Supplements for Pets • Chinese Herbal Folk Tales • Ginseng and Alzheimer's • 2008 Herbal Market Report

HERBALGRAM

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Number 82 | May – July 2009

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Juniper Berry

Juniperus communis

Family: Cupressaceae

Introduction

Juniperus is the world's most widespread genus in the Cypress family (Cupressaceae).[1] *Juniperus communis*, known as common juniper or, simply, juniper, is the main species found in the cooler regions of Europe, although it is also native to temperate Asia and North America.[2,3] Juniper varies in shape and size and can be a dense evergreen shrub, prostrate or creeping, or a small tree that grows to 20 feet in height.[1,2,3] The leaves are dark green to blue-green and sharply pointed.[1] The glaucous blue female cone is called the fruit or berry, and it grows to ¼ to ½ inch in diameter and is blue or reddish in its second year.[1,4] The cone usually matures in the third year and has 3 seeds.[1] Currently, the berry and the oil extracts from the berry are the parts that are used commercially. The berry is steam distilled after fermentation or without fermentation to extract the essential oil.[2]

History and Cultural Significance

Many Native American tribes of North America have utilized various parts of *J. communis* for a wide range of ailments.[5] A decoction of the berries has been used for lung and venereal disease by the Blackfoot tribe. The Woodland Cree smoked the blue berries for asthma and have made a decoction of the green berries for sore backs caused by kidney trouble. A combination of the berries with kinnikinnick (*Arctostaphylos uva-ursi*, Ericaceae) leaves or balsam has been decocted, strained and used for tuberculosis by the Carrier tribe. The Inupiat have used the berries alone or as an infusion, or a decoction of the berries, needles and twigs, to prevent and treat colds and flu. A compound decoction of the berries has been used by the Kwakiutl for diarrhea. The Upper Tanana have used both the raw fruit and a decoction of the fruit and branches for colds, coughs, and urinary disorders. The Cheyenne have utilized an infusion of the fleshy cones for coughs, fevers, tickles in the throat or tonsillitis, and also as a sedative. They have also chewed the cones and have taken steam baths with an infusion of the cones as a cold remedy. The Hanaksiala have prepared heated poultices of the branch and berry paste, which they have applied to wounds and cuts. While the method of preparation is not specified, both the Okanagon and the Thompson tribes have used the berries for urinary disorders, and the Micmac have used the cones for ulcers. A compound preparation made with the berries and unspecified other herbs has been used for urinary tract disorders by the Potawatomi.[5]

In Western traditional medicine, juniper berry preparations have been used to relieve flatulence and indigestion and to stimulate the appetite.[6] Due to their reputation as having a stimulating effect on appetite, juniper berries have been used traditionally as a flavoring in sauerkraut.[6] The berries have been eaten to relieve rheumatism[6] and were made into topical ointments for aching joints and muscles.[7] A 70% alcohol extract of juniper berries, called spirit of juniper, has been used to treat dropsy (edema), intestinal pain,[8] and lack of appetite.[6] Juniper berry has been utilized to treat colic, cystitis,[7] some forms of cancer, as a steam inhalation to treat bronchitis, and as an extract to treat snakebites and intestinal worms.[2] Juniper berry oil has been used even in veterinary medicine, mixed with lard and applied to wounds to ease irritation from fly infestation.[8] Juniper berry has been used as a diuretic[9,10,11] and to battle bad breath.[10]

Commercially, juniper berries are used as flavoring agents in teas, beers (*genevrette*), liqueurs (*ginepro*), alcoholic bitters, and gin.[2,4,9] The word 'gin' may be either a shortened form of the Dutch *genever*, which is derived from the Latin *juniperus*,[9] or derived from the term "Holland's Geneva" as the Dutch-invented drink was first known.[12] One legend suggests that a Dutch chemist developed juniper extract as a diuretic known as *ginever,* which was later popularized by the British as simply *gin.* The extracts or oils are used in alcoholic and non-alcoholic beverages, baked goods, candy, frozen dairy desserts, gelatins, meat products, and puddings.[2,4] Juniper berry oil is used as a fragrance component in creams, detergents, lotions, perfumes, and soaps.[2,9]

Juniper berries and their steam-distilled oil were listed as official medicines in the first edition of the *United States Pharmacopeia* (USP) in 1820 and stayed in the USP until 1960, at which time they were removed upon recognition of their potential irritating effect on the kidneys.[13] A critical review of the literature from 1844 to 1993 concluded that observed nephrotoxic effects associated with juniper berries and oil may have been confused with observations of the possible adulteration of juniper oil in veterinary medicine with turpentine.[14] Official US quality standards for juniper berry oil are available in the currently valid edition of the *Food Chemicals Codex*.[15] Juniper fruit remains an official article in the currently valid editions of

Juniper Berry *Juniperus communis* ©2009 Stevenfoster.com

the *Mexican Herbal Pharmacopoeia*[16] and *European Pharmacopoeia*.[17] Pharmacopoeial-quality juniper fruit consists of the dried ripe cone berry containing minimum 10 ml/kg of essential oil, with maximum 5% unripe or discolored cone berries; and identification must be confirmed by macroscopic, microscopic, organoleptic, and thin-layer chromatography (TLC) tests.

In 1984, the German Commission E approved the use of juniper dried fruit (for aqueous infusions and decoctions, alcoholic extracts, and wine extracts) or essential oil to relieve dyspepsia (disturbed digestion or indigestion),[3,18] but did not approve juniper as a single-ingredient aquaretic (an agent that increases urine flow, without affecting electrolyte balance). Juniper is said to possess antirheumatic, antiseptic, carminative, diuretic, and stomachic properties.[2,7] In 2008, the European Medicines Agency (EMEA) published a draft monograph, which, once final, will be relevant for traditional herbal medicinal product (THMP) registrations in all EU member states, including Germany. The public comment deadline for the draft monograph is May 15, 2009.[19] The EMEA draft monograph proposes therapeutic indications for juniper fruit or preparations of juniper (e.g. herbal tea, 1:1 liquid extract with 25% ethanol, and 1:5 tincture with 45% ethanol) that are intended as traditional herbal medicinal products to increase urine for flushing of the urinary tract as an adjuvant in minor urinary tract complaints, and as traditional herbal medicinal products for symptomatic relief of digestive disorders such as dyspepsia and flatulence. Also in 2008, Health Canada published its final monograph for juniper fruit for the purpose of natural health product (NHP) compendial product license applications. In the final monograph, Health Canada approved traditional uses of the dried fruit or preparations of the fruit (e.g. herbal tea infusion, 1:1 fluidextract in 25% alcohol, and/or 1:5 tincture in 40-45% alcohol) as a diuretic, as a urinary tract antiseptic to help relieve benign urinary tract infections, as a carminative to help relieve digestive disturbances such as flatulent dyspepsia, and as a stomachic to aid digestion and stimulate appetite.[20]

Juniper fruit is also used in the Indian Systems of Medicine, and thus there are official quality standards monographs along with approved therapeutic actions and uses available in the currently valid editions of the *Ayurvedic Pharmacopoeia of India*[21] and *Unani Pharmacopoeia of India*,[22] respectively.

Modern Research

While there are *in vitro* and animal studies that suggest the potential usefulness of juniper berry, human clinical studies on juniper are lacking. One study of a mouthwash that included juniper, nettles (*Uritica dioica*, Urticaceae), and yarrow (*Achillea millefolium*, Asteraceae) showed no effect on plaque growth and gingival health.[23]

Future Outlook

Most of the juniper berry supply for Europe and North America comes from wild collection in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Kosovo, Romania, Serbia, and Montenegro, of which increasing amounts are being wild harvested under organic certification (J. Brinckmann, e-mail, February 26, 2009). India produces juniper berries (found growing in the Himalayas from Kumaon westwards ranging from the altitude of 1500-4250 m), but this is mainly for domestic consumption in the Indian systems of traditional medicine. Unfortunately, accurate figures on the export of juniper berries are difficult to obtain because the harmonized system tariff code (HS Code) assigned to juniper fruit is shared with fennel fruit, which confounds import-export trade analysis of juniper. HG

—Gayle Engels

References

1. Hageneder F. *The Meaning of Trees: Botany, History, Healing, Lore.* San Francisco, CA: Chronicle Books; 2005.
2. Leung AY, Foster S, eds. *Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics.* 2nd ed. New York, NY: John Wiley and Sons, Inc; 1996.
3. Blumenthal M, Goldberg A, Brinckmann J, eds. *Herbal Medicine: Expanded Commission E Monographs.* Austin, TX: American Botanical Council; Newton, MA: Integrative Medicine Communications; 2000.
4. DerMarderosian A, Beutler JA, eds. *The Review of Natural Products.* St Louis, MO: Facts and Comparisons; 2002.
5. Moerman D. *Native American Ethnobotany.* Portland, OR: Timber Press; 1998.
6. Tyler V. *The Honest Herbal*, 3rd ed. New York, NY: Pharmaceutical Press; 1993.
7. Barnes J, Anderson LA, Phillipson JD. *Herbal Medicines.* 3rd ed. London: Pharmaceutical Press; 2007.
8. Grieve M. *A Modern Herbal*. Vol 1. New York, NY: Dover Publications Inc.; 1979.
9. Bown D. *The Herb Society of American New Encyclopedia of Herbs and Their Uses.* London: Dorling Kindersley Ltd.; 2001.
10. Hocking GD. *A Dictionary of Natural Products.* Medford, NJ: Plexus Publishing; 1997.
11. Duke JA, ed. *Handbook of Medicinal Herbs.* 2nd ed. Boca Raton, FL: CRC Press; 2000.
12. Foster S, Johnson RL. *Desk Reference to Nature's Medicine.* Washington, DC: National Geographic; 2006.
13. Robbers JE, Tyler VE. *Tyler's Herbs of Choice: The Therapeutic Use of Phytomedicinals*. New York, NY: Haworth Press, 1999.
14. Schilcher H, Heil BM. Nierentoxizität von Wacholderbeerzubereitungen. *Zeitschrift fur Phytotherapie.* 1994;15:205-213. Cited by: Robbers JE, Tyler VE. *Tyler's Herbs of Choice: The Therapeutic Use of Phytomedicinals*. New York, NY: Haworth Press, 1999.
15. USP Food Ingredients Expert Committee. Juniper Berries Oil. In: *Food Chemicals Codex*, 6th Edition. Rockville, MD: United States Pharmacopeial Convention. 2008.
16. Comisión Permanente de la Farmacopea de los Estados Unidos Mexicanos: Fruto Junípero. In: *Farmacopea Herbolaria de los Estados Unidos Mexicanos*. Secretaria de Salud, México D.F. 2001;106-107.
17. European Pharmacopoeial Commission. Juniperi-pseudo-fructus. In: *European Pharmacopoeia*, 6th edition. Strasbourg, France: European Directorate for the Quality of Medicines and Healthcare. 2008;2206-2008.
18. Blumenthal M, Busse WR, Goldberg A, Gruenwald J, Hall T, Riggins CW, Rister RS, eds. Klein S, Rister RS, trans. *The Complete German Commission E Monographs–Therapeutic Guide to Herbal Medicines.* Austin, TX: American Botanical Council; Boston: Integrative Medicine Communications; 1998.
19. European Medicines Agency (EMEA) Committee on Herbal Medicinal Products (HMPC). Draft Community Herbal Monograph on *Juniperus communis* L., Pseudo-Fructus. London, UK: EMEA. January 14, 2009. Available at: http://www.emea.europa.eu/pdfs/human/hmpc/juniperi_psuedo-fructus/44192908en.pdf.
20. Health Canada Natural Health Products Directorate (NHPD). Juniper. In: NHPD Compendium of Monographs. Ottawa, ON: Natural Health Products Directorate. April 21, 2008. Available at: http://www.hc-sc.gc.ca/dhp-mps/alt_formats/hpfb-dgpsa/pdf/prodnatur/mono_juniper-genevrier-eng.pdf.
21. Ayurvedic Pharmacopoeia Committee. Hapusa (fruit). In: *The Ayurvedic Pharmacopoeia of India*, Part I, Volume III, 1st edition. New Delhi, India: Government of India, Ministry of Health and Family Welfare, Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH). 2001;63.64.
22. Unani Pharmacopoeia Committee. Abhal (fruit). In: *The Unani Pharmacopoeia of India*, Part I, Volume IV. New Delhi, India: Government of India, Ministry of Health and Family Welfare, Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH). 2007;5.6.
23. Van der Weijden GA, Timmer CJ, Timmerman MF et al. The effect of herbal extracts in an experimental mouthrinse on established plaque and gingivitis. *J Clin Periodontol.* May 1998;25(5):399-403.

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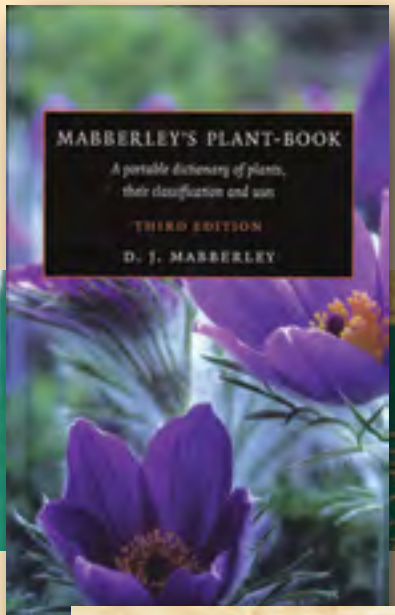

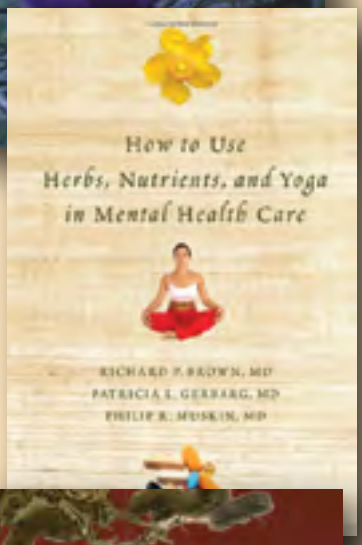

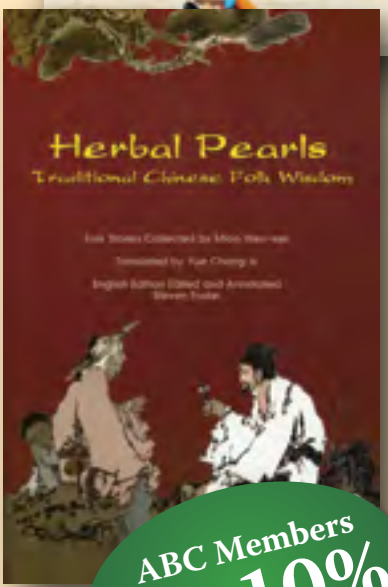

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- **How to Use Herbs, Nutrients, and Yoga in Mental Health Care** by Richard P. Brown, MD, Patricial L. Gerbarg, MD, and Philip R. Muskin, MD, 2009. Each chapter covers a major diagnostic category: mood, memory, anxiety, ADD, sexual enhancement, psychoses, and substance abuse. Presents a range of complementary and alternative treatments including herbs, nutrients, vitamins, nootropics, hormones and mind-body practices. Hardcover, 441 pages. **$34.95**

- **Herbal Pearls: Traditional Chinese Folk Wisdom** by Yue Chong-xi, translator, and Steven Foster, editor, 2008. From 1934 to 1980, Chinese folklorist Miao Wen-wei collected stories that were hundreds if not thousands of years old regarding the naming of certain plants used in Traditional Chinese Medicine. The 53 stories in this collection convey much about Chinese culture, folk customs, social habits, history, medical knowledge, mythology and wisdom. Most reflect a reverence and respect for the ancient herbal healers who cared for the oppressed peasants. From the well-known dong quai, ginseng and licorice to the much-maligned kudzu, dandelion and Japanese honeysuckle, these stories will engage, entertain and educate. **$19.95**

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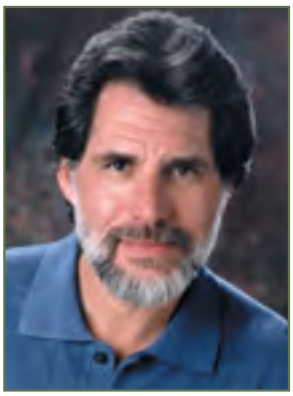

Honoring Those Who Came Before Us

The somewhat worn phrase "we stand on the shoulders of those who came before us" is perhaps trite because, like so many such sayings, it's true. At certain times all of us must stop and take stock of who we are, how we operate—professionally and personally—and where we obtained our knowledge, ideas, values, and inspiration. Much of this comes, of course, from our parents, grandparents, and other family members, and much also derives from our teachers.

Many of us in the medicinal plant community recently lost several of our most inspirational teachers: Nina Etkin, Madalene Hill, and Michael Moore. All three could not have been more different, and yet they shared a common trait—their love of plants and how they nourish and heal.

I first met Madalene Hill in the late 1970s. Over the years, she became one of my greatest teachers, with an almost encyclopedic knowledge of herbs, their botany and horticulture, their history, culture and lore, their flavors and aromas, and so much more. To me, Madalene was a modern-day Mrs. M. Grieve (the author of the classic 1930s 2-volume herbal treasure *A Modern Herbal*).

My first meeting with Michael Moore was at his herb shop in Santa Fe, New Mexico in the early 1970s. Michael was one of my first teachers on herbs. Michael was one of those people who appears almost larger than life. There are few people in North America who knew more about medicinal plants in general than Michael Moore did and probably no one who knew more about Southwestern plants. Michael was a botanical dynamo, the virtual godfather of traditional herbal medicine in the United States, with a stream-of-consciousness style that kept the listener's attention focused on his next words. No one nodded off in Michael's lectures!

Noted ethnobotanist, scholar, and author Nina Etkin was known throughout the world of ethnobotany and ethnopharmacology as a consummate scholar who wrote extensively on the cultural aspects of plant-based foods and other plant uses. She focused on the human side of these disciplines, or as one colleague commented, putting the *ethno* into ethnopharmacology. Hers was one of the most popular courses at the University of Hawaii, typically filling up on the first day of registration.

We memorialize these elders in this issue, but nothing we write about them in our limited space can fully communicate the depth of their passion for plants and their interactions with people, and the contributions they made to the entire field of herbal studies.

Also in this issue, we share some fascinating folk tales on how certain herbs used in Traditional Chinese Medicine received their names or were discovered to have health benefits—excerpted from the book *Herbal Pearls: Traditional Chinese Folk Wisdom*. Another of our featured articles explores the market and regulation of supplements for pets in the United States. Such products, though less frequently covered in the media than supplements for humans, represent a growing sector of the herbal market.

Herb sales in the United States appear to be rising, if only slightly. Our annual report on herbal supplement sales is included in this issue. This year's market report draws on additional data and follows a slightly different format than previous *HerbalGram* market reports. We include additional information because the herb market in the United States consists of multiple channels, some of which are tracked by different market research firms. Our 2008 herbal supplement market report addresses this complexity by incorporating additional data from the health and natural foods channel—a particularly important sector of the herbal supplement market. This year's expanded coverage therefore provides a more comprehensive view of the overall sales of herbal dietary supplements in the United States. HG

Mark Blumenthal


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Perilla *Perilla frutescens* Photo ©2009 Steven Foster

features

Herbal Pearls: Traditional Chinese Folk Wisdom: An Excerpt of Herbal Lore 50

Adapted for HerbalGram by Steven Foster

Based on a folk lore survey in rural China beginning in the 1930s, the book *Herbal Pearls: Traditional Chinese Folk Wisdom* contains 53 short stories on how certain herbs received their traditional Chinese names or were discovered to be of use for certain health conditions. This excerpt of the book showcases the stories behind garlic's use in treating dysentery, the origin of kudzu's Chinese name, and perilla's use in relieving stomach upset caused by shellfish consumption. These engaging, often humorous, anecdotes provide a glimpse into Chinese culture, the medicinal uses of the profiled plants, and the value of oral histories.

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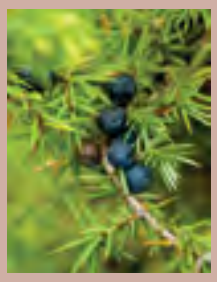

On the Cover
Juniper Berry *Juniperus communis*
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ABC's 2009 Botanical Excellence Awards

The 4th Annual American Botanical Celebration and Awards Ceremony took place March 5, 2009, in Anaheim, California, with approximately 250 people in attendance. The evening kicked off with a cocktail reception and featured the presentation of the annual ABC Botanical Excellence Awards, honoring individuals and companies with a significant positive impact on the present and future of the herbal medicine movement.

ABC's James A. Duke Excellence in Botanical Literature Award

The 2009 James A. Duke Excellence in Botanical Literature Award was presented to David J. Mabberley, PhD, author of *Mabberley's Plant-Book: A Portable Dictionary of Plants, Their Classifications, and Uses*, 3rd edition.

The Duke award, created in 2006 in honor of ABC co-founding Board of Trustees member James A. Duke, PhD, is given annually to a book from the preceding year, or to a literature service, that ABC believes provides a significant contribution to literature in the fields of botany, ethnobotany, phytomedicine, and/or other disciplines related to medicinal plants.

Mabberley's Plant-Book, 3rd edition, contains over 24,000 entries and claims information on every family and genus of seed-bearing plant, including gymnosperms, ferns, and club mosses.[1] Each past entry has been updated to incorporate the most recent literature available, and over 1650 new entries have been added.

First published in 1987 as *The Plant-Book: A Portable Dictionary of the Higher Plants* and then in 1997 as *The Plant-Book: A Portable Dictionary of the Vascular Plants*, this improved edition is significantly different from previous editions—which have been widely used and referenced and considered internationally to be indispensable to plant cultivators and researchers.

The author, Dr. Mabberley, is an internationally renowned botanist. He has held prestigious positions at locations such as Oxford Botanic Gardens and the Herbaria of Oxford University, the University of Washington Botanic Gardens in Seattle, and currently the Royal Botanic Gardens, Kew in Richmond, Surrey, UK. There he serves as keeper of the herbarium, library, art and archives. This award is particularly timely since the world-renowned Kew Gardens celebrates its 250th anniversary in 2009.

A review of *Mabberley's Plant-Book,* 3rd edition, written by Dr. Duke and Steven Foster, is published on page 64 in this issue of *HerbalGram.*

ABC's Norman R. Farnsworth Excellence in Botanical Research Award

The 2009 Norman R. Farnsworth Excellence in Botanical Research Award was given to Ikhlas A. Khan, PhD, professor of pharmacognosy at the University of Mississippi.

The Farnsworth Award is named for ABC co-founding Board of Trustee, Prof. Norman R. Farnsworth, PhD. ABC presents this award each year to a person or institution who has made significant contributions to botanical and/or pharmacognostic research.

Dr. Khan

At the University of Mississippi's National Center for Natural Products Research, Dr. Khan serves as director of the Food and Drug Administration (FDA) Center of Excellence, and a professor in the Department of Pharmacognosy. Additionally, he is the director for Sino-US TCM Research Center, director for the Center for Research of Indian Systems of Medicine (CRISM), research professor and coordinator for Natural Products Research at the Center for Water and Wetlands Research, and an adjunct professor for the Chinese University of Hong Kong.

Dr. Khan earned his bachelors in chemistry and his masters in organic chemistry from the Aligarh Muslim University in Aligarh, India. In 1987, he received his doctorate in pharmacy from the Institute for Pharmaceutical Biology in Munich, West Germany, where he studied under the renowned Prof. Hildebert Wagner. He joined the University of Mississippi in 1988–1989 and then completed postdoctoral studies at Swiss Federal Institute of Technology (ETH) in Zurich. In 1992, he re-joined the University of Mississippi and currently resides in Oxford, Mississippi.

Dr. Khan's primary research interests include standardization of herbal products and the improvement of product quality and safety, particularly through the development of new analytical methods. He has authored or co-authored over 300 original publications, has given speeches at events and conferences around the world, and serves on several important professional committees. He also serves as co-editor of the pharmacognosy and research journal *Planta Medica* and is a foreign editor for *Journal of Traditional Chinese Medicine.*

"I was really surprised," said Dr. Khan about receiving the Farnsworth Award (oral communication, February 10, 2009)**.** "I was not expecting it so soon in my career. I am honored and humbled to receive this prestigious award named for Norman Farnsworth, whom I admire and respect and who is legendary in the field of pharmacognosy and natural products. It is also a very personal honor to follow behind last year's recipient, Prof. Hildebert Wagner, under whom I received my doctorate. This is certainly a high point in my career."

ABC's Varro E. Tyler Commercial Investment in Phytomedicinal Research Award

The 2009 Varro E. Tyler Commercial Investment in Phytomedicinal Research Award was presented to Indena, SpA, of Milan, Italy.

The Varro E. Tyler Commercial Investment in Phytomedicinal Research Award was named after the late Varro E. Tyler, PhD, a leading authority in botanical medicines, as well as a Trustee of ABC. That Indena is this year's recipient is especially appropriate

considering that, among his few commercial affiliations, Dr. Tyler was a consultant and spokesperson for Indena after his retirement in the late 1990s.

Indena SpA has researched and developed extracts and active principles from medicinal plants for nearly 90 years. It was also instrumental in introducing standardized herbal extracts to the American dietary supplement market 25 years ago.

ABC's Mark Blumenthal and Greg Ris, Vice President of Indena USA.

Indena's mission is to identify, develop, and produce active principles from plants, for use in the pharmaceutical, health food, and cosmetics industries.[2] The company's considerable success stems from the research it conducts at its personal research center in Settala, Italy involving the screening of medicinal plants for pharmacological benefits, the identification of new active principles, and the development of extraction and purification systems.[3] Indena coordinates with universities and research institutions around the world to assess the safety and effectiveness of its extracts up to clinical phase I. The company has accomplished over 150 patents, 700 published scientific studies, and has more than 700 employees. Indena has distribution operations in more than 40 countries, operates 5 production sites, and has 5 international branches.

"First of all, speaking for everyone at Indena worldwide, it is a tremendous honor to receive this award," said Greg Ris, Indena's vice president of sales (e-mail, February 9, 2009). "There was always a deep mutual respect between Indena and Dr. Tyler. 'Tip' (Prof. Tyler's nickname) was a true gentleman. I would like to thank the American Botanical Council for recognizing Indena's leadership in the botanical extract arena by bestowing on us this prestigious award." HG

—Kelly Saxton Lindner

References

1. D Mabberley. *Mabberley's Plant-Book: A Portable Dictionary of Plants, their Classifications, and Uses*, 3rd edition. New York, NY: Cambridge University Press; 2008.
2. Indena Company Profile. Indena Web site. Available at: http://www.indena.com/pages/profile.php. Accessed February 18, 2009.
3. Our research page. Indena Web site. Available at: http://www.indena.com/pages/research.php. Accessed February 18, 2009.

ABC Publishes Monograph on Scientific and Clinical Research of Sinupret®

The American Botanical Council (ABC) published a monograph summarizing the scientific and clinical studies of Sinupret® in February 2009. Sinupret is a clinically-tested herbal combination for upper respiratory tract health, including conditions associated with sinusitis and bronchitis.

Studies of Sinupret reviewed in the monograph include 4 clinical trials regarding acute sinusitis, 2 clinical trials regarding chronic sinusitis, 1 meta-analysis of clinical trials evaluating treatment of sinusitis, 2 clinical trials regarding bronchitis, and a post-marketing surveillance study of patients with bronchitis.

Based on the review of the available scientific and clinical information from these studies, the monograph concludes that Sinupret has a relatively significant level of safety and efficacy data compared to many other natural products intended for use in maintaining the health of sinuses and the upper respiratory tract.

"Year after year, Sinupret is one of the top-selling herbal products in Germany, a country where the strong tradition of herbal preparations is combined with modern science," said Mark Blumenthal, founder and executive director of ABC. "Extensive use by millions of people attests to this product's overall safety and effectiveness in the area of upper respiratory tract health.

"The availability of this product, particularly the version for children, comes at a time when millions of parents are concerned about recent government advisories about the safety of conventional over-the-counter cough and cold medications in children," he added. The US Food and Drug Administration has advised parents not to administer cold and flu remedies to young children under 2 years of age and is reviewing the safety of such products for older children. The Consumer Healthcare Products Association (CHPA), a leading over-the-counter drug industry trade association, has recommended that parents not administer such products to children under 4 years of age.

The ABC Sinupret monograph is published in 3 parts: The full monograph, a Clinical Overview containing condensed information from the full monograph, and a consumer/patient information sheet, consisting of essential information for consumer education about the responsible use of the product. Each of these elements is accessible separately on the ABC Web site (www.herbalgram.org).

The full monograph provides information on Sinupret's popularity within the German market, the uses of the product, the chemistry of the product's 5 herbal ingredients, dosage information, summaries of the product's researched pharmacological actions, and safety data. The monograph also contains an extensive summary of human clinical research in both text and table form, among other data.

Sinupret contains extracts of 5 traditional European herbs: elder (*Sambucus nigra,* Caprifoliaceae) flowers, primrose (*Primula veris,* Primulaceae) flowers with calyx, common sorrel (*Rumex acetosa,* Polygonaceae) herb, European vervain (*Verbena officinalis,* Verbenaceae) herb, and gentian (*Gentiana lutea,* Gentianaceae) root.

Sinupret is manufactured by Bionorica, a 76-year-old company in Neumarkt, Germany with offices in San Clemente, California. Bionorica is widely considered one of Europe's leading manufacturers of clinically tested herbal preparations.

According to Scott Bukow, president and CEO of Bionorica's US division, Sinupret has a great deal of safety and efficacy data behind it, and Bionorica commissioned the ABC monograph so that this information would be readily available to the general public (oral communication to C. Cavaliere, February 3, 2009). Bukow noted that such information could be particularly important for consumers interested in safe and effective natural products for children.

"ABC is recognized as an outstanding organization with an excellent reputation that plays a key part in educating and informing all relevant target groups in the US," said Dr. Harel Seidenwerg, head of corporate communications of Bionorica (e-mail to C. Cavaliere, February 3, 2009). "Bionorica wanted to perform an independent review about Sinupret and believes that with ABC it has chosen one of the most credible organizations to do so."

The monograph was written by Heather S. Oliff, PhD, and ABC's Blumenthal. It was formally peer reviewed by scientific and medical experts for its accuracy.

"This monograph is extremely valuable for the consumer and healthcare provider because it provides an unbiased review of the Sinupret literature," said lead author Dr. Oliff, who is the principal in the Scientific Consulting Group, LLC, and holds a doctorate in toxicology and pharmacology (e-mail to C. Cavaliere, February 2, 2009). "The monograph includes numerous studies to which people in the US have limited access," she continued, noting that some studies of Sinupret have been published only in German.

The publication of the Sinupret monograph is not an endorsement or recommendation of the product or manufacturer by ABC. "ABC has had a long history of documenting the specific herbal products and ingredients that have been clinically tested," said Blumenthal. "As part of our nonprofit educational mission, we believe it is in the public interest to identify clinically tested natural plant-based products and ingredients which the scientific literature indicates are safe and beneficial."

ABC's Sinupret monograph is the third in a series of product-specific monographs that the organization has initiated. Previous product-specific monographs developed by ABC have focused on the scientific and clinical trial data regarding the health benefits of CVT-E002® (the active ingredient in the ginseng-based dietary supplement COLD-fX®) and of POM Wonderful® Pomegranate Juice. Additional monographs concerning specific researched commercial products and ingredients are being developed by ABC. HG

Employee Profile: **Lucy Bruno**


Bruno

One of the key roles in the operation of ABC, as in any other nonprofit or for-profit business, is the person who "manages" the executive director or chief executive officer. I'd like to introduce you to my 'boss' – Lucy Bruno.

Lucy came to ABC last summer with prior work experience that includes serving as a personal assistant and a flight attendant for about 10 years. She was one of the chief international flight service managers for Continental Airlines on over 400 flights from Newark, New Jersey to various cities around the world, including Milan, Paris, Madrid, London, Tel Aviv, Munich, Copenhagen, and Honolulu. During the time she worked for Continental she also worked at the Vatican assisting the Webmaster under Pope John Paul II, translating letters and statements to the public on the Vatican's official Web site. After Continental, Lucy worked for the Palestinian Ambassador at the United Nations in New York during the Summit Meetings after September 11, 2001.

Born in Sicily, Lucy speaks 5 languages: English, Italian, Spanish, French, and some German. These language skills make her invaluable in much of her communications for ABC, especially since we have so many members in countries all over the world. (Now, if she could only learn Arabic, Chinese, Japanese, Portuguese, Russian……)

Lucy has a great attitude about her role at ABC; she throws herself into her work and takes on as many tasks and responsibilities as she can. And she does so with a positive attitude and a great sense of humor. (Whenever I want to try out a new line for an upcoming speech, I often start with Lucy. However, she laughs at almost everything, so I don't know if this is really the best way to test new lines!)

Lucy's duties are manifold. She handles all of my appointments, conference calls, media interviews, invitations to speak at conferences, and travel arrangements (airplane, hotel, car rental, etc.) for all staff. She is the main interface with my communications with members of the ABC Board of Trustees (BOT), Advisory Board, and Director's Circle. She also takes the minutes of all BOT meetings and prepares the agenda and documents for BOT meetings. She is our key event planner, e.g., for the ABC's annual American Botanical Celebration and Awards Ceremony, which we hold in Anaheim, California as part of the Nutracon and Natural Products Expo West.

Lucy also handles many other administrative functions for the organization. These include keeping track of media inquiries, issuing press releases and ABC member advisories, coordinating the shipment of educational materials to conferences, and many more items, too numerous and detailed to list here.

There's recently been a big change in Lucy's life: the birth of her baby Vittoria Maria. We may redecorate Lucy's office so that Vittoria can join us at ABC and begin to learn about herbs early in life! HG

—Mark Blumenthal

Meet ABC Board Member Michael J. Balick: Award-Winning Ethnobotanist and Conservationist

Michael Balick, PhD, became fascinated with plants at 5 years old, when he worked with his grandparents in their vegetable garden in Pennsylvania (M. Balick, oral communication, February 3, 2009). Observing the rate at which tiny seeds transformed into full-grown vegetables captivated young Dr. Balick's imagination as he watched the garden grow through the seasons.

From early childhood, Dr. Balick's interest in plants has remained steady. He studied agriculture at the University of Delaware and biology at Harvard University, where he earned his master's degree and doctorate, focusing on ethnobotany, the study of the relationship between plants and people across cultures. For more than 3 decades, Dr. Balick has studied ethnobotany and has become a well-known and respected specialist in the field, even helping to transform it into a scholarly and popular discipline recognized around the world.[1]

The study of plants and people is the primary focus of the New York Botanical Garden's (NYBG) Institute of Economic Botany, which Dr. Balick helped found in 1981.[2] He is now the director and philecology curator of the Institute and NYBG's vice president for botanical science, as well as a long-time member of the American Botanical Council's (ABC) Board of Trustees. Dr. Balick has authored or co-authored more than 17 books and monographs and more than 100 scientific papers. He has also conducted field work in 56 biologically and culturally diverse places around the world, such as Central America, the Amazon Valley, Micronesia, and Northeast Brazil. He was recently named the Society for Economic Botany's 2009 Distinguished Economic Botanist, along with the late Nina Etkin, PhD.[3]

"Mike is an amazing guy in that he has been everywhere and done everything," said Jim Miller, PhD, dean and vice president of science at NYBG's International Plant Science Center and a friend and colleague of Dr. Balick for almost 20 years (oral communication, February 6, 2009). "The breadth of his research experience provides him with a perspective that few people have."

Among numerous projects, Dr. Balick has conducted ethnopharmacological investigations in Belize, where he and Rosita Arvigo, DN, founded the Ix Chel Tropical Research Foundation to preserve the region's culture and healing traditions and to promote sustainable organic cultivation to reduce rainforest destruction.[2] He has worked in Costa Rica to help build a major botanical garden and the *Semillas Sagradas*, a garden of medicinal plants, as well as worked on the domestication of native plants in the Amazon Valley and Northeastern Brazil.[1] He has also been a part of a team that surveyed Latin America and the Caribbean for plants with potential anti-cancer and anti-AIDS properties, eventually testing thousands of species.[2]

"[Dr. Balick's] studies have become models and inspiration for the work of other people," said Dr. Miller. "The lesson that the world has learned from him is how research of plants and traditional knowledge about their uses can inform conservation and help to implement conservation."

A key tenet of his career, Dr. Balick works with many indigenous cultures to document their traditional plant knowledge and develop sustainable-use systems, while ensuring that the benefits are always shared with the local communities.[2] In recognition of these efforts, he was awarded the American Association for the Advancement of Science (AAAS) 2004 International Scientific Cooperation Award.[1]

"Mike showed great respect and genuine reverence for all the people that we worked with," said Steven King, PhD, about working with Dr. Balick in Columbia (e-mail, February 13, 2009). Dr. King, the vice president of ethnobotanical research at Napo Pharmaceuticals, an ethnobotanically-based pharmaceutical company, has known Dr. Balick for 27 years and said that he has led the field in benefit-sharing with local peoples, both conceptually and tangibly.

For Dr. Balick, living with indigenous groups far away from home, with minimal provisions, feels natural because he was raised to know the importance of nature (M. Balick, oral communication, February 3, 2009).

"I think for me, every day living in the small villages is different than the next day. It is full of discovery, education, humility, wisdom. The opportunity to serve science, sustainable development, and human rights in this particular way is a great career opportunity," he said.

Currently, Dr. Balick is continuing his work in New York City's Dominican community, where project leaders are

Board of Trustee Member Michael J. Balick
Photo ©2009 Ann Kitalong

publishing a manual and curriculum on plants commonly used by the Dominican community to help healthcare providers with Dominican patients.

He is also involved in an ongoing program on the island of Pohnpei of the Federated States of Micronesia that has ecological, ethnobotanical and floristic components. With a grant from the National Science Foundation, the project team is now comparing the effects of various land management systems for the cultivation of kava (*Piper methysticum*, Piperaceae) on the watershed and biodiversity of the streams and forests. His latest book, *Ethnobotany of Pohnpei: Plants, People and Island Culture* (University of Hawaii Press/The New York Botanical Garden, 2009) was written with a group of 15 international and local researchers and codifies the ethnomedical and traditional agricultural practices of this island group. The book is copyrighted by the *Mwoalen Wahu Ileilehn Pohnpei* (the Pohnpei Council of Traditional Leaders) under whose direction the program is being carried out, said Dr. Balick.

"It was partly due to his work with the indigenous people of Pohnpei that Mike received the Natural Product Association's Rachel Carson Award in 2007," said Mark Blumenthal, founder and executive director of ABC. "The short speech he gave in accepting the award speaks volumes about his respect for native peoples, and his innate humility. He accepted the award not for himself and his large body of ethnobotanical field work and scholarship, but on behalf of the people of Pohnpei who have been so generous and hospitable to him."

Always working on projects abroad or in the United States, applying for grants, or teaching classes, Dr. Balick's work ethic has been described as tireless and focused. Nonetheless, his personality creates a pleasant atmosphere for those who work with and know him personally, and he is always generous with his time, guidance and advice, said Dr. King.

"[Mike] taught me to play and laugh and be joyful while doing not always fun, and at times difficult, field work," said Dr. King. "Mike is Mike in and out of his professional life. He is playful, irreverent, compassionate, curious, opinionated, loyal, and dedicated to life." HG

—Lindsay Stafford

References

1. Ethnobotanist Michael J. Balick receives prestigious international science award [press release]. Austin, TX: American Botanical Council; February 17, 2005.
2. Michael J. Balick. New York Botanical Garden Web site. Available at: http://www.nybg.org/science/scientist_profile.php?id_scientist=1. Accessed February 9, 2009.
3. Michael J. Balick and Nina Etkin are recipients of the Society for Economic Botany Distinguished Economic Botanist Award [press release]. St. Louis, MO: Society for Economic Botany; January 21, 2009.

American Society of Pharmacognosy Celebrates 50th Anniversary

In 1959 at the University of Illinois Medical Center (UIMC), 88 members of the Plant Science Seminar (PSS) met to discuss the group's possible transformation into a broader-scoped organization.[1] PSS had been meeting informally for 36 years to discuss the relationship between educational institutions and pharmacognosy, the scientific study of drugs from natural sources.[2] According to Prof. Norman Farnsworth, PhD, however, a growing and younger faction in the pharmacognosy field believed that the discipline needed more chemistry, scientific meetings, and its own journal (oral communication, January 21, 2009).

Despite some resistance, the gathering at UIMC became PSS's last meeting as members ultimately voted on and approved a new constitution and bylaws to officially create the American Society of Pharmacognosy (ASP). The new society elected Prof. Varro E. Tyler, PhD, as its first president and Dr. Farnsworth, who was a graduate student at the University of Pittsburgh at the time, as the first vice president. Two years later in 1961, Dr. Farnsworth helped secure for ASP the publishing rights of *Lloydia,*[3] a journal originally created and published by the famous medicinal plant researcher John Uri Lloyd and his brother Curtis Gates Lloyd.[4]

Fifty years after that small meeting, ASP is celebrating its golden anniversary. The organization has grown to 1,200 active and associate members, over 40% of whom are internationally-based (R. Okuda, oral communication, January 28, 2009). These members aim to promote the growth of pharmacognosy and all sciences that relate to medicinal plant research and natural products.[1]

"[ASP has] become a forum where all people with an interest in natural products can really gather, either at meetings or on the Web site," said Guy Carter, PhD, the current president of ASP (oral communication, February 11, 2009). He added that the organization's scope has grown to include the pharmaceutical, marine, and herbal natural products industries.

An essential and very successful component of ASP is the organization's journal, which changed its name from *Lloydia* to the *Journal of Natural Products* in 1978 and is now co-published by the American Chemical Society.[3] This highly respected publication quickly and widely disseminates information on the chemistry and biology of natural products of animal, microbial, marine, and plant origin. All content is also easily accessible from the journal's Web site (http://pubs.acs.org /journal/jnprdf).

"[This journal] has contributed to the science of natural products considerably," said Dr. Farnsworth.

The *Journal of Natural Products'* stature and significance have especially grown over the last 10 years, partly because it has incorporated a broader spectrum of scientists into its editorial board, which now represents diverse areas of study and locations around the world, said Dr. Carter.

Throughout the past 5 decades, ASP has been involved in many achievements within the field of pharmacognosy, as many members have contributed to the discovery of important drugs. For instance, Monroe Wall, PhD, and Mansukh Wani, PhD, an ASP honorary member, discovered and elucidated the structure Taxol®, which has anti-cancer properties and was originally derived from the bark of the Pacific yew (*Taxus brevifolia*, Taxaceae).[5] With the efforts of former ASP President Matthew Suffness, PhD, who aided in developing Taxol's application as a drug, it is now approved for various types of cancers (R. Okuda, e-mail, March 9, 2009).

ASP also performs numerous services for its members, such as its annual meetings that create networking opportunities for people from around the globe and the recently added yearly interim meetings that focus on issues surrounding dietary supplements and plant products. As another service, ASP's Web site provides related news, job postings, meeting announcements, and contact information for many people in the natural products fields.

Though pharmacognosy's status as a science has experienced fluctuations over time, Dr. Carter said he expects the field to continue to have relevance and be taught in pharmacy schools due to its historical roots in modern pharmaceuticals. Similarly, the natural products field has growth potential from entrepreneurs and scientists who have great ideas and are willing to do the work to develop new products, he said, adding that genomic information opportunities are also on the horizon.

In celebration of its 50th Anniversary, ASP is hosting a special annual meeting in Honolulu, Hawaii from June 27 to July 1, 2009.[6] This scientific program features 10 speakers from all parts of the world, who will provide a broad perspective on the current state of pharmacognosy, natural products, and other related topics. Also speaking will be K.H. Lee, Adolf Nahrstedt, and Shengmin Sang, recipients of ASP's Norman R. Farnsworth Research Achievement Award, Varro E. Tyler Prize for Research in Botanicals, and Matthew Suffness Young Investigator Award, respectively. Social events will include a nighttime luau and the ASP annual banquet. A historical multimedia presentation will open the meeting.

"Hawaii is a unique setting for the meeting, not only because of the location, but also because of the long history of natural products there," said Roy Okuda, PhD, a past ASP president and a co-chair of the Organizing Committee of the 50th Anniversary Meeting of the ASP (oral communication, January 28, 2009).

Dr. Okuda added that Hawaii became the 50th US state in 1959, the same year ASP was created.

Even though the economic recession has caused the number of attendees to drop somewhat, expected turnout is about 500-600 people, possibly making it the largest pharmacognosy meeting ever held in the United States, Dr. Okuda said. HG

—Lindsay Stafford

References

1. History of the Society. The American Society of Pharmacognosy Web site. Available at: http://www.phcog.org/history.html. Accessed February 11, 2009.
2. Upton R. American Society of Pharmacognosy hosts historic forum on classical botanical pharmacognosy. *HerbalGram.* 2005; 67:69-71.
3. Kinghorn A. A new beginning based on a proud tradition. *Journal of Natural Products.* 1996;59(1):1.
4. Journals. Lloyd Library and Museum Web site. Available at: http://www.lloydlibrary.org/journals.html. Accessed February 19, 2009.
5. Ginsberg J. The discovery of Camptothecin and Taxol®. American Chemical Society Web site. Available at: http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_ARTICLEMAIN&node_id=926&content_id=CTP_004450&use_sec=true&sec_url_var=region1&__uuid=150542b9-d1cc-4ba2-ae4d-b39b55038ebf#P58_16453. Accessed March 9, 2009.
6. Okuda R. 1595-2009: Our Golden Anniversary! The ASP Newsletter. 2008;44(3):1, 4. Available at: http://www.phcog.org/Newsletter/ASPNL-Fall200844(3).pdf. Accessed January 6, 2009.

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Oldest Pharmacological Cannabis Found in Chinese Tomb

During a 2003 excavation, archaeologists discovered 789 grams of vegetative material in one of the 2,500 ancient Yanghai tombs in China's Gobi Desert.[1] Though the material was originally thought to be coriander (*Coriandrum sativum,* Apiaceae), researchers determined it to be cannabis (*Cannabis sativa, C. indica*, Cannabaceae) in 2006. Shortly afterward, a large and multidisciplinary team of international researchers came together to discover as much as possible about the ancient herb's possible uses and chemical and genetic fingerprints (E. Russo, e-mail, February 20, 2009).

"This was a unique and rewarding project," said Ethan Russo, MD, a lead researcher in the study.

After carrying out botanical, phytochemical, and DNA analyses in 2007 and field work in March 2008, the researchers concluded that the cannabis was psychoactive and cultivated for medicinal or divinatory purposes, a confirmation of their original hypothesis.[2] Their research, published in the November 2008 issue of the *Journal of Experimental Botany*, also included radiocarbon dating to date the cannabis to 2,700 years BP (before present), making it the oldest discovered cannabis to have been used as a pharmacologically active agent.

Many findings led to their conclusion. A microscopic botanical analysis revealed the seeds to be light in color with some striations and rough, non-concave fruit attachment, all traits of domestication that show the cannabis was cultivated rather than wild-harvested. No obvious male cannabis plant parts were present, suggesting possible human removal of these psychoactive materials, which are less pharmacologically active. Also, phytochemical analysis showed the cannabis contained cannabinol (CBN), a degradation product of tetrahydrocannabinol (THC), as the predominant residual phytocannabinoid component, indicating that the original plants contained THC as the major constituent. This also suggests that humans selected the material from plants on the basis of their higher-than-average THC content.

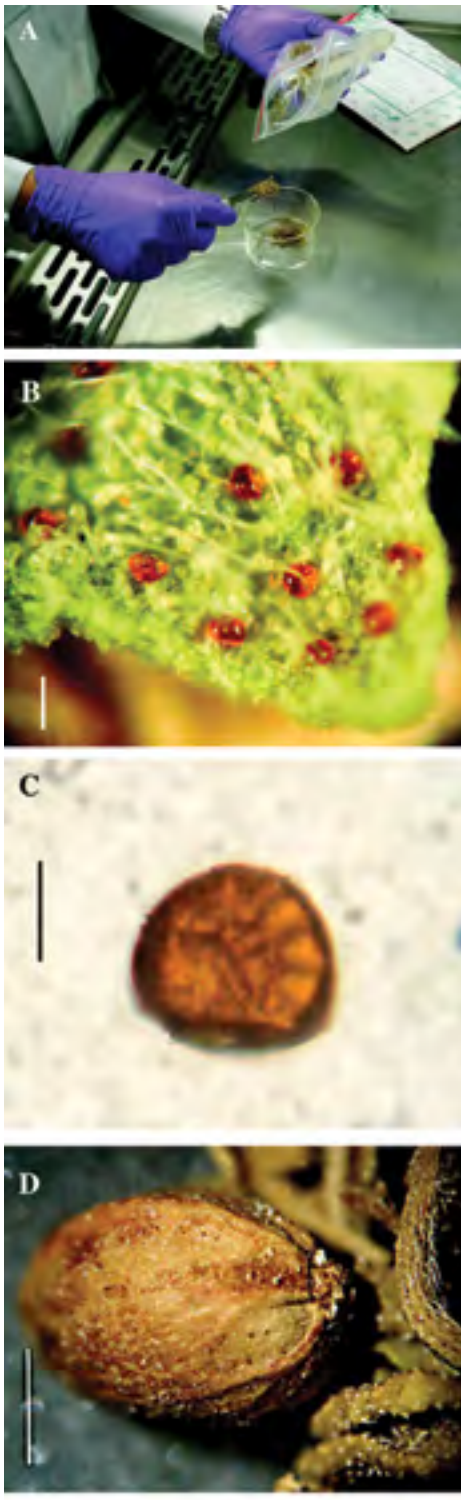
Though some media reports have stated that the cannabis was potent, the relative potency cannot be determined with the available tools, said Dr. Russo, who is also a senior medical adviser for the Cannabinoid Research Institute at GW Pharmaceuticals (Salisbury, United Kingdom). The sample had very low concentration levels of THC and far greater amounts of THC oxidative breakdown products, all of which are consistent with very old cannabis samples.[2]

Genetic analysis also demonstrated the presence of THC's biosynthetic enzyme, THCA synthase, and a unique variant with 2 single nucleotide polymorphisms (or mutations), never previously observed in cannabis.

After reading the detailed research article, Dennis McKenna, PhD, an ethnopharmacologist and senior lecturer at the University of Minnesota's Center for Spirituality and Healing, agrees with the researchers' conclusion that this ancient cannabis was used medicinally or for its psychoactive properties and said it is unlikely the cannabis was used for other purposes (D. McKenna, e-mail, February 16, 2009).

"The chief evidence here is the phytochemical data showing that the cannabis was a high THC variety. The major cannabinoid found was CBN, which is known to be a degradation product of THC. If it were a variety of cannabis not selected for medicinal or psychoactive properties, one would expect a more equal distribution of cannabinoids," Dr. McKenna said.

The study's findings were possible through a detailed examination of the cannabis, which was so well preserved that macroscopic and microscopic structures could be shown in great detail, including the nonglandular and glandular trichomes.[2] Unlike all other discovered ancient cannabis specimens, which have carbonized or decayed, this cannabis was meticulously preserved by the tombs' climatic and burial conditions; these included burial in deep graves of 2 or more meters, an extremely arid climate (< 16mm annual rainfall), and



Photomicrographs of ancient cannabis. (A) Photograph of the whole cannabis sample being transferred in laminar flow hood. (B) Photomicrograph of leaf fragment at low power displaying non-glandular and amber sessile glandular trichomes. (C) Higher power photomicrograph of a single sessile glandular trichome. (D) Low power photomicrograph of a cannabis achene ('seed') including the base with a non-concave scar of attachment visible.
Photos ©2009 *Journal of Experimental Botany*

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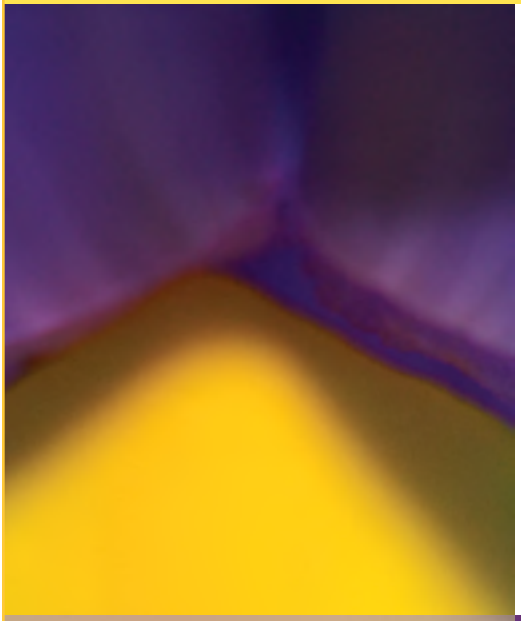

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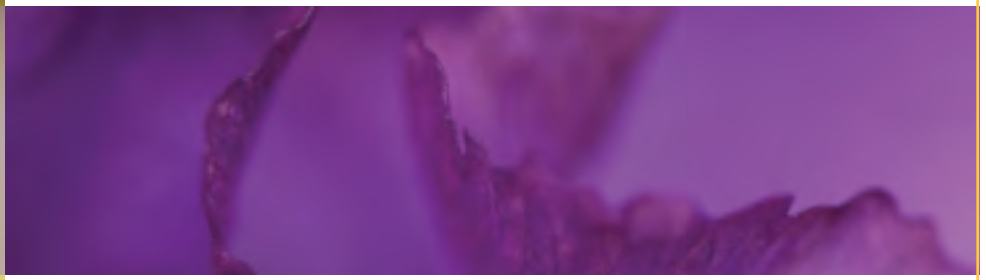

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alkaline soil conditions.

The researchers' original suspicion that the cannabis was used for its psychoactive effects by the ancient Gushi people, the culture to whom the tombs have been attributed, was partly based on the tomb's absence of hemp textiles and a complete lack of evidence to suggest the Gushi used cannabis for food, oil, or fiber purposes. Also an important factor was the cannabis's location near the skeletal remains of what is thought to be a shaman. The tomb containing the skeleton also held artifacts of high quality, denoting a person of high stature, a leader, healer, or sage, said Dr. Russo.

"Given the medicinal nature and abundance of the cannabis, and the presence of one other seeming shaman's tomb with cannabis, the archeologists involved feel his shamanic status is certain," he said.

A second cannabis specimen, found in a different tomb along with seed clumps of caper (*Capparis spinosa*, Capparaceae), an important culinary and medicinal herb with numerous uses,[3] has not yet been analyzed to the detailed extent as the first sample.

Though the tombs are full of numerous well-preserved artifacts, no evidence has been found to suggest any possible conditions or diseases that the Gushi people used cannabis to treat, said Dr. Russo. There is very little information known about this culture, whose people have been described as nomadic, light-haired, blue-eyed Caucasians who spoke an Indo-European language.[2]

"This study was one of the first times that there has been any degree of discussion of the Gushi in an English language publication," said Dr. Russo.

Limited information does show that the Gushi people had worn teeth from a fiber-rich diet or mechanical wear, as well as wear-and-tear arthritic effects, a result of the extremely harsh conditions of the local terrain, he added.

Also unanswered is the question of how the Gushi people ingested or administered the cannabis. No evidence has come to light that suggests its mode of administration, though this information might surface with more excavations and research.

Dr. McKenna suspects the cannabis was administered orally or by fumigation (e-mail, February 17, 2009).

"There is no evidence that it was smoked, and in fact smoking was not a practice in the Old World prior to its introduction from the New World, post Columbus. Still, [the Yanghai tomb cannabis] was probably used for medicinal or therapeutic purposes by oral administration," Dr. McKenna said.

In addition to documenting the oldest pharmacological use of cannabis, this study could potentially lead to further research, including shedding light on the historical migration routes of cannabis. Researchers said the cannabis studied is probably indigenous to Central Asia, but point out that the plant's long history of cultivation makes it difficult to know the specimen's original distribution point.[1]

"If, for example, we were able to find the same SNPs (single nucleotide polymorphisms) from the ancient cannabis in the shaman's tomb in other regional samples, this would be an important clue that might help to map the peregrinations of this extraordinarily useful plant," said Dr. Russo (e-mail, February 13, 2009).

The research team has plans for more investigation into the Yanghai tomb cannabis and may have additional results to announce in the coming months, said Dr. Russo. He added that he is interested in doing field research in the Tian Shan Mountains, where researchers assume the shaman died, to try to trace cannabis migration routes, find evidence of Gushi settlements (none have been found to date), and to look for feral cannabis, the genetics of which could be compared to the ancient sample.

"Only 500 of the 2,500 Yanghai tombs have been excavated to date, with only 2 harboring cannabis. Potential remains for additional discoveries if funding can be secured"

With the vast Yanghai tombs, many possibilities exist for future studies of migration routes and ancient uses of cannabis.

"Only 500 of the 2,500 Yanghai tombs have been excavated to date, with only 2 harboring cannabis. Potential remains for additional discoveries if funding can be secured," said Dr. Russo.

Although the Yanghai tomb cannabis adds to the historical knowledge of cannabis as a drug, both Dr. McKenna and Mahmoud A. ElSohly, PhD, of the Marijuana Project at the University of Mississippi, said this discovery does not have much significance on modern medicinal cannabis research and legality.

"We're not going to start approving a drug today because we just found out it was used 3,000 years ago," said Dr. ElSohly (oral communication, February 26, 2009). "We're going to approve drugs today based on the studies that need to be done." HG

—Lindsay Stafford

References

1. Jiang HE, Xiao L, Zhao YX, Ferguson DK, et al. A new insight into *Cannabis sativa* (Cannabaceae) utilization from 2500-year-old Yanghai Tombs, Xinjiang, China. *J Ethnopharmacol.* 2006;55(4):481-485.
2. Russo EB, Jiang HE, Xiao L, et al. Phytochemical and genetic analyses of ancient cannabis from Central Asia. *J Exp Bot.* 2008;59(15)4171-4182.
3. Jiang HE, Xiao L, Ferguson DK, et al. The discovery of *Capparis spinosa* L. (Capparidaceae) in the Yanghai Tombs (2800 years b.p.), NW China, and its medicinal implications. *J Ethnopharmacol.* 2007; 113;409–420.

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After Another Canceled Partnership, the Future of Hoodia Remains Unclear

Originally used to help calm the hunger pains of the indigenous San people of southern Africa, the appetite-suppressing succulent *Hoodia gordonii (Asclepiadaceae) has been heralded for several years as the future of weight-loss products.[1] A few factors have made this a challenging prospect, including the plant's slow growth rate, its declining availability,[2] and reports that many dietary supplements claiming to contain hoodia do not actually include the ingredient.[3]**

This has not deterred some large companies, however, from trying to develop authentic *Hoodia gordonii*-based products for the mass market, including Unilever (Rotterdam, Netherlands), a global manufacturer of food, home care, and personal care products. In 2004 Unilever teamed up with Phytopharm (Godmanchester, UK), the pharmaceutical and functional food company that holds the patent on an appetite-suppressing *Hoodia gordonii* compound—the oxypregnane steroidal glycoside named P57.[4] Unilever had plans to develop a *Hoodia gordonii*-based product for its line of Slim Fast® beverages. By mid-2008, pre-clinical studies had been completed and clinical studies were under way.[5] Submission to the US Food and Drug Administration for generally recognized as safe (GRAS) status was predicted for late 2009 for the use of *Hoodia gordonii* preparations as an additive in foods and beverages.

These anticipations soon changed when Unilever's research concluded that the *Hoodia gordonii* extract failed to meet the company's high standards for safety and efficacy, leading Unilever to terminate the agreement with Phytopharm in November 2008.[4] According to Unilever spokesperson Trevor Gorin, a recent clinical trial carried out by Unilever and Phytopharm on a prototype drink product containing *Hoodia gordonii* extract showed adverse effects and tolerability issues (D. Mastrojohn, e-mail, January 22, 2009).

"[Unilever] is naturally disappointed, but the project was only viable if we could produce a Unilever branded product which met the standards our consumers expect, and in this case, we did not think it possible," he said. Unilever reportedly invested about $40 million in the project.[4]

This makes the second failed Phytopharm partnership to develop a weight-loss product based on the *Hoodia gordonii* extract. The company previously attempted a partnership with Pfizer (New York, NY), the world's largest biomedical and pharmaceutical company, which canceled its *Hoodia gordonii* project in 2003. Up to that time, Pfizer was researching the possibility of producing

Hoodia *Hoodia gordonii*
Photo ©2009 Mathias Schmidt

* Because other species in the genus *Hoodia* sometimes may be sold in commerce as *Hoodia gordonii*, in February 2006 the American Herbal Products Association adopted a trade recommendation that the standardized common name for this species should be "*Hoodia gordonii*." (Ref: AHPA adopts labeling standards for *Hoodia gordonii* [press release]. Silver Spring, MD: American Herbal Products Association; February 22, 2006.)

a weight-loss drug from *Hoodia gordonii*, in contrast to Unilever's attempts to make a *food* product. Phytopharm's stock price fell 30% upon news of the canceled partnership with Unilever, after which the company's CEO and CFO resigned.

"Although it is disappointing that the collaboration with Unilever on hoodia did not reach a successful conclusion, we are pleased to have agreed termination terms with Unilever which enable us to take the product forward with another partner," said Phytopharm Chairman Alistair Taylor in December 2008.[6] Taylor added that Phytopharm continues to believe strongly in the commercialization of *Hoodia gordonii* and that it will seek potential partners in the areas of functional foods and veterinary and orphan pharmaceutical products (drugs intended to treat diseases or conditions that affect only a relatively few people, thereby making their projected sales revenues relatively small compared to those of drugs for more widespread diseases). This allows drug companies to bypass various regulatory requirements routinely required for most new drugs.

As of early 2009, Unilever and Phytopharm were still in a transition stage in which the original patents, rights, and *Hoodia gordonii* inventories were being reverted to Phytopharm. Unilever also gave Phytopharm a non-exclusive, irrevocable, royalty-free license, with the right to sub-license, to any Unilever patents and intellectual property rights connected with the *Hoodia gordonii* research program. Unilever handed over the responsibility of funding all costs of the *Hoodia gordonii* program to Phytopharm on January 1, 2009.

Many details of the canceled agreement have not been disclosed and remain somewhat unclear. Mathias Schmidt, PhD, of HERBResearch in Germany speculates that 2 forces may have led to the cancellation: toxicity issues with the P57 extract and problems with cultivated *Hoodia gordonii* material (e-mail, Janu-

ary 19, 2009).

According to Dr. Schmidt, the *Hoodia gordonii* plant itself, or when in the form of pressed juice or powder, can be expected to be safe. But, as often is the case, when a specific fraction or a purified constituent is isolated, such as the highly-touted P57, issues can arise. This was seen in data from preliminary experiments of the Phytopharm patent.[7]

Dr. Schmidt further stated that, because the plant has been over-harvested and is nearing extinction in its native range in southern Africa, it is protected from wild-harvest, and all exports and imports are required to have originated from cultivated plants. According to Dr. Schmidt, the actual cultivation process of *Hoodia gordonii* is quite easy.

"However, the cultivated plant material is not of the same quality as the wild crafted plants, especially when triterpene levels are compared," Dr. Schmidt said, adding that though P57 has long been thought to contribute to the overall appetite-suppressing effect of *Hoodia gordonii*, other related steroidal triterpenes also contribute to the overall effect.

Dr. Schmidt noted that HerbResearch and Medicinal and Aromatic Plants R&D are involved in a project in South Africa that compares the effect of different growth conditions of *Hoodia gordonii* on the plant's yield of triterpenes, "and with our results in mind, we think Unilever might have had problems isolating sufficient quantities of this phytochemical."

Dr. Schmidt explained that the triterpenes are responsible for *Hoodia gordonii*'s bitter flavor, which protects the slow-growing plant from being eaten by wild animals or damaged by insects. When *Hoodia gordonii* is cultivated and given ample supplies of water, however, it grows rapidly and has a decreased need to defend itself, which in turn lowers the need for high production of the foul-tasting triterpenes. Therefore, said Schmidt, the usual practice of *Hoodia gordonii* cultivation leads to plant material with very low levels of triterpenes. This may also result in a more agreeable flavor, but it will make the plants less efficacious as an appetite suppressant.

Though the partnership cancellation disappointed Unilever and Phytopharm, the setback in *Hoodia gordonii* commercialization also affects the San people of southern Africa. When Phytopharm received the patent on *Hoodia gordonii*'s P57 component, various reports stated that the San had become victims of biopiracy because the company used the indigenous group's traditional information and shared knowledge without paying them any royalties.[8] However, the Council for Scientific and Industrial Research (CSIR), which granted the patent to Phytopharm, later agreed to pay the South African San Council 6% of royalties from the sale of *Hoodia gordonii*-containing products and 8% of all milestone payments that CSIR receives from Phytopharm.

In regards to the Unilever/Phytopharm partnership cancellation, the San's attorney, Roger Chennells, said, "The San were certainly surprised, as they know that the hoodia has the properties that have been patented, and expected Unilever to go all the way to the market. Disappointment is also naturally present, as the San expected their first royalties within 2 or so years. The San leadership, however, has met and discussed the situation in the light of the positive attitude of Phytopharm to continue to develop the patent, and has every reason to believe that the benefits are simply delayed, rather than terminated" (e-mail, January 31, 2009). HG

—Lindsay Stafford

References

1. Leung R. African plant may help fight fat. CBS News. November 21, 2004. Available at: http://www.cbsnews.com/stories/2004/11/18/60minutes/main656458.shtml. Accessed January 21, 2009.
2. Hoodia gordonii (MASSON) SWEET ex DECNE. HERBResearch Germany Web site. Available at: http://www.herbresearch.de/en/arzneipflanzen_hoodia.html. Accessed January 21, 2009.
3. Bogus raw material tarnishes hoodia's equity, but committed report strong sales. *Nutrition Business Journal*. September 1, 2007. Available at: http://subscribers.nutritionbusinessjournal.com/ingredient-supply/bogus_material_tarnishes_hoodia/index.html. Accessed January 29, 2009.
4. Unilever axes plans for a hoodia functional food offering. *Nutrition Business Journal*. November 18, 2008. Available at: http://nutritionbusinessjournal.com/healthy-foods/news/11-18-unilever-plans-hoodia-functional-food-offering-axe/. Accessed January 21, 2009.
5. Phytopharm. Phytopharm plc Interim Report 2008. Available at: http://www.phytopharm.co.uk/news/newsreleases/?id=8391. Accessed January 26, 2009.
6. Unilever returns rights to *Hoodia* extract [press release]. Godmanchester, United Kingdom: Phytopharm; December 12, 2008.
7. Schmidt M, Betti G. Hoodia gordonii: safety issues. June 22, 2006. [Unpublished.]
8. Wynberg R. Rhetoric, realism and benefit sharing: use of traditional knowledge of hoodia species in the development of an appetite suppressant. *The Journal of World Intellectual Property*. 2004;7(6):851-876. Available at: http://www.biowatch.org.za/main.asp?include=pubs/wjip.html. Accessed January 29, 2009.

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Cochrane Review of St. John's Wort for Major Depression

Reviewed: Linde K, Berner MM, Kriston L. St. John's wort for major depression. Cochrane Database of Systematic Reviews 2008, Issue 4. Art. No.: CD000448. DOI: 10.1002/14651858.CD000448.pub3.

Major depression is typically treated with antidepressant medications. Although newer antidepressants (SSRIs, selective serotonin reuptake inhibitors) are better tolerated than older drugs (e.g., tricyclic antidepressants), they still have many unwanted side effects. Extracts of St. John's wort (SJW, *Hypericum perforatum*, Clusiaceae) are prescribed in Germany to treat depression. The purpose of this systematic review was to investigate whether extracts of SJW are more effective than placebo and as effective as standard antidepressants in the treatment of major depression, and whether they have fewer adverse effects than standard antidepressant drugs. Similar reviews have been published by the Cochrane Collaboration in the past. This review is an update, including the latest published studies.

Electronic databases were searched through July 8, 2008 to find appropriate studies. Reference lists were also searched. Only randomized, double-blind clinical trials were included in this review. Patients were required to have major depression (meeting DSM-IV or ICD-10 criteria). Trials in children (less than 16 years of age) were not eligible. Studies evaluating combination herbal products and trials using inappropriate synthetic drugs (e.g. benzodiazepines) or a dosage of an antidepressant below the lower thresholds recommended in current guidelines were excluded. Experimental and control treatments had to be administered for a duration of at least 4 weeks. Trials that measured only physiological parameters were excluded.

A total of 79 relevant studies were identified and 29 trials (conducted on a total of 5489 patients) met the inclusion criteria, including 18 placebo-controlled studies and 17 active-controlled studies. (Active controls are usually conventional pharmaceutical drugs approved and used for the indication being tested in the trial.) The severity of major depression was described as mild to moderate in 19 trials and moderate to severe in 9 trials (one trial did not classify severity). Eighteen trials were from German-speaking countries, four from the United States, two from the United Kingdom, and one each from Brazil, Canada, Denmark, France, and Sweden. Many different SJW preparations were used in the trials. The range of daily doses varied between 240 and 1800 mg of SJW extract, but most trials used 500-1200 mg. The active comparators were the conventional pharmaceutical antidepressants fluoxetine (6 trials, dosage 20-40 mg), sertraline (4 trials, 50-100 mg), imipramine (3 trials, 100-150 mg), citalopram (1 trial, 20 mg), paroxetine (1 trial, 20-40 mg), maprotiline (1 trial, 75 mg), and amitriptyline (1 trial, 75 mg). Treatment duration lasted 4 weeks (1 trial), 6 weeks (19 trials), 7 weeks (1 trial), 8 weeks (5 trials) or 12 weeks (4 trials).

The methodological quality of each trial was assessed by at least 2 independent reviewers using Jadad scales, and the majority of studies were of high quality (Jadad score of 5 out of 5). The report contains a table listing all of the included trials and their Jadad scores (a method of evaluating the design quality of a clinical trial). Data were extracted from the reports and a meta-analysis was conducted. The main outcome measure for assessing effectiveness was the response rate according to the Hamilton Rating Scale for Depression (HAMD), the Montgomery Åsberg Depres-

St. John's Wort
Hypericum perforatum
Photo ©2009 Steven Foster

sion Rating Scale (MADRS), or Clinical Global Impression Index (CGI) scales. The main outcome measure for adverse effects (AEs) was the number of patients who dropped out due to AEs.

In the placebo-controlled studies, patients receiving SJW were significantly more likely to be treatment responders (responder rate ratio = 1.48; 95% CI: 1.23 – 1.77), but study results were highly heterogeneous. Variables affecting the heterogeneity were baseline depression values (higher values had smaller effect size), precision of the study (more precise studies had smaller effect size), and country of origin (trials from German-speaking countries reported more positive findings). Remission rates (HAMD score < 8 or < 7) were significantly higher in patients receiving SJW than in those receiving placebo (ratio = 2.77; 95% CI: 1.80 – 4.26).

In comparator trials, an analysis based on the HAMD revealed no differences between the groups (RR = 1.01; 95% CI: 0.93 – 1.09). Analysis based on the CGI also found no relevant differences (RR = 1.01; 95% CI: 0.94 – 1.09). Studies from German-speaking countries reported findings that were slightly more favorable to SJW. However, in the multivariable meta-regression analysis, trials with patients having higher HAMD baseline values had less favorable results (P = 0.010), while country of origin and precision had no significant influence in comparator trials.

The number of patients dropping out for AEs was similar among patients receiving SJW and placebo (OR = 0.92; 95% CI: 0.45 – 1.88). Patients treated with SJW were less likely to drop out of the study due to AEs than patients treated with either older or newer (SSRIs) pharmaceuticals. More patients treated with older pharmaceuticals had AEs than those taking SSRIs. Despite the documented safety of SJW extracts with respect to lack of AEs, there was a short note mentioning the potential of adverse drug interactions for which SJW is increasingly well known, although such interactions were not detected in the clinical trials in this review.

Overall the findings support the use of SJW for treatment of major depression. It appears that SJW is effective and safe.

The authors of this 147-page report conclude:

> Patients suffering from depressive symptoms who wish to use a St. John's wort product should consult a health professional. Using a St. John's wort extract might be justified, but important issues should be taken into account: St. John's wort products available on the market vary to a great extent. The results of this review apply only to the preparations tested in the studies included, and possibly to extracts with similar characteristics. Side effects of St. John's wort extracts are usually minor and uncommon. However, the effects of concomitant drugs might be compromised.

In previous versions of this Cochrane review (published in 1998 and 2005), included trials were not restricted to patients with major depression, whereas the inclusion criteria of the present review were restricted to patients with major depression. This is not to say that SJW is ineffective in depressed patients who are not classified as having major depression. Rather, this restriction may make the results more generalizable.

A probable limitation of the review's results is that the authors concluded that the results pertain only to preparations evaluated in the review; the clinical results cannot be projected onto non-clinically-tested SJW preparations. A table shows that the following commercial SJW preparations were used: Hypericum extract LI160 (aka Jarsin®, produced by Lichtwer Pharma, Berlin, Germany), HYP611 (aka Felis® 650, produced by Biocur Arzneimittel GmbH, Holzkirchen, Germany), STW3-1 (Steigerwald Arzneimittelwerk, Darmstadt, Germany), STW3-IV (Steigerwald), STW3-VI (Steigerwald) LoHyp-57 (Dr. Werner Loges and Co, GmbH, Winsen, Germany), WS5572 (W. Schwabe Pharmaceuticals, Karlsruhe, Germany), WS5573 (Schwabe), WS5570 (Schwabe), Iperisan (Laboratorio Marjan, Sao Paulo, Brazil), STEI 300 (Steiner Arzneimittel, Berlin, Germany), ZE117 (Max Zeller Sohn, Romanshorn, Switzerland), and Psychotonin forte (Steigerwald). HG

—Heather S. Oliff, PhD

St. John's Wort *Hypericum perforatum*
Photo ©2009 Steven Foster

Rhodiola Extract Improves Burnout Fatigue, Attention, and Cortisol Response

Reviewed: Olsson EMG, von Scheele B, Panossian AG. A randomized, double-blind, placebo-controlled, parallel-group study of the standardized extract SHR-5 of the roots of *Rhodiola rosea* in the treatment of subjects with stress-related fatigue. *Planta Med.* 2009;75:105-112.

Psychological stress can induce fatigue syndrome, which is characterized by long-term exhaustion, physical weakness, depression, lack of drive, poor concentration, and difficulty sleeping. Consumers often treat stress-related fatigue with stimulants. Rhodiola (*Rhodiola rosea*, Crassulaceae) root extract has stimulant and stress-protective (or adaptogenic) properties. The objective of this study was to determine whether daily intake of a proprietary rhodiola extract would produce any positive effects on attention, quality of life, and symptoms of fatigue and depression in subjects with stress-related fatigue.

Sixty men and women (20-55 years) living in and around Stockholm, Sweden, responded to an advertisement to participate in this randomized, double-blind, placebo-controlled study. Included subjects had "fatigue syndrome" as classified by the World Health Organization's International Classification of Diseases. The project was approved by the Swedish Medical Product Agency and the University of Uppsala. The subjects had daily symptoms of fatigue, enduring for at least 2 weeks, related to a specific stressor that had been present for at least 6 months, and their daily functioning was negatively affected by stress. The symptoms could not be related to substance abuse or psychiatric or other primary disorders.

The diagnosis of fatigue syndrome differs from that of chronic fatigue syndrome. Fatigue syndrome requires the identification of specific stressors while chronic fatigue syndrome focuses on the immune system and symptoms of pain in the lymph nodes, joints, and muscles.

Subjects were given 120 placebo or identical-appearing tablets of a proprietary *Rhodiola rosea* root extract (576 mg extract/day, SHR-5, Swedish Herbal Institute, Gothenburg, Sweden). The extract was a 4:1 concentrate made by using a 70% ethanol solvent; it contained 4.0 mg/tablet of rhodioloside along with quantified but unspecified amounts of tyrosol, rosavin, and triandrin.

The primary endpoint was a reduction in fatigue symptoms assessed according to the Pines' burnout scale. Attention was evaluated by the Conners' computerized continuous performance test II (CCPT II) for features such as omissions, commissions, variability, and response reaction time standard error (Hit RT SE). The reduction in depressive symptoms was estimated using the Montgomery-Asberg depression rating scale (MADRS), quality of life was measured using the SF-36 questionnaire, and the cortisol (a stress hormone) response to awakening was determined from saliva samples. Saliva sampling was chosen because it is a simple,

Rhodiola *Rhodiola rosea*
Photo ©2009 Bertalan Galambosi

non-invasive, non-stressful method that participants could do at home. Saliva samples were collected using Salivette cotton rolls, which participants were instructed to place in the mouth for at least 1 minute or until the cotton roll was soaking wet, at 0, 15, 30 and 60 minutes after awakening.

One person dropped out of the treatment group; each group had 3 men. The placebo group had much better compliance than the rhodiola group (P = 0.07). The number of tablets remaining in the container was 0-75 tablets in the rhodiola group and 0-29 tablets in the placebo group. There was a significant improvement in fatigue symptoms, quality of life, depression, and attention in both groups. The authors state that these improvements could be due to a placebo effect, a general effect of taking the tests twice, or a regression towards the mean. However, the rhodiola group benefited more than the placebo group on assessment of fatigue symptoms (P = 0.047) and attention (omissions—not responding when a response is required [P = 0.02], variability [P=0.005], and Hit RT SE [P=0.001] that indicate a more stable work pace). The cortisol response to awakening stress (awakening is a mild stressor) was reduced significantly following 28 days of treatment with the rhodiola extract in comparison with the control group (P = 0.038). No adverse events occurred during the study, and no major side effects that could be clearly linked to the rhodiola preparation were reported by any of the subjects.

The authors conclude that repeated administration of rhodiola extract SHR-5 exerts an anti-fatigue effect that increases mental performance, particularly the ability to concentrate, and decreases cortisol response to awakening stress in burnout patients with fatigue syndrome. According to the authors, this study is the first to show that this proprietary rhodiola extract benefits patients with chronic stress-induced fatigue. Additionally, this study is the first to suggest clinically that *Rhodiola rosea* root benefits stress-induced disorders by modulating cortisol. There are data suggesting that the inhibitory effect of *Rhodiola rosea* on the increased basal level of cortisol results in an improvement in cognitive function. This proposal is consistent with other studies suggesting that optimal corticosteroid levels are a requirement for efficient cognitive function, as significant changes (up or down) in circulating levels of corticosteroids correlate with cognitive impairment.[1] Modulation of cortisol content is believed to be a key mechanism of action of phytoadaptogens.

The authors suggest that the reason a potential effect on depressive symptoms was lacking—as has been documented in a previous trial designed to measure the effect of this specific rhodiola extract on depressed patients[2]—may have been due to the inadequate duration and because subjects with depression as a major symptom were excluded from this trial. The authors do not hypothesize why the rhodiola group had poorer compliance or whether the findings would have been more robust if compliance were improved. It should be noted that the effects seen in this study may be specific to the proprietary rhodiola product used and the specific dose. HG

—Heather S. Oliff, PhD

References

1. Herbert J, Goodyer IM, Grossman AB, et al. Do corticosteroids damage the brain? *J Neuroendocrinol.* 2006;18:393-411.
2. Darbinyan V, Aslanyan G, Amroyan E, Gabrielyan E, Malmstrom C, Panossian A. Clinical trial of *Rhodiola rosea* L. extract SHR-5 in the treatment of mild to moderate depression. *Nord J. Psyc.* 2007;61:343-348.

Assessment of Liver Toxicity Cases Associated with Black Cohosh Concludes Lack of Causality

Reviewed: Teschke R, Schwarzenboeck A. Suspected hepatotoxicity by *Cimicifugae racemosae* rhizome (black cohosh, root): Critical analysis and structured causality assessment. *Phytomed*. 2009;16:72-84.

Over the past several years there have been numerous reports of possible liver toxicity associated with the use of various black cohosh (*Actaea racemosa*, Ranunculaceae, syn. *Cimicifuga racemosa*) preparations, popular for treating symptoms associated with menopause. Although some regulatory agencies and related bodies have reviewed these cases and have announced some preliminary cautions (for example, the European Medicines Agency [EMEA]), critical analyses have questioned the causality of such cases. In this paper, researchers from the Teaching Hospital of the Johann Wolfgang Goethe University of Frankfurt/Main, Hanau, Germany, analyzed case reports that regulators have previously considered as demonstrating "possible" or "probable" causality from black cohosh.

The EMEA has received 42 case reports of hepatotoxicity in patients taking black cohosh root for menopausal symptoms. In 26 of the cases, there was insufficient documentation to support a causal relationship between black cohosh use and hepatotoxicity. In 5 cases the association was deemed unrelated, and in 7 cases the association was determined to be unlikely. However, the EMEA has proposed a causal relationship for 4 cases. The purpose of this article was to analyze those 4 cases.

Details regarding the clinical course, co-medicated drugs, and diagnostic work-up were obtained from published case-study and EMEA reports. Causality was assessed with a structured algorithm based on the method of the Council for International Organizations of Medical Sciences. The algorithm has 3 steps: a pre-test, main-test, and post-test. The pre-test assesses each herb or drug consumed by the patient and qualitatively assesses if causality is unrelated or not assessable. In the main-test, each herb or drug is quantitatively evaluated for causality of histological changes. The post-test is a qualitative assessment (yes/no answers) of other diseases that are rare and may not have been considered in the previous steps.

Three of the 4 cases did not report the brand name of the black cohosh product, the ingredients, the manufacturer, the plant part used, or the solvent used in the extraction process. Information on duration of use is missing in one case and conflicting in another.

In Case 1, the patient was taking 4 concomitant medications that are known to be potentially hepatotoxic. After one week of taking black cohosh (dose and brand not known), liver-associated symptoms were noticed. Black cohosh treatment was discontinued, and a tapering steroid course was initiated, since drug-induced autoimmune hepatitis was suspected. Resolution of the abnormal liver function tests occurred within 9 weeks, and follow-up liver chemistries remained normal 2 months after steroid discontinuation. At 4 months, the liver disease recurred with rapid improvement by a second course of steroids and long-term azathioprine. A discussion of this case revealed that there is no certainty that the product taken by this patient included only black cohosh or any black cohosh. The patient recalled seeing the words "black cohosh" on the bottle but could not remember any details about the label or the bottle, which she had discarded. Another salient point is that drugs that cause autoimmune hepatitis are usually taken for a long

Black cohosh *Actaea racemosa*
Photo ©2009 Steven Foster

time; in this case, black cohosh was taken only briefly. Since the concomitantly taken conventional drugs were not discontinued (including labetolol, fosinopril, verapamil, metformin, aminosalicylic acid, and aspirin), it is possible that they may have caused or triggered the autoimmune hepatitis in this patient with prior autoimmune polymyositis (inflammation of muscle tissue). Based on these findings and the changes in alanine transaminase (ALT) liver enzymes, the authors conclude that the liver disease was unrelated to black cohosh. The EMEA classified the case as having probable causality; however, the EMEA evaluated only one of the concomitant pharmaceutical drugs.

In Case 2, the patient took 500 mg/day of black cohosh root for 5 months prior to presentation with clinical signs of liver disease. The patient regularly consumed alcohol and was taking numerous conventional drugs that are known as potential hepatotoxins (valaciclovir and ibuprofen). The patient was also being treated for herpes virus, so she could have had herpetic liver disease. She recovered after liver transplantation. The EMEA classified the case as having probable causality with black cohosh; however, the EMEA did not evaluate the concomitant drugs because in the published case report the patient had denied taking other drugs or alcohol initially. This information was documented at a later date by other physicians/researchers. The authors conclude that causality is unrelated to black cohosh since a non-drug cause (herpetic hepatitis) is highly probable and qualitative and quantitative causality could not be assessed because conventional drug treatments were not stopped and changes in liver enzymes could not be assessed.

In Case 3, the patient took 1000 mg/day of black cohosh for either 3 months or 8 months (according to the authors, one report documents 3 months of use and another report documents 8 months of use). She stopped taking the black cohosh at first presentation of liver disease; however, she did not stop taking concomitant conventional medications with known potential hepatotoxicity (fluoxetine, propoxyphene, acetaminophen). When black cohosh was discontinued, there was a decrease in ALT, followed by an unexpected increase in ALT above the initial levels. EMEA suggested a possible causality, and the authors of the case report reported a probable causality. However, neither took into account the concomitant medications. Also, the patient had antibodies for a herpes infection and died during liver transplantation. The authors conclude that the patient most probably had herpetic liver disease, so they conclude that the causality to black cohosh must be excluded.

In Case 4, the patient used 80 mg/day of black cohosh for an unknown period of time. The plant part, brand, and manufacturer are unknown. There is not much data available, so the case cannot be examined with the pre-test or main-test. The EMEA reported the case as having only possible causality, citing that the data were not presented in detail. Due to the lack of adequate details, the authors of this critical analysis conclude that the overall causality is unable to be determined.

The authors conclude that the clinical analysis and structured causality assessment reveal that no valid evaluation was possible for one patient due to lack of basic information, and the remaining 3 cases had no convincing evidence that the liver diseases were caused by black cohosh. These 3 patients were all treated with steroids for acute drug-induced hepatocellular jaundice and fulminant liver failure. The authors note that there is no evidence of steroids benefiting this condition, and that since early antiviral therapy is necessary for herpetic liver disease, steroid therapy should not be considered unless all viral causes have been safely excluded. It is interesting that the reanalysis of the data indicate that the EMEA drew inaccurate conclusions. Vigorous causality assessments using a diagnostic algorithm are essential to determine causality for any severe adverse event. HG

—Heather S. Oliff, PhD

Korean White Ginseng Improves Cognitive Performance in Patients with Alzheimer's Disease

Reviewed: Lee S-T, Chu K, Sim J-Y, Heo J-H, Kim M. *Panax ginseng* enhances cognitive performance in Alzheimer disease. *Alzheimer Dis Assoc Disord.* 2008;22(3):222-226.

The modern pharmacologic effects of ginseng and its components, ginsenosides, have been demonstrated in the cardiovascular, endocrine, and immune systems.[1] Also, ginseng has been reported to increase the cognitive performance of healthy persons.[2-5] For Alzheimer's disease, investigators have examined the neuroprotective and tropic effects of ginseng in experimental models. The authors of this study report on their investigation of Korean white ginseng (*Panax ginseng*, Araliaceae)* in enhancing the cognitive function in patients with Alzheimer's disease.

They conducted a prospective, open-label study at the Seoul National University Hospital in South Korea from June 2004 until October 2005. Ninety-seven patients who met NINDS-ADRDA (National Institute of Neurological Disorders and Strokes, and Alzheimer's Disease and Related Disorders Association) criteria for probable Alzheimer's disease were included (aged 47 to 83 years).

The authors excluded patients who had evidence of other neurodegenerative disorders or cognitive impairments resulting from acute cerebral trauma, dysthmia (a chronic mild state of depression), hypoxic cerebral damage, vitamin deficiency, infection, cerebral neoplasia (growth of new tissue, e.g., a tumor, in the brain), metabolic disease, mental retardation, oligophrenia (subnormal mental development), or a coexisting medical condition that could prevent them from completing the study.

The patients were randomly assigned to the ginseng group (n=58; 20 men and 38 women) or to the control group (n=39; 15 men and 24 women). The ginseng group was treated with Korean white ginseng powder (4.5 g/day of 6-year-old root powder from Hongcheon and Heongsung provinces in South Korea, powdered and encapsulated by Nonghyup Co., South Korea) for 12 weeks. According to the authors, the ginseng contained total 8.19% of ginsenosides† plus essential oils, diacetylenic compounds, acidic polysaccharides, phenolic compounds, peptidoglycans, amino acids, vitamins, and carbohydrates.

To evaluate possible dose-response effect, an additional 9 patients were administered a higher dose of ginseng (9 g/day).

After the 12-week period of ginseng treatment, all patients were monitored for another 12 weeks.

To evaluate cognitive functions, the authors used scores on the mini-mental state examination (MMSE) and Alzheimer's disease assessment scale (ADAS), including the ADAS cognitive subscale (ADAS-cog) and noncognitive subscale (ADAS-noncog). Efficacy variables included changes of MMSE and ADAS from baseline

* Korean white ginseng is the dry natural cultivated ginseng root, with the skin peeled or scraped, and usually ground into powder for use in capsules and tablets, or extracted with water and ethanol. It differs from Korean red ginseng root in that it is not treated by steaming the fresh white roots, a process that turns the roots a caramel color and causes changes in the ginsenoside profile. In Korea and China, *Panax ginseng* is widely termed Asian ginseng.

† This appears to be a relatively high concentration of ginsenosides; the normal range for Asian ginseng root is usually between 3-5%. Thus, the generalizability of the results of this trial may be limited by what appears to be about double the normal ginsenoside content in these ginseng roots.

Korean Ginseng *Panax ginseng* Photo ©2009 Steven Foster

scores at 4, 12, and 24 weeks after the start of treatment.

The efficacy analyses were primarily preformed on an intention-to-treat (ITT) basis; a per-protocol analysis was also done. Intergroup comparisons for changes from baseline in ADAS and MMSE scores were performed using the Student's *t* test. They used repeated measures analysis of variance to compare the raw MMSE and ADAS scores in addition to the comparison of changes from baseline. Statistical significance was accepted for P values less than 0.05.

At 4 weeks, 91 patients (54 in the ginseng group, 37 in the control group) were reevaluated and included in the efficacy analysis. Eighty-two patients (50 in the ginseng group, 32 in the control group) completed 12 weeks of treatment, and 58 patients (36 in the ginseng group, 22 in the control group) were reevaluated at 24 weeks after the treatment began.

Baseline characteristics including age, sex, ADAS-cog, ADAS-noncog, MMSE, and clinical dementia rating scale scores were similar between the 2 groups.

At 4 weeks, the ginseng group showed an improvement in MMSE score by 1.0 ± 2.4 points from baseline, according to efficacy analysis, whereas the control group changed by –0.58 ± 2.4 points (P = 0.033 between the 2 groups). At 12 weeks, the ginseng group improved by 1.8 ± 2.8 points, whereas the control group changed by only –0.03 ± 3.1 (P = 0.009 between the 2 groups). However, after the 12-week period of ginseng discontinuation, no difference was observed between the 2 groups (control = 0.88 ± 2.5, ginseng = 0.56 ± 3.6, P = 0.673).

ADAS-cog scores were also improved in the ginseng group at 4 weeks and at 12 weeks after the ginseng treatment compared with the control group on ITT basis. And, again, after the ginseng had been discontinued for 12 weeks, the differences between the ginseng and control groups disappeared. In contrast, say the authors, the ADAS-noncog scores, which represent neuropsychiatric symptoms, showed no significant difference between the ginseng and control groups on ITT basis at 4 weeks, 12 weeks, or at 24 weeks.

According to the authors, the repeated measures analysis of variance revealed that at 4 weeks, the ginseng group showed an improvement in ADAS-cog score compared with the control group, after adjusting the baseline values. At 12 weeks, the ginseng group showed improvements in both ADAS-cog and MMSE scores, after adjusting the baseline values.

The ADAS-cog and ADAS-noncog and MMSE changes for the 9 patients treated with 9 g/day of the ginseng powder for 12 weeks were not different compared with those treated with 4.5 g/day of ginseng.

Adverse events (reported by 7 of the 58 patients in the ginseng group and 6 of the 39 patients in the control group) were mild and transient.

Among the limitations of this study are the small number of patients involved, the short duration, and the fact that, because this was an open-label study, the effect of the ginseng was not relative to a placebo.

The authors report that these results suggest that Korean white ginseng is clinically effective in the cognitive performance of patients with Alzheimer's disease and that longer-term, placebo-controlled, double-blind studies are warranted. HG

—Shari Henson

References

1. Attele AS, Wu JA, Yuan CS. Ginseng pharmacology: multiple constituents and multiple actions. *Biochem Pharmacol*. 1999;58:1685-1693.
2. Kennedy DO, Scholey AB. Ginseng: potential for the enhancement of cognitive performance and mood. *Pharmacol Biochem Behav*. 2003;75:687-700.
3. D'Angelo L, Grimaldi R, Caravaggi M, et al. A double-blind, placebo-controlled clinical study on the effect of a standardized ginseng extract on psychomotor performance in healthy volunteers. *J Ethnopharmacol*. 1986;16:15-22.
4. Sorensen HSJ. A double masked study of the effects of ginseng on cognitive functions. *Curr Ther Res*. 1996;57:959-968.
5. Kennedy DO, Scholeya AB, Wesnes KA. Dose dependent changes in cognitive performance and mood following acute administration of ginseng to healthy young volunteers. *Nutr Neurosci*. 2001;4:295-310.

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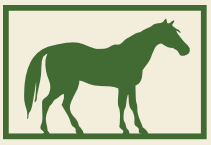
The Expanding Market and Regulatory Challenges of Supplements for Pets in the United States

By Courtney Cavaliere

Many men and women know that they can take natural remedies such as echinacea (*Echinacea* spp., Asteraceae) to help ward off colds or valerian (*Valeriana officinalis*, Valerianaceae) to combat anxiety. In increasing numbers, pet owners have begun to realize that similar natural supplements are also available to treat their sneezing Labradors or to calm their high-strung tabbies.

Recent market statistics indicate that sales of supplements for companion animals* are on the rise. Tinctures, tablets, and powders designed to supplement the diets and treat the ailments of humankind's furry friends are increasingly available, despite on-going regulatory challenges. These products are expected to experience continued growth in the near future, indicating that the supplement industry may quickly be "going to the dogs."

The Pet Supplement Market



Nutrition Business Journal (NBJ) has estimated that US pet supplement sales reached $923 million in 2007, an increase of 8% over 2006 sales (See Figure 1).[1] NBJ found that the overall natural pet and pet nutrition market (defined as pet supplements, natural and organic pet foods, and pet supplies and other products) exceeded $2.1 billion in 2007, of which supplements accounted for 43% of sales.

Research published recently by *Packaged Facts*, meanwhile, estimated US retail sales of pet supplements and nutraceutical treats at $1.2 billion in 2007, with 74% of this figure representing supplement sales.[2] According to the *Packaged Facts* report, the majority of pet supplements (51%) are purchased for horses, while dog supplements represent 38% of the market and cat supplements represent 6%.

The company Native Remedies (Boca Raton, FL), which has manufactured natural supplements and treatments for men and women since its founding in 2002, launched a line of supplements for dogs and cats under the brand name PetAlive® in 2005. PetAlive products are compound formulas consisting of herbal and other natural ingredients, as well as a range of homeopathic remedies. According to George Luntz, president and co-founder of Native Remedies, sales of PetAlive products have more than tripled

*Dogs, cats, horses, and other animals not intended for human consumption are considered "companion animals." Supplements marketed for pets are typically geared toward dogs, cats, or horses.

over the past few years. "The growth rate has pretty much surpassed the rate of our human products—which are also rising," said Luntz (oral communication, February 19, 2009). The company initiated a line of products for horses in March of 2009.

Many supplements for pets are based on or use herbal ingredients. According to William Bookout, president of the National Animal Supplement Council (NASC), probably 15% of the approximately 125 pet supplement companies that belong to NASC produce herb-specific supplements for dogs, cats, and horses (oral communication, November 10, 2008). He added that around 80% of NASC member companies probably use herbs as ingredients in some of their product formulas.

Greg Tilford, president of Animal Essentials (Victor, MT), stated that herbal supplements for animals have definitely become a fast-growing market niche. Animal Essentials established a line of herbal medicinal pet products under the brand name Animals' Apawthecary in 1995, and the company now produces over 40 single-herb extracts in a glycerin or mild alcohol base and over 15 combination formulas in liquids as botanical supplements for pets. According to Tilford, Animal Essentials' product line has experienced double-digit growth almost every year since its inception (G. Tilford, oral communication, October 28, 2008).

The latest annual meeting of the American Holistic Veterinary Medical Association (AHVMA), held in October of 2008, also gave an indication that there is growing availability of herbal veterinary products. According to Nancy Scanlan, DVM, president of the Veterinary Botanical Medical Association (VBMA) and a veterinarian at the Sherman Oaks Veterinary Group in California, about one-third of the exhibitors at the meeting were herbalists (oral communication, October 27, 2008).

Dr. Scanlan added that the rise in associations supporting complementary and alternative medicine techniques for animals reinforces growth in the field of alternative healthcare for pets. Over the past 2 decades, the number of associations supporting the use of acupuncture for animals has increased from 1 to 3. The VBMA, an education-based organization dedicated to promoting the responsible use of herbal medicine for animals, was founded in 2002.

Many factors have been fueling growth in the pet supplement industry. Pet ownership, for instance, is on the rise.[1] According to the 2007-2008 National Pet Owners Survey, 63% of US households own a pet, whereas 56% of households owned a pet when the survey was first conducted in 1988.[3]

Luntz noted that more and more people throughout the world have begun to take an interest in using natural treatment options to care for their own health, as well as the health of their families. "Pets are pretty much part of our families," he explained. "It makes sense that people would want to include them in their quest for healthier living."

"There is now very strong awareness that the food supply is not what it used to be and that there is a need for people to supplement their diets. That carries over for animals, as well," said Tom Cameron, DVM, veterinary technical support for Standard Process Inc. (Palmyra, WI), a company that manufactures nutritional whole food supplements for both humans and animals (oral communication, February 16, 2009). "A lot of health conditions are caused by nutritional deficiencies, and foods for animals, in particular, are highly processed."

Use of supplements for animals is also rising due to the growing recognition of their effectiveness and gentleness, particularly in comparison to some pharmaceuticals. "In my practice, almost every animal I see goes out the door with some herbs," said Dr. Scanlan. "I use herbs both because of situations where they are more effective than Western medicine and situations where they have less side effects than Western medicine."

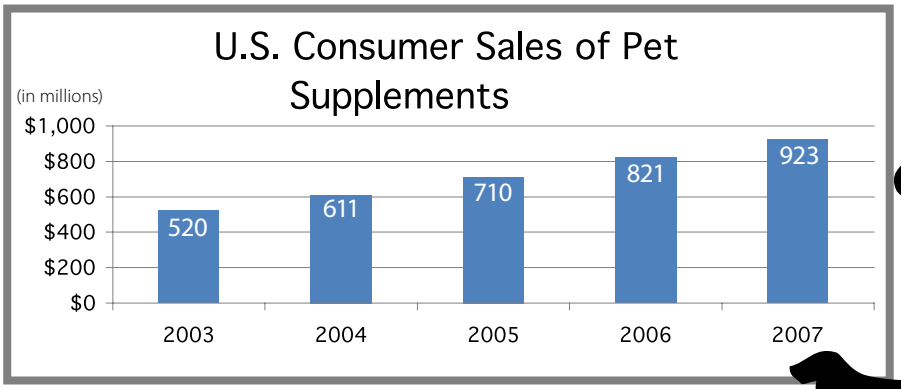
Dr. Scanlan noted that, for instance, there are no conventional pharmaceutical medications that are particularly effective for treating prostate problems in animals, and herbal supplements are therefore a good choice for veterinarians confronted with this condition. She has found that saw palmetto (*Serenoa repens*, Arecaceae), either alone or with Chinese herbal formulas, often helps where Western medicine is less effective. She also frequently recommends herbal treatments for animals with arthritis, since herbal medications do not have the adverse effects on liver and kidneys that are often associated with pharmaceuticals.

Regulation of Supplements for Pets

Supplements for pets have been able to achieve impressive strides in the marketplace despite a complicated legal status and a lack of formal regulations.

The Dietary Supplement Health and Education Act of 1994 (DSHEA) established regulations for human dietary supplements at a time when there were few similar products for pets on the market.[4] DSHEA did not specifically address the topic of supplements for pets, but a posting in the *Federal Register* later specified that the US Food and Drug Administration (FDA) does not consider such supplements to be covered under DSHEA.[5] Supplements marketed for

Figure 1



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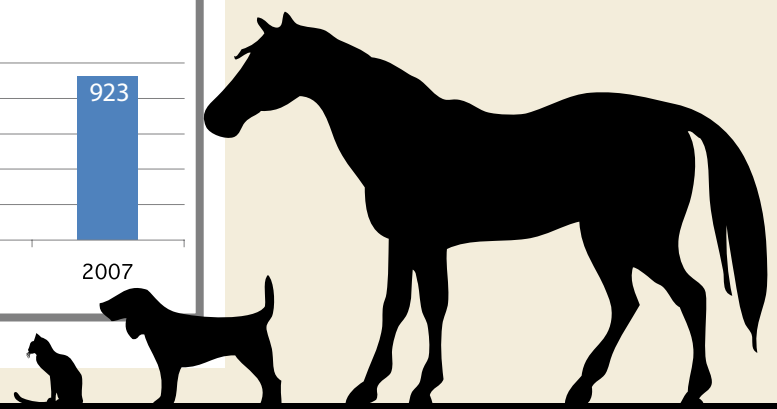
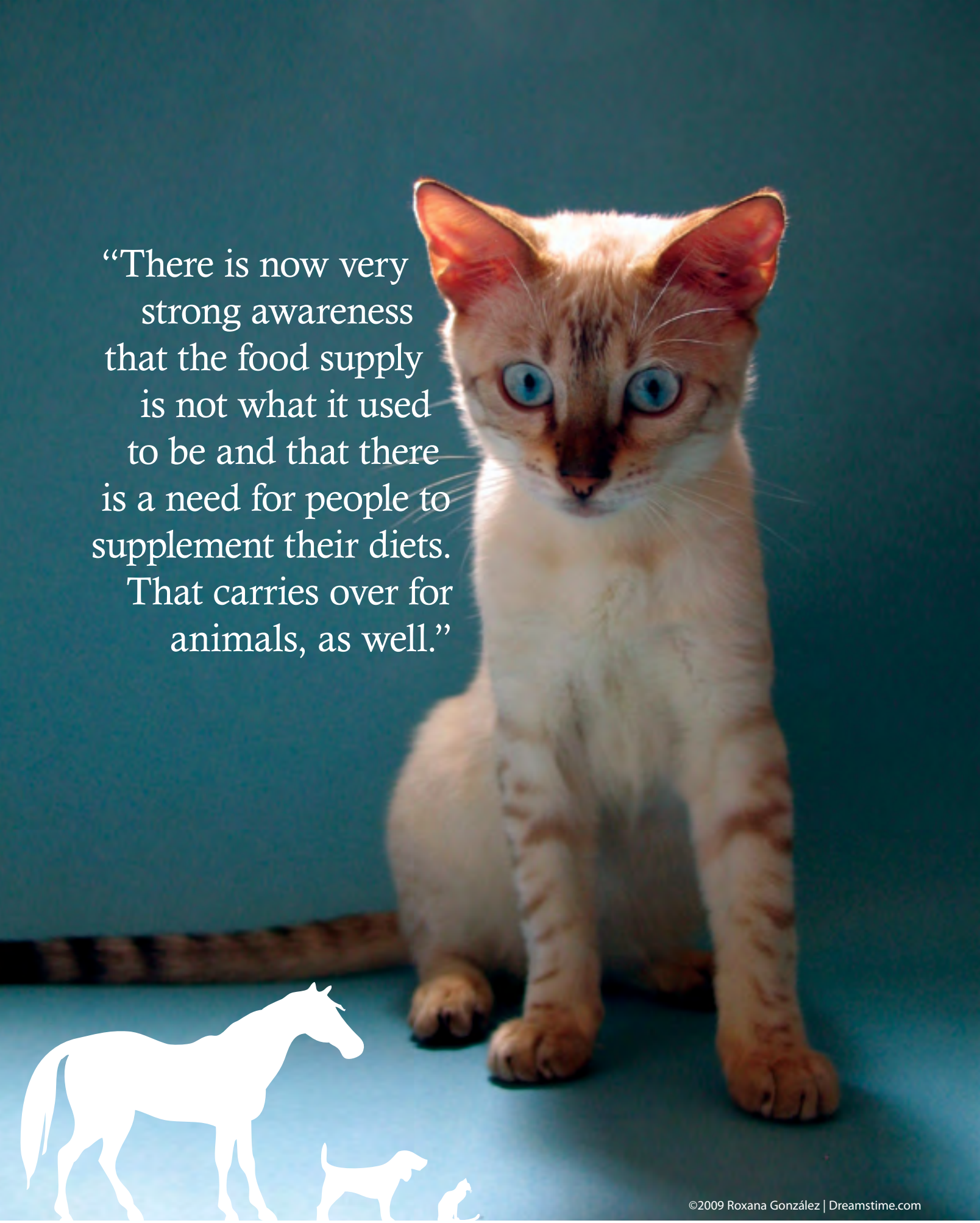




dogs, cats, and horses have therefore been left with 2 possible legal categories under US law—they may be defined as animal foods/feeds or animal drugs.[4,6]

Most supplement products for pets are classified by the manufacturers as nutritional or feed supplements. However, hundreds of ingredients commonly used for human and pet dietary supplements are not technically approved for use in animal feed products.

The other regulatory option for pet supplements, as animal drugs, requires that supplement marketers submit a New Animal Drug Application to the FDA's Center for Veterinary Medicine (CVM), demonstrating the product's safety and efficacy according to certain criteria. According to Bookout, these applications, and the testing that they require, are expensive and problematic. In particular, companies cannot recover the considerable costs incurred through product development and testing, since, in most cases, natural substances cannot be patented. Many animal supplements are thus discouraged from even attempting to meet the criteria for "drug approval."

Most supplements for animals are therefore considered animal feeds that contain unapproved ingredients or unapproved drugs, depending on intended use.[7] Supplements for animals were nearly removed from the marketplace beginning in 2002, after the American Association of Feed Control Officials (AAFCO) organized a committee to develop an enforcement strategy for unrecognized, undefined animal feed ingredients, as well as accepted ingredients that were being marketed for unapproved uses.†

The NASC (www.nasc.cc), however, which was established in 2002, was able to placate concerned consumers and regulators by initiating effective self-regulation measures for the pet supplement industry. The NASC, a nonprofit dedicated to providing a unified voice for animal health and nutritional supplement companies, immediately created quality control guidelines and instituted risk monitoring procedures for the industry.

Member companies of the NASC must use a written quality control manual, follow proper labeling guidelines, and implement an adverse event reporting system for tracking complaints and safety concerns.[8] All NASC members must demonstrate their compliance with NASC protocols by having completed or scheduled an independent facility audit. Those companies that have successfully completed an audit are able to use the NASC Quality Seal on their products, Web sites, and advertisements, as a symbol to the public that the company conforms to strict quality standards. About 90% of companies that produce supplements for pets are members of NASC.[1]

Animal Essentials is a member of NASC and conforms to the organization's quality protocols. The company uses only human-grade ingredients, identifies all ingredients using at least US Pharmacopeia standards, and tests all materials for marker compounds, microbes, and shelf-life. "I think it's safe to say that my company has higher standards than some companies selling similar products for humans," said Tilford.

Although not currently members of the NASC, Standard Process and Native Remedies also claim to adhere to very high quality control standards. Standard Process tests products and ingredients multiple times throughout the manufacturing process in its onsite laboratory and participates in routine inspections by the FDA and regulating agencies. Dr. Cameron added that the ingredients used in the Standard Process Veterinary Formulas product line are also used in the company's line of human products, and all of the products are developed in the same manufacturing facility. Both sets of products are therefore produced according to the same good manufacturing practices (GMPs) and high quality control standards.

Likewise, Native Remedies performs rigorous testing on ingredients and produces both human and pet products according to the same GMPs and quality standards. The company also registers its manufacturers as approved food facilities and individually registers homeopathic medicines (including some PetAlive products) as over-the-counter products with the FDA.

Due to quality control and risk assessment efforts by the industry, the FDA-CVM currently regulates pet supplements with an intended use other than feed as unapproved drugs of low regulatory priority.[7] However, Tilford stated that the industry will ultimately need more regulation. He argued that the pet supplement industry is currently in a situation similar to the one faced by the human dietary supplement industry before the passage of DSHEA. "It's like being in the herbal industry 20 years ago," said Tilford. "History is repeating itself."

Bookout also stated that more regulation is bound to be implemented within the pet supplement industry in the future, and he claimed that such regulation is not necessarily detrimental to pet supplement companies or to the NASC. "Anybody who is a

†Many herbal ingredients have been given GRAS status by the FDA and AAFCO and are categorized as feed additives, with their intended use defined as "spices and other natural seasonings and flavorings" or "essential oils, oleoresins, and natural extractives." When such ingredients are incorporated into an animal supplement with the purpose being to "effect the structure or any function of the body," they are considered by regulatory agencies to be unapproved ingredients, thereby causing the product to be considered "adulterated."

Twenty-one year-old gelding Rico was given a course of Standard Process's veterinary formula Equine Metabolic Support. Before treatment, Rico was overweight, lame, had a fasting serum insulin of greater than 1600 units/mopl, and had fat pads—especially on the thorax and around his tail. After a month of treatment, he lost significant mass on his neck and the fat pads diminished, his fasting serum insulin dropped to 601 units, and he walked without evidence of pain. Equine Metabolic Support contains such ingredients as licorice (*Glycyrrhiza glabra*, Fabaceae) root, cinnamon (*Cinnamomum verum*, Lauraceae), and green tea (*Camellia sinensis*, Theaceae) extract. Photos © 2009 Standard Process.

"Anybody who is a responsible participant within an industry should not be opposed to regulation that is fair, reasonable, responsible, and consistent."

responsible participant within an industry should not be opposed to regulation that is fair, reasonable, responsible, and consistent," said Bookout.

According to Bookout, the NASC has always been interested in achieving a viable long-term solution to the industry's regulatory challenges.

"We work very cooperatively and very constructively with regulatory authorities at the federal and state level," said Bookout. He explained that the FDA and state officials have expressed interest in ultimately formulating sufficient and consistent regulations for pet supplements, and the NASC intends to assist in those efforts and help ensure that future regulations are fair and responsible. "If we are not proactive in supporting that objective, then it will be defined for us. It's better to shape your own destiny than to have it defined for you," he said.

Safety of Supplements for Pets

The actual and perceived safety of supplements for pets undoubtedly affects their sales in the marketplace. The FDA-CVM recently requested that the National Research Council of the National Academies investigate the safety of supplements for dogs, cats, and horses. The National Research Council convened a committee of experts to analyze this issue, and they released a report on the topic in 2008.[9]

The committee concluded that there is limited safety data for determining safe use of supplements for animals. The committee specifically assessed the safety of 3 supplements for dogs, cats, and horses—lutein (a carotenoid, usually derived from marigolds, *Tagetes* spp., Asteraceae), evening primrose (*Oenothera biennis*, Onagraceae) oil, and garlic (*Allium sativum*, Liliaceae). They discovered a lack of quality safety data on those supplements to

determine safety in drugs and animal food additives, and they wrote that they could only report on historical safe intakes and estimate presumed safe intakes for the 3 animal supplements. The committee noted that supplements and ingredients considered safe in humans and other species are not always safe in horses, dogs, and cats. Excessive garlic, in particular, can cause hemolytic anemia in all 3 species. They recommended that clear and precise regulations for animal supplements be established, as well as a comprehensive adverse event reporting system that is not limited by membership or paid access and that generates accurate and reliable data.

Bookout issued a response to this report, in which he pointed out that the majority of the pet supplement industry belongs to NASC and participates in adverse event reporting through the organization.[10] NASC member companies report all adverse events that they have received to the NASC on a monthly basis, and the NASC has built alerts into its system so that it is notified anytime a serious adverse event is reported by a member company (W. Bookout, oral communication, November 10, 2008). The organization's NASC Adverse Event Reporting System (NAERS) can organize and retrieve data regarding adverse events according to company, product, or ingredient.

The NAERS system defines an adverse event broadly as any complaint for a product linked to a physical effect or health problem that may be (but is not necessarily) connected to or associated with use of the product—including transient events like vomiting, diarrhea, etc. According to the NAERS system, there have been, on average, 0.31 adverse events reported per million pet supplement administrations (dosage unit administered to an animal) sold by NASC member companies. NASC also collects information on serious adverse events, defined as any event with a transient incapacitating effect or a long-term or permanent health effect that requires follow-up with a veterinarian. According to the NAERS system, there have been, on average, 0.001 serious adverse events reported per million pet supplement administrations sold by NASC member companies.

Bookout noted that the incidence of adverse events is very low, particularly in light of the organization's broad definition of adverse events. He added that companies' and NASC's adverse event reporting systems are important for vigilant risk management and for identifying early warning signs of potential dangers.

All NASC member companies also employ warning or cautionary statements in labeling for products that contain certain herbal ingredients, as recommended by the NASC Scientific Advisory Committee. For instance, supplements with garlic must include a cautionary statement in product labels advising consumers not to administer the product to a pet prior to surgery, since garlic can prolong bleeding and clotting time. Further, some herbal ingredients are banned from member companies' products. Bookout explained that the FDA-CVM has recommended that kava (*Piper methysticum*, Piperaceae), comfrey (*Symphytum* spp., Boraginaceae), and pennyroyal (*Mentha pulegium*, Lamiaceae) oil not be used in pet food products, and the NASC has prohibited these herbal ingredients in supplements due to the agency's recommendation. Kava has been associated with possible liver toxicity per some human case reports (although no causality has been confirmed), comfrey contains hepatotoxic pyrrolizidine alkaloids, and pennyroyal oil is thought to contain the toxin pulegone and has been linked to the death of one dog following dermal exposure according to a case report.[11]

Efficacy of Supplements for Pets

According to Dr. Scanlan, there has not been much research into the efficacy of herbal medicines for pets. However, she added that a research committee of the AHVMA has been providing grants for many research projects and encouraging researchers to test pet supplements for efficacy. Some supplement companies have begun partnering with veterinarians, university veterinary clinics, and animal shelters to test the effectiveness of their products.

A randomized, controlled clinical study to assess an herbal supplement for canine pain and lameness was initiated in October 2008 at Colorado State University.[12] In this study, 36 dogs with confirmed osteoarthritis will be given either the herbal supplement Pet Relief® or a placebo over a 5-week period in order to test the supplement's effectiveness and to investigate any complications associated with its use. Pet Relief, manufactured by RZN Nutraceuticals (Orange Park, FL), contains juniper (*Juniperus communis*, Cupressaceae) berry, goldenrod (*Solidago virgaurea*, Asteraceae), dandelion (*Taraxacum officinale*, Asteraceae) leaf, meadowsweet (*Filipendula ulmaria*, Rosaceae) herb, willow (*Salix alba*, Salicaceae) bark, and cranberry (*Vaccinium macrocarpon*, Ericaceae).

"Having a clinical study done by an independent third party and with the collection of objective measurements of improvement in study subjects puts RZN at the leading edge of this type of research for animal products," said Mark Lubin, founder of RZN (e-mail, November 18, 2008). "We wanted to be able to prove by direct measurement that the results obtained were not imaginary or subjective."

According to Narda Robinson, DVM, director of Colorado State University's Center for Comparative and Integrative Pain Medicine and lead investigator of the study: "It is a rare company that will support a randomized, controlled, blinded study. I hope that, with this study, we can encourage more herbal manufacturers to clinically test their products" (e-mail, October 21, 2008).

"I am concerned about the health and safety of animals treated with herbs for which neither the mechanism of action, nor the purity of the product, nor the safety in small animals is known," she continued. "Although many herb courses teach veterinarians how to prescribe Chinese herbs, they do so, all too often, from a metaphorical, i.e., Traditional Chinese Medicine perspective. For me, saying a product will 'eliminate wind' or 'remove dampness' is insufficient. That may have been okay centuries or millennia ago, but as bio-medically based, scientifically trained healthcare professionals, we must go beyond the metaphors and insist on mechanisms. We should expect medical professionals to know how the herbal ingredients in a product work, what the potential adverse effects are, and how the herbs may interact with other herbs or medications. My primary concern is helping animals and keeping them safe."

Dr. Cameron explained that Standard Process has tested some of its veterinary

According to Dr. Scanlan, there is a need for more proof, more case studies, and more scientific evidence to support the growing field of botanical supplements for pets.

products in various university veterinary schools, and the company is negotiating with other schools to arrange future studies. The company has also tested its equine formulas through local veterinarians in southern Wisconsin.

In February of 2009, Standard Process initiated a study of its product Feline Immune System Support™, a combination product containing such herbal ingredients as eleuthero (*Eleutherococcus senticosus*, Araliaceae) and Indian gooseberry (*Emblica officinalis*, Euphorbiaceae), through a cat shelter in Ohio. According to Dr. Cameron, 75% of cats admitted to the shelter in 2008 had to be treated at some point during their stay with antibiotics for upper respiratory tract infections—a common problem in shelters. All cats that enter the shelter are now being given Feline Immune System Support on a preventative basis, to see if this will lower the incidence of such infections among the shelter's cats. If preliminary results from this and other studies are promising, then the company plans to perform more rigorous clinical trials with monitored samples and biomarkers.

Greg Tilford said that Animal Essentials does not test the efficacy of its products through clinical trials. However, the company works with between 400 and 450 veterinarian clients in the development and production of botanical pet supplements, and he said that the successful use of Animals' Apawthecary products by veterinarians attests to their safety and efficacy. "The proof is in the pudding," said Tilford.

Similarly, Native Remedies does not conduct clinical trials on its products for pets. According to Luntz, natural ingredients do not typically raise safety concerns the way that pharmaceutical agents do, and the natural ingredients used in the PetAlive products are backed by clinical research and a history of hundreds of years of traditional use. "We don't choose our ingredients lightly," said Luntz. "They have to have strong research supporting them, as well as a long history of safe usage and efficacy."

Different Forms of Pet Supplementation

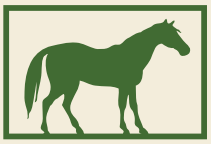
Although the market for supplements for pets appears to be growing, it is important to note that use of supplements for animals may extend beyond pet-specific products. Men and women sometimes use supplements intended for humans to treat pets, as well.

Luntz noted that Native Remedies initiated the PetAlive line of products after receiving numerous inquiries from the company's consumer base for pet products. The company initially guided its customers on how to use Native Remedies products for humans in different dosages to treat their pets, but "with as much demand as we were seeing, we decided to launch a product line for pets in 2005," said Luntz.

Standard Process's human supplements were likewise recommended for pets with nutritional needs, prior to the establishment of the company's veterinary line. The company created its veterinary line in 2002, based on the idea that animals have different nutritional needs than humans. Dr. Cameron noted that pet-specific formulations may be the preferred treatment option for that reason.

The company RZN manufactures supplements for both people and pets, and the differences between Pet Relief and the versions of that product for humans (Arthi-Zen Relief®) and horses (Horse Relief®) illustrate how care may need to be taken in administering particular herbs and supplements to certain species. According to Lubin, dogs seem more sensitive to specialized dosing requirements, so Pet Relief provides more dosage recommendations for weight classes than the other 2 products. Further, for Pet Relief, cranberry extract has been substituted for the whole grape (*Vitis vinifera*, Vitaceae) extract found in Arthi-Zen Relief and Horse Relief. "We made this substitution because research is available which shows that grape and its derivatives may be harmful to the excretory systems of canines, whereas cranberry is not," said Lubin.

The Future of the Industry



NBJ has forecasted continued strong growth of the natural pet and pet nutrition market, of which supplements for animals are a key category. NBJ noted, however, that shifts are likely to occur in the types of supplements sold and the outlets through which supplements are sold.[1] *Packaged Facts* likewise has estimated that the industry of pet supplements and nutraceutical treats will experience continued growth. Caring for aging pet populations could generate particular market interest in the coming years.[2]

According to Dr. Scanlan, there is a need for more proof, more case studies, and more scientific evidence to support the growing field of botanical supplements for pets. She recommends that new-comers to the field collaborate with the VBMA and NASC as much as possible, and that they invest in efforts to educate veterinarians and consumers regarding the products they develop. "The more help I get from an herb company, the more likely I am to use their products," she added. HG

References

1. Joint, omega-3 and other supplements prove popular for Bowser and Fluffy. *Nutrition Business Journal.* June 2008.
2. Pet supplements and nutraceutical treats in the US. *Packaged Facts.* February 2008.
3. Industry Statistics & Trends. American Pet Products Manufacturers Association Web site. Available at: http://americanpetproducts.org/press_industrytrends.asp. Accessed November 18, 2008.
4. Regulation of Animal Health Supplements—A Historical Summary. National Animal Supplement Council Web site. Available at: http://nasc.cc/index.php?option=com_content&task=view&id=19&Itemid=41. Accessed November 10, 2008.
5. US Food and Drug Administration. Inapplicability of the Dietary Supplement Health and Education Act to Animal Products. 61 *Federal Register* 78. April 22, 1996. Available at: http://bulk.resource.org/gpo.gov/register/1996/1996_17706.pdf. Accessed November 14, 2008.
6. Bookout W. Regulatory overview of "dietary supplements" for animals: things you need to know and mistakes not to make. Powerpoint presentation given at SupplySide West; October 23, 2008; Las Vegas, NV.
7. Bookout W, Khachatoorian LB. Regulation and quality control. In: Wynn SG, Fougere BJ, eds. *Veterinary Herbal Medicine.* St. Louis, MO: Mosby Elsevier; 2007:99-120.
8. The NASC Seal. National Animal Supplement Council Web site. Available at: http://nasc.cc/index.php?option=com_content&task=view&id=40&Itemid=80. Accessed November 7, 2008.
9. Safety of Dietary Supplements for Horses, Dogs, and Cats: Report in Brief. The National Academies; 2008. Available at: http://dels.nas.edu/dels/rpt_briefs/satety_of_dietary_supplements_final.pdf. Accessed November 7, 2008.
10. Bookout, B. Report from the National Research Council on the safety of dietary supplements for horses, dogs, and cats—comments from the NASC president. *National Animal Supplement Council Newsletter—Supplemental.* November 2008.
11. Poppenga RH. Herbal medicine: potential for intoxication and interactions with conventional drugs. In: Wynn SG, Fougere BJ, eds. *Veterinary Herbal Medicine.* St. Louis, MO: Mosby Elsevier; 2007:183-207.
12. Clinical study at Colorado State University looks at herbal supplements to address canine pain and lameness [press release]. Fort Collins: Colorado State University; October 14, 2008.

Managing and Interpreting the Complexities of Botanical Research

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This paper is based on a keynote address delivered by the author at the Cork Institute of Technology & Irish Institute of Medical Herbalists Conference in Cork, Ireland, April 18, 2008.

Summary

The need to examine botanical medicines scientifically is a compelling requirement in modern evidence-based culture. However, not all botanical research is necessarily valid. Good quality research must consider and document the specific character of the botanical preparations being studied and assess the results in the proper context. The importance of accurately identifying the herbal preparation and content being studied cannot be overstated, as this information is necessary for the scientific interpretation of the results. The inherent limitations of preclinical research approaches should be explicitly acknowledged, especially when attempting to apply the findings to normal human use and/or clinical practice. Human clinical trials can provide some solid evidence for specific preparations, but conventional research methodologies do not necessarily apply to traditional herbal practice. In nearly every type of research on complex botanicals, utilizing 2 or more distinct forms of well-characterized preparations from a single herb is an especially effective and practical means of assessing their comparative value. Human studies on the pharmacokinetics and pharmacodynamics of different preparations from the same herb may be the most useful for herbal practitioners who prefer to develop individualized prescriptions.

This illustration originally appeared in chapter 6, Herbal Medicine (by Mark Blumenthal), in the *Reader's Digest Family Guide to Natural Medicine* (1993) Used with permission of The Reader's Digest Association, Inc., Pleasantville, NY, www.rd.com. Illustration by Jean Francois Allaux.

Introduction

The scientific research protocols for determining clinical efficacy of drugs may be insufficient for botanicals for several reasons;[1] however, good quality research to validate efficacy and compare outcomes of conventional medicines, botanicals, and/or their combinations is necessary for the widespread acceptance of botanical products.[2] The question of what constitutes good quality research requires different answers for botanicals than for pharmaceutical drugs, largely due to the phytochemical complexity of botanicals versus the comparative chemical simplicity of drugs, most of which are single chemical entities.[3]

Simply identifying research outcomes of botanical derivatives by the name of the mother herb may be the single greatest obstacle that researchers and reporters must overcome in regards to generalizations in botanical discussions. The varying content and proportions of active components in different types of extracts requires that they be seen as separate entities—children of the same mother but with their own particular identities. Due to the limited amount of scientific research on most botanical species, the utilization and consolidation of any and all published observations and research findings on an herb and its derivatives can at times be described as "grasping at straws." Commonly, the unfortunate result is the construction of a straw house.

There are 2 main questions regarding research results and their interpretation that will be addressed in this discussion. Since variations and uncertainties exist in regards to different types of preparations, what are appropriate means for characterizing these differences? And given the limitations of applying standard scientific protocols for drugs to botanicals when attempting to establish their safety and efficacy and provide accurate mechanistic rationales, what methods of research are achievable and appropriate to develop practical knowledge of modern and traditional botanicals?

Botanical Product Variations and Characterizations

Research that attempts to treat the study of botanicals as if they were drugs often fails to make important distinctions that clarify exactly what preparation is being studied and how the results can best be assessed from the perspective of multifactoral, versus linear, influences. There needs to be greater transparency in communicating the accurate identity of each preparation undergoing research. (See Table 1.)

Due to the vast complexity of the phytochemical content of herbs and most botanical preparations, utilizing the proper scientific taxonomy for the herb is of critical importance. Reliance on botanical experts to establish identity through plant morphology, organoleptic testing, and/or chromatography is also essential for assuring meaningful data from research. Results are scientifically valid only if the material studied can be positively identified and verified so as to be able to reproduce the research. Techniques for quantitative phytochemical assessment should be form-appropriate. For example, in comparing herb versus extract contents with phytochemical assays, the methods of solubilizing solid preparations may need to differ, such as requiring exhaustive Soxhlet extraction for certain herbs rather than merely sonication that is adequate for simply dissolving solid extracts.*

The key to accurate characterization is to verify, rather than to presume, knowledge of the preparation and its use. Adequate documentation involves preservation of a voucher specimen. Description of processes and/or solvent proportions is necessary, but in cases of research on proprietary products where this information remains undisclosed, at a minimum the lot number and expiration date must be given. In the context of *in vivo* studies, errors in designing research often occur in failing to assess the propriety of dosage regimens and the relative applicability of particular dosage forms that can be pertinent to their efficacy.

Fundamental aspects of preparation and dosing characteristics can influence outcomes and thus need to be specifically described in detail. Providing precise descriptions of content and use helps establish a sound basis for outcome comparisons, so research design and reporting need to take such factors into account. For example, do research reports address issues such as the relative dilution or concentration of extracts? Not only should the use of 'x' ml or 'y' mg of extract be noted, but also that these are derived from 'z' mg of herb. (Often when this is done, unfortunately the phrase "equivalent to," rather than "derived from," is used to express the relation between the amount of extract and original herb, suggesting an unfounded assumption about the activity of these quantities of the herb and its extract.) When comparing studies, one must assess dosage to see whether design variations are appropriate to account

Glossary

For the purpose of this discussion, the following 3 words are to be interpreted as follows:

Herb: a living or dried plant or its complete medicinal part(s), including the insoluble fiber content, whether intact or fragmented, taken to improve health. (These plant forms of medicine are designated as "herbal drugs" in the *European Pharmacopoeia*.)

Botanical: an herb or one of its complex therapeutic derivatives, i.e., an extract or fraction that consists of a variety of component chemicals. (The extractives are designated as "herbal drug preparations" in the *European Pharmacopoeia*.)

Drug: an isolated bioactive compound, whether natural or synthetic, used for medicinal purposes irrespective of its pharmacopeial recognition. (For the purposes of this paper, herbs or other botanicals with official pharmacopeial status, whether available by prescription-only or over-the-counter, will not be incorporated under this term.)

Table 1. Appropriate Botanical Characterization and Inadequate Means of Describing Herbal Preparations[2]

Appropriate Characterization	Inadequate Description
a. Identified by scientific binomial	Using common name only
b. Described plant part used	Giving only herb or manufacturer's name
c. Verified species identity	Accepting supplier's or manufacturer's claim of identity
d. Established chemical profile	Assuming chemical content or label claim
e. Specified preparation precisely	Calling it simply an "extract" or "tablet"
f. Detailed dosage exactly	Listing "tablets" per dose or only daily dose
g. Noted details of administration	Not identifying when or how it is taken

* Soxhlet extraction utilizes a Soxhlet apparatus by which constituents can be extracted from solid matter by repeated treatment with distilled solvent. Sonication uses a device (sonicator) to apply ultrasound energy that agitates particles in solution to speed dissolution by breaking intermolecular interactions.

for the size or age of subjects, acute versus chronic therapy, prevention versus therapy, etc. If botanicals are used in combination, these concerns of documenting the preparation for each species still apply.

Without the particular qualifying features being explicitly discussed, meaningful conclusions and comparisons become implausible.[4] The modern era of botanical research requires a sophisticated understanding of identification[5] to avoid misapplication of research outcomes "borrowed" from studies of other preparations.[6] The US Congress has directed the Office of Dietary Supplements at the National Institutes of Health to establish a validation process for analytical methods, analytical standards, and reference materials.[7] Along with providing the identity and origin of the herb being studied, the application of proper processing and phytochemical nomenclature to accurately describe the final product being studied is demanded by those who rely on scientific criteria to evaluate relative merits of different preparations from the same botanical species origin.[8]

Need for Comparative Studies to Assess Phytochemical Differences of Similar Botanicals

By determining and describing similarities and differences in defined variables, distinctive identities of particular botanical preparations can be more accurately discerned. Since studies of a single complex botanical agent yield isolated data that is relatively limited in extrapolation to other preparations, the comparison of outcomes from 2 or more well-characterized preparations undergoing the same means of assessment can greatly help in identifying those features that most influence the results. Research on what is simply called "echinacea" (*Echinacea* spp., Asteraceae) illustrates this point nicely. The various species of echinacea and their plant parts each have their own chemical fingerprints, and preparations made from the different parts of the echinacea plant or according to different dosage forms have been found to have different chemical properties (See Table 2.)

Limitations of *in vitro* Laboratory Research

Herbs remain a major source of compounds that are screened to develop modern drugs for neurological, microbial, inflammatory, and neoplastic pathologies. The production of laboratory data on botanical activity as preliminary research for human outcomes has commonly been intended for the development of such drugs. That is, the focus is on sequentially reducing the complexity of phytochemical bioactivity by selectively partitioning extracts into fractions and subfractions and then into isolates, ultimately developing semi-synthetics, thereby increasing chemical purity and potency rather than maintaining complexity and balance.

In vitro research can function as a means of demonstrating phytochemical differences between botanical preparations. However, a common error is to assume *in vitro* findings for complex mixtures ultimately apply to their *in vivo* influence. (See Table 3.) Direct exposure *in vitro* to a complex mixture of bioactive therapeutic agents *does not* reflect systemic tissue exposure to altered and partially absorbed component combinations following oral dosing. *In vivo* pre-absorption digestion and/or metabolism by gut flora can chemically change phytochemicals, as does post-absorption catabolism and/or conjugation, resulting in reduced absolute concentration and/or bio-activation or inactivation. What is more, variable absorption can lead to significant, and even dramatic, systemic proportional differences between compounds or entire classes of phytochemicals, compared to the botanical content consumed.

In vitro studies of an isolated phytochemical may be a useful tool in assessing partial botanical activity when this bioactive component has an established pharmacokinetic profile and known tissue bioavailability following oral dosing. However, long duration of exposure and steady concentration *in vitro* misrepresent *in vivo* fluctuations, as inevitable changes occur due to ongoing metabolism and excretion. The effects of a steady-state isolate concentration *in vitro* are often inappropriately correlated to its peak tissue or serum level achieved *in vivo*.

In regard to the target tissues, cells separated from the extremely dynamic human ecology of systemic biochemical interactions are relatively static templates in comparison to the *in vivo* milieu. *In vitro* results for botanicals appear most applicable to *in vivo* effects when they involve cells to which the complete phytochemical complex of a botanical can be applied directly, i.e., skin or mucosa and conditions involving these tissues. For example, extrapolation of *in vitro* antimicrobial activity is largely limited to local botanical applications.

Table 2. The Chemical Complexity of Different *Echinacea* Species, Plant Parts, and Preparations

a. Species phytochemical variations –
Extracts (80% methanol / 20% water) of 3-year-old echinacea roots yielded these total phenolic amounts and major/minor caffeic acid derivatives:
E. purpurea 23.2 mg/g (cichoric acid / caftaric acid),
E. pallida 17.8 mg/g (echinacoside / cichoric acid, caftaric acid),
E. angustifolia 10.5 mg/g (echinacoside / cynarin).[9]

b. Alkamide content of plant portions –
Alkamides were highest in *E. angustifolia* roots and absent in *E. pallida* root. *E. purpurea* roots/rhizome are much higher in alkamides (especially C_{12} diene-diynes) than its leaves, while the aerial (above-ground) plant has proportionally more C_{12} tetraenes.[10]

c. Absorption and bioavailability –
Alkamides from tablets of ethanolic extracts from *E. purpurea* and *E. angustifolia* are readily absorbed and identified in the plasma, whereas caffeic acid derivatives in the tablets are not.[11] Maximum serum concentration of alkamides from these echinacea root extracts occurs more rapidly from 60% ethanol liquid extract (20 min.) than from tablets (30 min.).[12]

d. Metabolism –
Echinacea alkamides are metabolized variably by human liver cytochrome P450 (CYP) microsomes *in vitro*, but metabolism rates differ depending on individual structural chemistry and whether they are isolated or combined.[13]

e. Herb components versus extract content –
Whereas *Echinacea* spp. (*E. angustifolia, E. pallida, E. purpurea*) water and ethanolic extracts lack melanin, melanin in the herb (5-10% of plant dry weight) has bioactive mechanistic implications. Echinacea melanin activates monocytes *in vitro* by binding to toll-like receptor 2, and after being fed to mice melanin increased immunoglobulin (Ig)A from Peyer's patch cells and interferon (IFN)-γ from spleen cells *ex vivo*.[14]

In vivo and *ex vivo* Laboratory Research

Findings from pre-clinical laboratory studies are simply suggestive, or at best supportive, of systemic clinical effects of a particular botanical preparation. Very high doses are often used with lab animals to produce an overt measurable effect and are typically injected to avoid dosing variability. Animal studies provide stronger supportive evidence when oral botanical administration (including gastric intubation) is utilized and when dosage is proportional to human use. Such approaches better reflect normal clinical applications and human tissue exposure. While

Table 3. Results of *in vitro* Research on *Echinacea* spp. Contrast with Results Observed *in vivo*

a. Complex extracts used in vitro do not match the post-digestion exposure from extracts used in vivo.

In a series of tests, different types of *Echinacea* spp. extracts tested *in vitro* failed to enhance mononuclear cell proliferation and macrophage activation until they had undergone a simulated digestion process.[15]

b. Peculiar preparation or noncommercial solvents of in vitro samples can result in artifacts or atypical effects not found with ordinary use.

Increased T-cell proliferation and cytokine secretion *in vitro* is found with *Echinacea* spp. root cold infusions after refrigeration for 4 days (but not with hot water infusions or 50% ethanolic tinctures) due to microbial endotoxin contamination.[16] These xenobiotic compounds and subsequent reactions would not occur with standard preparations used *in vivo*. A 90% aqueous phenol solvent is required to extract melanin from *Echinacea* spp. that enhances immune responses *in vitro*.[14] Solvents employed in research but not used in producing commercial preparations can provide phytochemicals that are not available in commercial botanical extracts and thus would not contribute to the effect *in vivo*.

c. Some isolated compounds or subfractions used in vitro misrepresent post-absorption influence.

High molecular weight heteropolysaccharides isolated from 30% ethanolic extracts of *E. angustifolia, E. pallida,* and *E. purpurea* roots by ultrafiltration demonstrate mitogenic activity directly on spleen cells[17] that would not ordinarily be exposed to such large compounds following oral administration. The phytochemical matrix as it exists in botanicals may also enhance or reduce the activity of isolated components.[13]

d. Types of cells or tissues employed for in vitro research can limit expression of critical processes.

Healthy cells (normal physiology) can differ in critical responses to those of diseased specimens (pathophysiology). This was demonstrated when *E. purpurea* plant juice and root 50% ethanolic extract reduced cytokine/chemokine secretions from rhinovirus-infected epithelium but increased them in normal epithelial cells.[18] Laboratory research utilizing normal tissue cells can thereby result in misleading implications if it is theoretically applied to the therapeutic application of the same preparation to cells in tissue involved in pathogenic processes (and vice versa).

e. Pharmacodynamic activity demonstrated through in vitro research can be different or opposite from human effects.

Separate extracts of *E. purpurea* root or aerial plant and *E. angustifolia* root greatly increased THP-1 cell cytokine gene expression *in vitro*, whereas human consumption of the combined extracts over 3 days decreased the cytokine gene expression of these cells (except for significantly increased IFN-γ by day 12).[19] Further, *E. purpurea* 55% ethanolic extract was found to be moderately active against influenza virus and equivocal with 70% ethanolic extract *in vitro*,[20] but root tincture of *E. purpurea* with 55% ethanol was effective in flu-like infections in a human clinical trial.[21] No antiviral effects were seen with the *E. pallida* root 55% or 70% alcoholic extracts in the *in vitro* research,[20] yet efficacy was shown with *E. pallida* root tincture in viral respiratory tract infections in a clinical study.[22] *E. angustifolia* 70% ethanolic root extract was moderately antiviral and equivocal with 55% ethanolic extract for rhinovirus type 14 *in vitro*,[20] but *E. angustifolia* root tincture with 60% ethanol was ineffective for induced rhinovirus type 39 infection in a clinical study.[23]*

[*Unfortunately, use of these 3 separate clinical trials for demonstrating that the outcomes are inconsistent with the *in vitro* results is marred by the differences between processing the root extracts and in the clinical research protocols.]

these issues also apply to synthetic drugs, the multiplicity of active agents in complex botanical preparations produces greater challenges for correlating human outcomes.

Animal physiology and/or metabolism may not allow accurate extrapolation to humans. Interspecies genetic variations and subsequent biochemical peculiarities alter pharmacokinetics and pharmacodynamics. For example, rats and rabbits do not have the same CYP isozymes as humans, though the isozymes from pigs, monkeys, and humans are similar.[24] The strongest indictment against depending on botanical results exclusively from *in vitro* and animal CYP isozyme inhibition studies is the lack of validation in many comparable human oral studies.[25]

Human *ex vivo* studies can be useful for verifying activity after oral dosing but are limited to accessible fluids and cells (blood, urine, bile, feces) or surgically-excised pathological tissue. For example, testing antimicrobial activity of urine collected after oral consumption of a botanical urinary tract antiseptic would provide better direct evidence than testing the extract *in vitro*.

Echinacea *Echinacea purpurea*
Photo ©2009 Steven Foster

These types of post-absorption human pharmacological mechanistic studies can provide useful data for relatively little expense, risk, and subject inconvenience.

Outside of empirical data established clinically in humans for a particular preparation, applying the findings of almost any other research (positive or negative) to humans can be challenged on the basis of inherent limitations and constraints of the methodology. Given this limitation, however, *in vivo* laboratory data clearly indicative of botanical toxic effects applicable to human physiology and usage patterns should be given relative credence unless contradicted by human studies. When it comes to clinical applications, the premise of *primum non nocere* ("first, do no harm") should be paramount.

Botanical Issues Illustrated in Human Clinical Studies

Though research data on botanicals from the same species are typi-

cally compiled under the heading of the herb from which they are derived, this does not mean that research conclusions regarding a particular botanical preparation should be applied to other dissimilar preparations. (See Table 4.) When several human studies examining different types of preparations of an herb confirm their efficacy for a given application, this is supportive evidence (not proof) for similar extracts and the herb itself, as long as dosages provide adequate delivery of effective components. On the other hand, when divergent results are found, the distinctions between preparations are compromised in a "meta-analysis" approach of compiling research from different botanical products that fails to take into account the variations in processing, contents, and established clinical applications. Consequently, these details must be examined.

Eighty-one English-language MEDLINE-indexed studies that were published between Jan. 1, 2000, and Feb. 9, 2004, were selected based on being randomized, controlled, single-botanical trials of 1 of the 5 most popular herbs: echinacea, garlic (*Allium sativum*, Liliaceae), ginkgo (*Ginkgo biloba*, Ginkgoaceae), saw palmetto (*Serenoa repens*, Arecaceae), and St. John's wort (*Hypericum perforatum*, Clusiaceae). When these studies were assessed for preparation characterization, only 40 (49%) identified the plant source by its scientific Latin binomial, and only 8 (10%) identified the plant part used. In addition, only 23 (28%) reported the processing and/or extraction method used. In 12 (15%), quantitative analysis was performed to determine actual contents and this information was published. In a randomized survey of 40 of the authors who had published no quantitative analysis, several cited editorial decisions for not doing so. While 3 authors noted lack of funding, 17 of the 23 principal investigators who responded to the survey indicated that it was because a claimed "standardized" extract was used. Of these 81 trials, 54 (67%) were assessed as good by Jadad scores (≥ 3), though obviously many of these were compromised by failure to adequately describe the preparation utilized. Quantitative analysis was performed more frequently in studies with lower Jadad scores (7/27, 26%) than those with good scores (5/54, 9%). The use of preparations claiming to be standardized in 36 trials (44% of studies) was not a definite advantage, since the claimed contents were not verified.[26]

Label content and standardization claims have not always proven reliable. Investigators assessed content claims for 59 preparations sold as echinacea in August 2000 in the Denver metropolitan area. They reported that 9 products claimed standardization to specific polyphenolic markers (the caffeic acid derivatives echinacoside for *E. angustifolia* and *E. pallida* or cichoric acid for *E. purpurea*), though none had sufficient quantity to match the label claim. Seven had on average only 26% of the label claims, and 2 contained none.[27] The failure of this report to specify plant parts compromises species identification based on single polyphenolic markers, as does the fact that phenolic "markers" in fresh echinacea juice preparations are rapidly degraded by enzymatic activity and therefore are absent. Nonetheless, some of the observations are worth noting.

In 10 of the products evaluated, the labels on 4 made no particular species claim, and 6 contained no measurable polyphenolic markers. Based on qualitative thin layer chromatography assays of the other 49 preparations from *Echinacea* species verified by their polyphenolic markers, species identification matched the label species claim for 21 of 30 (70%) of the non-standardized products. Only 10 of 19 (53%) of the products claiming standardization were actually verified as the appropriate species. Quantitative analysis showed that the non-standardized products contained on average over 2 times more of the species markers than the standardized samples.[27] While the recently-implemented good manufacturing practices being required of all US herbal dietary supplement manufacturers will help greatly to resolve such problems with commercial products in the United States, it does not relieve researchers of the responsibility of independently verifying product content.

Failure to document content of bioactive phytochemicals in product-specific human studies makes them more difficult to interpret.[25] For example, *E. purpurea* root extract given orally at 1.6 g/day for 8 days to 12 subjects reduced bioavailability of intravenous midazolam, apparently by inducing liver CYP 3A. However, no change in clearance was detected with oral midazolam, a result that suggests that this herbal extract may also inhibit intestinal CYP 3A. This root extract increased bioavailability of oral caffeine, suggestive of inhibition of CYP 1A2, but no inhibition was detected for CYP 2D6 substrate dextromethorphan.[28] On the other hand, *E. purpurea* whole plant extract administered at 1.6 g/day orally for 28 days to 12 subjects had no significant effect on the CYP metabolism of oral midazolam (3A4), caffeine (1A2), or debrisoquin (2D6).[29]

Echinacea *Echinacea purpurea* Photo ©2009 Steven Foster

These apparent discrepancies may be theoretically explained by differences in the phytochemical content of the different preparations, with total alkamide and C_{12} diene alkamides in particular being in much higher concentration in the roots and C_{12} tetraene alkamides higher in the leaves.[10] Inhibition of CYPs 3A4 and 2D6, but not 1A2, has been shown to be related to total *E. purpurea* alkamides and the C_{12} tetraene alkamide content with a whole plant extract and 7 other *E. purpurea* preparations *in vitro*.[30] Therefore, the actual CYP effects of *E. purpurea* extracts and their alkamide compounds *in vivo* are demonstrably different than those found *in vitro*. These components appear quite pertinent since echinacea alkamides are detected in the serum after oral administration, while the phenolic caffeic

acid derivatives are not.[11] Nonetheless, the polyphenolic influences on CYP isozymes in the gut mucosa may be just as significant, or moreso. Without documenting the research product content used in human studies to allow for comparisons of phytochemical complexes, assessing outcomes remains not merely challenging but an unrelenting guessing game.

As these examples illustrate, research can best establish meaningful and conclusive knowledge of similarities and differences between preparations from the same herb if it utilizes direct comparative pharmacological or therapeutic trials of well-characterized products. This is convincingly demonstrated by human studies that administered a wide variety of St. John's wort preparations. These studies showed the preparations' impact on inducing both the major drug metabolism isozyme CYP 3A4 and that the cellular efflux drug transporter P-glycoprotein is hyperforin-dose-dependent.[31,32] Unfortunately, such direct comparative human studies of different preparations from the same herb are rare. This makes it even more imperative that reviews of clinical studies identify and assess distinctive parameters that help determine relationships between preparations that render them more or less effective.

Table 4. Different Botanical Preparations Present Particular Concerns in Human Research

a. *Powdered herb capsules/tablets*
- Individual digestive capability varies, especially being reduced in elderly and those with gastrointestinal (GI) or febrile diseases.
- Unless an herb powder is appropriately assayed for bioactive markers, its content remains uncertain. Standard assays for extracts may not be adequate for greater herb complexity.

b. *Liquid extracts*
- Relative strength depends on potency of herbs and methods used for extractions.
- Rapid absorption may increase peak concentrations but reduce duration of activity.
- Compliance may be difficult when taste and/or flavor is unusual or strong.
- Herbal flavors are often difficult to mask or mimic with inert liquid placebos.

c. *Solid standardized extracts*
- Dissolution of material in GI environment/medium is usually untested.
- The rate and percentage of absorption of standardized content can vary between products depending on type and amount of coating, fillers, binders, adjuvants, etc.

d. *Concentrated fractions*
- Reduction in the phytochemical content compared to herb or simple extracts can alter parameters of absorption, metabolism, excretion, and ultimately the bioactivity found in the original extract or herb.

For example, confusion is regularly expressed about conclusions from research in regard to the efficacy of echinacea preparations used for treating upper respiratory tract infections related to colds and influenza. When comparing the preparations studied, it becomes clear that in single-species studies of echinacea preparations for the treatment of acute upper respiratory viral infections in adults, the liquid extracts of the fresh *E. purpurea* aerial plant or whole plant yield consistently beneficial outcomes.[33] Simply drying the same batch of this herb by different methods changes the bioactive content. Freeze-drying preserves caffeic acid derivatives in fresh *E. purpurea* flowers significantly better than air-drying at 40°C, which is better than air-drying at 25 or 70°C.[34] Similarly, freeze-drying preserves the alkamide content better than air-drying at 70°C in *E. purpurea* roots but not in its leaves.[35]

General Aspects of Clinical Research Strategies and Botanical Outcome Interpretations

There are a number of issues that can compromise clinical study results with which those who design research and those who interpret it must contend, whatever the agent being tested. Botanicals may be even more vulnerable to such compromising factors due to the inherent complexities of their poly-phytochemical nature, the less overt impact of some of the phytochemical effects, and the receptivity of those using the intervention.

When conducting research using subjects with specific diagnoses, the researcher must ensure the appropriateness of the tested botanical preparation's form. The form of a preparation may or may not be conducive to a positive outcome, based on content, bioavailability, or patient psychosomal preference. Also, subjects' individual genetic, physiological, and pathological variations could alter their response to a botanical, despite having the same diagnosis. Short-term pharmacological studies, meanwhile, may not represent an actual pattern of use. Single-dose pharmacokinetic or pharmacodynamic assays may not replicate the response that occurs with repeated dosing, especially with mild botanical effects. For example, CYP isozyme induction typically requires over a week of exposure to a botanical. It is important to note that pharmacokinetic diversity due to genetic polymorphisms is more likely to have some impact on the activity of botanicals, since they contain multiple bioactive components whose metabolism can potentially be influenced. Also, the pharmacodynamic effects can depend on whether they were tested in healthy or non-healthy individuals.

Still other features of clinical research protocols are frequently overlooked that can impact interpretations of the data and/or conclusions about its value. These can be especially significant for assessing the relative value of botanicals. (See Table 5.) All attempts should be made to optimize the processes that allow for more reliable data collection and interpretation.

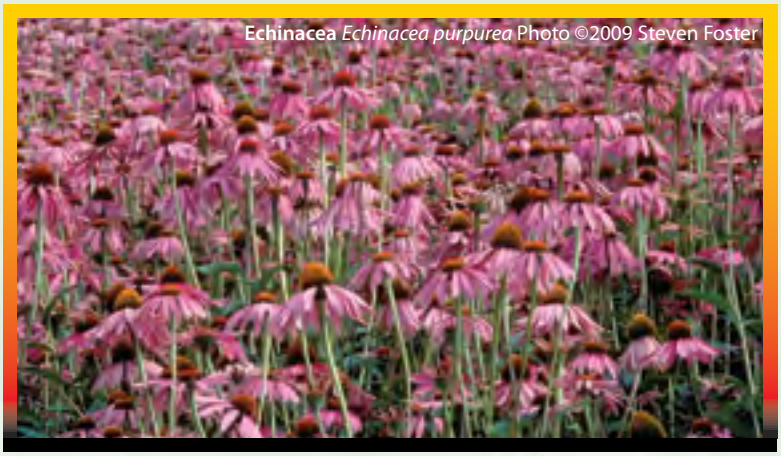
Over the last several decades, increases in the number of botanical clinical studies have led to progress in recognizing features of trial design that serve to better validate outcomes and improve interpretation of results. For establishing efficacy in healthcare interventions, randomized / controlled / blinded trials have become the preferred means of clinical validation, involving methodologies that can be effectively applied to botanicals.

Table 5. Steps Toward a Better Assessment of Outcomes in Botanical Research

Good Research Practices	Common Practices to Avoid
a. Check volume or pill count left.	Assume dosage compliance.
b. Specify reasons for withdrawal.	Report only the number of withdrawals.
c. List number/type of adverse effects.	Fail to specify adverse effects or whether they occur.
d. Compare adverse effects with drug.	Compare only to benefits of drug.
e. Compare/contrast responders and non-responders.	Assume homogeneity of responders and non-responders.
f. Document concurrent medication.	Ignore impact associated with drug use.
g. Emphasize value of co-medication.	Presume neutral effect from drug combination(s).
h. Assess cost effectiveness.	Disregard comparative cost to patient.

However, as has been repeatedly stated, without adequate identification and reporting on the preparation utilized, interpretations of the process and data are compromised. There remains an urgent need to accurately communicate details regarding the product studied, its content of known active constituents, and specification of the means used to establish these criteria, as well as the larger context behind a product's selection for study. These points have been made previously as expanded recommendations for consolidated standards of reporting trials (CONSORT) specific to botanicals.[36]

"Mining the data" for analysis of a product's application to specific presentations found in patients is optimized when trials report a thorough intake history, physical, and lab work-up for each individual to help possibly correlate phenotypic data with outcomes. Inherent variations in effective doses within a patient population suggest utilizing an adjustable protocol or a trial follow-up comparing effects after dosage adjustment. This approach allows increasing dosage for those without efficacy and decreasing it in those with adverse effects to observe the impact of these changes on effectiveness and safety. Such research also more accurately mimics clinical practice. Uncontrolled clinical trials should be encouraged, since they can provide a useful first step in evaluating these parameters and assist in developing a more sophisticated controlled clinical study.[37] Among the different types of possible clinical study designs, each has its own specific advantages and relative limitations.[38]



Echinacea *Echinacea purpurea* Photo ©2009 Steven Foster

For assessing the relative benefits of single-species botanical preparation options, it is highly desirable, if not imperative, especially in preliminary clinical studies with fewer cost demands, to design a trial with several arms that allows comparative assessment of outcomes. Whether this is done on the basis of variations in herbs, dosages, specific herb parts, or different solvent extraction products, the opportunity to observe and describe differences from adjusting these variables in an otherwise standard protocol is possibly the most helpful means of establishing parameters to optimize botanical selection. When the different preparations utilized are appropriately characterized on the basis of herb production, sourcing, and verification, phytochemical fingerprinting, and extract processing details, then valid comparisons and reasonable conclusions can be made more reliably.

Clinical research using conventional drugs as bioactive controls provides the opportunity for comparisons of adverse effects as well as therapeutic and/or pharmacological outcomes.[39] For example, in evaluating botanical effects on drug metabolism, statistically significant effects do not necessarily result in clinically significant effects. Clinical trials on botanicals with positive drug controls also serve as a means of assessing potential research design flaws, as when the positive control arm fails. Herbal therapies typically differ mechanistically from conventional pharmaceutical approaches. Though botanical influence may not be as overt, adverse effects are also generally less frequent and/or less severe. These differences provide incentive not only for comparative trials with drugs to examine efficacy and safety but to also incorporate a combination arm in the trial to determine if concurrent use can enhance outcomes and/or reduce adverse effects, e.g., by lowering the effective drug dose. A number of recent studies such as those on anti-inflammatory and anti-hyperglycemic botanicals have been performed with patients using similar drugs as part of the inclusion criteria. This under-reported feature should be emphasized, rather than overlooked.

Intervening with botanicals in patients who are reliant on life-saving and/or vital organ-sustaining drug therapy can be controversial. Where potential complementary effects appear to enhance therapeutic outcomes, safety issues remain a top priority. Pharmacodynamic botanical-drug interactions are reasonably predictable and can often be assessed in animal studies. Pharmacokinetic interactions are largely unpredictable unless specific mechanisms have previously been demonstrated through human research. To responsibly consider combining botanicals with drugs, the potential for both types of interactions and their clinical relevance should first be evaluated. In researching the concomitant use of botanicals and drugs, identification of the drugs, their doses, dosage adjustments, and durations of use or percentage of discontinuations should be detailed, if possible. Adverse effects and their amelioration should both be reported as significant secondary outcomes for these combination studies.

Clinical research typically fails to address the historical application of complex herbal products in an individualized holistic context. Studying botanical efficacy as the mean response of a group that shares a particular diagnosis or symptom follows the conventional medical therapeutic paradigm. In contrast, traditional herbal medicine systems evaluate and treat cell, organ and/or system functions of an individual, depending on their particular expressions of associated physiological deficiencies and/or excesses. Differentiating disease expressions beyond standard diagnostic categorization enables the selection of the most appropriate botanical options. The evaluation of botanical impact on particular disease expressions in clinical trials can be facilitated by identifying distinguishing symptomatic features in the exclusion or inclusion criteria of the studies.

Establishing the human pharmacological effects of a particular botanical preparation may be one of the most useful approaches to assist herbalists, since traditional prescribing criteria and blending of remedial agents goes beyond applying a botanical monotherapy to a conventionally diagnosed condition. As a means of identifying some of the potential impact of botanicals, the employment of human pharmacokinetic studies and *ex vivo* research, along with non-invasive evaluation techniques and monitoring changes in physiological function and/or performance, can effectively aid in evaluating and comparing botanical preparations and their clinical combinations for supportive clinical interventions.[40]

Conclusions

The challenge and promise of botanical research was well-stated in a recent comparative laboratory anti-inflammatory study for extracts from *Echinacea* spp. roots: "It is tempting to consider the diversity of these plant genera and the complexity of their constituents as barriers to understanding their potential health benefits.

However, the range of variation in these plants, when systematically analyzed, provides a strong foundation on which to develop the strategies and tools needed to produce the most efficacious products for a growing body of consumers."[41]

Only a few dozen botanicals have been *thoroughly* studied by modern scientific methods. Besides evaluating processing influences on botanical composition, pharmacology and selective therapeutic efficacy, the issues of safety and drug interactions have become important topics in the discussion on the need for improving approaches to research. Further human studies on phytochemical pharmacokinetics and the impact of botanicals on drug pharmacokinetics are central to assessing these features. The complexity of content and activity involving botanicals from the same genus or species make studies that compare their similarities and differences of paramount value, especially when evaluating their clinical impact. Possibly the best means to analyze and interpret outcomes is to be able to compare and contrast the effects of several well-characterized botanical preparations in the same study.

Herbal science applied to traditional holistic practice addresses patient individuality beyond simply monitoring the expression of similar pathological characteristics shared by a group. Every person is much more than his or her medical diagnosis. In an analogous fashion, botanicals and their complexity must be considered similarly distinct and deserve to be studied as such.

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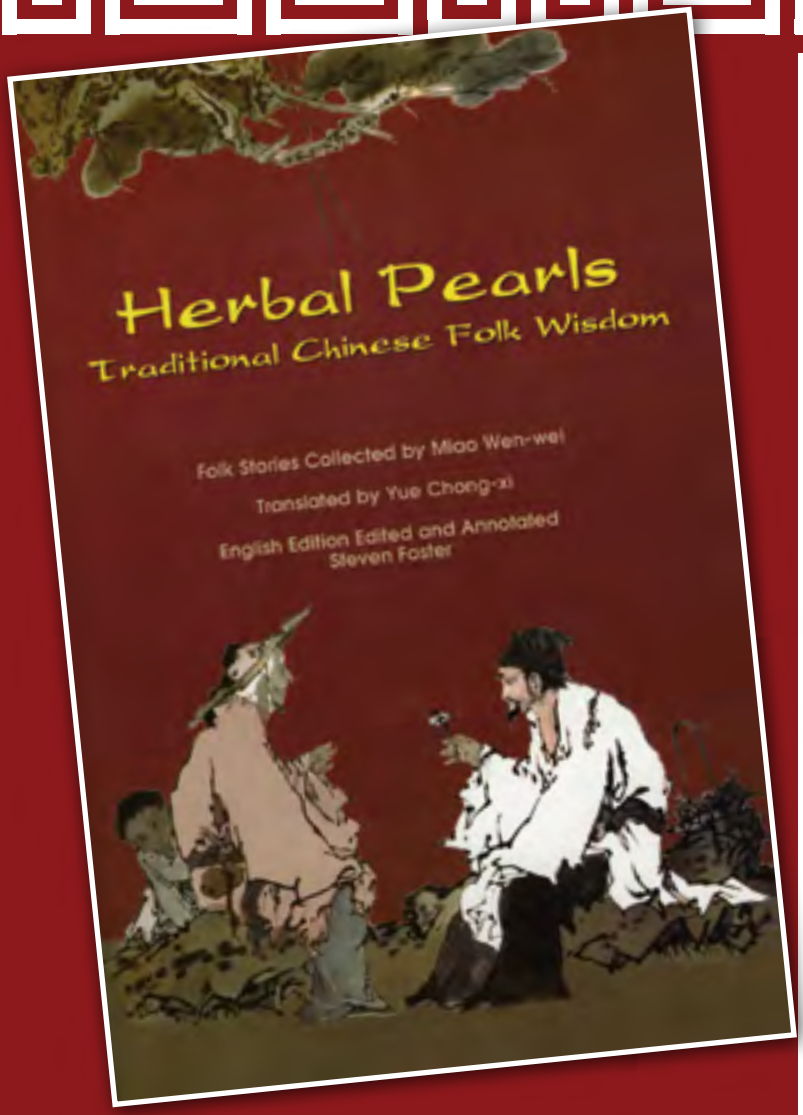
References

1. Jensen CB. Clinical trials of herbal and pharmaceutical products. *Alt Compl Ther*. February 1998;30-35.
2. Bondurant S, Sox HC. Mainstream and alternative medicine: converging paths require common standards. *Ann Intern Med*. 2005;142(2):149-150.
3. Tyler VE. Product definition deficiencies in clinical studies of herbal medicines. *Sci Rev Alt Med*. 2000;4(2):17-21.
4. Leung A. Scientific studies and reports in the herbal literature: what are we studying and reporting? *HerbalGram*. 2000;48:63-64.
5. Cooper R. Contribution of pharmacognosy to clinical trials of botanicals and dietary supplements. *J Alt Comp Med*. 2007;13(9):1045-1046.
6. Bucco G. Industry grapples with ethics of "borrowed" science. *NFM's Nutr Sci News.* January 1997;18-20.
7. Betz JM, Fisher KD, Saldanha LG, et al. The NIH analytical methods and reference materials program for dietary supplements. *Anal Bioanal Chem*. 2007;389:19-25.
8. Kroll DJ, Shaw HS, Oberlies NH. Milk thistle nomenclature: why it matters in cancer research and pharmacokinetic studies. *Integr Cancer Ther*. 2007;6(2):110-119.
9. Pellati F, Benvenuti S, Magro L, et al. Analysis of phenolic compounds and radical scavenging activity of *Echinacea* spp. *J Pharm Biomed Anal*. 2004;35:289-301.
10. Perry NB, van Klink JW, Burgess EJ, et al. Alkamide levels in *Echinacea purpurea*: a rapid analytical method revealing differences among roots, rhizomes, stems, leaves and flowers. *Planta Med*. 1997;63:58-62.
11. Matthias A, Addison RS, Penman KG, et al. Echinacea alkylamide disposition and pharmacokinetics in humans after tablet ingestion. *Life Sci*. 2005;77:2018-2029.
12. Matthias A, Addison RS, Agnew LL, et al. Comparison of Echinacea alkylamide pharmacokinetics between liquid and tablet preparations. *Phytomed*. 2007;14:587-590.
13. Matthias A, Gillam EMJ, Penman KG, et al. Cytochrome P450 enzyme-mediated degradation of Echinacea alkylamides in human liver microsomes. *Chem-Biol Int*. 2005;155:62-70.
14. Pugh ND, Balachandran P, Lata H, et al. Melanin: dietary mucosal immune modulator from *Echinacea* and other botanical supplements. *Int Immunopharm*. 2005;5:637-647.
15. Rininger JA, Kickner S, Chigurupati P, et al. Immunopharmacological activity of *Echinacea* preparations following simulated digestion on murine macrophages and human peripheral blood mononuclear cell. *J Leuko Biol*. 2000;68:503-510.
16. Senchina JDS, McCann DA, Asp JM, et al. Changes in immunomodulatory properties of *Echinacea* spp. root infusions and tinctures stored at 4 ºC for four days. *Clin Chim Acta*. 2005;355:67-82.
17. Willigmann I, Egert D, Bodinet C, et al. Chemical and immunological properties of the immunomodulatory active compounds from the roots of different *Echinacea* species. *Planta Med*. 1993;59(Suppl):A671-A672.
18. Sharma M, Arnason JT, Burt A, et al. Echinacea extracts modulate the pattern of chemokine and cytokine secretion in rhinovirus-infected and uninfected epithelial cells. *Phytother Res*. 2006;20:147-152.
19. Randolph RK, Gellenbeck K, Stonebrook K, et al. Regulation of human immune gene expression as influenced by a commercial blended echinacea product: preliminary studies. *Exp Biol Med*. 2003;228:1051-1056
20. Hudson J, Vimalanathan S, Kang L, et al. Characterization of antiviral activities in Echinacea root preparations. *Pharm Biol*. 2005;43(9):790-796.
21. Braunig B, Dorn M, Limburg E, et al. *Echinacea purpurea* radix for strengthening the immune response in flu-like infections. [German] *Z Phytother*. 1992;13:7-13.
22. Dorn M, Knick E, Lewith G. Placebo-controlled, double-blind study of *Echinacea pallida* radix in upper respiratory tract infections. *Comp Ther Med*, 1997;5:40-42.
23. Turner RB, Bauer R, Woelkart K, et al. An evaluation of *Echinacea angustifolia* in experimental rhinovirus infections. *N Engl J Med*. 2005;353:341-348.
24. Butterweck V, Derendorf H, Gaus W, et al. Pharmacokinetic herb-drug interactions: are preventive screening necessary and appropriate? *Planta Med*. 2004;70:784-791.
25. Venkataramanan R, Komoroski B, Strom S. In vitro and in vivo assessment of herb drug interactions. *Life Sci*. 2006;78:2105-2115.
26. Wolsko PM, Solondz DK, Phillips RS, et al. Lack of herbal supplement characterization in published randomized controlled trials. *Am J Med*. 2005;118:1087-1093.
27. Gilroy CM, Steiner JF, Byers T, et al. Echinacea and truth in labeling. *Arch Int Med*. 2003;163:699-704.
28. Gorski JC, Huang S-M, Pinto A, et al. The effect of echinacea (*Echinacea purpurea* root) on cytochrome P450 activity in vivo. *Clin Pharm Ther*. 2004;75:89-100.
29. Gurley BJ, Gardner SF, Hubbard MA, et al. In vivo assesment of botanical supplementation on human cytochrome P450 phenotypes: *Citrus aurantium, Echinacea purpurea,* milk thistle, and saw palmetto. *Clin Pharm Ther*. 2004.76:428-440.
30. Modarai M, Gertsch J, Suter A, et al. Cytochrome P450 inhibitory action of Echinacea preparations differs widely and co-varies with alkylamide content. *J Pharm Pharmacol*. 2007;59(4):567-573.
31. Godtel-Armbrust U, Metzger A, Kroll U, et al. Variability in PXR-mediated induction of CYP3A4 by commercial preparation and dry extracts of St. John's wort. *Naun-Schmied Arch Pharmacol*. 2007;375:377-382.
32. Mueller SC, Uehleke B, Woehling H, et al. Effect of St John's wort dose and preparations on the pharmacokinetics of digoxin. *Clin Pharm Ther*. 2004;75(6):546-557.
33. Brinker F. Echinacea for upper respiratory viral infections: preparatory differences matter. *Alt Med Alert*. 2008;11(4):41-45.
34. Kim H-O, Durance TD, Scaman CH, et al. Retention of caffeic acid derivatives in dried *Echinacea purpurea*. *J Agric Food Chem*. 2000;48:4182-4186.
35. Kim H-O, Durance TD, Scaman CH, et al. Retention of alkamides in dried *Echinacea purpurea*. *J Agric Food Chem*. 2000;48:4187-4192.
36. Gagnier JJ, Boon H, Rochon P, et al. Recommendations for reporting randomized controlled trials of herbal interventions: explanation and elaboration. *J Clin Epidemiol*. 2006;59:1134-1149.
37. White A, Ernst E. The case for uncontrolled clinical trials: a starting point for the evidence base for CAM. *Compl Ther Med*. 2001;9:111-115.
38. Gatchel RJ, Maddrey AM. Clinical outcome research in complementary and alternative medicine: an overview of experimental design and analysis. *Alt Ther*. 1998;4(5):36-42.
39. Fonnebo V, Grimsgaard S, Walach H, et al. Researching complementary and alternative treatments – the gatekeepers are not at home. *BMC Med Res Meth*. 2007;7(7):1-6.
40. Bone K. Modern phytotherapy: integrating scientific data and methodology with traditional herbal practice. *J Am Herb Guild*. 2002;3(1):34-39.
41. Birt DF, Widrlechner MP, LaLone CA, et al. *Echinacea* in infection. *Am J Clin Nutr*. 2008;(suppl):488S-492S.



HERBAL PEARLS

TRADITIONAL CHINESE FOLK WISDOM

AN EXCERPT OF HERBAL LORE

Editor's note: The 3 stories contained in this article were excerpted from **Herbal Pearls—Traditional Chinese Folk Wisdom**, *a collection of stories compiled by Miao Wen-wei. The Chinese edition was published by the China Society for Folk Literature and Art (Beijing, China; 1981). The English edition was translated by Yue Chong-xi, edited and annotated by Steven Foster, and published by Ozark Beneficial Plant Project in association with Boian Books, LLC (Eureka Springs, Arkansas; 2008).*

Hidden within the great treasure house of Traditional Chinese Medicine (TCM) and the medicine of rural China are pearls of folk wisdom. One form is oral folk tales about origins of plant names or how a plant came to be used as a drug—perhaps by chance discovery, intervention by immortal beings, or simply observing a diseased animal eating a plant and then returning to a healthy state. For hundreds, if not thousands of years, peasant storytellers have passed down the tales from one generation to another. This rich oral tradition conveys much about Chinese culture, folk customs, social habits, history, medical knowledge, mythology, and wisdom. Many of the stories reflect how the repressed poor labor class of feudal China valued, even revered, those who could cure their illnesses. The stories include profiles of sages, who through kind acts earned the heart-felt respect of the peasants oppressed by tyrant overlords.

From 1934 to 1980, folklorist Miao Wen-wei collected these stories from farmers, peasants, and traditional doctors in the central coastal region of China's Jiangsu, Anhui, and Zhejiang provinces. In 1981, the China Society for Folk Literature and Art published this collection of 53 folk tales collected over the 46 year period.

The book includes 48 short stories on name origins and discovery of use of traditional herbs. The other 5 stories discuss animal or mineral drugs, such as cinnabar, snake venom, dried scorpions, and other medicinal items, many official in the modern *Pharmacopeia of the People's Republic of China*. Here we excerpt 3 stories, garlic (*Allium sativum*, Liliaceae), kudzu (*Pueraria montana* var. *lobata,* Fabaceae) and perilla (*Perilla frutescens*, Lamiaceae).

Garlic *Allium sativum* Photo ©2009 Steven Foster

Garlic is one herb famous for both its culinary and medicinal value. In Western traditions, garlic is valued for health benefits such as antibacterial and antifungal activity along with its value for the possible prevention and treatment of cardiovascular disease. In modern China, the drug derived from the bulbs, known as *da suan*, is used for treating diarrhea, tuberculosis, and especially amebic and bacterial forms of dysentery. Its use in treating dysentery is first recorded in *Shen Nong Ben Cao Jing* (*Herbal Classic of the Divine Plowman*), attributed to the "divine plowman," Shen Nong, a mythical ruler of China some 4,000 years ago.

The following story relates how garlic was discovered to be an effective drug against dysentery. For decades, this folk tale circulated among the peasants of Tian Chang, Gao You, and Bao Ying counties in Anhui Province, and was collected in 1942 from a farmer named Miao Shu Dong.

Many centuries ago, before written history, people knew that garlic could change and enhance the flavor of food. Years later it was found to have medicinal qualities. How was its medicinal use discovered? Here is the story:

In ancient times, there was a doctor who could read pulses with great skill. The doctor employed a small boy to process herbs and roots to give his patients. The boy did housework, some business work, and other tasks. When the doctor was free, he would teach the boy how to use drugs to cure disease.

One of the doctor's neighbors was a farmer who very much wanted to learn to become a doctor of traditional medicine.

He asked the doctor, "Sir, please let me be your student, your apprentice."

At that time, the father always taught his trade to his son. The knowledge was passed from generation to generation. This was the way of ancient China. Very few doctors would teach an apprentice who was not his own blood. The doctor said no to the farmer's request.

However, the farmer didn't give up the idea of learning medicine. One day, a villager told the farmer that in the evenings, the doctor always taught medicine to the young boy who worked for him. So one evening the farmer quietly hid in front of the window of the doctor's house, perking up his ears to hear what the doctor taught his student.

In fact, this evening the doctor and the boy discussed the doctor's accounts - not medicine at all.

A patient bought some medicine from the doctor, but had not paid for it. When the boy settled his accounts, he asked the doctor, "That patient owes a debt for drugs. Should we charge him interest on the amount owed?"

"No, don't charge interest. If he can pay the money for the drug, I think this is fine," the doctor replied.

Chinese is a complex language and eavesdropping can produce unexpected results. Each word has "four tongues." Depending upon the inflection of a word's pronunciation, the same word can have several, very different meanings. A

phrase must be heard in the context of the entire conversation to be understood. As it happens, the Chinese phrase meaning "not to pay interest," in another context, means "garlic stops dysentery." Before he heard the phrase "not to pay interest," the farmer hidden beneath the doctor's window had not heard the rest of the conversation, and really didn't know exactly what the doctor and his helper were discussing. Without knowing the context of the phrase he had overheard, the farmer thought that the doctor had taught the young boy a prescription for curing dysentery with garlic. The farmer thought he had learned a practical medical secret.

The next day the farmer told other villagers that he could cure dysentery. Of course, nobody believed him and no one asked him to cure the disease.

A few days later, the farmer learned that a relative living ten miles away had contracted a bad case of dysentery. When the farmer heard this, he walked to the home of the relative and administered garlic to him. After several days of treatment, the relative returned to good health, much to the surprise of everyone.


Garlic *Allium sativum* Photo ©2009 Steven Foster

After this, the farmer abandoned his crops, stayed in his relative's house, and specialized in curing dysentery. He treated patient after patient with great success, and soon became famous for his ability to cure the disease.

When the doctor heard the news, he went to the farmer and asked, "Who teaches you how to affect this cure?"

"I learn from you," the farmer replied.

"You don't learn this from me," the doctor retorted scornfully, "I didn't teach you anything!"

The farmer told his story to the doctor.

The doctor laughed. "That evening," he said, "the boy and I talked about settling my accounts."

Bewildered, the farmer stared blankly wondering how his folly had turned to the good fortune of a cure for dysentery.

Finally, the doctor broke the silence and said, "You have the desire to learn medicine, so now I ask you to be my apprentice. You have hit the mark by a fluke, and in this way discovered that garlic has the ability to cure dysentery."

Since that time, garlic has served as a traditional drug used to cure dysentery.

Few plants are as much maligned in the southeastern United States as kudzu, which, especially in the deep south, swarms like a green tidal wave over once productive farmland, abandoned homes, and wooded thickets. Kudzu was introduced into the United States in 1876 as an ornamental. In China, the root is used for a condition termed "superficial syndrome" when a disease is manifest under the surface of the skin (such as measles without skin eruptions), but is not yet severe, and is accompanied by fever, thirst, a lack of sweating, and headache. It is also used to treat diarrhea and dysentery. Since ancient times, before written history, the drug has been known as *ge gen* in Traditional Chinese Medicine. *Ge gen* is first mentioned in the middle class of herbs in *Shen Nong Ben Cao Jing* (*Herbal Classic of the Divine Plowman*). In 1938, Miao Wen-wei discovered the story of how its name came to be. An 86-year-old traditional doctor, Feng Xing Kui, told him the tale.

Once upon a time, an old man spent his days digging root drugs on a great mountain covered in a dense forest. One day, he heard men shouting and horses neighing from the mountainside below. He did not know what was wrong, so he peered out from behind some trees to see what he could. A few minutes later a young man about fourteen or fifteen years old was frantically running across the sharp mountain stones and scurrying around trees. The boy caught sight of the old man and ran to him. Then, in a most respectful way, the boy threw himself

Kudzu *Pueraria montana* var. *lobata* Photo ©2009 Steven Foster

to his knees before the feet of the old man.

"Why do you bow on the ground before me in such a respectful way, like a chicken eating rice?" the bewildered root-digger asked.

"Grandfather, grandfather, help me! Help me! They want to kill me!"

"Who are you?" the old man asked.

"I am the son of the gentleman Mr. Ge," the boy replied.

"Who wants to kills you?" asked the old man.

"In the dynasty, there is a treacherous court official," the boy explained, gasping to catch a breath. "He falsely accuses my father of having a private army and says he stations troops and conspires to rebel against the Emperor. The fatuous self-indulgent ruler believes this is true, so he ordered his officials to lead an army to surround my home and kill everyone in the family. My father said to me, 'you are the only seedling of the Ge family. If you are killed, our family will be without a new generation.' He told me to run away and to avenge this wrong when I grow up. If not, at least the Ge family can have a new generation. Therefore, I had to leave my home and escape quickly, but the officials found me, and they have followed me here! Grandfather, please save me! If you save me, you save the Ge family."

Kudzu *Pueraria montana* var. *lobata* Photo ©2009 Steven Foster

The old man firmly stroked the ends of his long silver mustache as if to invoke a plan, then thought aloud, "I know the gentleman Ge, and he is very loyal, in fact, the family has been loyal to the Emperors for several generations."

The soldiers following the boy were now close behind. The ponderous old root digger and frightened boy could hear the horses breaking through the forest. The old man looked toward the backside of the mountain and had an idea.

"Follow me quickly," he commanded, moving into a thicket of trees.

The boy followed him deep into the mountain forest where they took refuge in a well-hidden sacred stone cave. There, they stayed for several days. The army followed the boy's tracks into the mountain forest, searching in vain for three days, not finding as much as the boy's shadow. The officer called the search off.

About this time, the old man led the boy out of the cave and asked, "Where do you want to go?"

The boy cried and said, "All of my family were caught and the entire family was exterminated along with my eight relative families."

In ancient China, the extended family consisted not only of the immediate family of the father, but included the patriarchal mother's family, the wife's family, and her immediate relatives. In all, the extended family consisted of nine natural groups, including the father's parents and siblings. So not only were the boy's immediate family killed, but his entire extended family as well.

"Grandfather, you saved me," the boy cried with deep gratitude, "I would like to serve you for my whole life. After your hundred years, I would like to wear hemp, and be in mourning for you. But, I don't know if you would like to have me with you."

In ancient China, a person is afforded a life of one hundred years. Once a son's parents die he was forbidden from wearing silk or cotton. Only hemp clothes could be worn. His remorse was a ritual expression of guilt for not having served his parents as well as he might have. At first, the clothes are to be of white, then after several weeks, one wears gray clothes, and sometime later, black clothing. The boy offered himself as a servant son to the old man. In essence, he would adopt the old root gatherer as his father and treat him with the respect due to parents.

The old man deeply considered the boy's offer and replied, "You may live here with me, but my home is the forest. I am a person who spends his time collecting herbs and drug plants. Every day I climb mountains, one mountain after another. The lifestyle is not as comfortable and easy as the ways of your gentlemen family."

"I am happy to be alive. You have saved me, and thus have saved the Ge family," the boy replied. "If you would adopt me, I can do the hard work."

From that time forward the boy followed the old herb gatherer, collecting herbs and roots every day. The old person always dug one particular herb with a very large tuberous root. The root was much in demand to cure fever, thirst, and diarrhea.

Several years later, the old man died, but he had passed his knowledge of herbs on to the boy as if he were his own son. Like the old herb gatherer, the boy made a specialty of digging the herb with the large tuberous root. He used the herb to treat many sick people with excellent results. However, the herb did not have a name.

One day someone asked, "What is the name of the herb?"

The son of the gentlemen Ge considered the question, thinking of his life's experience.

"I am the only one left in the Ge family, I am something like a root for my family, so I will call this herb *ge gen*."

In China when a person dies, he leaves behind a root. That root is the new generation. This is called *gen*. The traditional drug derived from the root of the kudzu is still called *ge gen*.

Perilla *Perilla frutescens* Photo ©2009 Steven Foster

Perilla is a plant of many disguises borne of its wide distribution and diverse use in each culture that adopts it. In America, when food enthusiasts hear the word shiso, they think of an exotic, distinctly flavored leaf garnish used in virtually every Japanese restaurant. Go into any Korean grocery in the United States, even in small cities, and kkaennip—the pickled leaves of perilla—are commonly sold packaged in sardine-sized cans. In American herb gardens, perilla is widely grown, primarily as an ornamental for the attractive purple-leaved and crisped-leaved varieties.

Perilla is a common weed in the southern United States. In some places in the Ozarks it blankets the ground in moist woods. The dried seed stalks rattle as one walks along a perilla-covered logging road in autumn, earning it the name "rattle-snake weed."

In China, perilla is known as *zi su*. The great physician Tao Hong Jing (452–536 CE) wrote about its many uses in the classic herbal *Ming Yi Bie Lu*. All parts of the plant are used. In Traditional Chinese Medicine, the seeds (*zi su zi*) make *qi* move in a downward direction, stop asthma, expel phlegm, relieve coughs, strengthen the diaphragm, and widen the intestines. The leaves (*zi su ye*) expel cold, regulate vital energy (*qi*), and expand the chest. The stems (*zi su geng*) regulate vital energy, expand the chest, disperse depressed vital energy, and soothe a restless fetus. The leaves are also used to counteract the discomfort from eating too much seafood.

How did this curious use come to be discovered? The legendary herbalist, Hua Tou, reveals the secret. Hua Tuo from Qiao in the Pei State (now Bozhou City, Anhui Province) is thought to have lived about 110–207 CE, toward the end of the Eastern Han Dynasty. He is honored in Chinese medical history for development of a narcotic anesthetic, *ma fei san*, allowing him to perform surgery with anesthesia 1600 years before Europeans did the same. The prescription is lost, but was thought to contain Jimsonweed (*Datura* spp.) and *Cannabis*. He also devised exercises to enhance health, now incorporated into modern Qi Gong. His wisdom was legendary. He worked for neither fame nor money, but devoted his life to help the suffering. Numerous stories recount his life, achievements, and near miraculous cures. This story was collected in 1963 from an elderly patient, Wei Kai Xiang, in North Jiangsu Hospital No. 5, Yang Zhou in Jiangsu Province.

In the ninth day of the ninth month is the double ninth festival. A group of young men from a rich family were in a bar at an inn to see who could eat the most crabs. The big crabs had much flesh with yellow, delicious oil. All of the young men found that the more they ate, the more delicious the food became. The empty shells on the table were like a small tower.

Hua Tuo brought his apprentices to the inn to have a drink. He saw the group of young men. He thought they were crazy for trying to outdo each other in devouring crabs. Hua Tuo kindly advised them that the crabs were cold in character and that they shouldn't eat too much.

"Young men you have your match to see who can eat the most crabs. It is not a good thing."

The young men felt quite unhappy with the words of the old doctor, "We have the food that we buy with our own money. Who cares what you have to say!"

Hua Tuo advised, "If you have too much of the crabs you will get diarrhea. Then maybe risk your lives."

One young man hastened, "Go, go, go. Don't come here to frighten other people. We are just eating crabs. It is none of your concern."

The young man who said these words was drunk. He did not heed the advice of Hua Tuo. The young men continued to eat and drink to their hearts' content.

One cried out loudly, "Crab is a delicious food. Has anyone heard anything as ridiculous as they can kill people? We are at the limits of our stomach. We just make the old man envious."

Hua Tuo found that the young men were making much noise, were unreasonable, and would not follow his advice. So he decided to say something to the master of the inn.

"Don't sell anymore crab to them. The food can endanger human life."

The innkeeper was more interested in the money of the customers than the words of Hua Tuo.

With an angry tone he snapped, "This matter is none of your business! Don't meddle in my matters."

Hua Tuo sighed heavily and sat down to have his own drink. Until midnight, the group of young men kept eating. Suddenly, one fell to the floor and doubled over in abdominal pain. Soon, the others followed. Their pain was so intense that they began to sweat profusely. They were on the floor writhing with pain.

The master of the inn became terribly frightened and dumbfounded.

"What is the matter with you boys?" he asked nervously.

"We have much pain, please ask a doctor to help us."

"In the depth of night, where can I find a doctor!" the innkeeper cried.

"We entreat you to charitably achieve this good act, if no doctor comes to see us, we may lose our lives!"

By that time Hua Tuo came over and said, "I am a doctor."

The young people were surprised and their faces turned red with embarrassment. They thought that the old person asked them not to have too many crabs because he was jealous. Now they lose face as they had turned away the words of the old man. Doubled over in pain, they clutched their abdomens with both hands.

They begged Hua Tuo, "Please cure our disease."

Hua Tuo laughed, "Just now you said you don't need me to manage your business."

"Your Excellency, please forget our villainous words," one young man pleaded.

Another added, "Please good doctor, show your mercy upon us. How much money would you like, it is no problem. We only ask you to save our lives."

"I don't need money."

"If you want anything else, just name it!" the boys replied.

"I only ask you to agree to one thing."

"One thing, one thousand, ten thousand things, we will do! Please offer your demand quickly!"

"From now on," Hua Tuo said, "you should accept the advice of older persons. Don't run wild again."

"Certainly, certainly, whatever you ask, please save our lives quickly, please!"

Hua Tuo left them to await his return. He went to get his

Perilla *Perilla frutescens* Photo ©2009 Steven Foster

apprentices and sent them to a wild area to collect a purple-colored herb. They harvested the stems and the leaves of the herb and decocted them for the young men. After drinking the decoction, their abdominal pain stopped.

Hua Tuo asked, "How do you feel after drinking the medicine?"

"Much more comfortable," they replied.

Hua Tuo thought to himself, hmmm, the herb hasn't a name.

He then said aloud, "After consuming this herb people have a comfortable feeling, so from now one we will call it purple comfortable herb."

The young people gave thousands and thousands of thanks, said good-bye and left.

Hua Tuo scolded the innkeeper, "How dangerous. From now on, you must pay attention to more than just earning money. You must pay attention to the lives of others!"

The innkeeper solemnly nodded his head again and again.

When Hua Tuo left the inn, the apprentices asked him, "The leaves of the purple herb can expel the poison of crabs? Which book recorded this knowledge?"

Hua Tuo told his apprentices. "None of the ben cao [Chinese herbals] mentions this. I learned it from an animal."

The story is this: One day Hua Tuo was in the mountains in the south part of the Yangtze River to collect some drugs. I saw a common otter. The otter caught a very big fish, spent a long time eating it, and finally swallowed it. His abdomen was swollen, as full as a drum. Then the otter spent time in the water, and time on the bank, time lying without moving, and time turning from side to side, as if writhing in pain. We can guess that the common otter was very uncomfortable. At last, the otter crept to the bank to a clump of purple plants. The otter ate some leaves of the herb and then laid down for a rest. Unexpectedly, nothing happened. Hua Tuo thought that the fish character belonged to cold and that the purple herb character belonged to warm.

"I thought that the purple herb could expel the fish poison. Since this time Hua Tuo remembered this in his mind," he told his apprentices with a glint in his eye.

Afterwards, Hua Tuo used the purple herb and its leaves and stems to make pills and powders. He then developed the use of the herb to promote sweating to expel the exogenous evils from the body surface and to expel cold. Meanwhile the herb benefits the spleen and lungs. It also regulates vital energy, widens the middle warmer, stops cough, dissipates phlegm, and can cure many diseases.

Since the medicine is purple in color, and when taken for abdominal pain it makes people comfortable, Hua Tuo called it *zi shu* (purple comfortable). Then for some reason, people started calling it *zi su*, probably because of a change of pronunciation in a local dialect. HG

Herbal Supplement Sales Experience Slight Increase in 2008

By Courtney Cavaliere, Patrick Rea, Mary Ellen Lynch, and Mark Blumenthal

Sales of herbal and botanical dietary supplements in the United States rose slightly in some market channels in 2008, according to data gathered from market research firms. Information Resources Inc. (IRI) found steady growth of herbal supplement sales in the mainstream market channel,[1] and SPINS has reported that botanical supplement sales remained relatively stable in the health and natural food stores sector.[2] Nutrition Business Journal, meanwhile, has pooled various primary and secondary data sources and determined that total estimated herb sales in the US market rose by 0.9% in 2008 (see Table 1).

Herbal dietary supplements are sold in the United States through a variety of market channels, including health and natural food stores; food, drug, and mass market (FDM) retailers; warehouse and convenience stores; mail order, radio and television direct sales; Internet sales; network or multi-level marketing (MLM) companies; health professionals in their offices (e.g. acupuncturists, chiropractors, naturopaths, some conventional physicians); and other channels. While market data companies are able to generate relatively accurate data of herbal dietary supplement sales for some market channels through cash register and computer scanning records, most channels do not have such tracking capabilities and are estimated with a lesser degree of accuracy. However, by pooling various sources of available data and modeling the remaining multi-channel firms, NBJ has arrived at a total estimated figure for all US herbal dietary supplement sales in 2008 of $4,800,000,000.

Table 1. Total Estimated Herb Sales in All Channels 1998—2008

Year	$ Total Sales (millions)	% Increase (-decrease)
1998	4,002	12.5%
1999	4,110	2.7%
2000	4,230	2.9%
2001	4,356	3.0%
2002	4,238	-2.7%
2003	4,146	-2.2%
2004	4,290	3.5%
2005	4,381	2.1%
2006	4,561	4.1%
2007	4,759	4.3%
2008	4,800	0.9%

Source: Nutrition Business Journal, www.nutritionbusinessjournal.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, Insight, The Hartman Group, company data and other published material.

According to data supplied by IRI of Chicago, Illinois, sales of herbal dietary supplements in the FDM channel increased by 7.16% in 2008 from 2007 sales, for a total figure of $289,248,200.[1] However, the IRI data does not represent the entire FDM channel, as it does not include sales reports from Wal-Mart, Sam's Club, and other large warehouse buying clubs, or from convenience stores. Based on data from a SPINSscan consumer report driven by Nielsen Homescan's panel of 125,000 households, the market information firm SPINS of Schaumburg, Illinois, has estimated that Wal-Mart probably accounts for less than 9% of all herbal supplement sales in the United States.

Previous statistics from IRI found that sales of herbal supplements increased for the first time in the FDM channel in 2007, after showing steady decreases for several years.[3] This year's IRI data shows a continuing trend toward increased consumer purchasing of herbal supplements from mainstream market retailers.[1] The 20 top-selling single herbal dietary supplements within the FDM channel, as determined by IRI, are listed in Table 2.

Sales of cranberry (*Vaccinium macrocarpon*, Ericaceae) supplements, which increased by more than 23% in 2007 from 2006,[3] continued to rise in 2008, making cranberry the top-selling herbal supplement product within the FDM channel.[1] As noted in last year's *HerbalGram* article on the herb supplement market,[3] a systematic review of 10 randomized controlled trials was published by the Cochrane Collaboration in January of 2008, concluding that cranberry products may prevent recurrent urinary tract infections in women.[4] Such information, in addition to other studies on cranberry's health benefits, may have contributed to the steady rising sales of cranberry supplements. Sales of elderberry (*Sambucus nigra*, Caprifoliaceae) and ginger (*Zingiber officinalis*, Zingiberaceae) supplements made significant strides in the FDM channel in 2008, whereas sales of yohimbe (*Pausinystalia johimbe*, Rubiaceae) supplements appear to have dropped rather sharply.[1]

Natural and health food stores typically provide a larger share of the herbal/botanical supplement market than FDM outlets, since they tend to cater to what are frequently referred to as "core" shoppers, i.e., consumers who are aligned with the values of the natural products market. SPINS has determined that sales of botanical dietary supplements in the natural and health food channel—including estimated sales from the natural foods retailer Whole Foods—decreased minutely by 0.004% in 2008 from 2007 sales, for a total of $329,148,875.[2] SPINS collects data on supplement sales from a variety of natural and health food retailers. Although Whole Foods no longer reports its sales to SPINS, the market information firm is able to estimate sales of supplements from Whole Foods using an algorithm that incorporates historical point of sale data, industry trends, Whole Foods' quarterly financial reports, and other factors.

The 20 top-selling botanical dietary and food supplements

within the natural and health foods channel, as determined by SPINS, are listed in Table 3. According to SPINS, flaxseed (*Linum usitatissimum*, Linaceae) and flaxseed oil products were the top-selling botanical supplements within the natural and health foods channel. Steady interest of consumers in sources of omega-3 fatty acids may be the cause behind this supplement's high sales. The superfruit supplement acai (*Euterpe oleracea*, Arecaceae), meanwhile, showed a particularly significant increase in sales from 2007.

The sweetening-agent stevia (*Stevia rebaudiana*, Asteraceae) was also a top-selling botanical supplement in 2008, and its sales increased from the previous year. Future data, however, may show decreased sales of stevia as a supplement, due to recent introductions of mass market brands of stevia as food additives. As was reported in *HerbalGram* issue 81, 2 companies received notice from the US Food and Drug Administration in December of 2008 that the agency would not object to the use of the companies' stevia preparations as food substances that are generally recognized as safe (GRAS).[5] Other companies that produce and market stevia are reportedly seeking and may receive similar FDA acceptance for their respective preparations, meaning that sales of stevia as a supplement may decrease as sales of stevia as a sweetener increase.

It bears emphasis that various market research companies use different definitions and coding techniques to compile and analyze data on a particular topic. Therefore, data from IRI on botanical supplement sales in the FDM channel and data from SPINS on botanical supplement sales in the natural and health foods channel—though both considered reliable statistics and important for understanding the herbal market—may not be directly comparable. The 2 market research firms categorize products differently and do not necessarily include the same products in their data of herbal supplement sales. For example, some of the leading products noted by SPINS as top-selling botanical supplements (including flaxseed and stevia) are not classified as individual herbal supplements in IRI's data for the FDM channel. Likewise, NBJ's total estimated figure for herbal supplement sales may include or not include some herbal/botanical supplements contained within the data of IRI and/or SPINS.

Sales of single herbal dietary supplements experienced growth in 2008, whereas sales of combination herbal supplements decreased slightly, according to data from NBJ (see Table 4). Sales of single herbal dietary supplements (monopreparations) grew by 1.5%, while combination herbal supplements decreased by 0.3%. Monopreparations typically pull in almost twice as much in sales as combinations.

NBJ data also indicates that herbal supplement sales increased in the mass market and natural foods channels but decreased in the direct sales channel (see Table 5). According to NBJ, herbal dietary supplement sales increased in the FDM channel by 6% in 2008 over 2007 sales (and

Table 2: 20 Top-Selling Herbal Dietary Supplements in the Food, Drug, and Mass Market Channel in the United States for 2008 (per IRI)*

Common Name	Latin Name	$2008 Sales (USD)	% Change 2007
1. Cranberry	*Vaccinium macrocarpon*	25,225,310	5.29
2. Soy	*Glycine max*	22,199,090	-12.94
3. Garlic	*Allium sativum*	19,343,150	-5.73
4. Saw Palmetto	*Serenoa repens*	17,492,010	3.21
5. Ginkgo	*Ginkgo biloba*	17,418,460	-2.55
6. Echinacea	*Echinacea* spp.	15,137,210	4.45
7. Milk Thistle	*Silybum marianum*	9,286,905	7.94
8. St. John's wort	*Hypericum perforatum*	8,264,811	1.54
9. Ginseng†	*Panax ginseng*	8,141,222	-3.67
10. Black Cohosh	*Actaea racemosa*‡	8,122,758	-7.07
11. Green Tea	*Camellia sinensis*	5,510,541	5.28
12. Evening Primrose	*Oenothera biennis*	3,901,131	-7.03
13. Valerian	*Valeriana officinalis*	3,313,504	11.29
14. Horny Goat Weed	*Epimedium* spp.	2,411,335	8.74
15. Grape Seed	*Vitis vinifera*	1,852,095	7.13
16. Elderberry	*Sambucus nigra*	1,843,422	123.61
17. Bilberry	*Vaccinium myrtillus*	1,841,200	1.92
18. Ginger	*Zingiber officinalis*	947,627	41.79
19. Horse chestnut seed	*Aesculus hippocastanum*	783,805	-19.84
20. Yohimbe	*Pausinystalia johimbe*	673,467	-43.06
Total All Herb Sales (including herbs not shown)		**$289,248,200**	**7.16**

*Source: Information Resources Inc. (www.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: 20 Top-Selling Botanical Dietary Supplements in the Health and Natural Foods Channel in the United States for 2008 (per SPINS)*

Common Name	Latin Name	$2008 Sales (USD)	% Change 2007
1. Flaxseed and/or Oil	*Linum usitatissimum*	36,197,002	-3.98
2. Wheat or Barley Grass	*Triticum aestivum* or *Hordeum vulgare*	18,526,246	0.75
3. Stevia	*Stevia rebaudiana*	17,552,753	7.74
4. Aloe Vera	*Aloe vera*	14,145,433	-0.01
5. Milk Thistle	*Silybum marianum*	13,590,926	0.78
6. Turmeric	*Curcuma longa*	11,338,403	12.71
7. Echinacea	*Echinacea* spp.	9,226,488	2.95
8. Saw Palmetto	*Serenoa repens*	8,925,254	-4.62
9. Garlic	*Allium sativum*	8,540,801	-5.22
10. Echinacea with Goldenseal Combination	*Echinacea* spp. and *Hydrastis canadensis*	7,005,549	8.49
11. Valerian	*Valeriana officinalis*	6,506,690	-0.37
12. Ginkgo	*Ginkgo biloba*	6,330,098	-3.69
13. Acai	*Euterpe oleracea*	5,945,932	120.54
14. Elderberry	*Sambucus nigra*	5,903,292	16.43
15. Oregano Oil	*Origanum vulgare*	5,886,308	-3.96
16. Chlorophyll/Chlorella	*Chlorophytum arundinaceum*	5,724,750	-5.86
17. Goji Berry	*Lyceum* spp.	5,196,456	-4.98
18. Black Cohosh	*Actaea racemosa*†	4,915,972	-4.11
19. Cranberry	*Vaccinium macrocarpon*	4,726,087	-2.89
20. Evening Primrose	*Oenothera biennis*	4,547,996	-5.75
Total All Herb Sales (including herbs not shown)		**$329,148,875**	**- 0.004**

*Source: SPINSscan Natural with Whole Foods estimate. (www.spins.com)

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

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

	2004		2005		2006		2007		2008	
	$ Sales (millions)	% Growth	$ Sales (millions)	% Growth	$ Sales (millions)	% Growth	$ Sales (millions)	% Growth	$ Sales (millions)	% Growth
Total Single Herbs	2,717	1.6%	2,742	0.9%	2,912	6.2%	3,047	4.6%	3,093	1.5%
Total Combination Herbs	1,573	4.6%	1,639	4.2%	1,649	0.6%	1,712	3.8%	1,707	-0.3%
Total Herbs	**4,290**	2.7%	**4,381**	2.1%	**4,561**	4.1%	**4,759**	4.3%	**4,800**	0.9%

Source: Nutrition Business Journal, www.nutritionbusinessjournal.com

this figure does include sales from Wal-Mart, club warehouses, and convenience stores). The natural and health foods channel increased slightly by 1.5%, and the direct sales channel decreased slightly by 1%. According to NBJ, early indications suggest that slower growth in superfruit supplement sales in 2008 led to the decrease in the direct sales channel, as well as flat to slightly negative sales growth in US sales from publicly traded MLMs. (NBJ's figures on growth in the FDM and health and natural foods channels differ from IRI and SPINS primarily because NBJ estimates and includes other retail channels not tracked in IRI and SPINS data.)

Some retailers and market research firms have indicated that sales of herbal supplements may have risen significantly in the last quarter of 2008 and into 2009, due to the economic recession.[6] As consumers are faced with growing financial concerns and budget restraints, selected herbal dietary supplements may continue to become substitutes for the more costly conventional pharmaceuticals, particularly among many of the millions of consumers without health insurance. Market statistics from the first and second quarters of 2009 should provide further evidence as to whether the nation's financial downturn results in increased sales of herbal supplements. HG

Table 5. Herb Sales by Channel for 2007 & 2008

$ Channel Sales (millions)	2007	2008	% Increase (-decrease)
Mass Market*	721	764	6.0%
Natural & Health Food†	1,537	1,560	1.5%
Direct Sales‡	2,501	2,476	-1.0%
Total	**4,759**	**4,800**	**0.9%**

Source: Nutrition Business Journal, www.nutritionbusinessjournal.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.

References

1. FDM Market Sales Data for Herbal Supplements, 52 weeks ending Dec 28, 2008. Chicago, IL: Information Resources Inc.
2. SPINSscan Natural, $2mm+ Natural Supermarkets with Whole Foods estimate sales data, Total US, 52 weeks ending December 27, 2008 and year ago, SPINS defined herbal category.
3. Cavaliere C, Rea P, Blumenthal M. Herbal supplement sales in United States show growth in all channels. *HerbalGram.* 2008;78:60-63.
4. Jepson RG, Craig JC. Cranberries for preventing urinary tract infections. *Cochrane Database of Systematic Reviews.* 2008:Issue 1.
5. Cavaliere C. FDA accepts safety of two stevia preparations for food and beverage use. *HerbalGram.* 2009;81:67-69.
6. Tanner L, With economy sour, consumers sweet on herbal meds. Associated Press; January 13, 2009.

4th World Conservation Congress of the International Union for Conservation of Nature

The 4th World Conservation Congress of the International Union for Conservation of Nature (IUCN)* took place October 5-14, 2008, in Spain at the Centre de Convencions Internacional de Barcelona. The central theme of the Congress, "A Diverse and Sustainable World," was to highlight linkages between natural, social, cultural, and economic diversity. The Congress, held every 4 years, is billed as the world's largest and most important conservation event that aims to improve management of the natural environment for human, social, and economic development. The Congress drew more than 8,000 specialists from the conservation community, governments, NGOs (non-governmental organizations), academia, the private sector, women's groups, and indigenous groups.

The 2 main goals of the 4th Congress were to (1) profile innovative conservation research and work throughout the world, and (2) set the global conservation mandate through the IUCN motions process.[1]

The primary focuses of the Congress included biodiversity-based climate change mitigation, impacts of biodiversity loss, impacts of biofuels projects, rights of vulnerable and indigenous communities in conservation-related activities, and endangered animal species. There were also a few events related to the conservation, sustainable use, and trade of medicinal and aromatic plants (MAPs).

Awards and Agreements Reached

Danna Leaman, PhD, a founding member of the Medicinal Plant Specialist Group (MPSG) of the IUCN Species Survival Commission (SSC) and MPSG chair since 2000, received the "Harry Messel Award for Conservation Leadership." The award, which recognizes exemplary service to the SSC, was given in recognition of Dr. Leaman's "inspirational role in the development of the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP)[2] and for ably assisting in the work of the IUCN SSC Plant Conservation Sub-committee."

An important agreement was also signed at the Congress between the 4 founding institutions of the ISSC-MAP to endorse global implementation of the standard through the newly established FairWild Foundation. The ISSC-MAP was developed by a partnership including the German Federal Agency for Nature Conservation (BfN), the MPSG, World Wide Fund for Nature (WWF-Germany), and TRAFFIC (the wildlife trade monitoring network and joint program of IUCN and WWF), plus industry associations, companies, certifiers, and community-based NGOs. Development of the FairWild Standard[3] was initiated by Swiss Import Promotion Programme and financed in cooperation with Forum Essenzia e.V. (Society for Promotion, Protection, Dissemination of Aromatherapy, Aromacare and Aromaculture).

"A successful wild plant collection standard is essential to ensure sustainable use of medicinal plants not only for purposes of nature conservation but also in a social and economic context," said Professor Beate Jessel, president of the BfN. "Germany, as one of the major medicinal plant importers worldwide, has a special responsibility of acting upon such principles."[4] Under the auspices of FairWild Foundation, the ISSC-MAP and the FairWild Standard will be jointly implemented to assure buyers that wild collected botanicals are produced in a socially and ecologically sound manner. The joint implementation of both standards also ensures traceability, transparency, and improves product safety.

Dr. Sonja Lagos-Witte (of TRAMIL C.A., Nicaragua; right) facilitates a Q&A discussion as Ferdousi Begum, PhD, (Executive Director of DEBETC, Bangladesh; left) comments on medicinal plant conservation at the "Go Wild!" workshop. Photo ©2009 Uwe Schippmann.

The Exhibition

Co-located with the Congress was an exhibition as well as an International Women Environmental Entrepreneurs Fair. Some exhibitions of relevance to the sustainable use and trade of MAPs included the following:

- ***Alimentos Nutri-Naturales S.A.*** is a community-based enterprise owned

* The world's oldest and largest global environmental network, IUCN is a democratic membership union with more than 1,000 government and NGO member organizations, and almost 11,000 volunteer scientists and experts in some 160 countries. IUCN's work is supported by over 1,000 professional staff in 60 offices and hundreds of partners in public, NGO, and private sectors around the world. IUCN's headquarters are located in Gland, near Geneva, in Switzerland.

and operated by women of Ixlu Petén, Mayan Biosphere Reserve of Guatemala, that wild collects, processes, and commercializes ingredients and products based on breadnut seed (*Brosimum alicastrum,* Moraceae). The first direct customer for their produce is the US herbal tea company Guayaki Yerba Mate (Sebastopol, CA).[5]

- ***Crop Wild Relatives Global Portal*** (http://www.cropwildrelatives.org) provides access to information and data resources important for the conservation and use of crop wild relatives. The project is coordinated by Biodiversity International with financing from the Global Environmental Facility and implementation support from the United Nations Environment Program.
- ***Global Diversity Foundation*** is a UK registered charity whose projects include encouraging responsible commerce of 300 species of plants traded in southern Morocco and promoting use of wild food and medicinal plants by the indigenous San people to support healthy lifestyles in sedentary settlements in South Africa, among other locations.
- ***Rainforest Alliance*** is a secretariat of the Sustainable Agriculture Network, which is a coalition of nonprofit conservation organizations that work together to promote socially responsible and environmentally sustainable agriculture.
- ***Southern Alliance for Indigenous Resources*** is a regional NGO operating in 10 southern African countries that focuses on the promotion of rural development through the sustainable utilization, commercialization, and management of natural resources. This NGO showed herbal products including baobab (*Adansonia digitata,* Bombacaceae) seed oil and pulp, makoni tea (*Fadogia ancylantha,* Rubiaceae), and sausage tree (*Kigelia africana,* Bignoniaceae) fruit extract.
- ***The Union for Ethical BioTrade*** stems from efforts initiated by the BioTrade Initiative of the United Nations Conference on Trade and Development,[6] which was created to contribute to international efforts to promote sustainable development and biodiversity conservation. Its Board includes representatives from several natural products companies.

One particularly interesting poster, represented by Gary J. Martin, PhD, director of Global Diversity Foundation, Marrakech, Morocco, was titled "Promoting Conservation and Wise Use of Plants Traded in Southern Moroccan Marketplaces."[7] From March 2003 through March 2007, Dr. Martin and his colleagues have collected over 1,500 specimens of commercialized plants and animals, analyzed the composition of diverse ethnopharmacological mixtures blended by local herbalists, and started an in-depth analysis of medicinal roots based on structured interviews that characterize vendor knowledge of 39 key species.

Workshops

The IUCN Species Program sponsored a workshop titled "Wild Plants for Food and Medicine—Assessing and Conserving Plants for People." The workshop focused on the future of plant species assessments and their use in conservation initiatives, such as the joint project of IUCN Species Program and Botanic Gardens Conservation International to assess and conserve the plants of Uganda and Madagascar.

Another workshop was titled "Go Wild! Herbal Products, Local Livelihoods, and the New International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP)." The session opened with the new 6-minute film "Healing Power from Nature,"[8] which explains the ISSC-MAP initiative with the voices and views of local collectors of MAPs from around the world. The workshop addressed challenges and benefits associated with sustainable wild collection of plants.

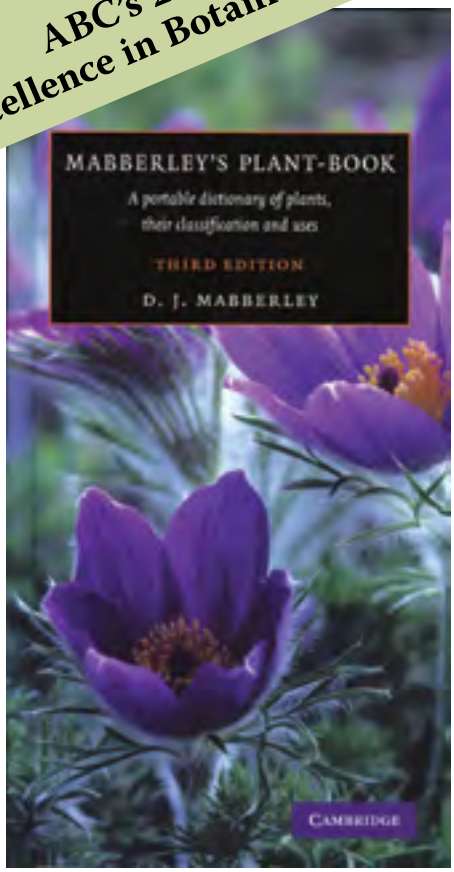
Another seminar was titled "Transforming Markets: The Private Sector's Role in Securing a Diverse and Sustainable Future." The main objective was to present and discuss private sector initiatives that aim to reduce measurably the environmental impacts of producing key global commodities while also improving the livelihoods of producers.[9] HG

—Josef Brinckmann

References

1. IUCN World Conservation Congress: what does it aim to accomplish? *IUCN Species Newsletter of the Species Survival Commission*. January-December 2008;49:11-12.
2. Medicinal Plant Specialist Group (MPSG). *International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP)*. Version 1.0. January 2007. Available at: http://www.floraweb.de/proxy/floraweb/map-pro/Standard_Version1_0.pdf.
3. Meinshausen F, Winkler S, Bächi R, Staubli F, Dürbeck K. *FairWild Standards*, Version 1 FairWild Foundation. 2006. Available at: http://www.forum-essenzia.org/PDFs/FairWild-Standards.pdf.
4. Thomas R. Press Release: New foundation to promote sustainable collection of wild plants. *TRAFFIC News*. October 9, 2008.
5. Guayaki Yerba Mate establishes historic direct-marketing partnership with a community-based women's business in Guatemala. *CSR Wire*. October 22, 2008.
6. United Nations Conference on Trade and Development (UNCTAD) BioTrade Initiative. *BioTrade Principles and Criteria*. New York and Geneva: United Nations. 2007. Available at: http://www.biotrade.org/BTFP/BTFP-docs/Working_docs/UNCTAD_BT_PC_en.pdf.
7. Abdelaziz Abbad, My Ahmed El Alaoui El Fels, Mohamed Alifriqui, et al. Poster: Promoting conservation and wise use of plants traded in southern Moroccan marketplaces. Marrakech Hay Mohammadi, Morocco: Global Diversity Foundation. 2008.
8. TRAFFIC and WWF Germany. Film: *Healing Power from Nature*. Viewable online at: http://www.traffic.org/home/2008/5/19/therapy-for-medicinal-plants.html.
9. Holland R. Seminar Report IUCN World Congress Barcelona. Transforming Markets: the Private Sector Role in Securing a Diverse and Sustainable Future. Cambridge, UK: TRAFFIC International. October 2008.

Recipient of ABC's 2009 James A. Duke Excellence in Botanical Literature Award



Mabberley's Plant-Book: A Portable Dictionary of Plants, Their Classification and Uses, 3rd edition by David J Mabberley. New York, NY: Cambridge University Press; 2008. Hardcover; 1021 pages. ISBN 978-0-521-82071-4. $90.00. Available in ABC's online store.

Most readers will not have heard of the "herbarium crawl." That's this tired old retired taxonomist's (JAD) jargon for trying to identify an unknown specimen by searching for a matching named specimen in the herbarium. Most of my herbarium crawls were in the herbarium of the Missouri Botanical Garden between 1959 and 1963, when I was trying to identify specimens among collections from Panama and Peru. Later, on my move to the US Department of Agriculture, I crawled at the Smithsonian Herbarium, trying to identify some of the thousands of specimens I had collected in Latin America for the National Cancer Institute (NCI), and other entities. The New York Botanical Garden's Michael Balick probably did many herbarium crawls in his role with the NCI's cancer screen as well. These are all important herbaria. In them, there were usually multiple copies of various indices that were often vitally useful in guiding the "crawl." Lamentably the "new taxonomy," based on molecular evidence, has changed many such assignations; nearly half of the family names in a recent flora of Maine are different from what they were in my herbarium crawl days. If the herbaria have been reorganized to conform to the new classifications, I'll really need my *Mabberley's Plant-Book*, 3rd edition, which conforms to the new molecular classifications.

Last March, author David Mabberley, PhD, moved from the University of Washington to become keeper of the herbarium, library, art, and archives at the Royal Botanic Gardens, Kew. Kew Gardens embraces, of course, one of the world's best herbaria in one of the world's greatest botanical gardens.

Mabberley's 3rd edition, I predict, will be strategically located in most major herbaria as a compact tool to facilitate the neotaxonomists in their more modern herbarium crawls, maybe even assisted by bar-coded evidence.

We (the authors of this book review) thought so highly of the volume that we recommended it to the nominations committee of the American Botanical Council for the eponymous James A. Duke Excellence in Botanical Literature Award for the year 2008.

Few, if any, books get as much use in our libraries as previous editions of Mabberley. This new edition includes the best explanation of the taxonomic shifts resulting from the introduction of molecular data (what we call the new taxonomy) for lay plant enthusiasts.

Though I'd (JAD) like to have the *Plant-Book* 3rd edition in my office, I'm going to leave it in the Green Farmacy Garden office so that the garden director, interns, visitors, and volunteers can consult the book before coming to me with questions about the family placement of the 300 species in the Green Farmacy Garden. They raise vexing questions these days.

For example, is *Callicarpa* still in the Verbena family or has it shifted to the mint family? It shifted to the mint family! Is *Sambucus* (elderberry) in the Caprifoliaceae or is it relocated to a different family? It is in a different family, indeed—the Adoxaceae! Mabberley provides answers to these and other questions in the moving target that is botanical taxonomy. Be prepared to relearn everything you thought you already knew about plant families and their evolutionary relationship!

To get a generous aliquot of useful information on more than 24,000 entries (mostly common names, families, genera, and tribes), Mabberley has skillfully constructed some very useful shortcuts and necessary abbreviations, all concisely included in the back of the book. An Appendix, "system for arrangement of extant vascular plants," incorporates the latest findings from molecular systematics in the classification of flowering plants. "Acknowledgement of Sources," a polite British phrasing for "references," begins on page 939 and includes an extensive list of floras, handbooks, Web sites, and periodicals consulted by the author. Pages 957–1019 have extensive listings of abbreviations and symbols used in the book, including the names of botanists truncated in botanical authority abbreviations, with year of birth and death (if applicable). One may want to bookmark this essential key to *Mabberley's Plant-Book*'s content. The final page of the book is a brief list of new plant names introduced within the pages of the book. New users are advised to study page xvi, "How to use this book," to understand some of the shortcuts Mabberley employs.

We will use bay as an example, since bay is the International Herb Association's Herb of the Year designee for 2009. On page 95, we find bay laurel assigned to *Laurus nobilis*. On page 471, under *Laurus* we find Lauraceae (II) for example, which sends us to the Lauraceae entry, in which the genus *Laurus* is placed in: "II" referring to Laureae the second of two tribes under the Lauraceae.

Similarly, on the same page, the entry for Lavandula is "Labiatae (VIIa)," which sends you to the entry for Labiatae, and the subfamily: VII "Nepetoideae," under which *Lavandula* is placed in the tribe "3. Ocimeae" followed by "a"—the subtribe Lavandulinae. So all those Roman numerals in parenthesis after the family name are simply referring to the family entry in the dictionary and the relevant subfamilies, tribes and subtribes within the primary family entry. Of course, nobody except a working taxonomist cares much about subfamilies, tribes, and subtribes, but the information is there. The specific "condensed styles" of the entries are expanded *in extenso* in the genus and family examples given on pages xvii-xviii. The sample entries on these 2 pages are absolutely key to understanding the condensed style of Mabberley's entries throughout

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† Watson et al., (2007) Nutr Res, 27:692-697
†Belcaro et al., (2008) Redox Report,13(6): 271-276.
†Cisar et al., (2008) Phytother Res, 22(8): 1087-1092.
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his new plant-book. Some readers may be tempted to skip the introductory material in a book (the "front matter") or the back sections (the "back matter"), but don't do that with this edition of Mabberley or your gray matter will be vexed with confusion.

This book contains over 24,000 entries and "information on every family and genus of seed-bearing plant (including gymnosperms) plus ferns and club mosses," combining taxonomic details and uses with English and other vernacular names. We have no reason to question the introductory note that "Mabberley's Plant-book continues to rank among the most practical and authoritative botanical texts available," aptly deserving the ABC Excellence in Botanical Literature Award for the year 2008, and a place on your book shelf for 2009 and beyond.

—James A. Duke, PhD
Economic Botanist
Fulton, MD

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

Alternative Medicine? A History by Roberta Bivins. Oxford, England: Oxford University Press; 2008. Hardcover; 264 pages. ISBN-13: 978-0-19-921887-5. $36.50.

As regular readers of *HerbalGram* are aware, there has been a great surge of interest in natural medicine throughout the globe for the past 2 or 3 decades. It has now become fairly commonplace to visit an acupuncturist for the treatment of various ailments, use flower remedies for trauma or depression, practice yoga and Tai Chi and/or meditation for relaxation, and employ herbal medicine and phytotherapy alongside conventional medical care.

This trend is certainly not as new as some of us would seem to think, but rather has been an ongoing process for many years—especially in various countries of the Western world.

In the same erudite style reminiscent of her late mentor (the great medical historian Roy Porter), Roberta Bivins both lucidly and entertainingly introduces the reader to the complexities of the principal traditional medical systems that are now becoming common in the modern world. What many people may not realize is that these so-called "alternative" practices are in fact the common traditional methods of healing in most of the underdeveloped world.

For such a concise book, it contains a wealth of information regarding the workings of various healing systems, including homeopathy, Ayurveda from India, and Traditional Chinese Medicine (TCM), which includes acupuncture, moxibustion, and herbal therapies.

This book consists of 4 chapters, which are preceded by an excellent introduction to the history and development of alternative and complementary medical systems around the world.

Chapter 1, "What is Burning?" deals with the dissatisfaction or disillusionment that many people have felt towards what is known as modern, mainstream, scientific, conventional, orthodox, or allopathic medicine. This dissatisfaction includes, but is not limited to, the high-tech, high-cost, and impersonal aspects of this modality.

Chapter 2, "Health and the New Science," deals with various European therapeutic modalities in vogue during the late 18th and 19th centuries, such as mesmerism and homeopathy. These and other treatments are also discussed in chapter 4, regarding their impact on healing practices in India.

Chapter 3, "The Chinese Have a Great Deal of Wit," discusses the basic tenets of TCM and its sometimes erroneous interpretation by European physicians of the 19th century. For example, some European physicians regarded acupuncture as a form of bloodletting (bleeding was a somewhat common practice by some European and American physicians in the 18th and 19th centuries), which clearly shows how much this practice was misunderstood, even though it had been introduced in Europe at least one century before.

Chapter 4, "With our Western Brethren, the Case Seems to be Quite Different," looks at the historical impact of cross-cultural medical interchanges, with special emphasis on non-Western approaches to healing. Examples of this include pluralistic medical options available in India, which led to the origin of vaccination and the treatment of cholera epidemics in various Asian nations.

This work ends with "Conclusion: The Im(patient) Consumer," which examines the main differences between the concepts of alternative medicine (such as homeopathy), and complementary medicine (such as herbal therapy). It also describes various natural products that are popular around the world.

Alternative Medicine? A History is an excellent achievement and appears on the scene precisely in an epoch when a plethora of misinformation exists regarding the origin and application of a diverse array of alternative and complementary medical healing systems. For example, homeopathy is sometimes regarded as synonymous with herbal medicine by the lay public. This is clearly not the case since phytotherapy, or the evidence-based approach to herbal medicine, can be regarded as a subspecialty of modern conventional medicine, as is the case in some Western European countries. Homeopathy, on the other hand, is a type of "energetic medicine," which uses highly-diluted remedies, some of which are herbs, but also employs an array of other items—such as diseased tissue, animal venoms, and minerals—in a very different manner.

Additionally, the ancient healing systems of Ayurveda and TCM are regarded by some critics as "unscientific" because they stem from a cosmological/philosophical worldview (one might say this is also the case with Western "scientific" medicine). These healing systems also do not often conform to the Western perspective of the scientific method—even though controlled clinical trials do exist attesting to the efficacy of some of their remedies or procedures, as exemplified by certain herbal combinations used to treat a variety of ailments.

The book includes various black-and-white photographs and illustrations, which provide a visual attraction for the reader. It will be of great value to both conventional and alternative health practitioners alike in helping to explain the differences, as well as the similarities, between diverse healing modalities practiced around the world today.

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

High-Performance Thin-Layer Chromatography for the Analysis of Medicinal Plants by Eike Reich and Anne Schibli. New York, NY: Thieme; 2007. Hardcover; 264 pages. ISBN-13: 978-1-58890-409-6. $149.95. Available in ABC's online store.

The ability to determine whether a product has met its specifications for quality is very much dependent on the effectiveness of the analytical tools employed. At first glance, thin-layer chromatography (TLC) may not be considered the most effective or, perhaps, modern tool available. In writing this book, the authors have provided a comprehensive and effective argument to dispel such preconceptions. Overall, the text expertly presents a basic but comprehensive introduction to TLC and further presents the technique's more modern modifications and applications. While the dominating focus is on the use of high-performance TLC, (HPTLC) for the analysis of medicinal plants, the information provided should be an essential reference for anyone interested in this versatile analytical tool.

The opening chapter employs clever analogies and illustrations to guide readers through the potential benefits of using this chromatographic technique. Theoretical concepts and a more technical discussion follow in the next chapter, which provides a good starting point for understanding the methodology. The true substance of this text can be found in the third chapter, wherein the authors clearly and effectively walk the reader, step-wise, through the TLC process. Throughout chapters 3 and 4 are examples and illustrations that employ botanical substrates and which are used to demonstrate the application of HPTLC.

It is the final 2 chapters, however, that reveal the true strength and value of this book. Chapter 5, on Method Development, has a section on Defining the Analytical Goal that is edifying for anyone embarking on an analytical pursuit. The inclusion of a chapter devoted exclusively to the "why" and "how" of method validation is a welcome addition. The information is presented in a clear and concise manner, including very useful definitions of validation parameters.

While, in general, I have no complaint with this chapter—especially as many texts overlook this integral part of method development—I did find some details a little lean. For example, the discussion on validation guidelines specific to identity methods would have been extremely useful if provided with a statistical justification for the recommended criteria. The authors discuss International Conference on Harmonisation (ICH) guidelines and the International Organization for Standardization (ISO) but barely mention Association of Official Analytical Chemists (AOAC), which I consider a weakness of this chapter (although it must be acknowledged that this reviewer is the General Referee for the AOAC Dietary Supplement Methods Committee and may therefore be biased). After such an excellent discussion on Defining the Analytical Goal and the importance of validation, it was disappointing that the same level of attention and clarity wasn't applied to the variety of statistical operations that can be employed, especially as each validation scheme and statistical tool provides a different level of confidence in the result.

The authors have presented information in a clear and concise manner with numerous practical examples and illustrations throughout the text. The appendices contain especially useful resources including invaluable lists for mobile phases and reagent descriptions, a template for a HPTLC standard operating procedure, and even an example of a validation protocol for identity. Overall this book provides an exceptional introduction and overview to the many applications of HPTLC in medicinal plant analysis.

—Paula N. Brown, MS
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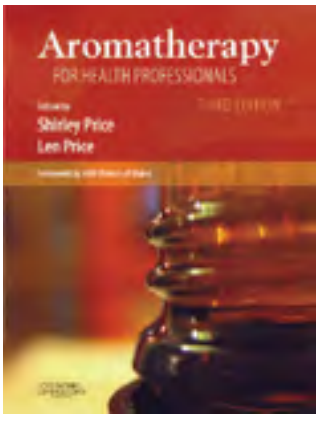
Aromatherapy for Health Professionals, 3rd ed., by Len Price and Shirley Price. Oxford, UK: Churchill Livingstone, Elsevier; 2007. Paperback; 576 pages. ISBN-13: 9780443101342. $53.95. Available in ABC's online store.

The third edition of *Aromatherapy for Health Professionals* is a comprehensive book outlining the safe and effective uses of essential oils in complementary healthcare as palliative treatment and integrative therapy for a wide range of health conditions. A forward by His Royal Highness Prince Charles endorses aromatherapy and indicates the prince's support of integrative care among healthcare providers in the United Kingdom. As founders of the International Federation of Aromatherapy and fellows of the Institute of Aromatic Medicine, the authors follow strict guidelines for external application only, as is allowable by certified aromatherapists throughout Great Britain. The author of 12 other books on aromatherapy, Shirley Price is a long respected aromatherapist whose reputation exceeds the boundaries of the United Kingdom. Her husband Len Price co-authored one of those books on carrier oils and another on hydrolats.

Even though this is a text targeted to the professional market, the introductory chapters provide an easy-to-understand foundation of aromatherapy for the serious novice. Technical details of botany pertaining to aromatic plants give even the most experienced practitioner a greater understanding of aromatherapy as a phytotherapeutic extension of herbalism, as information is provided on secretory structures, as well as the creation, purpose, and therapeutic value of essential oils. Aromatic chemotypes, which allow for greater specificity in using essential oils for focused uses by experienced practitioners, are supplied from the genera *Rosmarinus* and *Thymus.* Though *Eucalyptus* and *Melaleuca* are overlooked in this section, they are detailed in the materia medica. Hybrids and species of *Lavandula* are covered for their useful differences and specific applications. The botanical



families of various aromatic plants and their summarized and generalized actions are not this thoroughly covered in other aromatherapy books. Len is well versed in—and does a thorough job educating the reader on—aromatic chemistry and quality of essential oils.

The authors' vast experience as educators is reflected in this edition, which is well organized and allows one to find specific information easily. Compared with the previous edition, expanded areas include 24 additional essential oil profiles, bringing the total materia medica of individual oils to 101. New research and updated references provide the latest scientific research applicable to this healing modality. The chapters on carrier oils and hydrolats incorporate new information that is likely expanded from their 2 previous and separate books. New illustrations, easy-to-read charts, and an updated index including indications and properties make this a useful reference book, if you are not the type to read cover to cover. The glossary of medical terms is a boon to less medically inclined practitioners wishing to expand their understanding of the remedial uses of essential oils. I especially appreciate the tables that outline specific essential oils and their application to specific bacteria, viruses, and fungi, as well as the countless charts specific to conditions.

The section on safety of essential oils is thorough, reflecting the Prices' awareness and consideration that this issue is of utmost importance. The updated discussions for expanding safety awareness for the practitioner and client make this a useful read for anyone providing or receiving aromatherapy services. The weaving of current science while remaining focused on healing outcomes is skillfully done.

The book is replete with case studies, showcasing the extensive personal experience of the authors. It is understandably focused on the context of the UK medical system, where essential oil use is accepted and sought after by the lay-public and well established in hospitals. There are contributed writings and case studies from nurses and midwives sharing their experiences of using essential oils in a hospital or clinical setting—something less accepted and rarely allowed in the United States, with few exceptions. It is interesting to read of the policies and practices allowed in other countries for essential oil use in modern healthcare. Perhaps books for professionals such as this one will sway our medical model into seeing the benefits of incorporating essential oils into complementary care here in America, especially regarding the huge wave of rampant bacteria to which one is most likely to be exposed in hospitals. With over 500 bibliographic citations, I highly recommend it as a thorough read and a great reference book.

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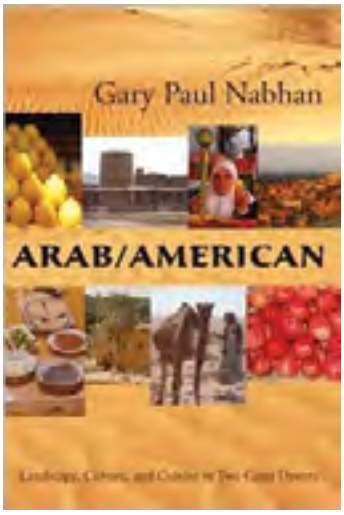
Arab/American: Landscape, Culture, and Cuisine in Two Great Deserts by Gary P. Nabhan. Tucson, AZ: University of Arizona Press; 2008. Paperback. ISBN 978-0-8165-2659-8. $17.95.

As its title implies, this book is a comparative journey in 2 desert lands: the Arizona Sonoran desert and the Middle Eastern deserts of North Africa and the Arabian peninsula. The author continues his trek to unveil more of his ancestral heritage and how it is linked to his present home in Arizona. The journey spans 9 chapters, each with its own theme and topic. Topics include people, plants, animals, and food, as well as socio-political, historical, and to a certain extent, philosophical views of the author about life and human relationships. The book ends with a reference section for each chapter followed by source credits and the author's biography. It also contains a set of black-and-white pictures from different locations mentioned in the book.

The first chapter provides the reader with a historical background about the importing of camels from the Middle East before the American Civil War and how people attempted to use them in transportation. Camels were eventually released in the Sonoran desert, where they were gradually hunted by the locals until they completely disappeared from the area around the mid-1950s. The chapter also chronicles the journey of the first Arabian immigrants who were initially hired by the US army as camel drovers and who finally settled in the United States to pursue their own interests. Chapter 2 describes the strong influence of Arabian cuisine and culinary spices on some of the ethnic foods popular in the Southwestern United States and Mexico. Chapter 3 further explores the Arabian influence by citing various words in the spoken language of the Sonoran desert population that have common roots in Arabic language. In chapter 4, the author moves to North Africa to recount his experience in the Siwa Oasis located in the Western desert of Egypt, close to the border with Libya. In this chapter, the author describes his interaction with the local Berber-descendant people, their habits and habitat, as well as their foods and economic crops. In the following chapter, Nabhan elaborates on 3 species belonging to the genus *Zizyphus*, one of the plants common to both Middle Eastern and North American deserts. He uses this relationship to illustrate the concept known as the "Geography of Nowhere": how the similarities in plant populations make all places on Earth look alike. In the course of the chapter, he also lists at least 50 plants that are common to the North African and North American deserts, such as wild watermelon (*Citrullus lanatus*, Cucurbitaceae), jimson weed (*Datura stramonium*, Solanaceae), milk thistle (*Silybum marianum*, Asteraceae), and many others.

Chapters 6 and 7 comprise part two of the book, which explores the author's family histories in the Middle East and the United States. In these 2 chapters, he tells the story of the old Arabian tribes, the Nabhanis, from which his family name is derived. He also talks about his visits to Lebanon and Mexico, where his contemporary relatives now reside. Thyme (*Thymus vulgaris*, Lamiaceae) was brought in focus as an essential herbal ingredient in many of the ethnic foods shared by modern Arab Americans. Another common plant mentioned in chapter 6 is prickly pear



(*Opuntia ficus-indica*, Cactaceae) growing in the Sonoran Desert, and its wild type *O. humifusa*, grown by the Nabhanis in old times. The regional and global effects of the Gulf War were also discussed at the end of part two. The final part of the book, included in chapters 8 and 9, summarizes many of Nabhan's opinions and impressions about human aggressive behavior through incidents that he experienced during his travels. More discussion is included in chapter 9 about the significance and implications of human immigration and displacement.

This book is not only about an Arab American trying to explore his mixed heritage in time and space; it is a compilation of genuine stories about special people and their special places. The described locations, populations, foods, and plants have an authentic and exotic quality that should captivate the reader from start to end. As such, the book achieves its goals and may thus appeal most to those interested in travel, ethnic history, and exotic fauna, flora, and foods. The author's philosophical views often encountered through the book may also be of interest to readers with similar inclinations. The style of the book and its content, however, are more suitable for the general reader than for the professional/academian seeking an in-depth reference text. Overall, *Arab/American* is a delicious light meal with a unique flavor that stays with the reader long after the meal is over.

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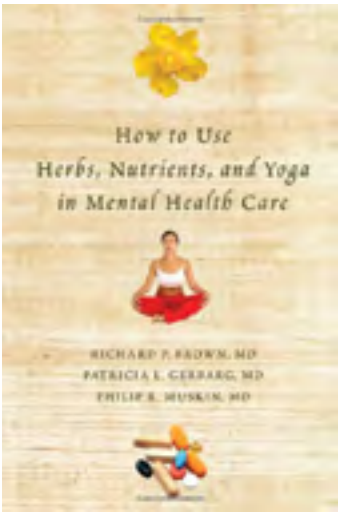
How to Use Herbs, Nutrients, and Yoga in Mental Health Care by Richard P. Brown, Patricia L. Gerbarg, and Philip R. Muskin. New York, NY: W.W. Norton & Co. Inc.; 2009. Hardcover; 441 pages. ISBN: 0393705250. $34.95. Available in ABC's online store.

Richard Brown is a psychiatrist and psychopharmacologist at Columbia who specializes in integrative therapies. His wife Pat Gerbarg is also a psychiatrist who employs herbs and other integrative modalities in her practice. Among their other books is *The Rhodiola Revolution: Transform Your Health with the Herbal Breakthrough of the 21st Century* (Rodale Books, 2005), and they have also written a good deal about S-adenosylmethionine (SAMe) and depression. In addition, Drs. Brown and Gerbarg have considerable experience in mind-body medicine. This is apparent in the reviewed book, which explores the subject as it relates to mental health. Dr. Philip Muskin is a geriatric psychiatrist at Columbia and is chair of the American Psychiatric Association's Council on Psychosomatic Medicine. Thus, these individuals are well qualified to discuss the subject at hand.

This book is a useful source of information for both mental health consumers and professionals and has received high praise from both. Chapters include the following: principles of integrative mental healthcare, mood disorders, anxiety disorders, disorders of cognition and memory, attention-deficit disorder (ADD) and learning disabilities, sexual enhancement and other life stage issues, schizophrenia and other psychotic disorders, medical illnesses, substance abuse, and the use of complementary and alternative medicine (CAM) to counteract medication side effects. The last chapter is a favorite of mine, since it provides an alternative for the often irrational use of more medications to treat medication side effects.

The chapter on mood disorders considers the usual suspects for biologically based treatments including SAMe, St. John's wort (*Hypericum perforatum*, Clusiaceae), rhodiola (*Rhodiola rosea*, Clusiaceae), vitamins, nutrients (such as inositol, 5-HTP [5-hydroxytryptamine], omega-3 fatty acids, N-acetylcysteine), and hormones like dehydroepiandrosterone (DHEA) as well as non-biologic, mind-body practices. The discussions of SAMe and rhodiola are predictably strong, since the authors have published on these agents in the past. Some issues regarding St. John's wort need some minor additions, however. The Shelton et al (2001) study referred to in the text was actually sponsored by Pfizer and was an out-patient study, rather than in-patient. The authors correctly noted some of the weaknesses of the study but did not mention that St. John's wort beat placebo on the number of patients who attained remission. Another weakness in this and a later National Institutes of Health study is the fact that the patient population was



chronically ill. The duration of the current depressive episode in the Shelton study was 2.3–2.7 years! Experience suggests that these are not the kind of patients you want in a depression trial (unless you *want* the outcome to be negative).

The authors include a very nice review of omega-3 fatty acids and provide some additional nuggets of their own, such as the importance of using a mixture of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) and occasionally going to quite high doses (8-10 g/day). I have found that EPA by itself may induce mania in individuals with bipolar disorder while pure DHA may induce depression, something I've never seen in print. One typo is apparent in the Keck et al study, which used 6 g/day rather than 6 mg/day. Also, the prescription version of omega-3 changed names from Omacor to Lovaza in 2007. In the section on 5-HTP, levodopa is mentioned as a decarboxylase inhibitor. It should have been carbidopa.

The herb and nutrients section in the anxiety disorders chapter is much shorter than in the previous chapter (lots of mind-body and life-styles considerations are found here). Most of the "supplement" section deals with adaptogens and the standard herbs historically used for their mild sedative effects. The St. John's wort product referred to from Nature's Way (Perika®) is actually the German extract WS® 5570 from Schwabe. Also mentioned in a subsection on gamma-aminobutyric acid (GABA) is an anticonvulsant pharmaceutical called pregabalin. Unlike the name implies, it does not appear to work through GABA and does not have the kind of safety/toxicity profile that would be desirable for the

treatment of anxiety disorders.

The chapter on cognitive and memory disorders mostly contains information about supplements. There's a long section on the use of adaptogens, including *Rhodiola rosea*, both in research and clinically. There's a nice introductory summary of how brain functions such as membrane integrity may be involved, as well as some useful summary tables at the end of this chapter.

The chapter on ADD and learning disabilities includes sections on dietary supplements, cognitive activators (mostly herbals; many were covered in the previous chapter), biofeedback, and mind-body treatments.

Chapter 6 deals with life stage issues for women and separate sections for sexual enhancement in women and in men. This chapter is packed with useful and practical information and is complete with informative summary tables at the end. It covers all the things one might expect to see and some that you might not. All in all, it's quite comprehensive.

The chapter on schizophrenia and other psychotic disorders covers mostly nutritional support to help reduce the effects of medication rather than treatments in and of themselves. As such this is extremely useful information as most people don't really think in terms of supplements that may be supportive of conventional treatments, rather than as a replacement. Examples are given of ways to reverse some of the

New Book Profiles

Annual Plant Reviews, vol. 33: Intracellular Signaling in Plants. Zhenbiao Yang (ed). West Sussex, United Kingdom: Wiley-Blackwell; 2008. 430 pages, hardcover, index. ISBN 1460-1494. $224.99.

This is the new addition to the increasingly popular and respected *Annual Plant Reviews*, a series for researchers and postgraduates in the plant sciences. This important volume focuses on major known signaling mechanisms and various representative intracellular signaling networks in plants. Leading experts in the field contribute their insights and reviews. Color diagrams of signaling pathways and other illustrations complement the subject matter.

Food Energetics: The Spiritual, Emotional, and Nutritional Power of What We Eat. Steve Gagné. Rochester, NY: Healing Arts Press; 2008. 562 pages, softcover, index. ISBN 978-159477242-9. $24.95.

This book presents the wisdom of food energetics to revitalize our connection to food and remedy our physical and psychic imbalances. Also provided is a comprehensive catalog of foods and their corresponding energetic properties as well as explanations of the spiritual effects of each food. The author aims to show how one can create truly healthy cuisine that nourishes the body and the soul.

Dietary Supplements: Pocket Companion. Pamela Mason. London, United Kingdom: Pharmaceutical Press; 2008. 278 pages, softcover, appendices, index. ISBN 978-0-85369-761-9. $39.95.

With 88 monographs on specific food supplement ingredients in tabular format, this conveniently small reference is designed to provide busy healthcare professionals with quick information on the safety and efficacy of dietary supplements. Included are indices on the guidance of safe upper levels of vitamins and minerals as well as drug and supplement interactions.

Garden Witch's Herbal: Green Magick, Herbalism, and Spirituality. Ellen Dugan. Woodbury, MN: Llewellyn Publications; 2009. 298 pages, softcover, glossary, bibliography, index. ISBN 978-0-7387-1429-5. $19.95.

From common herbs and flowers to enchanted shrubs and trees, Dugan reveals the secret splendors of the plant kingdom and shares ideas for incorporating one's garden into spellwork, sabbat celebrations, and more. The book features nearly 60 herbal illustrations to inspire and guide readers to connect with the earth.

Chia: Rediscovering a Forgotten Crop of the Aztecs. Ricardo Ayerza Jr. and Wayne Coates. Tucson, AZ: The University of Arizona Press; 2005. 197 pages, softcover, references, index, tables. ISBN 978-0-8165-2488-4. $16.95.

Chia, one of the 4 main Aztec crops at the time of Columbus' arrival in the New World, offers the highest omega-3 fatty acid content available from plants. It is also, among other things, a valuable source of energy. In this book, an agronomist and an agricultural engineer compare fatty acid profiles of chia with other major omega-3 sources and provide evidence of chia's superiority. Tables, charts, and photos complement the information.

Aromatherapy: A Complete Guide to the Healing Art, 2nd ed. Kathi Keville and Mindy Green. Berkeley, CA: Crossing Press; 2009. 245 pages, softcover, charts, appendix on botanical names of herbs, bibliography, useful resources, index. ISBN 978-1-58091-189-4. $19.95. Available in ABC's online store.

This revised edition is expanded to include the history and theory of aromatherapy as well as new sections on Ayurvedic aromatherapy, environmental sustainability, and massage therapy techniques. Providing over 100 formulas for first-aid treatments, medicinals, aphrodisiacs, skin and hair care, and massage oils, this new edition includes instructions for extracting and blending essential oils at home, updated herbal listings, and resources for making one's own formulations.

A Patient's Guide to Chinese Medicine: Dr. Shen's Handbook of Herbs and Acupuncture. Joel Harvey Schreck. Point Richmond, CA: Bay Tree Publishing; 2008. 256 pages, softcover, glossary, index, appendices, useful resources. ISBN 978-0-9801758-0-6. $18.95.

This book provides an explanation of ancient Chinese medical theory and practice, with an emphasis on traditional Chinese herbal therapy. It also includes recommended treatments for more than 40 common ailments including acne, allergies, weight gain, and yeast infections. Detailed information on herbal properties, preparation, dosage, and effectiveness of traditional Chinese herbs is also provided. Also featured are a Chinese herb list and pronunciation guide, appendices listing the functions, correspondences, and characteristics of the body

cognitive and metabolic side effects from prescription medications.

Supportive treatments during medical illnesses is another practical chapter, which includes information on cancer, cardiovascular disease, chronic fatigue, human immunodeficiency virus (HIV), and irritable bowel syndrome. Chapter 9 deals with substance abuse and mind-body practices as well as herbs and nutrients. Lastly, Chapter 10 deals with the very important (and seldom discussed in detail) use of CAM to counteract the most commonly experienced side effects from a variety of medications. I'm less enthusiastic about the inclusion of information on off-label use of prescription drugs for treating side-effects. I believe that this is what we need to get away from—not explore.

Finally, there is a table in the appendix listing quality herbal and other products with names, prices, and web links.

In summary, this is an excellent reference on the subject that will appeal to CAM consumers and practitioners as well as conventional physicians. All will find a thoughtful review of practical guidelines for the application of CAM treatments for neurology and psychiatry. I give it a thumbs up!

—Jerry Cott, PhD
Pharmacologist
Silver Spring, MD

organs, and processing and purity of Chinese herbs.

Herbal Constituents: Foundations of Phytochemistry. Lisa Ganora. Louisville, CO: Herbalchem Press; 2009. 214 pages, softcover, glossary, index, references. ISBN 978-0-615-27386-0. $40.00.

In this book one will find an exploration of the concept of phytochemistry through the examination of chemical properties, solubility, and extraction of herbal constituents. Synergy and variability in herbs and formulas are also considered. Chemical structures and tables are provided for better understanding.

The Tropical Vegan Kitchen: Meat-free, Egg-free, Dairy-free Dishes From the Tropics. Donna Klein. New York, NY: Penguin Group; 2009. 178 pages, softcover, index, metric conversion chart. ISBN 978-1-55788-544-9. $18.96.

This is a culinary tour of exotic destinations around the world through easy instructions on preparing delicious meat-free, egg-free, and dairy-free dishes with ingredients readily available at any supermarket. Included is a collection of over 225 recipes complete with hints and tips for easy preparation, explanations and definitions of terms and ingredients, and nutritional analyses.

The Scientific Basis of Chinese Integrative Cancer Therapy: A Color Atlas of Chinese Anticancer Plants. Bruce W. Halstead and Terri L. Holcomb-Halstead. Berkeley, CA: North Atlantic Books; 2002. 386 pages, hardcover, index, references. ISBN 1-55643-585-1. $85.00.

Examining the ancient traditional Chinese concepts of cancer therapeutics, this book presents findings on the remarkable Tien Hsien herbal products used in Asia to treat cancer. It also explores the scientific and historical basis of Traditional Chinese Medicine (TCM) and its application in cancer treatment. A beautiful color atlas illustrates various Chinese anticancer plants, while providing scientific information on the phytochemistry and pharmacology of each plant.

Herbal Medicine: From the Heart of the Earth, 2nd ed. Sharol Marie Tilgner. Pleasant Hill, OR: Wise Acres LLC; 2009. 439 pages, softcover, references, index, appendices. ISBN 978-1-881517-03-0. $29.95.

Comprehensive information like harvesting, storage, and preparation of herbal products and formulas is included in this book. Also included is detailed information on 192 medicinal herbs with dosage, active constituents, and contraindications. Herbal compound formulas are organized by body systems. Dictionaries of herbal properties, actions, and preparations are provided for better understanding.

Complementary and Alternative Medicine, 2nd ed. Steven B. Kayne. London, United Kingdom: Pharmaceutical Press; 2009. 619 pages, softcover, index, references. ISBN-13: 978-0-85369-763-3. $65.00.

Beginning with a practical introduction, this reference provides the most commonly used complementary medicines and therapies. Covering theory, practicality, safety and current scientific thinking, this edition has been updated and expanded to include new chapters covering integrative medicine, pharmacovigilance, and complementary and alternative medicine in the United States.

The Magic Teaspoon: Transform Your Meals with the Power of Healing Herbs and Spices. Victoria Zak. New York, NY: Penguin Group Inc.; 2006. 292 pages, softcover, bibliography. ISBN 0-425-20983-0. $13.00.

With 100 delicious recipes for health-boosting meals and snacks, this book promotes the use of everyday herbs and spices in cooking. Among its features are vegetable profiles, the "All-Naturals" chart that reveals best herbs and spices for specific health issues, and the creation of healing teas and energizing herbal purees.

Chinese Herbal Formulas and Applications: Pharmacological Effects and Clinical Research. John K. Chen and Tina T. Chen. City of Industry, CA: Art of Medicine Press; 2009. 1622 pages, hardcover, index, references, appendices. ISBN 978-0-9740635-7-7. $139.95

This companion volume to *Chinese Medical Herbology and Pharmacology* by the same authors aims to be a resource for general clinical practice while highlighting the pharmacological and integrative significance of Chinese herbal medicine. In this volume one will find an explanation of the pharmacology, clinical studies, and published research of Chinese herbal medicinal formulas and concurrent uses of Chinese herbal formulas and pharmaceuticals. Also in this volume are detailed traditional and modern uses, preparation, administration, dosages, combinations, cautions, contraindications, and toxicology of herbal medicine. Appendices on herbal medicine for pregnancy, postpartum care, etc. are included.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Madalene Hill
1913-2009

Madalene Hill, considered by many to be the Grande Dame of herbs in the United States, passed away on March 5, 2009, at the age of 95.[1]

"Madalene Hill was a leader in herb growing in North America and a pioneer in growing herbs in the Deep South," said Arthur Tucker, PhD, an expert on herbs and aromatic plants at Delaware State University (e-mail, March 9, 2009). "She was innovative in her use of herbs in a restaurant/greenhouse/nursery business, probably the first of its concept in the US."

Hill was born in Rock Island, Texas on November 7, 1913. In 1957, Hill and her late husband Jim created Hilltop Herb Farm near Cleveland, Texas, where she worked with herbs for 30 years.[2] What was originally a retirement plan for the Hills became a successful business venture, where eventually 25 staff members were involved in tending gardens, harvesting herbs, creating herbal products, mailing herbal goods to customers, and creating herbal food for the famous Hilltop Restaurant.[3] In 1983 a tornado destroyed the original structure in Cleveland, but Hill and her daughter Gwen Barclay rebuilt and continued the business until 1987. At that time, Chain-O-Lakes Resort & Conference Center purchased the Hilltop Herb Farm Restaurant, as well as all of its herbs and famous recipes.

"She was a stalwart and devoted herbal 'trooper,' admired and beloved by all who knew her," said ABC Board of Trustee James A. Duke, PhD (e-mail, March 9, 2009).

Dr. Duke is not the only person to describe her this way. Katherine K. Schlosser, editor of the *Herb Society of America's Essential Guide to Growing and Cooking with Herbs* (Louisiana State University Press, 2007) decided in 2001 that someone needed to record the life of this extraordinary woman, who persevered even after her house burned down in 1982 and the tornado ripped apart Hilltop Herb Farm in 1983.

"She was a trooper, rarely letting things get her down," said Schlosser (oral communication March 11, 2009). Schlosser is currently writing a biography about Hill that she hopes to name *Promise Kept*, a phrase she feels denotes Hill. "There was so much depth to Madalene," Schlosser continued. "People recognized her contributions to the herbal world, but I'm not sure they were aware of the range of her interests and abilities. She aspired to excellence herself, and encouraged others to look beyond cooking, crafting ,and gardening with herbs and to research and study their history, uses, and potential."

Hill discovered or otherwise introduced 7 herbs.[2] Two herbs are named after her: Madalene Hill doublemint (*Mentha* x *gracilis* cv 'Madalene Hill,' Lamiaceace) and Madalene Hill rosemary (*Rosmarinus officinalis* L. 'Madalene Hill,' syn. 'Hill Hardy,' Lamiaceae).

According to Dr. Tucker, Hill originally called the mint she found in the now-defunct Plantation Gardens in Rustburg, Virginia, *redstem applemint*. "The mint violates the so-called 'Reitsema Rule,' which says that 2-oxygenated and 3-oxygenated monoterpenes cannot be in the same plant because they belong to different, alternative pathways," said Tucker. "'Madalene Hill' (which I named from her cultivated material) has a genetic breakdown because of a high chromosome number of 2n=96, and it combines both spearmint and peppermint odors in the same plant—a true doublemint."

According to the *Houston Chronicle*, Hill found "Arp" rosemary, on a snowy January in Arp, Texas.[1] She also had the Knot Garden at the National Arboretum in Washington, DC dedicated to her in the 1980s by Houston benefactors Maurice and Susan McAshan.

"She had the most incredible memory for plants and people: their names, where she met them, the best things about them," said Gayle Engels, ABC's special projects director. "She was very generous—one of those people who seemed to think that if she had two of any plant, she should give you one. She contributed many of the plants found in the American Botanical Council gardens."

Hill was previously (since 1993) the curator of the Susan Clayton McAshan Herb Gardens at the International Festival-Institute in Round Top, Texas. This famous herb garden contains botanical collections from around the world and is part of an international music institute.[4]

"Madalene was always an inspiration to me and to all who came into her life. She graciously prodded us to learn about herbs

"She was very generous—one of those people who seemed to think that if she had two of any plant, she should give you one. She contributed many of the plants found in the American Botanical Council gardens."

Madalene Hill in her garden. Photo ©2009 Madalene Hill

and other plants and make them a daily part of our lives," said Henry Flowers, director of McAshan Gardens (e-mail, March 11, 2009). "She appreciated every aspect of the herbs that filled her life—their culinary attributes, medicinal uses, historical significance, exhilarating aromas, and, perhaps above all, their subtle beauty. Most importantly, I think, she wanted us to keep our eyes open to learn, to investigate, and to marvel at the many wonders of our world—something she surely did all of her life."

Hill was also a founding member of the Pioneer unit and the South Texas unit of the Herb Society of America (HSA), of which she was president from 1986–1988 and a member for over 50 years.

"She was an entrepreneur, an author, a teacher, a plantswoman, and a gardener," said Lois Sutton, PhD, HSA president (e-mail, March 5, 2009). "She will be sorely missed by The Society and personally by all of us who were fortunate enough to have been her students."

According to Rexford Talbert, HSA member for over 40 years and a co-founder of the South Texas Unit, Hill remained a humble person, despite the overwhelming adoration she received from others (oral communication, March 11, 2009). "Madalene was very humane and was never condescending toward anyone," said Talbert.

Former President of HSA Sue Trevarrow compared Hill's passing to "a library being lost." This is appropriate considering that Hill was well-read in both scientific and popular literature and wrote several scholarly articles about herbs. She also received numerous awards including: the Helen De Conway Medal of Honor (1978), the Nancy Putnam Howard Award for Excellence in Horticulture (1997), and the Gertrude B. Foster Award for Excellence in Herbal Literature (2005), the latter shared with her daughter Gwen Barclay.[2] She co-authored the famous *Southern Herb Growing* (Shearer Publishing, 1987) with Barclay and Jean Hardy. In 2006, Hill was awarded the Catherine H. Sweeney Award for extraordinary and dedicated efforts in the field of horticulture by the American Horticulture Society.

"Madelene was a remarkable person, a most gracious woman, and a never-ending fount of herbal knowledge," said ABC Founder and Executive Director Mark Blumenthal. "Truly one of my herbal heroes, she was one of my favorite people in the entire herb community. Known and admired internationally, there is no one like her. If she were an athlete, we would have to retire her number."

Hill is survived by her daughter, sister, 6 grandchildren, 7 great grandchildren, and 3 great-great grandchildren.[1] HG

—Kelly Saxton Lindner

References

1. Huber K. Madalene Hill 1913–2009. *Houston Chronicle*. March 5, 2009:2.
2. Donalson D. Madalene Hill receives AHS Award. *HerbalGram*. 2007;73:13.
3. Hilltop Restaurant History page. Artesian Lakes Web site. Available at: http://www.artesianlakes.com/HILLTOPBRRESTAURANT/History/tabid/78/Default.aspx. Accessed March 6, 2009.
4. The Gardens page. The International Festival Institute Web site. Available at: http://festivalhill.org/index.php?module=pagemaster&PAGE_user_op=view_page&PAGE_id=13&MMN_position=29:4. Accessed March 6, 2009.

Norman Krinsky 1928-2008

Norman Krinsky, PhD, known as the father of modern carotenoid research and admired for his kindness and sense of humor, died November 28, 2008, at the age of 80 from complications related to leukemia.[1]

Born in Michigan and raised in Chicago, Dr. Krinsky earned his bachelor's and master's degrees in science, followed by a doctorate in biochemistry, from the University of Southern California. Beginning in the 1950s, he blazed a trail in the scientific research of carotenoids, which are naturally-occurring pigments essential for plant growth and photosynthesis and are a main dietary source of vitamin A in humans.[2]

Dr. Krinsky's contributions set significant and lasting precedents and led to many advances in biochemistry, cell biology, and animal and human nutrition.[3] His work includes research on the action of carotenoids as vitamin A precursors, beta-carotene, and lycopene, as well as the demonstration of carotenoids' role in nutrition and as antioxidants.

"He really laid the foundation for carotenoid research by providing an understanding of how they are absorbed and metabolized and act as antioxidants," said Jeffrey Blumberg, PhD, director of the Antioxidants Research Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging and a professor at Tufts University (oral communication, January 9, 2009).

Dr. Krinsky was a professor emeritus of biochemistry at Tufts University School of Medicine, where he taught in the pharmacology and biochemistry departments for 40 years.[4] It was here that Dr. Blumberg met him when their respective interests in antioxidants and carotenoids brought the two together almost 30 years ago.

"[It was] an honor and a privilege to be collaborating with one of the best minds and nicest people in the field of antioxidant nutrition. It was always interesting to note that no matter how busy or noisy or chaotic the lab meeting or the seminar or the conference or the workshop, when Norman slightly raised his hand or quietly nodded his head to make a comment, everyone stopped to pay attention and listen to what he said," said Dr. Blumberg (e-mail, January 6, 2009).

One of Dr. Krinsky's numerous important pieces of work, according to Dr. Blumberg, was a study that determined why beta-carotene supplements were found in 2 large clinical trials to increase the incidence of lung cancer (oral communication, January 9, 2009). Dr. Krinsky and fellow researchers found that in heavy lifelong smokers, beta-carotene was metabolized differently than in healthy people, changing it from a health-promoting agent to a potentially toxic one.

"Though Norman's research focused on the molecular and biochemical mechanisms of carotenoid actions within the cell, his efforts fundamentally enhanced our understanding of how these phytonutrients can promote health and reduce the risk of chronic disease," said Dr. Blumberg.

In another of his many significant achievements, Dr. Krinsky and fellow researchers discovered that the ratio of beta-carotene to vitamin A molecules differed depending on the food source.[1] This showed that different foods had differing bio-availabilities of nutrients, i.e., the extent to which a substance is absorbed by a specific tissue. These findings influenced the World Health Organization's recommended daily allowance of antioxidants for consumption. It also helped mold strategies for improving vitamin deficiencies in third world countries.

According to Rob Russell, MD, professor emeritus at the Friedman School of Nutrition Science and Policy of Tufts University, the global impact of Dr. Krinsky's work shows that he will not only leave a legacy at Tufts, where he spent almost his whole career, but he will also continue to be remembered and respected worldwide (oral communication, January 9, 2009).

Though Dr. Krinsky was very well known for his massive contributions to the area of carotenoid research, he is equally remembered for his personality.

"Norman occupied a special place in the minds and hearts of his colleagues: it is impossible to find anyone who knew him that did not love and admire him," wrote Lester Packer in Dr. Krinsky's obituary for The Oxygen Club of California.[3]

Dr. Russell, who knew Dr. Krinsky for about 27 years and worked with him in a lab group, said he was a very pleasant person with whom to collaborate.

"He was an extremely kind person who always had a great sense of humor and a real twinkle in his eye all the time," said Dr. Russell.

The two friends spent time together outside of the professional realm, going to movies and concerts. Dr. Krinsky loved the composer Gustav Mahler, Russell said, and often traveled to other cities just to hear his pieces played.

Elizabeth Johnson, PhD, a research scientist and assistant professor at Tufts, recalled the day she met Dr. Krinsky about 20 years ago (oral communication, January 13, 2009). Then a recent college graduate, Johnson didn't know what to expect.

"To me he was like a god, you know," she said. "He was like 'Dr. Carotenoid.'"

After walking into his office and calling him Dr. Krinsky, he immediately told her to call him Norman. This, she said, exemplifies how Dr. Krinsky treated others with kindness and put people at ease by eliminating any intimidation factor.

Dr. Krinsky's interest in interpersonal connection lasted into the final months of his life. Unlike many people facing death, he could talk freely with others about his situation.

"What impressed me greatly is that when he had this bad diagnosis, he never flinched," said Dr. Russell. "He faced it. He joined

support groups [for people] with the same disease. He faced dying with an enormous amount of courage."

Dr. Krinsky is survived by Susan, his wife of 48 years, his daughter Lisa, his son Adam, and 2 grandchildren.[3] HG

—Lindsay Stafford

References

1. Brett R. Norman Krinsky; helped redefine diet guidelines across globe. *The Boston Globe*. December 10, 2008.
2. Carotenoids. International Carotenoid Society Web site. Available at: http://www.carotenoidsociety.org/carotenoids/fcarotenoids.html. Accessed January 14, 2009.
3. Norman I. Krinsky. Oxygen Club of California Web site. Available at: http://www.oxyclubcalifornia.org/occ_news.cfm. Accessed January 27, 2009.
4. FDA Food Advisory Committee Memberships, Curriculum Vitae, Norman I. Krinsky, PhD. US Food and Drug Administration Web site. Available at: http://www.cfsan.fda.gov/~dms/facvkrin.html. Accessed January 27, 2009.

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Nina Etkin 1948-2009

Nina Etkin, PhD, a leader in ethnobotany and ethnopharmacology, and the co-recipient of the 2009 Distinguished Economic Botanist Award, died due to breast cancer on January 26, 2009.[1]

The Distinguished Economic Botanist Award is given annually by the Society of Economic Botany (SEB) for outstanding accomplishments in research. Dr. Etkin had written many scholarly articles for a wide array of publications, including the *Journal of Ethnopharmacology* and *Economic Botany*, and she was so routinely prolific that at the time of her death she had 8 articles in press. In her publications and books, she explored human interactions with foods, medicines, and chemical ecology. Often referred to as a "medical anthropologist," her book *Edible Medicines: An Ethnopharmacology of Food* (University of Arizona Press, 2006) studies the physiological effects of food across different cultures, including the past and current state of medicine, food, nutrition, and human evolution.[2]

"Nina Etkin was an excellent scientist, critical thinker, and effective leader in our field," said Michael Balick, PhD, director of the New York Botanical Garden's Institute of Economic Botany (e-mail, February 4, 2009). "Her books are major contributions to ethnobiology, and her research has helped us achieve a much greater understanding of the relationship between plants and people at so many levels."

Dr. Etkin was born in New York City in 1948. In 1975 she received her PhD in anthropology from Washington University in St. Louis, Missouri.[1] She taught at the University of Minnesota for 11 years, beginning in 1979, before joining the University of Hawaii at Mānoa in 1990. She taught at that university for 19 years, serving as a professor and the graduate chair for the Department of Anthropology, as well as a professor of Ecology in the Health Group of the UH School of Medicine.[2] For Dr. Etkin, teaching was as valuable as conducting research and attracting grants.

"Nina's greatest accomplishment, in my opinion, is the legacy of her wonderful students," said William McClatchey, PhD, ethnobotanist and professor at the University of Hawaii at Mānoa (e-mail, January 29, 2009). "She genuinely loved her students, and when they worked hard, she would defend them and their work like a mama bear."

And her generosity wasn't just limited to students. According to Paul Cox, PhD, ethnobotanist and executive director for the Institute of Ethnomedicine, Dr. Etkin would often enclose a few bougainvillaea (*Bougainvillea spectabilis*, Nyctaginaceae) blossoms in letters to friends and colleagues to help share the spirit of Hawaii (e-mail, January 29, 2009). She even took the time to mentor colleagues in other disciplines: "In my case a wayward botanist who attempted to say something now and then about anthropology," added Dr. McClatchey.

"Nina is the class act in ethnobotany," said Daniel Moerman, PhD, past editor-in-chief of *Economic Botany*, the journal of SEB, according to an article in the *Ka Leo O Hawaii*.[1] "No one has been more generous in those behind-the-scenes collegial activities of reading early drafts of manuscripts, encouraging, supporting, and molding."

Dr. Etkin was a Linnean Society Fellow and a recipient of the Hawaii Regents' Medal for Excellence in Research.[1] She also participated in the International Congress of Ethnopharmacology, where she served as a board member and then president. "She told me that she wanted to see more of the *ethno* in ethnopharmacology, and with these positions she brought a strong anthropological basis to the field," said Dr. Cox. "She really helped bring ethnopharmacology into the mainstream of anthropology."

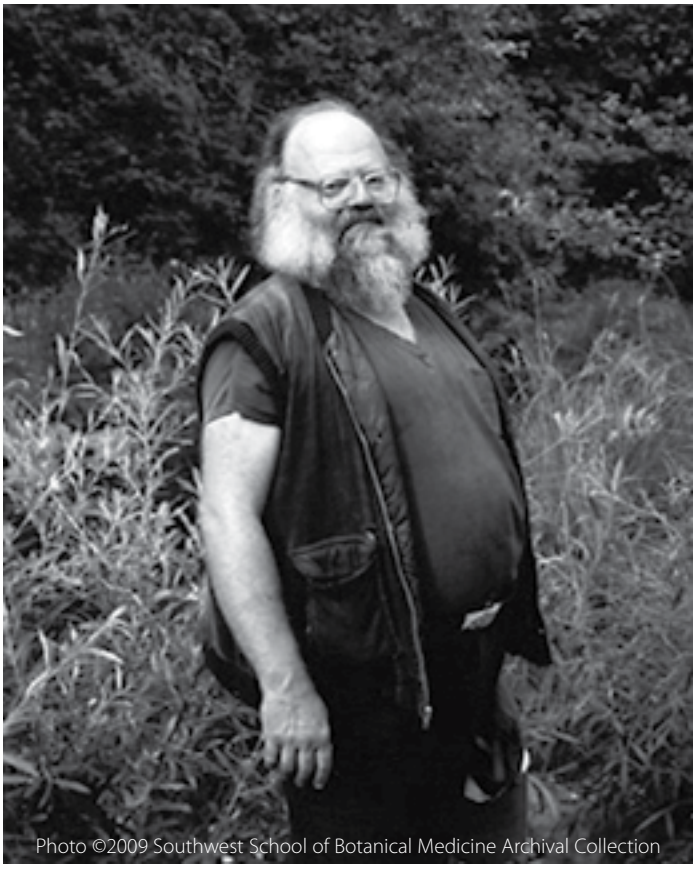
Dr. Etkin is survived by Paul J. Ross, her husband of 35 years. Names of other family members were not disclosed. In lieu of flowers, the family would like donations sent to the American Civil Liberties Union (ACLU).

"We will miss her presence in our midst very much," said Dr. Balick. "But her work will live on through her writing, her students, and the many others she so positively influenced throughout her life." HG

—Kelly Saxton Lindner

References

1. K DeRego. Gone too soon: Late professor receives national honor. *Ka Leo O Hawaii*. January 29, 2009. Available at: http://media.www.kaleo.org/media/storage/paper872/news/2009/01/29/News/Gone-Too.Soon-3603085.shtml. Accessed January 29, 2009.
2. Namkoong. Food, it's good medicine. *Star Bulletin*. January 13, 2007:12(13):1–3.



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Michael Roland Shaw Moore
1941 - 2009

Renowned herbalist Michael Moore lived his life exploring a passionate fascination with medicinal plants of the Southwest. Similar to the cacti, shrubs, and roadside weeds that were his expertise, Moore was rough around the edges but had an inner reservoir of knowledge to share and kindness with which to help others.

Moore, 68, died February 20, 2009, from complications related to kidney disease.[1] Moore made an immeasurable impact as his life's work influenced many in the herbal community. He taught and inspired hundreds of students, many of whom have gone on to bring herbal medicine into a variety of botanical and complementary medicine fields. His research and books have informed thousands and helped many non-mainstream herbs of the Southwest, such as osha (*Ligusticum porteri*, Apiaceae), become better known and appreciated. He also had a talent for music, writing compositions that were performed by the Orchestra of Santa Fe and the University of New Mexico Symphonic Band.[2]

Similar to his herbal intellect, Moore had an unmatchable personality. His endless storytelling, dry sense of humor, political incorrectness, and compassion touched many lives. Since his death, numerous former students, friends, and acquaintances have written tributes in his honor, making the memory of Moore even more palpable.

"[Michael] truly was one of the great herbalists of our time," said noted herbalist and author Rosemary Gladstar (e-mail, March 11, 2009). "He was a fully original character and a brilliant mind who left his indelible mark on most everything herbal and had a most profound influence on American herbalism. His teachings live on through his books, many students, endless work to make resources available, and beautiful music.

"It's hard to comprehend that that big, kind hearted, brilliant character is gone, but his place in the circle will be long honored and his place as 'grandfather' of the herbal community will be held in the circle as long as we all live."

Born in Washington state, Moore grew up in Los Angeles and later studied music at the Los Angeles Conservatory of Music and California Institute of the Arts, where he received his degree in musical composition.[1,2] He became interested in herbs and built up his plant knowledge through many different outlets, recalled Adam Seller, director of the Pacific School of Herbal Medicine, who knew Moore for about 23 years (oral communication, March 4, 2009). For instance, he would read all the medicinal plant entries in the Indicus Medicus and study the writings of the Eclectic physicians.

Moore eventually opened several herb shops in Southern California, but he had difficulty getting people to take what he did seriously.[3] Tired of being stigmatized as a drug pusher, he packed up and moved to the desert.

In Taos, New Mexico, Moore reopened his herb shop in 1970 under the name Herbs, Etc., and moved it to Santa Fe one year later.[1] He continued to read herbal books and journals and further expanded his knowledge by learning from the region's Native American and Latino cultures, as well as people who ran local herb companies, Seller said.

"As Michael Moore sought to learn herbal medicine, he respectfully spoke to everyone. And he listened," Seller said (written communication, December 11, 2008).

Moore went on to write several significant herb books, including *Medicinal Plants of the Mountain West* (1979), *Medicinal Plants of the Desert and Canyon West* (1989), *Los Remedios: Traditional Herbal Remedies of the Southwest* (1990), and *Medicinal Plants of the Pacific West* (1993), all currently published by the Museum of New Mexico Press. He also taught at several herbal schools, co-founded the Institute of Traditional Medicine with Stuart Watts, and founded the Southwest School of Botanical Medicine (SWSBM, www.swsbm.com), which he directed into the last year of his life.

The SWSBM was based on Moore's herbal residency program, which he initiated in the mid-1980s and developed into a 500-hour course by 1991, said Donna Chesner, Moore's wife and partner of many years (oral communication, March 24, 2009). For 2 decades, he trained 25 to 30 people each year and also held summer courses. Moore's classes included large amounts of field and classroom work, as well as a focus on the system of constitutional evaluation based on Western physiology that he created.

Moore brought alive this system of Western energetic herbal medicine and made it incredibly accessible to people who didn't feel drawn to Traditional Chinese Medicine (TCM) or Ayurveda, recalled herbalist and ethnobotanist David Winston (oral communication, March 24, 2009).

"In my mind, Michael is one of the 3 most important figures in the late 20th century renaissance, of not only American herbal medicine, but of constitutional/energetic herbal medicine worldwide," said Winston.

The American Botanical Council's Education Director Holly Ferguson was one of Moore's many students at SWSBM. Two years out of the University of Arkansas, Ferguson found Moore and his classes to be a refreshing change from academia.

"I was absolutely, utterly, and completely amazed by his teaching style," she said.

Describing his approach as "profound and profane," Ferguson said Moore would stand in front of the class and let his stream of consciousness flow for hours, covering a multiplicity of subjects while taking brilliant diversions that all came back to a central point. He had an ability to weave together the physiology of plants within larger historic, political, and social contexts.

Moore taught his students to understand a plant so deeply that you formed a relationship with it, she continued. One of the most meaningful and enduring things that Moore taught her was a genuine love for the less pretty things in nature.

"I started to realize that the desert wasn't barren and the weeds weren't meaningless," she said.

Another member of ABC's family was also impacted by Moore. ABC's Founder and Executive Director Mark Blumenthal met Moore in the early 1970s when he visited Herbs Etc. in Santa Fe. Moore would later become one of Blumenthal's greatest influencers.

"I was struck by his biker-Buddha appearance, and as I got to know him over the years, I saw him manifest traits of both," Blumenthal said. "Michael was a larger-than-life figure in the lives of many people. He became the 'godfather' of the American herbal movement, at least among the hundreds of herbalists he trained."

Photo ©2009 Southwest School of Botanical Medicine Archival Collection

When training and teaching his herbalism students, Moore was a storyteller. Dimid Hayes, who studied herbal medicine with Moore in 1982, recalled that he used these stories as the vehicle for a larger message (oral communication, February 26, 2009).

"You quickly became aware that you were in the presence of a remarkable person," said Hayes, owner of Nova Natural Consultants.

Though Moore's research, writing, and teaching made significant contributions to herbalism, he often went unrecognized by the mainstream herb industry and was known as an herbalist's herbalist, Hayes continued.

"He was this great, crazy genius who didn't care about how he was perceived and didn't care about putting himself out there for mass consumption," Hayes said.

This meant that Moore didn't make a great deal of money from his work. But that didn't bother him much, said Phyllis Hogan, a friend of Moore's for 34 years, owner of Winter Sun Trading Company and co-founder of the Arizona Ethnobotanical Research Association (oral communication, March 9, 2009).

"Michael used to say, 'It's not about the money; it's about being out there with the plants.'"

As Moore stayed away from publicly promoting himself, he also saw it important to not exploit the peoples and knowledge of the Native American and Spanish cultures of the Southwest.[3] Moore learned much from the traditions of these older cultures and worried that this could lead people to pester them for herbs or herb-related information. As a result, he encouraged his students to respect indigenous groups by teaching about their public health needs and political and social histories, Seller said (oral communication, March 4, 2009).

While most remember Moore as a teacher, others also knew him as a practitioner. In this setting, Moore often showed his kinder side by using a great level of carefulness and gentleness, focusing on the tenderness of a client's life, Seller said.

Stuart Watts, an acupuncture specialist in Austin, Texas, recalled Moore often providing services for poor patients at little or no charge in his herb store and at the large health clinic that they mutually ran (oral communication, March 2, 2009). Watts knew Moore as a teacher, business partner, and friend; the two were founders of the former Institute of Traditional Medicine. Watts claimed that knowing and spending time with Moore changed his life, as Moore taught him how to be respectful, humble, and strong in oneself.

Moore's generosity also carried over into his teacher-student relationships, Watts said. Because Moore was committed to education, information, and treatment strategies, he frequently handed out many classic texts, study guides, and handbooks, and later posted this material on his Web site so that students could obtain the material inexpensively or freely.

"He always gave everything he ever had."

Moore's deep understanding of herbs made him stand out from others in the herbal community, Watts continued. Often times they would be driving down the road when Moore would claim he smelled or detected the presence of a specific herb. When they would pull over, Moore would walk about 100 feet away from the road to find the exact herb that he had sensed.

"He was very much one with the plants," Watts said.

While recognizing all of his accomplishments, Moore's down-to-earth personality really made him special, Hogan said. He was an amazing friend who was always dependable and fun, she continued.

Sometimes Moore and Hogan would drive his less-than-reliable Volkswagen van with the windows down, their long hair blowing in the breeze, near the San Francisco Peaks and headed toward the Grand Canyon to pick the roots of Oregon grape (*Mahonia repens,* Berberidaceae). "There won't be a day that goes by that I don't think of him," she said.

"He made such a contribution to my life and to all of his

students. There will never be anybody like Michael Moore."

Though very ill, Moore spent the last 2 years of his life creating a DVD-learning course of his life's teachings, which continue to be offered on the SWSBM Web site.

"The legacy of his lifetime of knowledge and wisdom are the long distance programs," said Chesner. "These programs will continue to offer people who can no longer study with him in person an opportunity to do so in the future."

In addition to his wife, Moore is survived by his daughter Victoria, son Adrian, 5 grandchildren and one great-grandchild.

—Lindsay Stafford

References

1. Sharpe T. Herbs Etc. founder, the 'godfather of American herbalism,' dies at 68. *The Sante Fe New Mexican*. February 24, 2009. Available at: http://www.santafenewmexican.com/SantaFeNorthernNM/Michael-Roland-Shaw-Moore-. Accessed March 2, 2009.
2. Music. Southwest School of Botanical Medicine Web site. Available at: http://www.swsbm.com/Music/MMMusic.html/. Accessed March 9, 2009.
3. Moore M. Medicas y Medicos: A healing tradition in the Southwest – Chapter 6, Part 1. Video available on Youtube at: http://www.youtube.com/watch?v=eBCC1IL_Y6o. Accessed March 9, 2009.

Calendar

May 2–4: World Tea Expo. Las Vegas, NV. Taking place at the Mandalay Bay Convention Center, this gathering is the largest, most important tea event in North America and is an effective tool for growing sales and expanding market share. With thousands of focused and qualified buyers in an efficient, sales-rich environment, the World Tea Expo offers 3 don't-miss days to get ahead of the curve and the competition. The World Tea Expo is the largest trade-only conference in the world that showcases tea and other related products. The goal is to add value to the rapidly growing tea industry by providing a true global marketplace for commerce and education. For more information, visit the Web site at: http://www.worldteaexpo.com/.

May 5–7: Vitafoods International 2009. Geneva, Switzerland. Held at the Palexpo Centre, this event has an international reputation within the nutraceuticals industry as a high-quality conference that covers the hottest topics and themes in the food ingredients sector. The conference attracts some of the leading industry figures who will share their latest findings and discoveries. The 2009 conference will focus on topics such as gut, heart, and mental health, life stage nutrition, weight management, beauty foods and cosmoceuticals, new technologies, and marketing. For more information or to register, please visit the Web site at: http://www.vitafoods.eu.com/.

May 8–10: Medi Herbal Expo 2009. New Delhi, India. Held at the Pragati Maidan, the Medi Herbal Expo is an exposition for all who are concerned with the herbal trade, including farmers, exporters of value-added products, and agro-entrepreneurs. Exhibitors include companies and firms that deal with herbal and medicinal plants, herbal food products and supplements, teas, biotechnology, pesticides, farm management equipment, and more. For more information, please visit the Web site: http://www.biztradeshows.com/trade-events/medi-herbal-expo.html.

May 10–13: 6th Annual Nutrition & Health Conference. Chicago, IL. Titled "Nutrition and Health: State of the Science and Clinical Applications", this conference is the premier nutrition conference for health professionals in the United States. Co-presented by the Arizona Center for Integrative Medicine, the conference assembles internationally-recognized researchers, clinicians, educators, and chefs, whose work focuses on the crossing point between nutrition and healthful living. Attendees will learn about the connection between nutrition, disease, and health, as well as how to better advise patients on nutritional recommendations that can improve their conditions. For more information, or to register, please visit the Web site: http://www.nutritionandhealthconf.org/.

May 12–15: North American Research Conference on Complementary & Integrative Medicine. Minneapolis, MN. This conference showcases original scientific complementary, alternative and integrative medical (CAIM) research through keynote and plenary presentations, oral and poster presentations, and innovative scientific sessions. Areas of CAIM research presented and discussed at this conference will include: basic science research, clinical research, methodological research, health services research, and education research. For more information, please visit the Web site at: http://www.imconsortium-conference.org/.

May 14–15: Stevia World 2009. Shanghai, China. At the Intercontinental Shanghai Pudong Hotel, Stevia World 2009 will showcase who's who of the stevia sector, including top stevia growers, refiners, traders, key organizations, government officials, scientists, and investors. It will highlight upcoming opportunities, pinpoint regulatory challenges, and share market updates. For more information, or to register, please visit the Web site at: www.steviaworldforum.com.

May 16–19: 2009 American Food Fair. Chicago, IL. The 2009 American Food Fair (AFF) is dedicated exclusively to US food products and brings together buyers from 115 countries. The AFF is sponsored by the National Association of State Departments of Agriculture (NASDA) and shares a location with the National Restaurant Association's (NRA) Restaurant Hotel-Motel Show, where nearly 75,000 food service professionals will be present, including 5,000 international representatives. The AFF pavilion will be located at a high-traffic, high-visibility location on the NRA show floor. For more information or to register, please visit the Web site at: http://www.nasdatradeshows.org/.

May 16–17: Chicago Green Festival. Chicago, IL. A joint project of Global Exchange and Co-op America, this festival will showcase more than 350 diverse local and national green businesses. More than 150 speakers will appear for insightful panel discussions and presentations. The festival also provides how-to workshops; green films; a Fair Trade pavilion; yoga classes; kids' activities; organic beer, wine, and cuisine; and live music. Find out how Midwest neighbors, community nonprofits, and city departments are working together to make their cities healthier places to live. For more information or to register, please visit the Web site at: http://www.greenfestivals.org/chicago/.

May 16–17: Healthy Living Expo West. Reno, NV. Businesses that offer products or services relating to health and fitness, natural products, healthy foods, or green living, can exhibit at Healthy Living Expo West. This expo provides an opportunity to meet thousands of buyers in one place during a 2-day show, which is open to the trade and

general public and allows the selling of products directly to consumers. The show can also be an opportunity to demonstrate products and services, give out samples and literature, or make business and consumer contacts. Healthy Living Expo West welcomes all consumers and business owners. Public admission is $5 per person. For more information, please visit the Web site at: http://www.healthylivingexpowest.com/.

May 16–17: The United Plant Savers' Talking Forest Medicine Trail Inauguration and Celebration. Rutland, OH. United Plant Savers (UpS), a nonprofit organization dedicated to the conservation of native medicinal plants, will host this event at its Goldenseal Sanctuary. Highlights include an inauguration ceremony for the trail; guided hikes among some of America's largest remaining stands of ginseng, goldenseal, black cohosh, and other medicinal plants; and classes with some of the country's leading herbalists. The celebration will also offer guided hikes, classes, a marketplace of herbal products, and an evening program. Overnight camping is available. The cost for attendance is $35 for the general public and $20 for UpS members. For more information or to register, contact UpS at (802) 476-6467 or visit the Web site at: http://www.unitedplantsavers.org/.

More calendar listings at
www.HerbalGram.org

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

AltTox.org is an interactive Web site that provides discussion opportunities and information on non-animal toxicity testing. As a partnership between the Procter & Gamble Company (P&G) and The Humane Society of the United States (HSUS), the site aims to protect the health of humans and the environment, and to reduce the number of animals used in toxicology tests. An editorial board of subject experts oversees the Web site to promote its accuracy. The Web site is targeted at industry stakeholders and governmental, academic, and nongovernmental organizations, and promotes the sharing of information on *in vitro* and *in silico* methods of testing. The site has 3 interconnected parts: online forums, an informational resource center, and a commentary section. Forum message boards post news and other information and allow reader feedback on topics such as new technologies and policy. The resource center offers summarized information on toxicity testing and alternative test methods, and the commentary section consists of opinion pieces written by experts in several fields. The Web site can be accessed at www.alttox.org.

NIHSeniorHealth Web site. The National Institutes of Health (NIH) has added information on complementary and alternative medicine (CAM) to its NIHSeniorHealth Web site. Because government surveys show that older adults in the United States frequently use CAM, the site's home page now has CAM as a featured topic so that this demographic group can be well informed. The new addition provides easy-to-understand CAM information, along with advice on how to choose and talk honestly with a CAM practitioner. It also includes information on CAM research that relates to diseases common with older adults, and videos on topics such as meditation and acupuncture are also provided. Created by the National Institute on Aging and the National Library of Medicine, the site is based on cognition and aging research and includes short informational articles available in large-sized type. More information at http://nihseniorhealth.gov/.

The South African Rooibos Council (SARC) has published a 71-page farmers manual, *Biodiversity Best Practice Guidelines for Rooibos Production*. Rooibos (*Aspalathus linearis*), an herb whose leaves are dried and used in tea, is produced only in South Africa, and its production has been identified as one of the main threats to the Greater Cederberg Biodiversity Cooridor, a natural preserve that contains valuable plant life. This handbook informs rooibos farmers on how they can be sure that their production practices are sustainable and cause less loss of biodiversity in the area. The guidelines in the manual aim to add credibility to the efforts of rooibos producers and processors by creating an auditing and certification system. Formed in 2005, the SARC is a nonprofit organization promoting the interests of the South African rooibos industry while aiming to ensure sustainability. The manual can be accessed at http://www.cepf.net/ImageCache/cepf/content/pdfs/rooibosguidelines_2epdf/v2/rooibosguidelines.pdf.

Just an Old Fashioned Herbalist. This feature-length documentary on the late renowned herbalist Michael Moore, made by Jessie Emerson, premiered at the Michael Moore and American Herbalism conference in April 2009. It documents Moore's personality, contributions to the herbal movement, and numerous areas of work as a wildcrafter, trader, shopkeeper, researcher, botanist, clinician, and conservationist. The documentary also details medicinal plants of the Southwest, about which Moore spent his life studying and teaching others. It further includes original and vintage footage of Moore teaching inside and outside of the classroom, as well as interviews with him and his friends and students. As Moore was also a musician, his symphonic compositions are played throughout the film. Thirty percent of all proceeds will be donated to Moore's widow, Donna Chesner. To purchase a DVD of the documentary for $30, contact Emerson at osoherbalsjessie@yahoo.com.

Wildcraft!: An Herbal Adventure Game is now available in a new edition. This board game teaches children and adults (ages 4 and older) about edible and medicinal plants and their first-aid uses. Using a classic board game style, 1 to 4 players are sent to journey up a mountain, collecting herbs and berries for Grandma's pie, and must return before nightfall. Along the way, they learn which plants can be used to treat certain ailments, such as bee stings and hunger pains, and also travel through several different ecosystems in which the plants grow in the real world. The board on which the game is played features water-colored designs and the plant cards include illustrations of each plant and its common name and Latin binomial. As a new edition, the game is now made in the United States and its box and board are made from 100% recycled chipboard. For more information or to purchase the game for $39.95, visit http://www.learningherbs.com/wildcraft.html.

Publications

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

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

HerbalGram: Quarterly journal published by the American Botanical Council. A benefit at all levels of membership in ABC. See page 2 for membership information or join online at www.herbalgram.org. P.O. Box 144345, Austin, TX 78714. 810-373-7105 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 81308.

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