract name (e.g., EGb-761) and the name of the manufacturer of the product.
		3. Whether the product used is authorized (licensed, registered) in the country in which the study was conducted.
	4.B. Characteristics of the herbal product	1. The part(s) of plant used to produce the product or extract.
		2. The type of product used [e.g. raw (fresh or dry), extract].
		3. The type and concentration of extraction solvent used (e.g., 80% ethanol, H ₂ O 100%, 90% glycerine, etc.) and the herbal drug to extract ratio (drug:extract; e.g., 2:1).
		4. The method of authentication of raw material (i.e., how done and by whom) and the lot number of the raw material. State if a voucher specimen (i.e., retention sample) was retained and, if so, where it is kept or deposited, and the reference number.
	4.C. Dosage regimen and quantitative description	1. The dosage of the product, the duration of administration, and how these were determined.
		2. The content (e.g., as weight, concentration; may be given as range where appropriate) of all quantified herbal product constituents, both native and added, per dosage unit form. Added materials, such as binders, fillers, and other excipients; e.g., 17% maltodextrin, 3% silicon dioxide per capsule, should also be listed).
		3. For standardized products, the quantity of active/marker constituents per dosage unit form.
	4.D. Qualitative testing	1. Product's chemical fingerprint and methods used (equipment and chemical reference standards) and who performed it (e.g., the name of the laboratory used). Whether or not a sample of the product (i.e., retention sample) was retained and if so, where it is kept or deposited.
		2. Description of any special testing/purity testing (e.g., heavy metal or other contaminant testing) undertaken. Which unwanted components were removed and how (i.e., methods).
		3. Standardization: what to (e.g., which chemical component(s) of the product) and how (e.g., chemical processes, or biological/functional measures of activity).
	4.E. Placebo/control group	The rationale for the type of control/placebo used.
	4.F. Practitioner	A description of the practitioners (e.g., training and practice experience) that are a part of the intervention.

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WHO Surveys Worldwide Patterns of Herbal Regulations

by Courtney Cavaliere

The results of a global survey, released in May 2005 by the World Health Organization (WHO), indicate that many countries have made recent progress in the development and implementation of regulations on herbal medicinal products.¹ WHO's *National Policy on Traditional Medicine and Regulation of Herbal Medicines: Report of a WHO Global Survey* provides information on the status of herbal regulations and laws worldwide, as well as the state of national policies on traditional, complementary, and alternative medicines.

WHO distributed its Global Survey questionnaire in 2002 to national health authorities of the 191 countries serving as WHO's member states at that time. Survey responses were returned by 142 countries—a response rate of 74%. According to the Executive Summary of the report, only 14 of WHO's member states had regulations relating to herbal

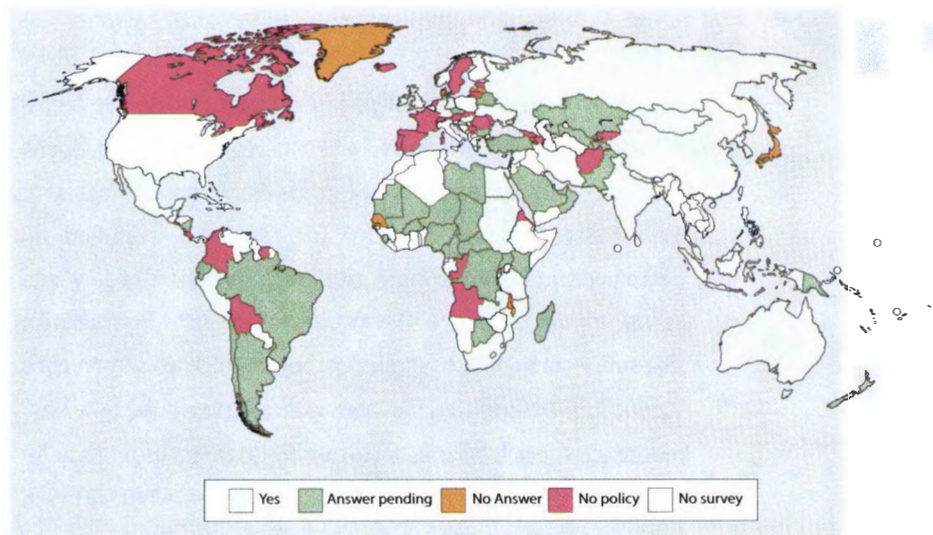
The most commonly utilized regulatory status for herbal medicines is that of over-the-counter medications, according to data from respondents. This status is reportedly used within 97 of the countries who responded to the survey. Other commonly-cited methods of regulating herbal medicines are as prescription medications (50 countries), dietary supple-

tions. The majority of respondents (73%, or 103 countries) indicated that they allow the use of claims in the sale of herbal medicines. Of the 103 countries allowing claims, the majority identified medical claims and health claims as those most commonly utilized. The authors of the report stipulated, however, that exact figures of claim usage seem unreliable, due to problems with the wording and/or interpretation of the question.

Only 24% of countries (34 countries) indicated the existence and use of a national pharmacopeia. Of the 104 countries without such a document, 25% (26 countries) claimed that a (national or regional) pharmacopeia is in development, and 56% (58 countries) responded that another (external) pharmacopeia is in use. A similarly small percentage of countries (33%, or 46 countries) claimed to have national monographs. Of the 84 countries lacking national monographs, 28% (25 countries) indicated monographs were being prepared and 38% (34 countries) claimed to use other monographs from other sources. Twenty-seven countries without national monographs provided data as to the other monographs utilized, some indicating the use of multiple compendia. The most commonly selected international monographs were those prepared by WHO (12 countries), followed by the *European Pharmacopoeia* (8 countries), ESCOP (European Scientific Cooperative on Phytotherapy) monographs (4 countries), German Commission E Monographs (3 countries), and the *British Pharmacopoeia* (3 countries). Twelve countries indicated use of other sources for monographs. Of the 46 countries with national monographs, 52% (24 countries) identified them as being legally binding; of the 34 countries using other monographs, 44% (15 countries) reported those texts as legally binding.

Data regarding manufacturing regulations and safety assessment of herbal medicines was also collected through the

Member States with National Policies and Those Pending



Source: *National Policy on Traditional Medicine and Regulation of Herbal Medicines: Report of a WHO Global Survey*.

medicine before 1988, but the number had increased to 53 member states (37%) by 2003.² Of those countries without such laws and regulations, 42 (49%) claimed herbal regulations were in the process of being developed. According to Figure 12 of the report, however, the majority of responding countries (92, or 65%) claimed to have laws or regulations on herbal medicines.¹ Information from 77 of those countries further indicates that such laws and regulations were either issued without any indication of when they were issued or have only recently been enacted, particularly within the last 15 years.

ments (47 countries), self-medication only products (40 countries), separate herbal-specific categories (25 countries), health foods (15 countries), and functional foods (9 countries). Respondents were allowed to choose multiple categories if more than one status was in effect; hence, the total of tallies for each of the categories (283) exceeds the number of countries participating in the survey. Twenty-three countries claimed to have no regulatory status for herbs.

The survey further inquired about the types of claims applicable to herbal medicines under countries' laws and regula-

global survey. Questions about manufacturing requirements were answered by 126 countries, and these countries were allowed to select more than one response. The majority of respondents (73 countries) claimed that the same rules of good manufacturing practices (GMPs) required for conventional medicines are enforced for herbal medications. Fifty-nine countries indicated that they are required to adhere to the criteria, requirements and other related information specified in pharmacopeias and official monographs, and 30 countries indicated that they use special GMP rules. Twenty-eight countries claimed to have no manufacturing requirements for herbal medicines.

Safety assessment questions, meanwhile, were answered by 130 countries. Again, respondents were allowed to make multiple choices. The majority of countries (82) claimed to use special requirements for safety assessment—including the requirement of traditional use without demonstrated harmful effects, or references to scientific research. Fifty-seven countries claimed to use the same safety

requirements as pharmaceuticals, and 28 countries answered that they have no safety requirements. Further, 59 of 114 responding countries indicated the existence of a post-marketing surveillance system for herbal medicines. Of those 59 countries, 53 (or 90%) also claimed to have a national system to monitor adverse effects. Forty-four of the 77 countries without post-marketing surveillance systems reported that such systems were under development.

Other topics addressed within the report include registration systems for herbal medicines, herbs on essential drug lists, sales of herbal medicines, and difficulties countries face in regards to herbal regulation. Using data obtained through the survey, WHO developed a global database regarding countries' herbal regulations and policies regarding traditional medicine or complementary and alternative medicine. The database contains all responses to the questionnaire, as well as detailed information on individual countries' laws and regulations, further regulatory requirements, monographs, and pharmacope-

ias. Much of this information has not been translated into English, and access to the database is presently limited to national health authorities. WHO intends to continually update the database's information. HG

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Does what the label claim = what the package contains? "Chinese Cimicifuga" vs. American Black Cohosh???

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1: Black Cohosh
2: "Chinese Cimicifuga"



Australian TGA Publishes Liver Warning Policy for Black Cohosh

by Mark Blumenthal

In February 2006 the Australian Therapeutic Goods Administration (TGA) issued a policy for a new label warning to be required for all herbal products containing black cohosh (*Actaea racemosa* L. Ranunculaceae, syn. *Cimicifuga racemosa*).¹ TGA cited at least 47 adverse event reports (AERs) of hepatotoxicity collected worldwide that have been allegedly associated with black cohosh-containing products. Even though some of these products have contained multiple herbs, some observers have classed them as black cohosh-related AERs.

Australia has had a rather tightly regulated market for herbs and other “therapeutic goods” since the passage of the Therapeutic Goods Act of 1990. Of the 47 cases reported worldwide of alleged hepatotoxicity associated with black cohosh-containing preparations, a number of them have been reported in Australian medical journals.^{2,3} Thus, it is understandable that the TGA has taken an interest and reviewed this issue. Based on its own criteria and processes, TGA decided to issue this warning. In Australia, 4 patients were reportedly hospitalized, including 2 patients who required liver transplants.

The TGA acknowledged that “Although some reports are confounded by multiple ingredients, by more than one medication or by other medical conditions, there is sufficient evidence of a causal association between black cohosh and serious hepatitis.”¹ The TGA hastened to add a note about the relative safety of black cohosh: “...considering the widespread use of black cohosh, the incidence of liver reaction appears to be very low.” The TGA policy requires the following label statement on black cohosh products:

“Warning: Black cohosh may harm the liver in some individuals. Use under the supervision of a healthcare professional.”¹

The new policy goes into effect immediately and will apply to all new products with a 12 month phase-in period for existing products.

It is not clear what criteria or process was employed in the TGA’s safety evaluation process; the publication of the warning did not link to any other documents related to this process. A TGA official involved with this new policy responded to several e-mails sent by this writer requesting clarification on these points, writing that TGA would provide more data on the criteria and process at a future date. [D. Briggs e-mail to M. Blumenthal, March 6, 2006.] However, despite several additional requests, ABC has not received any further communications from TGA.

The first Australian case reports that implicated black cohosh with hepatotoxicity were described in an Australian medical journal.² The first and more serious case concerned a woman who was reportedly using an undefined black cohosh monopreparation alone for one week to treat menopausal symptoms. She presented with jaundice and subsequently underwent a liver transplant. No specific data is included in the report, e.g., the brand name of the putatively offending product or a botanical or chemical analysis. The authors of the report acknowledge that there were no previous reports of hepatotoxicity associated with black cohosh.



Black cohosh *Actaea racemosa* Photo ©2006 stevenfoster.com

The second case concerned a 43-year-old woman who had taken a preparation containing black cohosh with several other herbs for an undefined period of time.² The formula reportedly contained the following herbs: skullcap (*Scutellaria lateriflora* L., Lamiaceae), valerian (*Valeriana officinalis* L., Valerianaceae), black cohosh, passion flower (*Passiflora* spp., Passifloraceae), dong quai (*Angelica sinensis* [Oliv.] Diels, Apiaceae), hops

(*Humulus lupulus* L., Cannabaceae), oats (*Avena sativa* L., Poaceae), and chasteberry (*Vitex agnus-castus* L., Verbenaceae).

The reported presence of skullcap has raised some questions among botanically-savvy experts. In some formulations, skullcap has been substituted with the herb germander (*Teucrium chamaedrys* L., Lamiaceae), a plant that has been previously reported as hepatotoxic³ and has been known as an adulterant for skullcap, at least in the herb trade in the United States during the 1980s.

Whether or not germander substitution has occurred in Australian herbal products is not clear, although an Australian regulatory expert contacted for this article expressed doubts that this is likely since there have been quality control measures instituted throughout the Australian herb industry since the passage of the Therapeutic Goods Act in 1990. Specifically, the germander issue had been raised in the Australian herb industry prior to these case reports, and as a result many suppliers were surveyed by TGA on this issue. By 2002, many of the manufacturers were sensitive to the need to ensure the correct identity of skullcap to preclude the possibility of the adulterant germander’s presence. Australia has mandatory adverse event reporting requirements for Listed (e.g., herbs) and Registered (pharmaceutical) medicines. Thus, TGA regulators might take the view that adverse event exposure data from other countries may be weakened by the lack of systematic adverse event reporting systems in those countries.

With regard to the second case report² discussed above (and others), it appears that no efforts were made to verify the botanical identity of the herbal materials in the formulation. Further, the case report provided no information regarding the plant parts used in this preparation—a problem that is all too commonly associated with many case reports alleging toxicity associated with the ingestion of botanical preparations. Nor did it provide

information regarding the characteristics of the herbal preparation, e.g., the solvent, concentration, manufacturing process, or chemical analysis of the product taken.

Another Australian case of alleged black cohosh-associated liver toxicity involved a 52-year-old woman who was using a multi-ingredient herbal preparation,⁴ but due to the presence of numerous other botanical ingredients in the preparation, a direct causal association of any of the black cohosh or any of the other individual ingredients cannot be definitively determined. According to this report, "The preparation was made and provided by a pharmacist. The preparation was supplied in a 200 mL bottle and contained a mixture of the fluid extracts of *Nepeta hederacea* (ground ivy) 80 mL [Editor's Note: This is quoted directly from the publication in the *Medical Journal of Australia*; the preferred binomial for ground ivy probably should be *Glechoma hederacea*.], *Hydrastis canadensis* (golden seal) 20 mL, *Ginkgo biloba* (ginkgo) 40 mL, *Avena sativa* (oats seed) 40 mL and *Cimicifuga racemosa* (black cohosh) 20 mL. According to the information supplied by the pharmacist, one gram of herb was contained in each 1 mL of extract, with the exception of golden seal, for which 0.5 g of herb was contained in each milliliter."⁴

NIH Acknowledges Safety of Black Cohosh

In an American case based on a 57-year-old woman who had been taking numerous prescription medications for 2 years, the black cohosh was presumably a mono-preparation taken for about 3 weeks. The patient was not certain about the contents or the brand, as the package had already been discarded.⁵ The dosage used was not reported. The publication of this case prompted the Center for Science in the Public Interest, a Washington DC-based consumer advocacy organization, to write to the Food and Drug Administration suggesting label warnings, an FDA letter to physicians, and a consumer advisory.⁶

In response to these concerns, the National Institutes of Health (NIH) held a one-day "Workshop on the Safety of Black Cohosh in Clinical Studies" in November 2004.⁷ The conclusions were that there was no competent evidence to support concerns about safety with respect to use of black cohosh in breast cancer patients. (To the contrary, there was testimony

given regarding clinical trials on such patients using black cohosh in which there were negative findings; CSPI had been concerned about an incomplete study on transgenic mice that had developed lung tumors, but the histology of the tumors has not been conducted to determine if they were malignant and the study has never been published in a peer-reviewed journal.)

Similarly, based on history of use, animal toxicology, and pharmacovigilance data from Europe and elsewhere (51 case reports from various international adverse event reporting databases were acknowledged), the consensus of the experts assembled at the NIH conference concluded that there is inadequate evidence that black cohosh preparations are causally associated with hepatotoxicity. However, NIH concluded that liver enzyme levels will be monitored in all women currently enrolled in NIH-funded trials on black cohosh, as a precautionary measure.

The NIH workshop report states the following:

Ultimately, the workshop participants concluded that a balanced approach be taken with respect to this issue. On the one hand, millions of people have taken black cohosh with very few adverse events reported. On the other hand, those cases of hepatotoxicity associated with products that are known to contain black cohosh and believed to be free from other substances of known toxicity raise concern. Thus, the workshop recommended that appropriate safety parameters should be used in clinical studies of black cohosh. Such measures would include monitoring liver function throughout the study period, specifically looking at alkaline phosphatase (AP), aspartate aminotransferase (AST), alanine aminotransferase (ALT), and bilirubin. And depending on what is being studied, investigators should consider screening potential subjects for liver function to exclude individuals with pre-existing liver problems. At this time, there is no known mechanism with biological plausibility that explains any hepatotoxic activity of black cohosh.⁷

In June 2005 Schaper & Brümmer, the manufacturers of Remifemin®, the world's most clinically-researched and top-selling

black cohosh preparation, introduced into the US market new packaging with the following warning, even though none of the cases of hepatotoxicity reported to date have been associated with this product:

"Consult your healthcare practitioner prior to use if you have a history of liver disease or are taking prescription drugs."⁸

Consistent with the conclusions of the NIH conference, the various pharmacognosy, pharmacology, toxicology, and medical experts consulted by the American Botanical Council to date do not believe that there are adequate scientific or medical data to support a direct causal connection between black cohosh preparations and cases of hepatotoxicity. So far as ABC has been able to determine, a liver-related warning for black cohosh products is not required in any country other than Australia. HG

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Supreme Court Ruling Protects Religious Group's Access to Ayahuasca

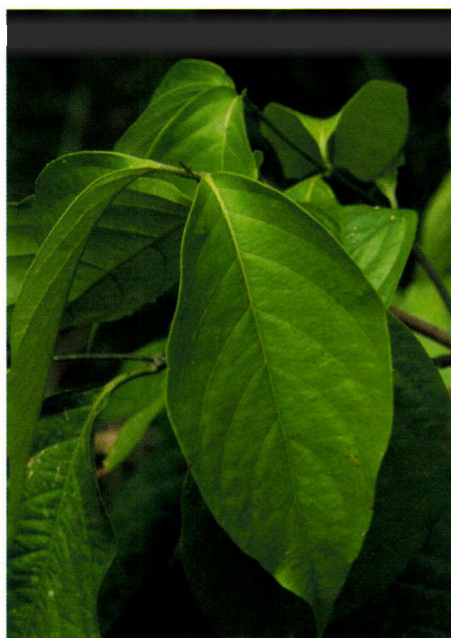
by Courtney Cavaliere and Mark Blumenthal

The Supreme Court unanimously ruled on February 21, 2006, that a small religious sect may continue to import and utilize a hallucinogenic tea central to its ritual ceremonies.¹ The court's decision rejected the federal government's efforts to completely ban the tea as an illegal substance. The tea, known as *ayahuasca* or *hoasca* (the term preferred by the religious sect), is a decoction prepared from a combination of psychoactive plants native to the Amazon. The beverage is used in bi-monthly rituals of the religious sect, known as O Centro Espirita Beneficente Uniao Do Vegetal (UDV), as a way for participants to connect with the divine.² The UDV originated in Brazil in the late 1950s, and its use of hoasca tea as a ritual sacrament has been legally permitted there since the mid 1980s. The sect officially incorporated as a church in the state of New Mexico in the early 1990s.

The ruling has been hailed as one of the most significant applications of the Religious Freedom Restoration Act (RFRA) of 1993. Under this act, the government had to prove that there was a compelling reason for criminalizing the religious use of ayahuasca tea by the UDV sect, that the tea posed actual harm to those who would consume it, and that the ban was the least restrictive means for meeting government interests.³ The Supreme Court, under the leadership of recently appointed Chief Justice John G. Roberts, Jr., found that the government failed to provide such proof.

"I see this decision as being so important not only for the UDV but for what it represents at this time in the country," said Jeffrey Bronfman, president of the United States chapter of UDV (e-mail to M. Blumenthal, February 28, 2006). "At its core it is a profound affirmation of the role plants have in support of our physical, mental, and spiritual well-being. The Supreme Court, as I see it, affirmed not only the fundamental principles of religious liberty that our country's democracy was based upon, but also strongly reminded the government that there are clear limits to its authority in interfering with the most personal, central, and sacred dimensions of its citizens' lives."

Ayahuasca is a shamanic plant potion derived from the jungle vine *Banisteriopsis caapi* (Spruce ex Griseb) CV Morton, Malpighiaceae, aka *caapi* and *yajé* or *yagé*, and other plants.⁴ Two plants typically used in the Amazon as admixtures to ayahuasca are either *Psychotria viridis* Ruiz & Pav, Rubiaceae or *Diplopteryx cabrerana* (Cuatr.) Gates, Malpighiaceae, depending on the geographical locale and plant availability.* The UDV's hoasca beverage consists of only *B. caapi* and *P. viridis*. In addition to *B. caapi* and the plants just mentioned above, some shamans in Amazonia utilize various other psycho-



Ayahuasca *Banisteriopsis caapi*. Photo ©2006 stevenfoster.com

active plants in mixtures that go by the name *ayahuasca*. These additional plants include angel trumpet leaf (*Brugmansia* spp. Pers., Solanaceae), known locally in Peru as *toé*, along with tobacco (*Nicotiana tabacum* L., Solanaceae) and others.

The term *ayahuasca* in the native Quechua language means "vine of the soul"—a reference to the deeply mystical/spiritual experience induced by the ritual use of the tea made from the bark of the vine and the hallucinogen-containing admixture plants.

The pharmacological activity of ayahuasca is derived from a synergistic interaction of active ingredients in the ayahuasca mixture. Dimethyltryptamine (DMT) is a hallucinogenic alkaloid found in the leaves of the admixture plants (*P. viridis* or *D. cabrerana*). It is regulated under the US Controlled Substances Act as a Schedule I Substance.¹ DMT is a potent, short-acting hallucinogen that

is chemically related to psilocybin, the active ingredient of "magic mushrooms" (e.g., *Psilocybe cubensis* [Earle] Sing, Strophariaceae), and to the neurotransmitter serotonin. However, DMT is inactive if ingested orally, due to its enzymatic degradation in the liver and gut by an enzyme, monoamine oxidase (MAO). It can be protected from peripheral degradation and enabled to cross the blood-brain barrier in an active form by simultaneous ingestion of MAO inhibitors. A unique aspect of ayahuasca is that its pharmacological activity depends on this synergistic activity: beta-carboline alkaloids in the "vine" *B. caapi* are potent MAO inhibitors and thus when prepared in combination with the DMT-containing leaves of one of the 2 admixture plants, the result is an orally active preparation. Under these circumstances, the effects of DMT are slower to manifest and usually last longer than when it is administered in some other manner (e.g., by injection, as a snuff in the case of other plant-based preparations, or smoked). (For more on the chemistry and psychopharmacology of ayahuasca, see the recent review by McKenna 2004).⁵

Evidence suggests a long historical use of ayahuasca in various South American cultures.⁴ According to the botanical text *The Healing Forest*, by the late Harvard ethnobotanist Richard Evans Schultes, PhD, and chemist Robert F. Raffauf, PhD, the drink has been employed widely in Amazonian Colombia, Ecuador, Peru, Bolivia, and Brazil, and to a limited extent along the uppermost tributaries of the Rio Orinoco of Colombia and probably adjacent Venezuela.⁶ In many of these cultures, ayahuasca is considered a medicine, since many traditional healers or shamans diagnose, cure, or treat illnesses and conditions while the healer and often the patient are under its influence. They believe ayahuasca gives them their healing

power through communion with the spirit world. Dr. Schultes and Dr. Raffauf's photographic essay *Vine of the Soul* details and illustrates the preparations and uses of *B. caapi* and other psychoactive plant-based preparations by Amazonian healers and peoples.⁷ Members of the Brazil-based religious sect UDV, meanwhile, reportedly use hoasca during twice-monthly rituals.²

The 130 members of the U.S. sect of the UDV sued the government under the RFRA in 1999 after Drug Enforcement Administration agents seized a shipment of the tea stored at the UDV's New Mexico offices and threatened the group with prosecution. The case was presented to the Supreme Court after the government appealed rulings in favor of the UDV made by both the US District Court for the District of New Mexico and the 10th Circuit Court of Appeals in Denver.

The Supreme Court justices sided against the administration's argument that ayahuasca should be banned to ensure the absolute authority of the Controlled Substances Act.³ Chief Justice Roberts claimed that the administration could not dismiss the possibility of exceptions to such laws, especially with regards to issues of religious freedom. Further, he pointed out that Native Americans' permitted access to peyote (*Lophophora williamsii* [Salm-Dyck] J. Coulter, Cactaceae), a psychoactive cactus used in traditional ceremonies, constitutes just such an exception to the federal controlled substances act.

"If such use [of peyote] is permitted in the face of the general congressional findings for hundreds of thousands of Native Americans practicing their faith, those same findings alone cannot preclude

"The Supreme Court affirmed not only the fundamental principles of religious liberty that our country's democracy was based upon, but also strongly reminded the government that there are clear limits to its authority in interfering with the most personal, central, and sacred dimensions of its citizens' lives," said Jeffrey Bronfman, president of the United States chapter of UDV.

consideration of a similar exception for the 130 or so American members of the UDV who want to practice theirs," Chief Justice Roberts wrote in the court's formal decision.¹ He further wrote, "While there may be instances where a need for uniformity precludes the recognition of exceptions to generally applicable laws under RFRA, it would be surprising to find that this was such a case, given the longstanding peyote exemption and the fact that the very reason Congress enacted RFRA was to respond to a decision denying a claimed right to sacramental use of a controlled substance."

Other factors that influenced the court's decision included a failure on the part of the government to show a compelling need for blocking the UDV's use of ayahuasca tea on the basis of health risks.³ The government further did not address how an exemption of ayahuasca for UDV's religious purposes might adversely affect the country's international relations (the Government had argued that the importation of ayahuasca was allegedly prohibited under the United Nations Convention on Psychotropic Substances).[†]

The government may still decide to take its case to trial, as the recent Supreme Court decision was based only on a preliminary injunction.² However, according to an article in *The New York Times*, the court's rejection of the government's arguments was so conclusive that it seems unlikely that a different decision would be reached through a trial. HG

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* In Ecuador and the Putumayo regions of Colombia and Peru, the admixture used most commonly is *D. cabrerana*; in the rest of the Amazon basin, and around Iquitos and south of there, *P. viridis* is most often used. This is changing now as people have brought *D. cabrerana* to the area from the north and a number of curanderos around Iquitos are starting to use it in preference to *P. viridis*. However, they are almost never mixed together in the same ayahuasca mixture. [D. McKenna e-mail to M. Blumenthal, April 17, 2006.]

† Whether hoasca/ayahuasca is prohibited under this Convention has been the matter of some debate. The District Court rejected the government's argument regarding international relations, claiming that hoasca is not covered under the Convention.³ That court cited the official commentary to the Convention, which states that plants are excluded from such regulations because plants are distinct from the Schedule I substances derived from them. Likewise, a 2001 fax from the Secretary of the International Narcotics Board, Herbert Schaepe, specifically notes the exclusion of ayahuasca from the Convention's prohibitions.⁸ The Supreme Court, however, disagreed with the District Court and claimed that hoasca is subject to the Convention.¹ Despite this agreement with the government, the Court stated that the government still did not prove that there would be negative international ramifications by exempting UDV's sacramental use of hoasca.

Total Sales of Herbal Supplements in United States Show Steady Growth

Sales in Mass Market Channel Show Continued Decline

by Mark Blumenthal, Grant K.L. Ferrier, and Courtney Cavaliere

Total sales for herbal dietary supplements (HDS) have shown continued growth for most channels of trade, indicating a steady increase in both 2005 and 2004, compared to 2003. Unpublished sales statistics gathered from various primary and secondary sources by *Nutrition Business Journal* (NBJ) demonstrate a 3.4% increase from 2003 to 2004 and an additional 2.1% increase in 2005 compared to 2004 for all HDS aggregated for all sales channels (see Table 1).

Despite the generally upward trend for all aggregated sales, HDS continued their generally downward trend in the mainstream market (i.e., food, drug, and mass market retailers, referred to as FDM) in 2005, with total herb sales in that channel being about 3.67% lower than sales for the same category in 2004, according to information provided by Information Resources Inc. (IRI) of Chicago (see Table 2). The IRI data, considered by most knowledgeable observers as probably the most reliable econometric sales data available on herbal supplements for this particular channel does not include sales reports from Wal-Mart, Sam's Club, and other large warehouse buying clubs, or sales from convenience stores. If such additional sales data were available in the IRI reports,

the total level of sales for HDS in 2005 reported by IRI (\$249,425,500) would possibly be at least twice the reported figure, since Wal-Mart alone has been termed the largest retail seller of dietary supplements in the United States.

To understand the relative significance of the IRI data, as well as the aggregate sales data compiled by NBJ, it is essential to recognize that HDS are sold in the United States through a variety of market channels. These include the following:

Table 1. Total Estimated Herb Sales in All Channels 1994–2005

Year	\$ Total Sales (millions)	% Increase (-decrease)
1994	2,020	
1995	2,470	22.3
1996	2,990	21.1
1997	3,557	19.0
1998	4,002	12.5
1999	4,110	2.7
2000	4,260	3.7
2001	4,397	3.2
2002	4,276	-2.8
2003	4,178	-2.3
2004	4,320	3.4
2005	4,410	2.1

Source: Ferrier et al. *Nutrition Business Journal* 2006 (in press).¹ (www.nutritionbusiness.com)

NBJ (*Nutrition Business Journal*) primary research includes NBJ surveys of supplement manufacturers, distributors, MLM firms, mail order, Internet and raw material & ingredient supply companies, as well as numerous interviews with major retailers (Wal-Mart, Costco, etc.), manufacturers, suppliers and industry experts. Secondary sources include Information Resources Inc., SPINS, ACNielsen, *Natural Foods Merchandiser*, *Whole Foods Magazine*, *Insight*, The Hartman Group, company data and other published material.

Table 2. Sales of Top-Selling Herbal Dietary Supplements in the Food, Drug, and Mass Market Channel in the United States in 2005

Common Name	Latin Name	\$ 2005 Sales (USD)	% change 2004
1. Garlic	<i>Allium sativum</i>	26,244,200	-3.28
2. Echinacea	<i>Echinacea</i> spp.	21,114,160	-11.21
3. Saw palmetto	<i>Serenoa repens</i>	19,252,980	-5.42
4. Ginkgo	<i>Ginkgo biloba</i>	16,553,030	-14.54
5. Cranberry	<i>Vaccinium macrocarpon</i>	15,839,160	16.97
6. Soy	<i>Glycine max</i>	14,497,100	-17.12
7. Ginseng*	<i>Panax ginseng</i>	11,444,550	-6.19
8. Black cohosh	<i>Actaea racemosa</i> †	9,736,738	-19.05
9. St. John's wort	<i>Hypericum perforatum</i>	9,035,399	-1.34
10. Milk thistle	<i>Silybum marianum</i>	8,312,867	6.77
11. Green tea	<i>Camellia sinensis</i>	5,648,459	93.89
12. Evening primrose	<i>Oenothera biennis</i>	5,303,904	-13.00
13. Valerian	<i>Valeriana officinalis</i>	3,435,420	-0.42
14. Horny goat weed	<i>Epimedium</i> spp.	2,184,910	-1.35
15. Grape seed extract	<i>Vitis vinifera</i>	2,162,104	-7.14
16. Bilberry	<i>Vaccinium myrtillus</i>	2,109,174	-10.04
17. Red clover	<i>Trifolium pratense</i>	1,718,605	-25.80
18. Yohimbe	<i>Pausynstalia johimbe</i>	1,542,513	-15.97
19. Horse chestnut seed extr.	<i>Aesculus hippocastanum</i>	1,220,254	-14.95
20. Ginger	<i>Zingiber officinalis</i>	862,719	5.75
Total All Herb Sales [including herbs not shown]		\$249,425,500	-3.67

Source: Information Resources Inc.² (<http://us.infores.com/>)

* It is not clear from the IRI data whether this figure also includes the sales of American ginseng root products (made from *Panax quinquefolius*), the sales of which are not as high as sales from supplements made from Asian ginseng (*P. ginseng*).

† The commonly used synonym and previously accepted binomial is *Cimicifuga racemosa*.

Table 3. Total Estimated Herbal Dietary Supplement Sales in US Food, Drug, and Mass Market (FDM) Channel—1998-2005

Year	\$ Total Sales*	decrease from previous year
1998	731,651,520	
1999	710,794,944	-3.0
2000	590,953,088	-15.1
2001	337,431,200†	-21.0
2002	293,397,664	-13.9
2003	278,212,100	-5.0
2004	257,514,900	-7.4
2005	249,425,500	-3.7

* Data from Information Resources Inc. (IRI) and published in various Market Report articles in previous issues of *HerbalGram* (i.e., issue numbers 49, 51, 55, 58, and 66).
† IRI stopped reporting data from Wal-Mart stores, a significant share of the sales in the FDM channel.

health and natural food stores; FDM as well other outlets in the mainstream market (e.g., warehouse buying clubs); convenience stores; mail order, radio and television direct sales, and Internet sales; companies that sell directly to the consumer (often called network marketing or multi-level marketing [MLM] companies); health professionals in their offices (e.g., acupuncturists, chiropractors, naturopaths, some conventional physicians, et al.), and other smaller channels.

Due to this wide variety of sales channels and the lack of accurate econometric tracking services for these channels (as is available from IRI in the FDM channel), it is difficult to accurately measure the precise level of sales of HDS in the United States. During the past 10-15 years, some

of the most precise sales data have come from the FDM channel due to the fact that the sales of herbs are reported by cash register and computer scanning data to companies like IRI (<http://us.infores.com/>) and AC Nielsen (<http://www2.acnielsen.com/>). According to IRI data, as has been reported in *HerbalGram* for the past 10 years, the 20 herbs that have enjoyed the top levels of sales in the United States in 2005 are shown in Table 2 (the top 20 herbs sometimes varying from one year to the next). It bears emphasis that the total sales of herbal dietary supplements in the FDM channels constitutes an estimated one-sixteenth of the *total* market for herbs in the United States, according to aggregates of the total sales of HDS in the US market as compiled by NBJ. Readers are thus cautioned not to utilize the IRI sales statistics in Table 2 without giving them proper context.

As shown in Table 2, of the top-selling 12 herbal dietary supplements, 9 indicate lower sales in the FDM channel in 2005 compared to the previous year. This is consistent with the total of all herbs sold in 2005 in FDM, calculated at \$249,425,500, or a 3.67% drop compared to 2004. During the past 7 or 8 years, sales in the FDM channel have suffered a continual decline, punctuated by spikes in sales for several herbs that have experienced surges due to increased demand stemming from positive publicity from clinical trials, market promotions, and/or other social trends (see Table 3).

For example, Table 2 indicates that sales for 3 herbs increased in 2005 (cranberry, milk thistle, green tea). The most dramatic increase (94%) occurred with green tea, the public perceptions of which are influenced by growing publicity about

the herb's strong antioxidant activity. (These statistics do not reflect the increase in green tea sales as "teas," i.e., as beverages; this relates to HDS only. Green and white tea beverage sales rose 18% in 2005, from \$136,041,305 in 2004 to \$160,258,650 in US natural supermarkets and conventional food/drug/mass market stores [excluding Wal-Mart], according to SPINS, a market research and consulting firm for the Natural Products Industry).³

With respect to the total market estimated sales, the NBJ statistics indicate that there has been an *increase in herbal combinations* in 2004 and 2005. Table 4 shows a 5.0% increase in combination formulations in 2004 and another almost equal (4.8%) rate of growth in 2005, after what appears to have been a precipitous decline of 18.6% from 2002 to 2003. The reduction is possibly due to the falloff in sales of Metabolife® 356 and a number of other ephedra-containing combinations during the period where significant adverse publicity was generated about ephedra (*Ephedra sinica* Stapf., Ephedraceae) in general (and its banning in HDS by the Food and Drug Administration), and the Metabolife product in particular.

Single herb HDS have not fared as well as combinations, according to the NBJ data. Singles (aka monopreparations) enjoyed a 3.2% growth rate in 2004 and a slight *decrease* of 0.7% in 2005.

Other channels of trade have experienced a more stable growth pattern with sales in the health food/natural food store channel generally being the most consistent over the past decade (see Table 5). Direct, or non-retail, sales have also performed better than the mainstream market but have not been as consistent, although they did outperform natural channel sales in 2005, mainly due to growth by MLMs. The better sales performance in natural and in direct sales channels is principally due to the fact that the so-called "core shopper," the consumer who has a relatively strong commitment to the philosophy underlying the natural products and natural health lifestyle—i.e., "natural is better"—are more willing to continue purchasing and using herbal supplements despite negative media stories about lack of effective regulation, safety concerns, or results of negative clinical trials. On the other hand, much of the consumer demand in the FDM channel comes from

Table 4. Herb Sales by Category in All Channels: Singles (Monopreparations) vs. Combinations

	2003		2004		2005	
	\$ Sales (millions)	% Growth	\$ Sales (millions)	% Growth	\$ Sales (millions)	% Growth
Total Single Herbs	2,810	6.0	2,900	3.2	2,880	-0.7
Total Combination Herbs	1,400	-18.6	1,470	5.0	1,540	4.8
Total Herbs	4,210	-3.4	4,380	4.0	4,420	0.9

Source: Ferrier et al. *Nutrition Business Journal* 2006 (in press).¹ (www.nutritionbusiness.com)

Market Report

what marketing consultants refer to as “peripheral shoppers,” consumers who are more mainstream and less committed to the natural health philosophy; these consumers are more easily influenced by negative media reports and are thus presumably less willing to continue to purchase an herbal supplement in the face of growing negative publicity. In addition, the mass market had a significantly stron-

ger dependence on the former availability of ephedra-based weight-loss products, which have now been banned by the US Food and Drug Administration, than the natural or direct sales channels.

Nevertheless, despite the appearance of a downward trend in the FDM channel, again chosen here due to the availability of better statistical data, the aggregated sales for *all market channels* as compiled by

NBJ strongly suggests that the market for herbs and plant-based dietary supplements in the United States appears to have stabilized in traditional single-category herbs, while offering significant recent growth in condition-specific blends (still mostly weight-loss) and certain new categories like liquid botanicals including noni (*Morinda citrifolia* L., Rubiaceae),

mangosteen (*Garcinia mangostana* L., Clusiaceae), and goji/wolfberry (*Lyceum* spp., Solanaceae) juices. Many creative and innovative companies are producing and marketing new ingredients and products that contain patented ingredients and/or those with clinical substantiation of safety and efficacy. Despite downward price pressures resulting from the importation of low-cost botanical ingredients and extracts from Asia, particularly China, the development of proprietary patented and clinically-tested ingredients and products promises to help provide the American consumer with an array of high-quality, safe, and clinically effective herbal products. HG

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Table 5. Herb Sales by Channel for 2005

Channel	\$ Sales (millions)	% Increase (-decrease)
Mass Market*	713	-3.5
Natural & Health Food†	1,429	2.0
Direct Sales‡	2,268	4.0
Total	4,410	2.1

Source: Ferrier et al. *Nutrition Business Journal* 2006 (in press).¹ (www.nutritionbusiness.com)

* Mass market includes food/grocery, drug, mass merchandise, club and convenience stores, including Wal-Mart, Costco, etc.

† Natural & health food include supplement and specialty retail outlets, including Whole Foods, GNC, sports nutrition stores, etc.

‡ Direct Sales include Mail Order (including catalogs), direct mail and direct response TV and radio; practitioners representing conventional and alternative practitioners selling to their patients, including ethnic herbals and herb shops; Multilevel (MLM) or network marketing representing firms like Advocare, Herbalife, Nature's Sunshine, NuSkin (Pharmanex), Nutrilite (Amway/Quixtar), Shaklee, etc.

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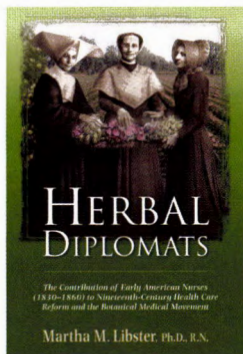
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Herbal Diplomats: The Contribution of Early American Nurses (1830-1860) to Nineteenth-Century Health Care Reform and the Botanical Medical Movement by Martha M. Libster, PhD, RN. West Lafayette, IN: Golden Apple Publications; 2004. 384 pages, hardcover. ISBN 0-9755018-0-1. \$37.00.

Author, nurse, and professor of nursing history at Purdue University, Martha Libster focuses on the healing work and use of botanicals by women in the United States during the mid 19th century (1830-1860). Dr. Libster, who holds a doctorate degree in Humanities and is an expert on the historical and contemporary integration of botanical therapies and nursing care, presents a most interesting history about herbal medicine during this time period. She also provides a valuable addition to the history of nursing in the United States, describing the roles of early nurses who provided health services to their communities. In recognition of its excellence, this book was awarded the 2005 Lavinia L. Dock Award by the American Association for the History of Nursing.

The women of this historical period bridged the gap between domestic and public domains by bringing to their communities the knowledge of health and healing through botanical remedies. The author describes in-depth case studies from 3 organized groups of nurses: Shakers, Latter Day Saints, and Sisters of Charity. These groups are representative of the early organizations of nurses in the United States. During the mid 19th century, there were few hospitals, and the role of nurses was that of a community resource or healer. The author situates the nurse's role in the cultural context of early 19th century when women's work was largely relegated to the domestic sphere, in contrast to men's work in the public spheres. Women's work had traditionally incorporated the health care of their families and members of their communities. Using detailed examples from these 3 groups, Dr. Libster asserts that these women acted as herbal diplomats by bringing the domestic knowledge of botanicals to the public. In keeping with their more domestic roles, the written histori-



cal accounts of these early herbal diplomats were not systematically recorded, as opposed to the healing practices of men. Thus, a good deal of the information comes from the "receipt book" journals in which women recorded some of their domestic exchanges, such as foods and healing remedies. Many of these receipt books contained case study notes about specific treatments. Additional sources of information came from letters, diaries, and organizational reports.

The author situates this kind of activity within its historical context. The political climate at this time was described as "Jacksonian democracy," one that valued self care, nature, and an agrarian economy. The practitioners of what was then considered conventional medicine (labeled the "Regulars") were moving toward a more scientific basis, oriented around the control or domination of nature. These practitioners were generally university educated and constituted a relatively elite class. This was the period of "heroic medicine," which refers to the use of treatments and medications with a powerful action. Their primary approach was to purify the body using the techniques of bloodletting and administering powerful emetics (which produced vomiting) and cathartics (which acted as powerful laxatives).

This was also a time of medical pluralism and several different groups of health providers were practicing. Dr. Libster describes the work of "Empirics," later called the "Eclectics," who embraced more natural cures and the use of botanicals. Most of Empirics did not have a university education. However, they were often very knowledgeable about botanicals or herbal medicine. One of the most prominent groups of health providers were the Thomsonians, who developed a "Materia Medica" based on botanical remedies from American Indian, immigrant, folk, and domestic remedies. Many of these remedies were patented and became known as "patent medicine." As America became more urbanized and industrialized, professional biomedicine emerged as the dominant practice, incorporating many of the botanical remedies into pharmaceuticals. Many of these early nurses worked with both the Regulars and the Empirics. Inter-

estingly, many of the botanical remedies of that period were also aimed at catharsis, but were much gentler than the heroic practices of the Regulars. These remedies were often combined with tonics and botanicals with a more nourishing intent.

Dr. Libster explores the archives of 3 religious communities: The Shaker Infirmary and Community Nurses, the pioneer Nurses and Midwives of the Church of Jesus Christ of Latter-day Saints (Mormons), and the Sisters of Charity hospital nurses. She highlights both commonalities and differences in how nurses in these distinct organizations integrated healing practices from both the Regulars and the Eclectics. Dr. Libster describes their relationship to the Botanical Medical Movement (in particular Thomsonianism), and the American Indian healing practices related to botanicals. The author includes many botanical therapies, recipes, and remedies used for various ailments. This book illuminates how these nurses cast a more feminine approach to health and healing.

Herbal Diplomats is well-researched and extensively documented with numerous specific examples from each of the 3 exemplar groups. It makes an excellent contribution to women's history studies as well as illuminating the contributions of women and nurses to healing and the use of botanicals. This book contains interesting and relevant material for those interested in the history of herbal medicine in the United States. It also makes a much needed contribution to the history of the nursing profession by documenting this work of early nurses, prior to standardized education and professionalization. The author provides numerous references and admirable scholarship, which makes it an excellent reference book. It is recommended for both academics and the literate lay audience. HG

—Joan C. Engebretson, DrPH,
AHN-BC, Professor, University of Texas
Health Science Center at Houston,
School of Nursing

Poisonous Plants: A Handbook for Doctors, Pharmacists, Toxicologists, Biologists, and Veterinarians, 2nd Edition, by Dietrich Frohne and Hans Jurgen Pfander, Inge Alford (Translator). Portland, OR: Timber Press; 2005. Hardcover, 469 Pages. ISBN 0-88192-750-3. \$150.00.

Book Reviews

Poisonings continue to occur in human beings and animals throughout the world, both from intentional and accidental encounters with a variety of plants. Small children are usually the most affected population, since their natural inquisitiveness entices them to handle and sometimes taste diverse plant parts such as flowers, fruits, or leaves.

Adult poisoning is also not uncommon, due to the misinformation and misidentification of wild plant gatherers and others who seek dangerous "recreational" experiences with some plants such as "Jimsonweed" or "Thorn apple" (*Datura* spp.). Such situations may end in tragedy because many people do not have a reliable and well-illustrated source of information regarding the toxicity of various members of the plant kingdom.

Livestock and pets may also be poisoned by eating feed contaminated with toxic plant parts, or simply by grazing poisonous plants when other more palatable or nutritious plants are unavailable.

Professor Dietrich Frohne and Dr. Hans J. Pfander are both researchers at the University of Kiel, Germany, who have continued to update this important compilation of information about hundreds of plants contained within approximately 89 botanical families, which are potentially toxic to humans, livestock, and companion animals.

Every economically important botanical family that contains toxic species is mentioned, including a description of its most salient morphological characteristics. For every plant discussed herein, the toxic constituents are thoroughly covered, as well as the methods of treatment. In some cases, beautiful color pictures of the plant, as well as black and white line drawings of its offending chemical compounds, are also provided. A selected bibliography for further reading is found after the description of each plant family.

The first English edition of this text appeared in 1984 and quickly became popular with the scientific community worldwide due to its ample coverage of plants that are potentially or actually toxic to both humans and animals.

The authors begin by defining a poisonous plant. This is indeed necessary, as

many plants used commonly as food, ornament, or medicine can indeed be toxic if consumed at the wrong stage of growth or by employing the wrong part of the plant, which could be both inedible as well as toxic. Species that can cause allergies or dermatitis by contact are also included.

There is also a discussion about how plant poisonings usually occur, as well as the most common species usually involved.

The diverse toxic constituents contained in plants, such as alkaloids, glycosides, toxic amino acids, terpenes, and the like are also briefly mentioned. This catalogue of plants poison-

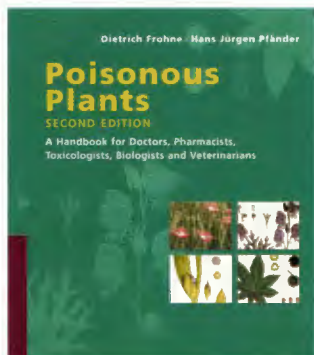
ous to humans and animals is arranged in alphabetical order by botanical family, including the most important representatives of toxicological interest contained in each family.

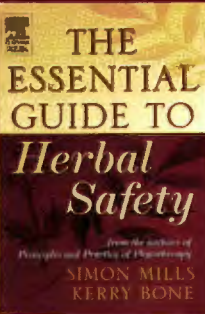
This second English edition of this

European classic has been substantially revised and updated, containing approximately 60% more information than the previous edition. New information is included about plant poisonings, as well as a broader coverage of plant species outside the main geographic scope of this text, which had been central Europe.

Information about North American poisonous plants has been included as an appendix thanks to the collaboration of Kark Cumpston, PhD, and the late Patrick Mckinney, PhD, both from the University of New Mexico. Within this appendix, the description of toxicity for many American species used in herbal medicine is expounded, as is the case of blue cohosh (*Caulophyllum thalictroides* [L.] Michx., Berberidaceae), for example, which can cause serious toxicity during pregnancy if used irresponsibly.

The authors not only mention the toxic properties and botanical characteristics of the plants as mere academic information, but provide an insert with the treatment (if known) regarding each species. This feature makes the book even more practical for those involved in poison control





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centers and hospitals who need a quick reference guide that not only includes the color picture of the plant for identification purposes, but which also suggests the currently accepted mode of treatment or support for the intoxicated patient.

Doctors Frohne and Pfander have included a useful synopsis of berry-like fruits in table format which aids toxicologists and others in the correct identification of the plant, according to the type, color, consistency of the fruit, and growth habit (woody, herbaceous, epiphytic, etc.) of the plant involved.

The book also contains a section with black and white pictures of leaves that point out the characteristic leaf features, which can be an invaluable source for the correct identification of the plant involved in an intoxication. Since time is of the essence in any intoxication, this information will be very handy when making split-second decisions regarding the treatment for a particular species of plant involved.

A glossary of botanical terms has been added and is a useful tool for understanding the botanical terms used throughout the book.

An important aspect of this work is that the authors caution readers not to look at plants with fear and suspicion, but rather encourage them to learn, as well as teach their children, about the risks of handling

certain plants, instead of the misguided "eradication" approach so common in many misinformed publications.

We must learn to identify and avoid the most common offending species, with the understanding that *even the most toxic plant, when used correctly, may have an important medicinal or therapeutic value for both humans and animals*. The Western yew tree (*Taxus baccata* L., Taxaceae) has been known to be poisonous for many centuries, yet the anticancer compound paclitaxel (commonly known as Taxol®) has been derived and eventually synthesized from this species and is now employed to treat breast cancer.

Podophyllotoxin and vincristine are 2 other anticancer compounds which have been obtained from the may apple (*Podophyllum peltatum* L. Berberidaceae) and the lesser periwinkle (*Catharanthus roseus*), respectively.

Some potentially poisonous plants may be present in homes, gardens, and perhaps even children's school yards. These plants usually occur as hedges or decorative houseplants, while others may be considered simply as weeds. For this reason it is important to know which plants could, at some point, pose a hazard to people or pets.

This long-awaited new edition will certainly be a valuable addition to the libraries of physicians, veterinarians, bota-

nists, agronomists, and others interested in a serious and in-depth coverage of toxic plants, not only from Europe, but throughout the world. HG

—Armando González Stuart, PhD
University of Texas at El Paso,
UT Austin Cooperative Pharmacy
Program

Handbook of Analytical Methods for Dietary Supplements by Frank Jaksch, Mingfu Wang, and Mark Roman. Washington, DC: American Pharmacists Association; 2005. Hardcover, 215 pages. ISBN 1-58212-055-2. \$197.95.

This book is basically a compilation of HPLC (high-performance liquid chromatography) methods for the analysis of predominantly "popular" herbs and some of the more common dietary supplements used in this industry today. There are 38 monographs in all, each with a standard format for quick reference. Entries include chemical names, formulas, and structures, along with information on solubility and other physical/chemical data. Also provided are a brief description of common uses and the mode of action, if known.

With new final rules for current Good Manufacturing Practices (GMPs) soon to be published by the Food and Drug Administration, this book is a timely publication that will help fill the analyti-

New Book Profiles

Sacred Mushroom of Visions: Teonanácatl. Ralph Metzner and Diane Conn Darling, eds. Rochester, VT: Park Street Press; 2006. 293 pages, softcover, contents, b&w photos, figures, references. \$16.95. ISBN 1-59477-044-1.

Surveys the history of mushrooms that contain the psychoactive substances psilocybin and/or psilocin. Offers an assortment of information on ancient Aztec traditions, twentieth-century scientific studies and psychotherapy, as well as many detailed personal accounts of mushroom ingestion by individuals desiring enhancement of their spirituality and consciousness. Additionally explains the global distribution, biochemistry, and neuropharmacology of these types of mushrooms.

Aromatherapy Science: A Guide for Healthcare Professionals. Maria Lis-Balchin. London: Pharmaceutical Press; 2006. 462 pages, hardcover, contents, bibliography, appendices, index. \$69.95. ISBN 0-85369-578-4.

Provides healthcare professionals with science-based information pertaining to aromatherapy. Provides detailed, scientific monographs on the essential oils and absolutes available in the United States and Europe. Introduces basic concepts of aromatherapy along with historical, chemical, and biological background information. Covers safety issues and clinical trials.

Dictionary of Nutraceuticals and Functional Foods. N.A. Michael Eskin, PhD, and Snait Tamir, PhD. Boca Raton,

FL: CRC Press, Taylor & Francis Group; 2006. 507 pages, hardcover, 172 chemical structures, 102 figures, 73 schemes, and 64 tables, references. \$79.95. ISBN 0-8493-1572-7.

Defines more than 470 nutraceuticals and phytochemicals and provides the latest facts and research for each entry. Gives the biological and chemical activities that constitute the health and disease-modifying properties for each herb, plant, vitamin, or compound. Each entry is followed by authoritative references.

Medicinal Spices: A Handbook of Culinary Herbs, Spices, Spice Mixtures and Their Essential Oils. Eberhard Teuschner. Edited and translated by Josef Brinckmann and Michael Lindenmaier.

cal gap for the dietary supplement (DS) industry. Regulatory considerations combined with increased competitive pressures have created a growing need for accurate analytical results from laboratory testing of botanical raw materials, their extracts, and finished products. With so many different methods of analysis becoming available for the same botanical ingredient, it has become necessary for members of the herb industry to use not only valid but "validated" methods of analysis to ensure the "identity, purity, quality, strength, and composition of their dietary ingredients." Accordingly, this book provides natural products chemists with the necessary confidence in their quantitative analysis for some of the marker compounds contained within these complex systems.

Anyone involved with the analysis of DS will want to have this book in his or her library. Moreover, it is probably an indispensable resource for any analytical chemist involved in botanical DS analysis. The book has much to offer an industry sorely lacking this kind of reference material. Too frequently, compendial methods are not available, and one typically has to

search through university or web-based libraries for any references to a particular method of analysis. In the lab, we usually have to combine various methods from different research papers as part of the method development process.

Finally, we can now look at one source and find analytical methods for many common as well as uncommon herbs and dietary supplements. In almost every monograph, this book presents several methods. This is a particularly nice feature because one has the opportunity to review, compare, and contrast several valid methods. Many of the methods offered are from peer reviewed journals and include a reference to the original publication. Some of the methods presented include an additional section

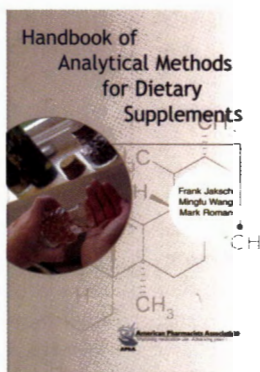
describing different levels of validation data.

Some minor improvements would make this book more complete. First, it would be helpful to have more actual chromatograms for any and all methods as well as the spectra of the various compounds of interest. A picture is worth a thousand words—especially when it comes to chromatography. It reveals

much about a method that isn't necessarily revealed from the data alone. Data are great but chromatograms are what we frequently use to evaluate a method. If there were more chromatograms, this book would be even more valuable to the natural products chemist. Second, although there is generally enough information to carry out the analysis, some of the methods leave out details in the method preparation that could be important. Fortunately, the reference to the original publication of the method should be useful in these situations. These suggestions would provide a welcome addition to a well written and researched book of analytical methods for DS.

All in all, we give this book "two thumbs up." It accomplishes its purpose of providing a sampling of analytical methods, along with appropriate validation data when available, for some of the more common herbs and DS in commerce today. Now all the authors have to do is continue publishing these practical lab books for all the natural product companies and their analytical chemists, and thus make their lives a little easier. HG

—Sidney Sudberg and
Jennifer Terrazas
Alkemists Pharmaceuticals, Inc.



Boca Raton, FL: CRC Press, Taylor & Francis Group; 2006. 459 pages, hardcover, contents, list of abbreviations, 173 full-color illustrations, 36 b&w illustrations, 498 chemical structures, index of general references, subject index, photo credits. \$149.95. ISBN 0-8493-1962-5.

Describes 300 plants and the spices that are obtained from them. Provides comprehensive monographs on 84 culinary herbs and spices. Extensive information on chemical constituents, pharmacological actions, sensory properties, potential toxicity, as well as culinary and medicinal uses. Covers the production of spices from breeding and cultivation to quality standards and governmental regulations.

Pocket Guide to Herbal Medicine. Karin Kraft, MD, and Christopher Hobbs, LAC, AHG. Stuttgart,

Germany: Georg Thieme Verlag; 2004. 503 pages, softcover, contents, 5 tables, 11 b&w illustrations, appendix with Latin-English plant glossary, dosages, addresses, references, and index. \$34.95. ISBN 1-58890-063-0 (US), ISBN 3-13-126991-X (Germany).

Provides plant summaries that cover pharmacology, indications, contraindications, dosage information, adverse effects, herb-drug interactions, and references for more than 100 herbs. Includes specific herbal treatments and procedures for diseases involving every human organ system, from cardiovascular to urogenital, with a separate section for pediatric diseases. Offers disease-specific clinical considerations and explains the basic fundamentals and guidelines of phytotherapy.

Textbook of Natural Medicine. Third Edition. Joseph E. Pizzorno, Jr., and Michael T. Murray, eds. St. Louis, MO: Elsevier Ltd.; 2006. 2368 pages, hardcover, contents, b&w figures, charts, tables, appendices, index. \$229.00. ISBN 0-443-07300-7.

This revised version of the classic two-volume edition offers extensively researched and referenced information on the practice of natural medicine. Six separate sections provide evidence-based overviews into the various topics regarding complementary and alternative medicine, such as its history, diagnostic procedures, and varieties, as well as pharmacology and disease-specific issues and treatment approaches. Provides comprehensive summaries on more than 70 natural medicines and over 70 specific health problems. HG



Gladys Iola Tantaquidgeon 1899–2005

Gladys Iola Tantaquidgeon, aka Mohegan Medicine Woman, passed away November 1, 2005, at the age of 106. She died peacefully of natural causes at her home on Mohegan Hill in Uncasville, Connecticut. At the time of her death, she was the oldest living member of the Mohegan Indian Tribe.¹

Among her many achievements, Tantaquidgeon played a critical role in disproving the “Last of the Mohicans” myth which, repopularized by the 1992 movie of the same name, was based on James Fenimore Cooper’s 1826 French and Indian War novel.² The novel ended with the Mohegan’s Chief Uncas’ dying, leaving no heirs, and signifying the end of the tribe.³

Tantaquidgeon, however, knew better of this myth. She was a 10th generation descendant of Chief Uncas who, contrary to Cooper’s account, lived a long life and had many children.² Tantaquidgeon worked tirelessly to document the tribe’s continuing existence through in-depth record-keeping and artifact preservation. In 1994, Tantaquidgeon’s efforts were paramount in the United States Bureau of Indian Affairs’ decision to officially recognize the Mohegan tribe, now with 1700 members.⁴ Tantaquidgeon also successfully campaigned against the use of the Dutch word “Mohican” in favor of the English word *Mohegan*, which in their native language means “wolf.”²

Born in 1899, the third of seven children to John and Harriet Fielding Tantaquidgeon, both Mohegan Indians, Tantaquidgeon’s childhood was steeped in Mohegan tradition and culture.¹ Most of the males in her family served as tribal chiefs, including her brother Harold, and the women as tribal matriarchs.²

“By age five, three tribal *nanus*, respected elder women whom she called her ‘grandmothers,’ had singled her out to receive the store of traditional practices, beliefs, and lore that comprise Mohegan culture,” wrote Peter Nichols in the article, “Running Against Time.”⁴

Her *nanus*, Lydia Fielding, Mercy Ann Nonesuch Mathews, and Emma Baker, guided Tantaquidgeon in her youth as she learned the ways of tribal spirituality and herbalism.¹ Ultimately, she had the honor of becoming only the third medicine woman of her tribe since 1959.²

In 1919, she enrolled at the University of Pennsylvania to study anthropology alongside Frank Speck, the founder of the college’s anthropology department and longtime Mohegan field researcher and friend.⁴ It was there her great niece, Melissa Fawcett, said Tantaquidgeon was exposed to new ways of thinking, to other Indian tribes, and to courses which broadened her academic focus.⁴ Her research at the University eventually led her to write her best known book, *A Study of Delaware Indian Medicine Practice and Folk Belief* (Commonwealth of Pennsylvania, Dept. of Public Instruction, Pennsylvania Historical Commission), published in 1942 and reprinted in 1972 and 2000 as *Folk Medicine of the Delaware and Related Algonkian Indians* (Pennsylvania Historical & Museum Commission).⁵

Though she never graduated from college, Tantaquidgeon received honorary doctorates from Yale and the University of Connecticut in recognition of her achievements.⁴

In 1931, Tantaquidgeon, her father, and her brother opened the Tantaquidgeon Indian Museum, now considered the oldest Native American-run museum in the United States.⁵ Displays are not exclusive to the Mohegan tribe and include artifacts from a variety of Native American tribes. Tantaquidgeon enjoyed educating others about Indian culture and sharing the oral tradition of storytelling.⁴ She was often heard saying, “You can’t hate someone that you know a lot about.”³

By 1934, Tantaquidgeon decided to take a job with the Bureau of Indian Affairs and went to work helping the Indians on the Yangton Sioux Reservation in South Dakota.⁵ In 1938, motivated by the poor living conditions on the reservation, she took a position with the newly formed Federal Indian Arts and Crafts Board and

encouraged Native Americans to improve their quality of lives through traditional Indian craft skills.⁴

“The strategy would also make the native economy a vehicle for handing down traditional tribal skills,” said Nichols. “She taught Indian art and handiwork on several Lakota reservations, invited accomplished Native American artists to come and teach, and exhibited the art in museums across the country.”

In the 1940s Tantaquidgeon worked as a librarian at the Niantic Women’s Prison in Connecticut.¹ In 1947 she returned home to Mohegan Hill to work in the museum. She gave public tours until she was 99.⁶

Tantaquidgeon received numerous awards for her lifetime of good works, including the National Organization for Women’s Harriet Tubman award, the Institute for American Studies’ Hall of Elders award, and induction into the Connecticut Women’s Hall of Fame.¹ She never married nor had children, but her legacy continues in the hearts of all whom she taught or inspired.

“She was Mrs. Mohegan. I always looked at her as such,” Lifetime Mohegan Chief Ralph Sturges told the Norwich Bulletin. “And I know that a lot of people will miss her. When you miss a shining light, you don’t realize it until it goes out.”⁶ HG

—Cynthia Crimmins

Tantaquidgeon knows how to make cough remedies from the inner bark on the south side of maple trees and that a howling dog is a herald of death. She knows that the relationship of her people, the Wolf People, with birds and animals, lands and waters, rocks and plants is profoundly different from the experience of most in Western society. She knows that we inhabit a vast and living cosmos in which all things are related and that it is “good medicine” to give thanks for all the blessings. Above all, she remembers the ancient legends and knows that time moves swiftly, despite the fact that Earth is mounted on the back of Doyup, Grandfather Turtle.

—Peter Nichols, editor, *Penn Arts & Sciences Magazine*; author, Tantaquidgeon biographical article, “Running against Time.”

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Courtesy Theodore Payne Foundation for Wild Flowers and Native Plants, Inc.

Edward Peterson 1905–2005

Edward Peterson, who collected wildflower seeds across the deserts, mountains, and meadows of Southern California, died on November 14, 2005, at a nursing home in Los Angeles.¹ He was 100 and the oldest surviving member of the Angeles Chapter of the Sierra Club.²

After helping launch the Theodore Payne Foundation for Wildflowers and Native Plants with a mission to preserve the area's native flora, he began the seed collecting program in 1962.³ In addition to collecting seeds, he sorted, cleaned, packaged, and sold them. According to the Foundation, he served "with exceptional distinction for 45 years" and "amassed a knowledge of native plant seeds that is unsurpassed."²

Despite vicious thorns and occasional rattlesnakes, Mr. Peterson persisted, often on his hands and knees, in floral expeditions that annually yielded no more than 20 pounds of mostly minuscule seeds. He knew the backcountry so well that

he could predict at what bend or mile marker a particular flower would appear. His "search and re-search" technique was to find a plant in bloom and then come back when it had turned brown and gone to seed. He called it "re-search" because it was often as difficult to find the plant the second time as it was the first.¹ Seed hunting, Peterson happily pointed out, was better than fishing, because "we always come back with something."⁴

In recent years, he continued his hikes despite becoming legally blind 5 years ago. He knew hundreds of flowers and identified them by others' descriptions, giving both common and Latin names. He regarded tents as a "nuisance" and slept on the ground, including on his last outing to Anza-Borrego Desert State Park on his 100th birthday in the spring of 2005.¹

Edward Leslie Peterson was born in Los Angeles on April 8, 1905, and grew up in Hollywood, where he watered his family's Shasta daisies and tended the vegetable garden. After high school, he worked at a local nursery for 3 years before attending the University of California, Los Angeles to earn a degree in botany in 1930.⁴ He spent the next 25 years as landscape supervisor at Los Angeles City College.

"He was a superb amateur botanist and an expert on the propagation of native plants from seeds," said Bob Cates, historian of the Angeles chapter of the Sierra Club, which Mr. Peterson joined in 1938.⁴ In the late 1940s, Peterson won a contest to name the newly launched newsletter of the Club, earning a lifetime subscription.

The microscopic seeds Mr. Peterson found were sold by the apothecary spoonful, not by the pound, he told the *Los Angeles Times* in 1988. "You could start as an infant and die a centenarian, and you couldn't gather 20 pounds of California fuchsia seed in your lifetime," he said wistfully.¹

Collecting seeds, nature's most basic creation, helped "give purpose to my life," he said in a 1998 interview. "It has kept me going through these years."⁴

Rather than having a traditional service, his family elected to spread his ashes on Mt. San Jacinto the following spring at a spot where he and his brothers camped as children and first learned to appreciate the wilderness.² HG

—Nancy Dennis

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Jeannine Parvati Baker 1949–2005

Celebrated author and midwife Jeannine Parvati Baker passed away on December 1, 2005, in Joseph, UT. She was 56 years old.

Ms. Parvati Baker had long served as a teacher and advocate of natural childbirth and therapies. She wrote hundreds of articles on health and wellness, as well as several books. Ms. Parvati Baker further promoted gentle birth practices, non-circumcision, and natural therapies through her many presentations at conferences throughout the world.

"She was one of the first herbalist teachers at those early herb conferences back in the early seventies, and her teachings live on through the thousands of people who studied with her," said Rosemary Gladstar, founder of United Plant Savers, author of several books on herbs, and long-time friend of Ms. Parvati Baker (e-mail, April 10, 2006). "She had a huge influence on women, conscious conception, and the home birth movement. That was her specialty."

Ms. Parvati Baker was born in Los Angeles, CA, on June 1, 1949. The story of her own hospital birth, described by her parents as traumatic, inspired her initial interest in birth psychology, as well as her life-long advocacy of natural and gentle childbirth practices. She began studying such topics at San Francisco State University, ultimately earning both her bachelor's of arts and master's degrees in psychology at that institution. Her personal birth history, as well as her experiences studying with the famous Indian guru Baba Hari Dass, motivated her to write *Prenatal Yoga and Natural Childbirth* in 1974, which was the first book on prenatal yoga in the West. She published her second book, *Hygieia: A Woman's Herbal*, in 1979, which served as her master's thesis. Ms. Parvati Baker later co-authored a third book, *Conscious Conception: Elemental Journey through the Labyrinth of Sexuality*, with Frederick Baker and Tamara Slayton in 1986.

Ms. Parvati Baker actively worked as a midwife and yoga instructor for many years, then taught such skills through both an informal correspondence course on midwifery and an apprenticeship program. She started the correspondence course—called Hygieia College—in 1980. By late 2001, there were approximately 1,000 students from around the world enrolled in the course.

According to Kathi Keville, director of the American Herb Association and author of several books on herbs and aromatherapy, “Jeannine Parvati was a midwife not only for all the babies she brought into this world, but of the spirit. She encouraged everyone—those who attended her workshops, read her books, or were her friends—to develop deeper and more honest relationships with their families, friends, the earth, and most importantly, with themselves.

“One of her skills was as a wordsmith, cleverly pointing out how the very words we choose, personally and as a society, to express ourselves, reveal much about one's true nature,” Keville continued. “She articulated this in her poetry and books on healing. Our herbal community has lost a guiding light. My sadness at her passing is eased knowing how many lives she touched, and will continue to touch, through her work” (e-mail, April 27, 2006).

Gladstar echoed such sentiments of Ms. Parvati Baker's speaking powers and

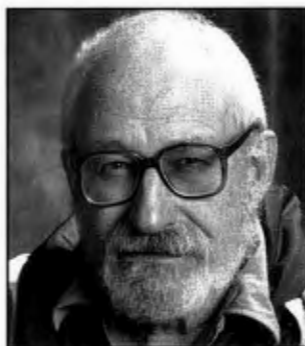
influence. “Whenever, wherever Jeannine spoke, her word magic transformed the people listening to her,” Gladstar explained. “She wrote and spoke in poetry, but it wasn't always easy to listen. She was fierce and tough at times, like the desert she lived in. And she fought relentlessly for those things she believed in, with her words and her writings. I say, thank the goddess, for the world has changed a little for the better because of her.”

Jeannine Parvati Baker is survived by her mother, sister, 6 children, and 1 grandchild. HG

—Courtney Cavaliere

Source

Jeannine Parvati Baker. Birthkeeper Web site. Available at: <http://www.birthkeeper.com/Obituary.html>. Accessed: January 24, 2006.



**John W. Thieret
1926–2005**

Renowned botanist John W. Thieret, PhD, passed away on December 7, 2005, at the age of 79.¹ His lifelong dedication to the botanical field resulted in contributions to taxonomy, education, research, and botanical literature.

Dr. Thieret was born August 1, 1926, in Chicago, IL.² He earned his bachelor's and master's degrees in botany from Utah State University (in 1950 and 1951, respectively) and obtained his PhD in botany from the University of Chicago in 1953.³ He began his career serving as Curator of Economic Botany at the Field Museum of Chicago from 1954–1961. He then entered academia, teaching at the University of Southwestern Louisiana in Lafayette from 1961–1973. He later served as Professor of Botany at Northern Kentucky University (NKU) from 1973–1992, after which he acted as that institution's Professor Emeritus of Botany.

Miriam Steinitz-Kannan, PhD, professor of biology at NKU and close associate of Dr. Thieret for 26 years, said Dr. Thieret attracted many students to the study of botany, some of whom had very little previous knowledge of plants (Steinitz-Kannan M, oral communication, June 1, 2006): “He got so many students interested in botany—that's probably his greatest legacy! He adored botany and had a tremendous eye for diversity. He had such a passion for the field that it was contagious. We're going to miss that a lot.”

For many years, Dr. Thieret also actively worked in an advisory or editorial capacity for various organizations and publications.³ He was an editor of the journal *Economic Botany* for over 25 years, from 1959–1984, and later also served as the journal's associate editor. He was an advisor in botany for the *Encyclopedia Britannica*, a member of the Board of Trustees for the Lloyd Library in Cincinnati, and a member of the editorial committee of the Flora of North America Association, to name just a few.

Another lauded accomplishment was his founding and development of the NKU herbarium.² His research and field work also led him to publish multiple articles and books, and several plant species bear his name.

“Probably the greatest legacy of John Thieret is his continuing influence on those he encountered who wished to learn about plants,” said Robert Naczi, Curator of the Claude E. Phillips Herbarium at Delaware State University (e-mail, May 26, 2006). “John was a gifted teacher whose enthusiasm for all aspects of plants was infectious. Through sharing his deep botanical knowledge, quick wit, and attention-getting (often unconventional) demonstrations and stories, John managed to communicate passion and accurate science to generations of students, naturalists, and other professional botanists.”

James Reveal, PhD, Professor Emeritus at the University of Maryland, commented that Dr. Thieret's botanical knowledge encouraged many organizations and individuals to seek his counsel (J. Reveal, e-mail, May 24, 2006): “John was the person the Flora of North America Committee turned to whenever they needed someone to write a treatment of some group that no one else particularly knew anything about. Foremost to me personally was his knowledge of botanical

explorations and discoveries in the Southeast; he was a valuable resource whenever I was working on the subject.”

Dr. John Thieret is survived by his wife Mildred, his 5 children, 7 grandchildren, and 5 great-grandchildren.¹ HG

—Courtney Cavaliere

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Courtesy Savan Donnelly/UC Berkeley

William J. Oswald 1919–2005

William J. Oswald, PhD, a scientist who pioneered many ways to use algae—from treating wastewater and generating energy to facilitating space travel—died of pancreatic cancer on December 8, 2005, at his home in Concord, California. He was 86. Dr. Oswald was a professor emeritus in civil and environmental engineering and a researcher at the Lawrence Berkeley National Laboratory (LBNL).

Oswald was among the first engineers to study the symbiotic interactions between algae and bacteria in wastewater treatment ponds. For over 60 years he combined biological and engineering knowledge to create many valuable applications for the ability of algae to make remarkably efficient use of solar energy.

The most widely used of the applications he developed is the Advanced Integrated Wastewater Pond Systems (AIWPS), a

technology in which wastewater passes through a series of ponds that use algae photosynthesis rather than electromechanical aeration devices to aerate the water. The algae-produced oxygen allows aerobic bacteria to break down contaminants in the water. Oswald designed well over 100 wastewater treatment facilities around the world.¹

“Bill Oswald has contributed to wastewater treatment, and hence to public health, in the less developed world, more than anybody else I know,” said Gedaliah Shelef, professor emeritus of Israel’s Technion Institutes of Technology, an expert on wastewater engineering and a former student of Oswald’s.¹

Many benefits flow from an algae pond treatment system: the algae can be harvested as a protein-rich food for animals; the cleansed water can be reused for irrigation or as a coolant; the sludge from the bottom of the pond can be added to the soil for a high humus fertilizer; microalgae can absorb heavy metals; settling and digestion chambers can produce methane for use as a fuel; and using microalgae to treat wastewater saves energy and reduces greenhouse gas emissions. And since algae can do all this work in seawater, precious freshwater can be conserved.²

Dr. Oswald’s largest AIWPS design was for the purpose of purifying the Ganges River, which is heavily used for daily religious bathing and drinking.³

Oswald’s inventions went beyond treating wastewater. Early in his career, he demonstrated a life support system for the US Air Force space program that used algae to purify astronaut waste while producing distilled water and oxygen.²

Dr. Oswald’s interest in the nutritional value of algae led to the development of production systems for spirulina (*Arthrospira maxima* Setchell & Gardner, Oscillatoriaceae) and dunaliella (*Dunaliella salina* [Dunal] Teodor, Dunaliellaceae). One of his graduate students set up the first spirulina production plant in the United States. Oswald also assisted in the establishment of a pond system growing dunaliella for commercial production of glycerol and beta-carotene.²

Born in King City, California, on July 6, 1919, Oswald grew up on an arid ranch where his interest in water, agricultural production, and human health began. Two early experiences accounted

for his passion for working on affordable sanitation. As a child in rural California, he witnessed the choking death of a schoolmate from a roundworm infection caused by poor sanitation. While serving as a hospital administrator in Europe after World War II, he coordinated the care of patients suffering from the effects of contaminated water.

When he came home, Oswald studied at UC Berkeley, earning a degree in civil engineering in 1950. He stayed on to get a doctorate in sanitary engineering, biology, and public health in 1957, the same year he joined the Berkeley faculty. In 2001 Dr. Oswald joined Lawrence Berkeley National Laboratory as a senior staff scientist.^{1,4} He retired from teaching at Berkeley in 1990, but continued his research and engineering practice as an entrepreneur and a scientist at LBNL until the last days of his life.¹

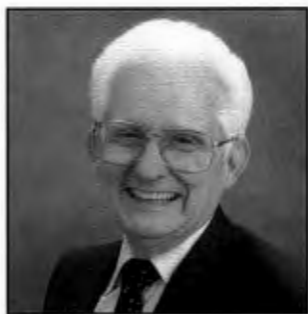
In 2005, the International Society for Applied Phycology (the branch of botany dealing with seaweed and algae) presented him with a lifetime achievement award. Colleagues from around the world have also nominated him for the 2006 Stockholm Water Prize.¹

“William Oswald developed and demonstrated sustainable technology decades before sustainability was a buzzword,” said Bailey Green, research scientist at LBNL and a colleague of Oswald’s for the past two decades. “He was a man ahead of his time, and a humanitarian above all else.”¹ HG

—Nancy Dennis

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Floyd Edwin Leaders, Jr 1931–2006

The herbal medicine movement lost an esteemed colleague and true friend with the passing of Floyd Edwin Leaders, Jr, PhD, at age 74. Following a lengthy illness, he died February 26 in Columbia, Maryland.¹

"Floyd was a monumental figure in the research and drug development of botanical products in the United States. He was a mentor and a colleague, and most importantly—a friend," said Freddie Ann Hoffman, MD, a former Food and Drug Administration (FDA) official and consultant on botanical drug approvals.

Dr. Leaders was born in Denison, Iowa, in 1931.¹ He graduated from Drake University in 1955 with a Bachelor of Science in Pharmacy and attended Iowa State University where he received his Master of Science in Pharmacology in 1960 and his Doctorate in Pharmacology in 1962.²

Dr. Leaders became an assistant professor of pharmacology at the University of Kansas Medical School, but "in 1967, he left academia to join Alcon Laboratories in Fort Worth, Texas, and continued to move up through the ranks of the pharmaceutical industry, serving as Director of Research Service at Schering-Plough, and then Director of R & D at Pennwalt Corporation," Dr. Hoffman said.

In 1977, Dr. Leaders founded Technical Evaluation and Management Services, Inc. Based in Dallas, the contract research organization was "one of the first to run clinical trials for the pharmaceutical industry to meet the FDA's regulatory standards," according to Dr. Hoffman.

"Dr. Leaders was particularly interested in improving the prospects for companies interested in pursuing the drug approval avenues for botanicals, and he mentored

numerous clients in this direction, including large pharmaceutical companies as well as small-venture startups," said Mark Blumenthal, Founder and Executive Director of the American Botanical Council (ABC).

By 1992, Dr. Leaders founded Leaders Group, Inc., and he served as consultant for the former Office of Alternative Medicine (OAM) at the National Institutes of Health (NIH), now called the National Center for Complementary and Alternative Medicine.¹

After the passage of the Dietary Supplement Health and Education Act in 1994, Dr. Leaders was one of the principle people to motivate OAM to sponsor and organize a two-day conference on botanical medicine, the first conference of its kind sponsored by the US government, a watershed moment in the history of the botanical medicine movement.

Dr. Leaders became a catalyst to increase communication and cooperation among various segments of the botanical medicine industry, researchers, and the federal government.

"In this role, he assisted researchers, clinical investigators, federal agencies, and the industry to understand not only the need for carefully designed studies and data management, but also the rigorous requirements for US [FDA] development and approval," Dr. Hoffman said. "Through his patience and powerful negotiation skills, Dr. Leaders was successful in assisting sponsors in filing Investigational New Drug applications for heterogeneous [i.e., chemically complex] botanical products with the FDA Center for Drug Evaluation Research."

He served as co-chair of botanical drug development workshops sponsored by the Drug Information Association, the FDA, and the NIH. His work also contributed to the "scientific underpinnings" for the FDA Center for Drug Evaluation Research Guidance Document on Botanical Drugs.²

In 1997, Dr. Leaders formed Botanical Enterprises in Rockville, Maryland, and as Chairman and CEO, he worked to make commercial agreements with companies interested in developing botanical drug products.²

"Dr. Leaders was instrumental in helping create a significant bridge of communication and understanding between the herb industry and botanical researchers,

on the one hand, and many scientists and policy makers at the FDA on the other, especially at a pivotal time in the development of the herb movement," Blumenthal said.

ABC Board of Trustees Chairperson Peggy Brevoort was close to Dr. Leaders for many years. "Floyd was a visionary and doer," she wrote. "He opened doors for me to new worlds and ideas and concepts that changed how I dealt with our business [East Earth Herbs, now A.M. Todd Botanicals] and its vision. He encouraged some of the most creative thinking I have ever done. He was one of the first persons to understand how our fledgling herb industry could work *with* rather than *against* a complicated, established health care system. And he dedicated his energies and business sense to building those bridges." [P. Brevoort e-mail to M. Blumenthal, February 26, 2006.]

Dr. Leaders is survived by his wife of 30 years, Madeline Van Hoose of Montgomery Village, Maryland; his daughter, Terra Leaders Singletary of Midland, Texas; and his grandson.¹ HG

—Cynthia Crimmins

References

1. Floyd Edwin Leaders, Jr, Medical Firm Founder. *Washington Post*. March 11, 2006: B6.
2. Botanical drug advocate Dr. Floyd Leaders, Jr dies after long illness [press release]. Austin, TX: American Botanical Council; February 26, 2006.



Tom Ferguson 1943–2006

Tom Ferguson, MD, a physician who persuaded people to take charge of their own health, died April 14, 2006, at the UAMS medical center hospital in Little Rock, Arkansas, where he was undergoing treatment for multiple myeloma. He was 62.

Dr. Ferguson straddled the worlds of mainstream and alternative medicine, empowering consumers not to ignore the dictates of medicine, but to fully understand them and all other appropriate avenues of treatment and prevention. He argued that informed self-care is the starting point for good health and worked to encourage medical professionals to treat clients as equal partners in achieving better outcomes. His goal was to change the entrenched practices of the conventional top-down hierarchy of the doctor-patient relationship.

After earning his medical degree from the Yale University School of Medicine in 1977, he launched a prolific career in consumer-focused medical writing as founder of *Medical Self Care Magazine* and as the health and medical editor for the *Whole Earth Catalog* in the 1970s. In 1979, he was interviewed by Dan Rather on 60 Minutes, introducing 40 million television viewers to what was then widely called the "self-care revolution."¹

From 1980 to 1996, he authored or co-authored over a dozen books,² including *Health Online: How to Find Health Information, Support Groups and Self Help Communities in Cyberspace*, a book Dean Ornish, MD has called "the Bible of self-care information on the Internet."³ With the rising popularity of the Internet, Dr. Ferguson's long history of advocacy for information-empowered medical consumers positioned him to be a leading proponent of online health information resources. He called laymen who used Internet medical resources "e-patients." In 1993, he organized the world's first conference devoted to computer systems designed for medical consumers. In 1998, he became editor and publisher of a newsletter called, "The Ferguson Report: the Newsletter of Consumer Health Informatics and Online Health."⁴ In 1999, he was one of 4 people to be recognized as an "Online Health Hero," an award given by the Intel Corporation's Health Initiative Project.²

In 2000, Dr. Ferguson began teaching the first-ever medical school course in Consumer Health Informatics at the University of Texas Health Science Center at Houston. In early 2001, he joined the Pew Internet and American Life project as Senior Research Fellow for Online Health.¹ At the time of his death, he was also a consultant to the Robert Wood

Johnson Foundation, an Adjunct Associate Professor of Health Informatics at the University of Texas Health Science Center at Houston, a Senior Associate at Boston's Center for Clinical Computing, and most recently an adjunct faculty at the University of Arkansas Medical Sciences Center, where he initiated a patient-centered, quality improvement program at the Myeloma Institute for Research and Therapy.²

When Dr. Ferguson became ill 15 years ago, he applied the principles he had advocated to himself. According to his wife, Meredith Mitchell Driess, "He kept with the traditional party line and did what the doctors told him he should do, but tweaked their advice in his own way. He read widely, worked out his own doses and was not afraid to experiment; when he heard about a clinical trial involving thalidomide, he called the drug company and told them he wanted to be in on it. He lived far longer than most people with this disease do."⁴

Dr. Ferguson was born in Ross, California, on July 8, 1943, but grew up in Coos Bay, Oregon. He did his undergraduate work at Reed College in Portland and received a master's degree in creative writing from San Francisco State University before pursuing medical studies. He moved to Austin, Texas in 1983.²

"While he wasn't an 'herb person,' Tom believed deeply in empowering people to take care of their medical needs as much as possible," said Michael Castleman, a former editor of Ferguson's *Medical Self Care* magazine. "To that end, he was very supportive of the dissemination of medical knowledge—all medical knowledge: mainstream, alternative, herbal—you name it. His mantra was: give people accurate information and they

can decide for themselves how they want to proceed." Castleman further explained that although Ferguson was an MD, he never considered mainstream medicine as inherently superior to other healing arts. "Tom had deep respect for herbal medicine. He was well aware that it was the basis for much of modern pharmacology. And he felt a special affinity for herbal medicine because so much of it was self-care."

Peggy Brevoort, a pioneer in the herb community and currently President of the American Botanical Council Board of Trustees, said, "Tom and I were only a month apart in age and had a special bond as cousins; I think of him always as gentle, kind, giving, full of humor and intelligence and life; always caring for others before himself, even in his illness."

Dr. Ferguson is survived by his wife, Meredith, of Austin, Texas; his stepdaughter, Adrienne Dreiss of Manhattan; his mother, Helen Williams Ferguson of Coos Bay, Oregon; a brother, Fergus Mclean of Eugene, Oregon; and a sister, Kirpal Kaur Khalsa of Española, New Mexico. HG

—Nancy Dennis

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1. "What they're saying about Tom Ferguson" page. doctom.com Web site. Available at: <http://doctom.com/about/saying.html>. Accessed May 2, 2006.
2. Tom Ferguson, M.D. *Austin American-Statesman*. April 19-22, 2006.
3. About page. doctom.com Web site. Available at: <http://doctom.com/about/>. Accessed May 2, 2006.
4. Brozan N. Dr. Tom Ferguson, Who Urged Self-Education, Dies at 62. *New York Times*. April 24, 2006.

Correction

An article in *HerbalGram* 69, "Jimson Weed: History, Perceptions, Traditional Uses, and Potential Therapeutic Benefits of the Genus *Datura*," omitted contact information for the authors. Readers may contact the primary author, Kofi Busia, by telephone at 00233242128799 and by e-mail at kbusia@ug.edu.gh/ or Kofi_Busia@hotmail.com. Fiona Heckles may be contacted by telephone at 01992587021/07830195745 and by e-mail at ellowsun@yahoo.co.uk. The American Botanical Council regrets this omission and apologizes for any inconvenience this may have caused.

August 5: A Workshop: Botanicals as "New" Drugs. Arlington, VA. This workshop is an introduction to the drug development process for naturally complex or heterogeneous products, such as botanicals. Experts in the field will address the current status of US drug development for botanical drugs. Phone: 202-545-6843. Web site: www.phcog.org/Annual-Mtg/Washington.html.

August 5-6: Rutland Biodynamics Conference. Oakham, UK. David Winston will be the keynote speaker at this event in rural Oakham. He will teach classes on the Duyukta—A Cherokee Look at Health, Spirit, and Life; The Differential Treatment of Depression and Anxiety; and The Alchemy of Herbs. Contact: Rutland Biodynamics, Ltd., Town Park Farm, Brooke, Oakham, Rutland LE15 8DG. Phone: 44(0)-1572-757440. Web site: www.rutlandbio.com.

August 5-9: Natural Products on Target: The 47th Annual Meeting of the American Society of Pharmacognosy. Washington, DC. Please join us at the meeting for an exciting series of presentations covering contemporary developments in natural products chemistry, biosynthesis, drug discovery, drug development, and NIH Road Map initiatives. Phone: 301-846-1943. Web site: www.phcog.org/AnnualMtg/Washington.html.

August 17-18: The International Conference & Exhibition of the Modernization of Chinese Medicine & Health Products. Wan Chaim, Hong Kong. This year, the comprehensive 2-day conference will feature 3 exciting forums. It includes a CEO forum on the development of strategies to internationalize Chinese medicines. A second forum will review advances in Chinese medical research on infectious diseases such as SARS, bird flu, and hepatitis. The third forum focuses on quality control, regulations, and the R&D of modern Chinese medicinal products. E-mail: exhibitions@tdc.org.hk. Web site: www.icmcm.com.

August 19: Planting the Future: A Conference on the Cultivation, Preservation & Uses of Native Medicinal Plants. East Barre, VT. Some of the many presenters for this conference include Rosemary Gladstar, Pam Montgomery, Deb Soule, Bob Beyfuss, Matthias and Andrea Reisen, Kate Gilday, Don Babineau, and Nancy and Michael Phillips. The conference will take place at the Sage Mountain Herbal Retreat Center. Activities include classes on sustainable practice of herbal medicine, "at risk" plant cultivation, plant identification walks, and related topics. For more information and registration forms, visit www.unitedplantsavers.org. Phone: 802-476-6467.

August 21-24: Quality and Safety and Processing Conference. Oxford, MS. The purpose of this conference is to review, discuss, and explore methods for determining the identity, purity, quality, and processing of botanical material. Topic areas will include such issues as authentication, cultivation, collection, and post-harvest practices for producing quality plant material, as well as chemical and toxicological methods for quality/safety assessment. Phone: 662-915-7821. E-mail: ikhan@olemiss.edu.

August 28: Materia Medica of the American West. Laurel, MD. Michael Moore, founder of the Southwest School of Botanical Medicine, will conduct this 1-week workshop, at the Tai Sophia Institute. Materia Medica of the American West will feature Moore's favorite plants and clinical applications. He will discuss their habitat, environmental risks, and availability. To register or for more information, contact the Tai Sophia Institute at 410-888-9048 ext. 6611. Web site: www.tai.edu.

September 4: Field Lecture Workshop: An In-depth Exploration of Regional Medicinal Plants. Laurel, MD. Michael Moore, founder of the Southwest School of Botanical Medicine, will conduct this 1-week workshop, at the Tai Sophia Institute. The workshop includes visits to regional parks and focuses on plant personalities, constituents, historical uses, and therapeutic applications. To register or for more information, contact the Tai Sophia Institute at 410-888-9048 ext. 6611. Web site: www.tai.edu.

September 12-14: 2nd Annual Inside Beauty Trade Show and Conference: "Cultivating the Beauty Market from the Inside Out." New York, NY. INSIDE BEAUTY brings together professionals from the cosmetics, personal care, fragrance, nutraceuticals, cosmeceuticals, botanicals, and functional foods industries to platform innovative new products designed to both promote beauty and address overall health and wellness. The educational conference program covers the latest marketing trends, scientific research, product innovation, and thoroughly explores the opportunities and challenges facing this growing market sector. E-mail: www.inside-beauty.com.

September 14: Herbal Therapies for the Eyes, Ears, Nose, & Throat. Washington, NJ. The purpose of this class is to discuss simple but effective clinical protocols for treating common ailments affecting the eyes (conjunctivitis, blepharitis), ears, (otitis media), nose (sinusitis, allergic rhinitis), and throat (sore throat, laryngitis, tonsillitis). Contact: Cathy Garland, Herbalist & Alchemist, Inc. Phone: 908-689-9020 ext. 101. E-mail: cathy@herbalist-alchemist.com. Web site: www.herbalist-alchemist.com.

September 16-19: The Conference: the Council for Responsible Nutrition (CRN) 2006 annual symposium on dietary supplements. Cambridge, MA. The Conference will feature sessions on regulatory, scientific, and business-building issues, combined with networking opportunities for dietary supplement leaders and managers. CRN Board Member John Venardos of Herbalife International of America, Inc., will serve as this year's conference chairman. For more information about The Conference 2006 and other upcoming CRN educational programs, please visit <http://www.crnusa.org> or contact Judy Blatman at 202-204-7962.

September 21-23: International Congress on Complementary, Holistic & Naturopathic Medicine (CHNM) and Expo "World Health." Samara, Russia. This event will address some current questions of CHNM development both in Russia and abroad. Participants will have the opportunity to become familiar with and discuss the most interesting CHNM techniques in workshops and classes. Phone: +7 846 2705392. E-mail:

peunova@smrtlc.ru. Web site: www.congress.peunova.ru.

September 22-24: Green Nations Gathering. Rowe, MA. David Winston will be joined by Doug Elliot, Rosemary Gladstar, Cecilia Mitchell, Susan Weed, Elena Avila, and many other superb teachers at the beautiful Rowe Conference Center. Special events include an emporium, demonstrations, sweat lodge, storytelling, and music. Contact: Pam Montgomery, 802-293-5996. Web site: www.green-nations.org.

September 22-24: Southeast Women's Herbal Conference. Hendersonville, NC. Red Moon Herbs is proud to present the 2nd Annual Southeast Women's Herbal Conference. The goal of this event is to help women deepen their connection with the Earth, the plants, each other, and their own bodies. Acclaimed author Starhawk will serve as the conference's keynote speaker. For further information or to register for this event, visit the Web site www.redmoonherbs.com. Phone: 888-929-0777.

October 2-9: Ethnobotanical Tour—Botanical Medicines from the Amazon with Optional Extension to Machu Picchu October 8-12. Sponsored by the American Botanical Council, the Texas Pharmacy Association Foundation, the ACEER Foundation, and West Chester University of PA. Faculty: Jim Duke, PhD; Steven Foster; and Sue Mustalish, RN. For more information, please visit the Web site at http://www.herbalgram.org/default.asp?c=ed_tours or contact Marguerite Gould at mgould@wcupa.edu or by phone at 601-738-0477.

October 3-7: Contributions of African Botana to Humanity 2006. N'Zérékoré, Republic of Guinea, West Africa. This event will study in detail the pharmacological, phytochemical, and genetic aspects of African botana to clarify the intimate structure of plants' molecules and to identify interesting characteristics of plants used for health maintenance. This symposium will also give plant reproduction specialists the opportunity to share their views about the agronomical aspects that can influence the content in bio-active compounds in medicinal, aromatic, and food plants. Web site: <http://www.botaniqueafricaine.com/>. Phone: 506-455-4110.

October 5-8: 5th Annual Traditional Chinese Medicine Conference. East Rutherford, NJ. "Building Bridges of Integration for Traditional Chinese Medicine—Transformation: Spirit in Healing" is a landmark educational forum on traditional Chinese medicine for Eastern and Western healthcare professionals interested in exploring this medical system's growing role in integrative and complementary healthcare. It will take place at the Sheraton Meadowlands Hotel, East Rutherford, New Jersey, just outside NYC. Visit www.tcmconference.org or call 1-888-TCM-6909.

October 6-8: Natural Products Expo East: Educational seminars. Baltimore, MD. Contact: Cathy Garland, Herbalist & Alchemist, Inc., 908-689-9020 ext. 101. E-mail: cathy@herbalist-alchemist.com. Web site: www.herbalist-alchemist.com.

October 9-15: CancerGuides. Bloomingdale, IL. CancerGuides is the world's first and only comprehensive training program in integrative oncology. This unique interdisciplinary

course teaches health professionals and patient advocates to work collaboratively with people with cancer to create safe, effective, humane, individualized programs of care that integrate the best of complementary and alternative approaches with conventional therapy. For more information, please visit the Web site www.cmbm.org.

October 16-19: International Symposium on Pomegranate and Minor Mediterranean Fruits. Adana, Turkey. This event, which will be held on the campus of Cukurova University, will feature lectures and workshops on issues relating to pomegranates and Minor Mediterranean plants. Topics include plant physiology, current research, harvesting, economics, and pests and diseases, among others. For more information, contact Dr. Ahsen Isik Özgüven; Phone: (90)3223386564. Fax: (90)3223386388. E-mail: ahsen@cu.edu.tr. Web site: www.cu.edu.tr/fakulteler/zf/bkb/ispm/.

October 26-27: Polyphenols Applications in Pharmaceutical, Food and Cosmetic Industries Conference. La Vlette, Malta.

The French Society of Antioxidants (SFA), the International Society of Antioxidants in Nutrition and Health (ISANH), the Japanese Society of Antioxidants (JSA), and the Malta University are pleased to announce their third international conference and exhibition. For more information, contact Dr. Sandrine Rodriguez. E-mail: sfa-paris@wanadoo.fr. Web site: www.isanh.com.

October 26-29: American Herbalists Guild Conference: From Expert Consensus to RCT: Creating an Evidence Base in Clinical Botanical Medicine. Boulder, CO. David Winston will be joined by some of the top clinical herbalists from the United States, Canada, and England for 2 and a half days of herbal education at its best. Contact: Tracy Romm, 203-272-6731. E-mail: ahgoffice@earthlink.net. Web site: www.americanherbalistsguild.com.

October 28-30: The 2nd International Symposium on Saffron Biology and Technology (ISSBT). Mashhad, Iran. This symposium is intended for those involved in the production, processing, marketing, or medi-

cal use of saffron. Organizers for the event are the Center of Excellence for Special Crops (CESC) Faculty of Agriculture and Ferdowsi University of Mashhad (FUM) under the auspices of the International Society for Horticultural Science (ISHS) Section of Medicinal and Aromatic Plants. Web site: <http://saffron-ir.um.ac.ir/>.

October 29—November 1: The 4th International Conference on Mechanism of Action of Nutraceuticals (ICMAN4). Tel-Aviv, Israel. The conference will deal with the latest developments in dietary and endogenous sources of nutraceuticals; the results of cellular, molecular, and animal studies in diabetes, cancer, neurodegenerative disease, cardiovascular and inflammatory disorders; proteomic-genomic developments; and anti-aging opportunities. Web site: <http://www.evetopf.org/icman4>.

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.

The Herbal Dispatch—Monthly publication of the Medicinal Botanical Program at Mountain State University in Beckley, WV. Provides description of Program's educational offerings, including monthly workshops and outreach activities, plus articles highlighting latest research on specific herbs. Covers cultivation, processing, and preventive and therapeutic uses of herbs and vegetables. Topics from recent issue include plant profiles of bloodroot and Jack-in-the-pulpit. Free subscription to printed or electronic version available by e-mailing to mmorales@mountainstate.edu. Article submissions and comments are welcomed.

Kampo Medicine Class. Keio University Medical School in Japan has posted a detailed overview of the history, uses, and effectiveness of Kampo medicine online as a "Kampo Virtual Class," available at <http://web.sc.itc.keio.ac.jp/kampo/vc/index.html>. Kampo represents the evolution of Chinese medicine after it was introduced into Japan in the 5th century CE. About 75% of Japanese doctors reportedly incorporate Kampo medicines and techniques within their practices. This online tutorial, available to entire public, covers differences between Kampo and traditional Chinese medicine; a history of how the formulations were derived; the methods used for prescribing Kampo medicine, including how it is integrated with Western medical models; a formula catalog; and an herb catalog.

Echinacea Species Distribution Maps are now available online, plotted by US county and Canadian census division, showing range of distribution of all 9 species in the genus *Echinacea* as compiled by plant ecologist and conservation biologist Kelly Kindscher, PhD, at the University of Kansas. Data were compiled from herbarium records and verified by Dr. Kindscher and colleagues for accuracy and currency. The researchers did not include herbarium specimens for cultivated vouchers (from the state of Washington, for example) or escapees (such as *E. angustifolia* along railroad tracks in downtown St. Louis). Maps available

at http://www.kbs.ku.edu/people/staff_www/kindscher/echinacea/maps2.htm.

Master's Degree in Integrative Health Studies available through the California Institute of Integral Studies (CIIS) in San Francisco, CA. This 2-year nonclinical program examines and integrates complementary, alternative, and conventional healthcare beliefs and systems from Eastern, Western, and indigenous traditions. Program is primarily intended for graduates interested in employment as integrative health administrators, integrative researchers, policy makers, or consultants. Students may enroll as either full or part-time participants at the start of both spring and fall semesters. Many classes are offered during evenings to accommodate schedules of working students, parents, or health professionals. CIIS is a small private university encouraging spiritual and practical approaches to intellectual life. More information at www.ciis.edu/academics/ihl.html.

NWFP Digest—Free monthly e-newsletter of the Non-Wood Forest Products program (NWFP) of the United Nations' Food and Agriculture Organization (FAO). A compilation of articles and items from a wide range of international sources, concerning all aspects of non-wood forest products. Topics include specific featured products, countries associated with NWFP production, current news and events, employment opportunities in the NWFP field, literature reviews, Web site profiles, etc. Subscriptions and back issues at FAO Web site: www.fao.org/forestry/site/12980/en.

Guide to BioDiversity for the Private Sector—New online publication from International Finance Corporation (IFC). Features information and examples of how businesses in emerging markets can perform and profit from environmentally-conscious practices. Provides businesses with understanding of responsibilities toward biodiversity, and explains the benefits to be derived through proper risk management and promotion of sustainable

production. Guide also gives overview of major biodiversity issues facing key business sectors and supplies case-studies of various IFC-client businesses that have handled biodiversity issues in their operations. Available at <http://www.ifc.org/ifcext/enviro.nsf/Content/BiodiversityGuide>.

Find a Professional—a service of Health-World Online—Helps connect Internet users with integrative healthcare professionals through a free searchable database. Database is divided into 16 different medical fields, including herbalism, nutritional medicine, dentistry, and acupuncture/oriental medicine. The directories of one or more leading professional medicine organizations within each field are available, through which users can search for CAM physicians by name, city, zip code, area code, state, or country. Information on over 17,000 professionals is accessible through this database. Web page also provides tip sheets and Web links to help in the search and selection of CAM practitioners. "Find a Professional" Web page available at <http://healthreferral.com>.

North American Institute of Medical Herbalism (NAIMH), in Boulder, CO, offers new onsite and distance education courses in medical herbalism and clinical nutrition. Courses are available for continuing education credit, and many are offered as certificate programs. Distance-learning courses are written and reviewed by practicing clinical herbalists and professional herbal educators, and materials include edited audiotapes of classroom lectures. In addition to offering coursework, NAIMH publishes textbooks of medical herbalism and other topics, prints a quarterly journal titled *Medical Herbalism*, and operates a payment-by-sliding-scale holistic center called the Evergreen Center. NAIMH promotes the Vitalist Tradition of healing, emphasizing the inter-connectedness of mind, body, spirit, and nature. Information available at www.naimh.com.

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

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 Herbal-

ists 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.

Schools

David Winston's Center For Herbal Studies To Offer On-line Course! Until now, David Winston's two-year herb studies program was only available to a limited number of students within commuting distance. Beginning in September 2006 any serious herb student with a high-speed Internet connection will be able to participate in this unique course. For over 25 years this program has been educating

herbalists, MDs, nurses, NDs, veterinarians, nutritionists, etc. in the art and science of clinical herbal medicine. For more information, please visit www.herbalstudies.org, www.herbaltherapeutics.net, or contact us at 908-835-0822, or dwherbal.office@verizon.net.

Other

Get Certified with ABC's Herbal Information Course. This self-paced online course is designed to help retail employees and multi-level distributors communicate knowledgeably 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.

17th Annual American Herbalists Guild Symposium



Many Ways of Knowing:
Evidence in Clinical
Botanical Medicine

October 27-29, 2006

preconference intensives on October 26

The Millennium Harvest House, Boulder, Colorado

✿ The AHG Annual Symposium is widely regarded as one of the preeminent conferences on botanical medicine, offering over 40 workshops by leading practitioners and researchers.

✿ Continuing education credits will be offered for herbalists, nurses, pharmacists, acupuncturists, and naturopathic physicians.

For information contact: **American Herbalists Guild, 141 Nob Hill Road, Cheshire, CT 06410**
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