Pelargonium and Acute Bronchitis in Children
Introduction

Cinnamomum verum is a small-to-moderate, bushy, evergreen tree that grows to about 52 feet (16 m) in height with smooth, pinkish bark. Fresh leaf growth, called a flush, begins in the monsoon season (June through September) and varies from green to deep purple. The fragrant flowers are small, pale yellowish-green, and are attractive to insects, particularly bees. Cinnamomum verum is native to Sri Lanka and southern India, from sea level to 2,953 feet (900 m) and is cultivated in Sri Lanka, the coastal regions of India (in the Western Ghats and adjoining hills), parts of Africa (Madagascar and the Seychelles), Indonesia (Java), South America (Brazil), and the West Indies. This species is also cultivated in southeastern China’s Guangdong Province and neighboring Taiwan. Commercial plant material comes primarily from Sri Lanka, India, Malaysia, Madagascar, and the Seychelles.

The main part of the tree used commercially is the dried bark, separated from the cork and underlying parenchyma (primary tissue that forms the greater part of the plant and fills the gaps between more specialized cells) of young branches and semi-hard shoots. For commercial cultivation, the shoots are coppiced (pruned almost level with the ground) to a regular basis to encourage dense, shrubby growth that results in more harvestable plant material.

The International Organization for Standardization (ISO) provides quality specifications for 4 main commercial grades of Sri Lankan type cinnamon known as quills, quillings, featherings, and chips. Within the quills grade alone, there are 13 different commercial designations of distinct qualities. There are also 4 commercial designations for grades of Seychelles type and Madagascan type cinnamon: whole tubes, pieces of scraped bark, pieces of unscraped bark, and chips/flakes of unscraped bark. Processed cinnamon bark products include Ceylon-type cinnamon bark oil (volatile oil obtained by steam distillation of the dried inner bark of the clipped shrub or shoots), liquid extract (ratio of dried bark to extraction solvent 1:1; ethanol 70% V/V), tincture (1:5; ethanol 70% V/V), various aqueous or aqueous-alcoholic dried extracts, and supercritical carbon dioxide (CO2) soft extracts. Cinnamon leaf oil is also used, but to a much lesser extent.

History and Cultural Significance

The species name verum refers to it being the “true” cinnamon. The synonym, or former Latin binomial, C. zeylanicum, refers to the species originating in Ceylon, what is now Sri Lanka, the island nation at the southern tip of India. Many Cinnamomum species are referred to as cinnamon, and most Western countries don’t differentiate much between cinnamon and cassia or Chinese cinnamon (C. aromaticum syn. C. cassia). The ISO 6538 defines commercial grades of 3 types of cassia bark, Chinese type cassia (C. aromaticum), Indonesian type cassia (C. burmani), and Vietnamese type cassia (C. loureiri), with a separate ISO standard for cinnamon bark (C. verum). The American Spice Trade Association allows both cassia and cinnamon bark to be labeled and sold as cinnamon for seasoning and spice purposes in food products. However, if cinnamon is used as a dietary supplement ingredient, US Food and Drug Administration (FDA) labeling regulations require use of the common name consistent with the name standardized in the American Herbal Products Association’s Herb of Commerce, 2nd ed., which does differentiate between cassia and cinnamon. For purposes of this article, however, the common name cinnamon refers to C. verum. Other species will be identified by Latin binomial.
Cinnamon played a major role in colonial expansion. In 1556, Portuguese invaders used a mixture called mercurio to monopolize the cinnamon trade. This allowed them to cultivate cinnamon and the Dutch East India company dominated the world trade in cinnamon from 1796 to 1853.

The major uses of cinnamon (Cinnamomum zeylanicum) are as a spice to flavor food. It can be found in curry and tea blends, baked goods, beverages, canned fruit, confections, desserts, pickles, liqueurs, marinades, meats, sauces, soups, and chewing gum. In Spanish-speaking countries cinnamon (canela) is popular in chocolate and is one of the ingredients in Chinese 5-spice powder. cinnamon, along with other spices and fruits, is used in making mullled wine which is often used as an apéritif to blend. Cinnamon, along with other spices and fruit, is used in making mulled wine which is often used as an apéritif to blend.

In the food industry, cinnamon bark is employed as a fragrance and germicidal ingredient in soaps, toothpastes, and mouthwashes. Cinnamon leaf oil is also employed as a fragrance and germicidal ingredient in soaps.

Cinnamon bark oil is used in the food, perfume, and pharmaceutical industries. It has replaced ground cinnamomum in the food industry in large part, as it can provide the only form of cinnamon which is used in making mulled wine and tea blends. Cinnamon bark oil is also employed as a fragrance and germicidal ingredient in soaps, toothpastes, and mouthwashes.

Cinnamon leaves are used to infuse tea and are also used to make herbal teas. Cinnamon bark is used in the food industry to flavor confections and to prepare synthetic vanillin. Cinnamon bark oil is also used as a fragrance and germicidal ingredient in soaps. Cinnamon bark oil is also employed as a fragrance and germicidal ingredient in soaps, toothpastes, and mouthwashes.

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A number of studies have concentrated on choosing cinnamon genotypes for crop improvement. Joy et al. (1998) investigated the genetic variability of cinnamon accessions from the Aromatic and Medicinal Plants Research Station at Kerala Agricultural University (KAU) in Odakkali, Kerala, India, and identified superior genotypes recognizable by the color of the flushes. The accessions with the darker purple flush yielded 29% more bark oil. Additionally, accession collections at the Indian Institute of Spices Research (IISR) and KAU, and collections derived from these 2 sources, have been used to develop better lines of cinnamon based on analysis of their genetic variability (fresh and dry bark yield, leaf oil, percent-age of eugenol in leaf oil and cinnamaldehyde in bark oil, regenerative capacity, etc.) and were released for cultivation in India in the latter part of the 1990s.

In Sri Lankan commercial plantations, cinnamon is usually maintained as a bush with 6–5 slender shoots growing to 6–10 feet (2–3 m). The bark can be harvested 2–3 years after planting, 2–3 times per year depending on growing conditions, and each plant has a commercially viable lifespan of 30–40 years. Cinnamon has a few insect pests and diseases that can affect crop production but there is very little informa-tion on their management. For the analysis of import and export trade data the World Customs Organization (WCO) assigns a general 4-digit harmo-nized system code that is inclusive of all cassia and cinnamon. The Customs Organization (WCO) assigns a general 4-digit harmo-nized system code that is inclusive of all cassia and cinnamon.


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Historically and presently, there has been and is a need for campus medicinal plant gardens. In 1928, 25 such gardens at pharmacy schools in the United States were identified in the Pharmacy Quarterly Bulletin — but today there may be fewer gardens emphasizing medicinal plants than there were 100 years ago. In 2011, The University of Kansas (KU) School of Pharmacy inaugurated its medicinal plant garden. Author Kirsten Bosnak and colleagues from KU describe the establishment of the garden, its distinct purpose, and its connection to the historical study of plants in an earlier medicinal garden at the same university.

46 New Research Supports Synthetic Origin of DMAA in Supplements
By Tyler Smith
In recent years, the chemical known as DMAA (also MHA) has been introduced into exercise-related dietary supplements for its stimulant-like effects. Although the substance has been claimed by some to be a natural component of the oil of the geranium plant (Pelargonium graveolens, Geraniaceae), international reports of adverse effects have called the safety and origin of the compound into question. HerbalGram Assistant Editor and Staff Writer Tyler Smith explores the background of this controversial compound and describes 2 new scientific papers whose analyses have failed to detect the chemical in authenticated samples of geranium leaf and oil.

50 Reading Rumphius: The English Translation of The Ambonese Herbal, The Most Important Translation of a Classic Herbal Publication in This Century
By Susan J. Murch, PhD
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56 Eu Yan Sang: “Caring for Humankind” with Traditional Chinese Medicine for 133 Years
By Lindsay Stafford Mader
Singapore-based Eu Yan Sang has its humble beginnings as a small grocery store in the late 1800s that occasionally sold Chinese herbs to the local tin mining community. More than 100 years later, Eu Yan Sang has grown into a multinational healthcare and wellness company with hundreds of stores and dozens of clinics that provide high-quality TCM products and services. Despite the negative reputation of some herbal and food products manufactured in Asia, Eu Yan Sang leads the industry in adhering to strict Good Manufacturing Practices and conducting significant research on its TCM herbal products, all while upholding the philosophy of “Caring for Mankind.” This article is part of a new series on Legacy Herb Companies, which will initially cover companies that are over 100 years old.

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Pelargonium sidoides. ©2012 Steven Foster

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American Botanical Council Announces New Publication

**Herbal News & Events**

Weekly E-Newsletter Aims to Inform Herbal and Natural Medicine Communities

The American Botanical Council (ABC) announces the publication of a new e-newsletter, Herbal News & Events. The weekly e-newsletter combines educational event notices with relevant news articles from the media, while providing convenient access to other ABC educational content.

On the web, ABC member organizations can access the newsletter for free. ABC members and other interested parties can receive the newsletter via email. Each issue includes updates about ABC news, events, and notes from the ABC Board of Directors.

Employee Profile: Sara Ellis

Sara Ellis joined the American Botanical Council (ABC) in May as the organization’s communications and marketing coordinator. The position was created in response to the increased importance of ABC’s online news presence and involvement in social media. Working with ABC’s Development Director, Denise Mekel, Sara will be responsible for enhancing public awareness of ABC’s educational mission, which includes disseminating information to the widest possible audience on the scientifically documented benefits of herbal and plant-based medicines.

“I was looking specifically for a nonprofit. I tried to work in the for-profit sector, and it wasn’t for me,” Ellis said. “There’s a huge cultural difference between working somewhere that is driven by profits and the bottom line, versus someplace like ABC, where money is also incredibly important because it’s supporting your mission, but there’s a lot that goes with it, and at the end of the day, you know you’re working toward something good.”

Sara relocated with her fiancé to Austin, Texas from the eastern coast of Florida, where she worked for The Astronaut Scholarship Foundation, a nonprofit organization that provides financial assistance to students interested in pursuing careers in science, technology, engineering, and mathematics. “It definitely had its perks,” she said. “I got to meet a whole lot of astronauts while I worked there, … and I also got to attend the last couple space shuttle launches from the VIP viewing area at the Kennedy Space Center.”

Although Sara is switching focus from scholarships and astronauts to herbal medicine and research, her strong work ethic, ambition, and commitment to science-based nonprofits are clearly evident. In her first 2 months on the job, Sara helped propose, design, and create ABC’s newest e-publication, Herbal News & Events.

“We just finished this huge push to create the new Herbal News & Events email, which is the new weekly e-newsletter that includes conferences and seminars that are of interest to our members and other interested parties,” said Ellis. “And of course Watch section, featuring the latest headlines in herbal medicine and related news from around the world. “We are pleased to see this new and much-needed ABC publication become available,” said Blumenthal. “This is a great opportunity to keep in touch with our existing supporters and hopefully reach new audiences with our educational message. Interest in natural products and herbal supplements continues to grow, and with it, the need for people to have easy access to reliable information they can trust.

“There is a wealth of new research being conducted on herbs and related plant-based materials all over the world,” said Blumenthal. “Much of this is being communicated at various scientific, medical, and nutrition conferences. We have consolidated the news regarding registration and other deadlines related to many of these conferences as a benefit to ABC’s many professional members and other stakeholders in the natural products research and practitioner communities, as well as many in industry, regulation, and other areas of interest.”

—Sara Ellis

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American Botanical Council Announces Major Milestone:
Publication of 5,000th HerbClip™ Research Summary

The American Botanical Council (ABC) proudly announces the publication of its 5,000th HerbClip on June 29, 2012. HerbClips are 2-to-3-page summaries and critical reviews of seminal articles covering medicinal plant-related clinical research, regulation, market information, and conservation and sustainability.

HerbClip summaries and critical reviews are typically based upon human clinical trials, systematic reviews and meta-analyses of such clinical trials, and other articles dealing with ethnomedicine, conservation and sustainability, and regulation of herbal and medicinal botanical products. These articles are drawn from a wide variety of peer-reviewed scientific and medical journals, monographs, government documents, special reports, trade journals, and the mainstream media. In addition to summarizing the original article, an HerbClip may include insights, perspectives, criticism, and/or links to other articles and issues. HerbClip summaries and reviews are examined by consulting editors and peer reviewers before they are published to help ensure their accuracy.

HerbClip’s roots stretch back to 1993, just 5 years after ABC was created. At the time, Founder and Executive Director Mark Blumenthal would often photocoppy and then share relevant news articles with numerous friends and professional colleagues. When the cost of toner for ABC’s copier reached at what that time was a prohibitive $200 per month, inspiration struck. Blumenthal called 2 close friends in the herb industry and asked if they would be willing to pay for a service to send them articles related to herb research, regulation, etc. The friends agreed and HerbClip was born.

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In the beginning, HerbClip involved mailing summaries and reviews of herbal literature to ABC colleagues in the academic and scientific communities, as well as key members of industry. At the time, no such service existed in the natural medicine and herbal supplement industry. The groundbreaking HerbClips offered not only summaries and reviews, but also the original articles upon which they were based when such permissions were granted by the articles’ publishers. In 2005, ABC started to include HerbClip News with each mailing. The year 2007 saw the first electronic HerbClips sent to ABC members, dramatically expanding the number of people receiving HerbClip. By 2009, all HerbClips were being delivered electronically. This change not only saved ABC the printing and postage fees of regular mailings, but further solidified the organization’s commitment to environmental sustainability.

“Reaching the 5,000th HerbClip is a gratifying milestone for a project that started out as simply as my sharing news with a few friends and colleagues,” continued Blumenthal. “The increase in HerbClip summaries and reviews are examined by consulting editors and peer reviewers before they are published to help ensure their accuracy.

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As one of ABC’s unique seminal publications, HerbClip has been integral to fulfilling our mission of providing reliable educational resources using science-based information to promote the responsible use of herbal medicine,” said Blumenthal.

“HerbClip summaries and reviews are available online through the ABC website, www.herbalgram.org. The entire database of 5,000 articles is searchable by any search term, including the herbs’ common and Latin names, names of authors of the originally cited article, journal titles, pharmacological actions, and/or clinical endpoints tested in clinical trials, and more. Fifteen new HerbClips and HerbClip News articles are produced twice monthly. All ABC members and non-members, have access to at least 2 free HerbClips from each installment; all ABC members at the Academic level and above can access all HerbClips; Sponsor members receive HerbClips and, when available, the PDF versions of the original articles on which they are based. [E-Cards]

—Sara Ellis

Tieraona Low Dog, MD, director of the fellowship, Arizona Center for Integrative Medicine, clinical assistant professor, Department of Medicine, University of Arizona Health Sciences Center, and also an ABC Advisory Board member, believes “HerbClips are an invaluable resource for busy clinicians who are trying to keep up-to-date with the research on herbal medicines. They are a tremendous contribution to the field, which is why we offer them to all of our Fellows at the University of Arizona center for Integrative Medicine.”

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Crowdsourcing Science: A New Frontier in Fundraising

Crowdsourcing websites like Kickstarter and IndieGoGo encourage fans of musicians, filmmakers, artists, and other creative professionals to contribute funds for unique projects. These sites have experienced great success, with the top crowdsourcing website Kickstarter raising $316 million for more than 66,000 projects since its creation in 2008.1 Although some artistic projects intend to have meaningful impact within the arts, many such projects seek to raise money for charity or "causes."2 So, the crowdsourcing pool ends up including many frivolous projects, such as one that proposed the creation of the "world’s largest jockstrap,"3 while others struggle to find a home. Scientific crowdsourcing projects have been left to the crowded fundraising game, as evident in both Kickstarter and IndieGoGo's lack of a "science" or "research" project category.

Within the last year, however, scientific crowdsourcing opportunities have been increasing. In March of 2012, a new platform called PetriDish.org launched with the objective of hosting just scientific projects.4 The site welcomes applications from any researcher affiliated with a university, nonprofit, or other such institution who is proposing to crowdsourc

The project will set out to do. According to SciFund co-founder Jai Ranganathan, PhD, a center associate at the National Center for Ecological Analysis and Synthesis, this is essential for science crowdsourcing, which he said is very different than crowdsourcing for artistic projects.

"Either you like the band or you don’t," he said, "and there isn’t any further judgment needed. But for science, the danger is always that there would have something put up a perfectly nice looking video that fools people. We want to make sure that doesn’t happen" (oral communication, July 3, 2012).

One project is deemed legitimate and accepted into the SciFund Challenge, the scientists receive guidance from SciFund blog entries and articles on how to take a complicated project and simplify it in a way that is interesting and engaging for the general public. They also learn how to communicate with the public through Twitter, Facebook, and other forms of social networking. SciFund.org also provides similar assistance in its blog entries.

Then scientists start putting together project outlines, which include effective marketing materials that will receive for donating and film informational videos that will serve as the "face" of the project viewed by potential funders.5 Fellow scientists are welcomed to write up articles about the project and science in the public sphere.

Once ready, they launch their projects on RocketHub, an up-and-coming crowdfunding website. SciFund continues to market their project for the ride through the long, long fundraising cycle, especially focusing on how to create a public "fan base." According to Dr. Ranganathan, this is the most important aspect of a successful campaign, even more so than the quality of a project’s video or outline.

"The hardest part is getting people to that video," he said. "They only way it works is to build an audience presence, every day with what is line with what

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As a Sponsor Member, you’ll also help ensure that independent source. will have multiple points of access to science-searchable resources at www.herbalgram.org.

**SPONSOR MEMBER**

dev@herbalgram.org

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**References**

Four Elements Herbs Receives USDA Grant for Bagging Herbal Teas

Four Elements Herbals farm in Wisconsin, recipient of a USDA Value-Added Grant, ©2012 Jane Hawley Stevens.

Agriculture Deputy Secretary Kathleen Merrigan announced in February 2012 the recipients of US Department of Agriculture (USDA) Value-Added Grants totaling more than $40 million. David and Jane Hawley Stevens, owners of Four Elements Herbs—a family farm based in rural, south-central Wisconsin—were notified of their $300,000 award earlier this year.

“It’s a big honor,” said Jane Hawley Stevens (oral communication, May 18, 2012). “For this particular grant, you have to grow 85% of what’s in the package that you’re selling. I couldn’t market my creams or lip balms because they have oils or beeswax that I didn’t grow. It had to be my herbal tea.”

According to a USDA press release, “Value-added products are created when a producer increases the consumer value of an agricultural commodity through processing or packaging.” Four Elements herbal teas were eligible for the grant because the Stevens’ certified-organic herbs are ground and packaged into bags to make them accessible for the average tea drinker. “Eighty-five percent of the public prefer their tea bags,” said Stevens. “Although herbalists really like to have loose tea to get a stronger infusion, Stevens explained. “The grant itself is about packaging herbal teas into tea bags and to expand the market into grocery stores, beyond health food stores and specialty shops.” Four Elements Herbs, which makes over 200 different products, sits on 130 acres of Wisconsin wilderness surrounded by 9,000 acres protected by The Nature Conservancy—an international, environmental conservation nonprofit organization—in a region known as the Baraboo Bluffs. “It’s a very pristine region and it’s great for growing these pure herbs for these pure products,” said Stevens. “You think, ‘Wisconsin? How does anybody grow there?’ The growing season is so short, but we have this great soil and long, long days…so things grow really well here.”

In addition to supporting small family farms, USDA Value-Added Grants are designed to help stimulate economic growth. “These projects will provide financial returns and help create jobs for agricultural producers, businesses, and families across the country,” said Merrigan in the press release. “This funding will promote small business expansion and entrepreneurship opportunities by providing local businesses with access capital, technical assistance, and new markets for products and services.”

With funds from the grant, Stevens said she has been able to sponsor an intern from a local college and hire a marketing accountant, as well as more part of her business to the small nearby town of North Freedom. Wisconsin. “The manufacturing portion of my business into an empty bank and open a little tea house in front of it,” she explained. Currently, Jane and her husband are prepping fields, planting herbs, and preparing for a busier-than-normal growing season.

The sustainable schisandra project is part of the EU China Biodiversity Programme (ECBP), which recently awarded the establishment of the Shuijing TCM Producer Association (STPA), now a top producer of southern schisandra. It began as a joint effort among the Worldwide Fund for Nature (WWF)-China, The International Union for the Conservation of Nature (IUCN), TRAFFIC (Beijing, office, and regional plant producers). According to the United Nations Environment’s Equator Initiative, which awards the Equator Prize, the unsustainable collection of medicinal plants has harmed panda habitats. “The small schisandra project “aims to develop and implement a strategic model for biodiversity conservation and sustainable development in the Giant Panda Bear Conservation Area of South-west China (Gansu, Shaanxi, and Sichuan provinces) to the east of the Tibetan Plateau.”

Important, Stevens noted that her grant is not simply a dollar. “This is a marching grant that I have to match, dollar for dollar. Everything that we get from the government I’ve got to put into it,” she said. “It’s a big commitment on our part too.”

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“I am so busy growing plants right now,” she said. “I’ve got to up my production from 200 lbs of dried herbs to about 1,500 lbs of dried herbs. This is all-American labor with hand harvesting. It’s a lot of work.”

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“We are really pleased that the implementation of this sustainable wild-harvesting plan for schisandra, that started with one village in 2008 and scaled out to 22 villages, has been so successful so far and has earned the recognition of the 2012 Equator Prize. Throughout the project there has been exemplary commitment and collaboration amongst all stakeholders: the harvesters, the Shuijing TCM cooperative that represents them, the Chinese government agencies and non-governmental organizations (such as WWF-China), and finally, the buyers.”

—Ash Lindstrom

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Sponsor of Sustainable and Panda-Friendly Chinese Schisandra Project Awarded a 2012 Equator Prize

In 2010, HerbalGram published an article titled “Cinderella Schisandra: A Project Linking Conservation and Local Livelihoods in the Upper Yangtze Ecoregion of China” that described a collaborative project to harvest southern schisandra (Schisandra sphenanthera, Schisandraceae) sustainable in the Upper Yangtze ecosystem, “the highest priority area for biodiversity conservation in China.” The sponsor of that project, the Kangmei Institute of Community Development and Marketing, is now being honored with a 2012 Equator Prize.

Cunningham, PhD, who was working with the ECBP “to assess and develop systems for sustainable management of traditional medicinal plants in high biodiversity landscapes of the Upper Yangtze ecoregion.” The ECBP grant and technical assistance, and Brillmann co-wrote the “Cinderella Schisandra” HerbalGram article.) “I was asked to assist the project team to establish links between the project partners. The DEC (Director of Communications) who was willing to pay a premium for sustainably (ecologically, economically, and socially) harvested medicinal plants from the project partner villages,” said Brillmann, who noted that his first visit occurred just months after an earthquake in the region took tens of thousands of lives (email, May 25, 2012).

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High Urinary Tract Cancer Rate in Taiwan Associated with Exposure to Aristolochic Acid

Plants from the genus Aristolochia (Aristolochiaceae) have been used medicinally for more than 2,500 years. The toxicity associated with aristolochic acid (AA) — a chemical produced by the plants — has become well established in only the last 2 decades. Today, AA is known to be a potent human carcinogen, and, beginning in 2000, the US Food and Drug Administration (FDA) listed AA as a “generally recognized as safe” (GRAS) herbal ingredient. The monograph, which is available for purchase on the FDA’s website, provides detailed information on the macroscopic, microscopic, and phytochemical characterization of AA-containing plants, as well as those plants that do not contain AA but may inadvertently be mixed up with adulterants. The paper also includes information on high-performance liquid chromatography (HPLC) — the FDA-preferred method of botanical analysis — as well as the European Union’s plants.

In an article dealing with the AA adulteration issue that appeared in HerbalGram 4:48, author John Chen, PhD, PharmD, emphasized the importance of proper identification techniques to ensure the safety of botanical products. "Physical inspection is the most commonly used method of identification. However, it is not 100 percent accurate or reliable," he wrote. "Laboratory techniques such as high performance liquid chromatography, thin-layer chromatography, and liquid-column chromatography must be used to confirm qualitative and quantitative analyses of the various herbs’ chemical profiles."

Aristolochic acid also has been implicated as the cause of widespread kidney problems first reported more than 50 years ago in rural areas of Bulgaria, Croatia, Bosnia and Herzegovina, Romania, and Serbia. In 2006, researchers discovered the source of the problem to be exposure to AA through the consumption of bread made with seeds of A. clematitis, a member of the family Aristolochiaceae.

Using detailed medical records from Taiwan’s National Health Insurance database — which covers roughly 96% of the country’s residents — researchers have estimated previously that one-third of the population has used herbal products that contain or are likely to contain AA. "The remarkably high incidence of UUC, coupled with the widespread use of Aristolochia herbal remedies, suggested that AA might play a central role in the etiology of [upper urinary tract carcinomas]," wrote the authors of the recent PNAS paper.

Aristolochic acid causes immediate damage to human genetic material. As AA is broken down in the body, it reacts with DNA to form lesions that concentrate in the kidneys. Additionally, exposure to AA results in unique, hallmark mutations in certain tumor-suppressing genes. Combined, these changes provide a highly traceable signature of AA exposure.

In the PNAS study, Dr. Grollman and his colleagues examined 151 patients with UUC for the specific biomarkers associated with AA exposure. Eighty-four percent of participants with AA exposure had at least one tumor-suppressing gene mutation. A. clematitis was identified as the AA-containing plant in two tumor samples. The researchers concluded that "persons treated with Aristolochia herbal preparations at any time in their life are at significant risk of developing UUC or chronic renal disease."

Determining one’s level of exposure to AA, however, can be challenging. "Most people would not know if they took an AA-containing plant unless they still had part of their formula and tested the ingredients," explained Upton.

"The herbs that historically have been most associated with AA adulteration include A. fangchi (mu zong), Clematis (wei ling xian), and Stephania (fang jı). The most popular formulas subject to AA adulteration historically were Lang Dan Xie Gao Tang — Gentiana Decoctum to Drain the Liver and Ba Zhi Tang (Eight- Herb Powder for Rectification). Both formulas contain A. fangchi (mu zong), an herb that can be mistakenly compounded with the AA-containing Aristolochia species (mu zong).” Upton added.

"In North America, these would likely be the most common formulas to have been adulterated. There is not a general consensus as to which herbs or herbal preparations in consumer use are likely to contain AA. Adulteration typically occurs in very specific instances with very specific ingredients.”

According to acupuncturist and Chinese medicine expert John Chen, PhD, LAc, of Lotus Herbs and Lotus Institute, the use of herbs that contain AA, such as guang fang jı (A. fangchi) or guan mu zong (A. chinensis), are banned not only in the United States and Canada but also in Taiwan and many countries in Asia. "In fact," he wrote in an email, "in a drastic measure to avoid any future incident, merchants in Taiwan who sell [these herbs] are subject to criminal charges." (email, June 4, 2012).

Despite existing regulations, Dr. Grollman and his colleagues caution that determining whether AA is associated with herbal remedies has significant implications for global public health.” According to Upton, "the issue of AA toxicity has been actively addressed by regulators and responsible elements of the herb industry worldwide who have taken steps to keep AA-containing herbs out of the market. Hopefully this will be considered a problem that once existed rather than an ongoing concern." 

—Tyler Smith

References


Pharmaceutical Company, Foci Pharmaceutical Company, and the active phytochemicals in the medicine. To bring it to market in Europe, including 2 years of research on 1988. According to DPG President Li Bogang, it took 6 years Di’ao Xin Xue Kang has been on the Chinese market since — which is derived from Japanese yam root (Dioscorea nipponica, Dioscoreaceae) — is used for the treatment of myocardial isch- emia. It was developed by the Di’ao Pharmaceutical Group (DPG) in Chengdu, China, together with the con- gregates against non-European traditional systems of herbal medi- cines are derived from several herbs, making the necessary research process for THR more laborious and costly. “We know that multiple preparations can get THR’s (there are several now in the United Kingdom) but there is a bit further to go before we can see typical TCM or Ayurvedic formulations getting their dosiers up to muster,” said Mills. According to the Portland, Oregon-based Institute for Tradi- tional Medicine’s Director Subhuti DharmaMandana, PhD, Di’ao Xin Xue Kang would be described more accurately as a folk remedy (email, June 5, 2012), “This herb is not recorded in the Materia Medica guides of the TCM tradition, but is a folk remedy commonly used for arthritis and bronchitis,” said Dr. DharmaMandana. “In folk medicine, unlike TCM, herbs are sometimes used singly. The rhizome, the part used in Chinese folk medicine, is rich in saponins derived from diosgenin, a well- known plant steroid.” Dr. DharmaMandana conveyed that because EU regulations have made registration for multi-herb formulas so expensive, “the herb parts — bringing the total of adopted European Union (EU) community herbal monographs to 96 (approximately 74 additional monographs exist in varying stages of completion in EMA’s online database). The London-based EMA, formerly known as the European Medicines Evaluation Agency, is responsible for evaluating the safety of medicines used in the European Union, including herbal medicines and conventional pharmaceuticals. The development of herbal medicinal herbal combinations, which are intended to harmonize herbal medicine labeling standards in all EU member states, are core activities of EMAs Committee on Herbal Medicinal Products (HMPC). The recently released monographs include traditional therapeu- tic apertures, indications, dosage and dosage forms, and risk state- ments required for product labeling and patient leaflets of the following herbs: horse chestnut bark (the plant part whose usage is the most clinically documented, while horse chestnut seed extract had a ‘well-established use’ monograph adopted in 2009 based on clinical data); echinacea angustifolia root, ash leaf, lavender flower and lavender oil, rhodolia rhizome and root, and ginger rhizome. Two additional monographs on licorice root and linden flower have been adopted but have not yet been uploaded into the EMA website (J. Brinckmann, email, July 4, 2012). It should be noted that community herbal monographs—as compared to community list entries—are not legally binding, but are to be considered guidelines for both national regula- tors and industry. In practice, this means that regulators can choose to override the monograph recommendations. For example, UK regulators granted traditional registrations for herbal products containing black cohosh (Actaea racemosa, syn. Cimicifuga racemosa), despite the fact that the Community Herbal Monograph envisages well-established use only. This stipulation may come as a blessing, as researching traditional use of an herb for the entire European Community (includ- ing its diaspora communities of Middle Eastern, African, and Asian origin) is a difficult and demanding undertaking, and omissions — for whatever reason — are not uncommon. For example, the well-documented use of ginger (Zingiber officinale, Zingiberaceae) rhizome as an anti-inflammatory, pain-relieving, anti-atherosclerotic inside and outside the Euro- pean Union was not incorporated into the monograph, possi- bly because clinical evidence was overlooked in the preced- ing assessment report. However, it remains in the hands of national regulators to make their own educated decisions when granting registrations for Traditional Herbal Medicinal Products. The new herb monographs are listed in the table below with their corresponding Latin binomial, pharmacopeial name, and common name. Access to the final community monographs can be gained by visiting EMA’s homepage at www.ema.europa.eu and entering the plant name in the “Search for medicines” field. PDFs for each monograph are available under the “All documents” tab as well as comprehen- sive assessment reports, lists of references used for the assessments, and HMPC final opinion reports.†

References

—Ash Lindstrom
Is CBD the Answer?

Analyzing the Role of Cannabidiol in Medicinal Cannabis

In the early summer of 2012, several news outlets reported that scientists in Israel had created a new strain of non-psychoactive medicinal cannabis by reducing levels of the plant’s main active ingredient tetrahydrocannabinol (THC) and increasing another important compound called cannabidiol (CBD).1,2 Israel's Haaretz Daily Newspaper called the strain a “new breed,” and wrote “nothing quite like this has ever been invented.”3 United States-based news service Reuters picked up on the development, reporting, “Recreational smokers may not see the point, but according to its developers, high-less pot gives people suffering from chronic pain and disease a way to get the all the medical benefits of weed while keeping their senses.”4

Contrary to these news reports, however, high-CBD, low-THC cannabis (Cannabis spp., Cannabaceae) has been produced prior to the Israeli research.

“There is already a great deal of interest in both the scientific community and the ‘user’ community in CBD,” said Michelle Sexton, ND, a clinical cannabis researcher at Bastyr University who owns a cannabis-analysis business. “There are trends at least in [California] and [Washington] for growers to try to access CBD-rich plant material” (email, July 5, 2012). In fact, some California parents allegedly prepare tinctures from similar strains for their sick children who are approved to use medicinal cannabis,5 and there is even a Netherlands-based company that developed a CBD chewing gum.6 Additionally, a US nonprofit, Project CBD, is dedicated to encouraging clinical research and disseminating information on the compound.7 While some details are largely inaccurate, the recent Israeli cannabis coverage brings attention to a significant and growing area of medicinal cannabis research.

State of Research

THC is the most active and well known of the more than 100 cannabinoids in cannabis, and it is also responsible for the plant’s psychoactive effects, commonly known as the “high” experienced by people who smoke or ingest cannabis. Because CBD — first elucidated by scientists in 19638 — acts differently than THC within the human endocannabinoid system, it produces no psychoactive effects.9-10 While THC binds to a cannabinoid type one (CB1) receptor in the brain, CBD exerts more activity at the CB2 receptor.11,12 When both THC and CBD are present, CBD can interfere with THC’s binding to the CB1 receptor, possibly neutralizing any psychoactive effects. Additionally, CBD increases the production of an endocannabinoid chemical that occurs naturally in the human body called anandamide, and also prevents anandamide from being broken down, resulting in an indirect increase in endocannabinoid tone with none of the effects of THC.13

According to a 2008 review of CBD research history, studies on the compound began slowly in the 1970s and waxed and waned until an “explosive increase” in the early 2000s.7 The current body of CBD research, which consists mainly of in vitro and in vivo studies as well as several small human trials and case studies, has shown that it exhibits anti-inflammatory, anti-oxidative, and neuroprotective effects, and also suggests that it might be useful in treating epilepsy, insomnia, anxiety, schizophrenia, Parkinson’s Disease, type 1 diabetes, and nausea in chemotherapy patients.7 In 2000, research into CBD’s affect on cancer cells increased, one of such studies showing it to be the most active of the 5 cannabinoids tested against cancer cell growth. Much of the recent research examines CBD’s affect on psychiatric disorders and cancer cells, such as a 2010 study by scientists at the California Pacific Medical Center’s (CPMC) Research Institute that showed CBD killed breast cancer cells in mice.14

More human studies on CBD are crucial, and researchers are making progress in this area. The CPMC researchers, for example, are now working on the design of a large-scale clinical trial to test CBD in breast cancer patients (S. McAllister, email, June 20, 2012). A 2012 German study on 39 schizophrenia patients published in Translational Psychiatry found that CBD was an effective treatment and produced far fewer side effects than the traditional pharmaceutical amisulpride.15 Additionally, according to a search on ClinicalTrials.gov, 19 human studies on “cannabidiol” recently were completed and 10 are currently recruiting or active (approximately half of the 30 studies are being conducted on Sativex®, GW Pharmaceuticals, London, England, a whole plant extract oromucosal...
spray containing predominantly THC and CBD that is in late-stage clinical trials in the United States for treatment of cancer pain.10 11

10. Multidisciplinary Association for Psychedelic Studies (MAPS) hopes to study cannabis with THC and CBD as well as cannabis with varying levels of just THC in veterans with post-traumatic stress disorder (PTSD).17  The MAPS research protocol was first approved by the United States Department of Veterans Affairs and the US Drug Enforcement Administration (DEA), but the National Institute on Drug Abuse (NIDA) and Public Health Service (PHS) rejected the proposal. Executive Director Rick Doblin, PhD, said that MAPS is now seeking to have the research supported by the University of Arizona Institutional Review Board, and will then re-try PHS and NIDA. Because MAPS intends to study the whole cannabis plant, and not isolated CBD or THC, it must receive permission from PHS and NIDA to conduct the study. The majority of studies conducted on CBD, including the aforementioned research, have used isolated and extracted CBD.

There is a lot of suggestive evidence that CBD will be effective with anxiety disorders, and in particular with PTSD, said Dr. Doblin. “One of the main purposes of that protocol is to evaluate the role of CBD” (oral communications, June 26, 2012).

According to Sarah Russo, former outreach coordinator of Project CBD who recently joined the staff of the Society for Cannabis Clinicians (SCC), SCC is currently conducting a physician-assisted survey on how lab-verified cannabis containing CBD is affecting patients (email, June 26, 2012). “They hope to eventually have enough data that they can use to create a peer review journal article about the effects of CBD as medicine,” she said.

Implications for Medical Cannabis

The results of CBD research thus far — and that the compound is non-psychoactive — will likely lead some to wonder if researchers and activists should focus more on CBD and CBD-rich cannabis than on THC and other cannabinoids. After all, if CBD is medicinal, what makes THC different? In its uses high, why would the federal government have a problem with it? Actually, the federal government has already made CBD illegal by placing it on the List of Controlled Substances as a Schedule 1 drug — a classification reserved for substances with the highpest potential for abuse, least evidence of medical value, and concerns for safety, i.e., heroin.18 All of the sources interviewed for this story said that they think CBD’s non-psychoactive properties will have no affect on federal regulations.

“In the eyes of the federal government,” said Russo, “any component in cannabis is regulated, whether on humans or humans active. CBD is, however, a ‘myth buster’ (according to Martin Lee, co-founder of Project CBD), because it refutes the idea that medical cannabis can be an excuse for people to get high. Now people can use a less psychoactive type of cannabis (or not if they wish).”

Many sources also expressed that focusing on CBD or cannabis that is not a smart medical strategy. The “high” produced by cannabis containing THC, for example, serves a medicinal purpose for patients with certain conditions. “I always say that for patients I deal with [who have] cancer, I don’t think euphoria is an adverse experience,” said Donald Abrams, MD, an integrative oncologist who studies clinical cannabis at the University of California – San Francisco. “It depends on the condition being treated. Some of my patients don’t like being high, that’s not what they want. Some welcome it. I don’t think it should be an unwelcome side effect unless it is not related to the actual condition that cannabis is a plant, and it should not be illegal, no matter the [content of] CBD or THC or other compounds.”

—Lindsay Stafford Mader

References


American Ginseng Extract Improves Working Memory in Schizophrenia Patients


Schizophrenia affects cognitive function and causes memory impairment. In particular, working memory — temporary memory storage for language comprehension, learning, and reasoning — is severely affected in patients with schizophrenia. The cognitive dysfunction may be caused by cholinergic abnormalities (deficits in working memory and other cognitive domains associated with reductions in production of the neurotransmitter acetylcholine and therapeutic options are limited.

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Ginsenosides, the major bioactive components of American ginseng (*Panax quinquefolius*, Araliaceae) root, are thought to help cognition by working on the cholinergic system. The purpose of this randomized, double-blind, placebo-controlled study was to evaluate a proprietary American ginseng product, HT1001 (Afexa Life Sciences Inc.; Edmonton, Alberta, Canada*), on working memory in patients with schizophrenia. HT1001 is claimed to be unique because it has undergone a chemical fingerprinting and biological characterizing technology (ChemBioPrint™, Afexa Life Sciences Inc.) that ensures consistency between batches, that its primary active ingredients are quantitated, and that impurities are eliminated. (HT1001 is different chemically and hence biologically from the CVT-E002 [aka COLD-FX®] extract made by the same company, the latter being standardized to primarily polysaccharides from the ginseng root, with little to no ginsenosides.)

Patients (n=64; aged 18-55 years) with stable schizophrenia (defined as having no significant change in medication or symptoms over the previous 3 months) were recruited from in- and outpatient facilities in Hong Kong. Patients were excluded if they had a history of significant medical illness, mental retardation, comorbid substance abuse, recent (within 2 years) electroconvulsive therapy, required a change in medication, or if they were at risk of violence or suicide. Patients received either placebo or 200 mg/day HT1001 along with their regular medication for 4 weeks. This dose was equivalent to 1000 mg dried American ginseng root. A battery of tests was conducted at baseline and after 4 weeks of treatment to assess efficacy. The Positive and Negative Syndrome Scale (PANSS) was used to assess the positive and negative symptoms of schizophrenia. The Montgomery-Asberg Depression Rating Scale (MADRS) was used to assess depressive symptoms. The Abnormal Involuntary Movement Scale, the Barnes Akathisia Rating Scale, and the Simpson-Angus Scale were used to assess dyskinesia, akathisia, and extrapyramidal symptoms, respectively. The Letter-Number Span Test of the Wechsler Adult Intelligence Scale—3rd Edition (WAIS-III) was used to assess verbal working memory. The Visual Pattern Test was used as a test of visual working memory.

At baseline, there were no significant differences between groups in the overall cognitive profile, working memory, severity of illness symptoms, or medication side effects. On the Visual Pattern Test performance, the HT1001-treated patients had a significant improvement over baseline (P<0.006); in contrast, the placebo-treated group had no significant change. The HT1001-treated patients had a significant improvement over baseline on the Letter-Number Span Test; however, the placebo-treated group had a significant decline on the test compared with baseline (P<0.01). Both groups had similar changes, or lack of changes, in clinical symptoms, except for extrapyramidal side effects (abnormalities in gait, excessive muscle rigidity, muscle spasms, and tics). The HT1001-treated patients had a significant improvement over baseline in extrapyramidal side effects (P<0.015).

The authors conclude that HT1001 significantly improved visual working memory function in patients with stable schizophrenia and prevented a decline in verbal working memory function. Another important finding was that HT1001 reduced extrapyramidal side effects caused by schizophrenia medication. These symptoms are a major cause of distress, morbidity, and treatment noncompliance. The authors think that this is the first study to examine the effects of an American ginseng extract on cognition in patients with schizophrenia. Herb-drug interactions are important considerations, and studies suggest that American ginseng should not be used with the anticoagulant warfarin (Coumadin®). Future studies are needed to assess the potential for HT1001 and conventional drug interactions. This study shows promise for patients with schizophrenia.

*—Heather S. Oliff, PhD

*Purchased by Valeant Pharmaceuticals, Inc., in October 2011.
Cognitive decline is a major threat to quality of life. Preliminary studies and traditional use have suggested that the spice rosemary (Rosmarinus officinalis, Lamiaceae) may have beneficial effects for cognitive function in older adults. Rosemary contains essential oil composed of 1,8-cineole, alpha-pinené, camphor, borneol, and carvacrol. Other constituents include phenolic diterpene (such as carnosol and carnosic acid), flavones, the caffeic acid derivative rosmarinic acid, and the triterpene ursolic acid. It has a GRAS (generally recognized as safe) status in the United States. This randomized, placebo-controlled, double-blinded, repeated-measures, crossover study investigated the acute effects of rosemary on cognitive performance in healthy, older adults.

Subjects included 28 non-smoking adults (20 women and 8 men aged 54-70 years, mean age = 60 years) who randomly received one of four different intake levels of rosemary (750 mg, 1500 mg, 3000 mg, and 6000 mg) or placebo. While the doses for this short study were higher than normally would be consumed in the diet, the crude powder was presumed to have a similar pharmacokinetic profile to that of ordinary culinary consumption. There was a 7-day washout period between treatments. The rosemary consisted of powdered rosemary leaf (authenticated by macro- and microscopic features; McCormick and Company; Hunt Valley, Maryland) added to 458 ml of tomato juice (low sodium; Campbell’s; Camden, New Jersey). The placebo consisted of plain tomato juice.

To confound the distinction between the treatment and placebo, inactive capsules were also administered to the subjects, who were told it could be part of the treatment. Following the one-time intake of the treatment, a battery of tests was performed at 1.25, 4, and 6 hours post-consumption using the Cognitive Drug Research (CDR) computerized assessment system. Assessment included power or speed of attention; accuracy or continuity of attention; quality of working memory; quality of episodic or storage memory; and speed of memory. Mood was also assessed using the Bond-Lader visual analog scales.

There was a significant improvement in speed of memory at the lowest intake level (P<0.006) when compared with placebo. Continuity of attention and quality of working memory were also adversely affected at most intake levels. There were no effects for power of attention and quality of episodic secondary memory. Self-ratings of mood and alertness improved compared to placebo for an intake of 750 mg (P<0.01) but decreased for the 6000 mg level (P<0.02). There were no significant effects on self-rating of calmsness and contentment. The mixed analysis of covariance (ANCOVA) showed there was no correlation between treatment and time for any of these findings. There were no serious adverse effects recorded for any treatment or placebo.

The data show a dose-dependent effect on speed of memory; this suggests that additional work should be done at the 750 mg intake level, which is closer to normal levels of dietary intake, and also at lower doses. The authors also noted the unexpected activity of the placebo as a limitation of the study, as well as the unusually high baseline cognitive test scores of the subjects. In addition, the inability to blind the study adequately and its short-term nature were also limitations. 

—Risa Schulman, PhD

References

Special Curcumin Extract from Turmeric Shows Promise in Rheumatoid Arthritis Patients in Pilot Trial


Rheumatoid arthritis is a chronic systemic inflammatory disorder that is distinguished from other forms of arthritis by the joint destruction that is its prominent feature. Typically, 30% of patients do not respond to the classic forms of treat- ment. Curcumin, the major active constituent of the spice turmeric (Curcuma longa, Zingiberaceae), has been shown to modulate numerous pathways related to inflammation. This randomized, blinded, pilot study examined the efficacy and safety of a curcumin extract in comparison to, and in combination with, diclofenac sodium (a pharmaceutical non-steroidal anti-inflammatory drug [NSAID]) in patients with mild-to-moderate rheumatoid arthritis (RA).

The study was conducted at Nirmala Medical Centre in Muvattupuzha, Kerala, India, and included 45 patients (38 females and 7 males; mean age=47±8 years) with RA according to the revised in 1987 American College of Rheumatology (ACR) criteria (with RA functional class I or II) and Disease Activity Score 28 (DAS28) > 5.1. Patients were excluded if they were taking NSAIDs or other anti-arthritis therapies, had any complicating surgeries or diseases, were pregnant or nursing, or had a history of substance abuse. Patients were divided into 3 groups: curcumin extract (500 mg BCM-95™; Arjuna Natural Extracts; Kochi, Kerala, India; imported and sold in the United States as CuraMed® by EuroPharma; Green Bay, WI), diclofenac sodium (50 mg; no source given), or both in combination; treatments were taken twice a day for 8 weeks. Neither the patient nor the manufacturer’s website describes standardization.

Data on demographic characteristics, medical history, and medications were collected at baseline. Body weight, blood pressure, hematological, and biochemical parameters were collected, and hematocrit, blood chemistry, C-reactive protein (CRP), antiprostetyslin- O (ASO), and blood sugar tests were performed. Each patient underwent an anteroposterior (AP) view of chest/hands/wrist/foot and 12-lead electrocardiography as well as a 28-joint assessment for tender joint count, swollen joint count, and duration of morning stiffness.

The primary endpoint was reduction in DAS28, a composite index based on the assessment of 28 joints, the erythrocyte (red blood cell) sedimentation rate (ESR), and visual analog scales (VAS) on which the patient scored his/her global assessment of disease activity. The secondary endpoints included ACR criteria scores. The ACR measures the improvement in tenderness or swollen joint counts and improvement in three of 5 parameters: patient global assessment, physician assessment, pain scale disability, functional questionnaire – HAQ (Health Assessment Questionnaire), and acute phase reactant (such as ESR).

There was no significant difference in any baseline characteristics between the groups. Thirty-eight patients completed the study. Curcumin extract treatment; all 45 patients were included in safety assessments. No explanation is given as to the reasons 7 patients did not complete the study.

There was a statistically significant change in DAS28 scores compared to baseline of similar proportion for all 3 treatment groups after 8 weeks (all P<0.005). There was no significant difference among the groups. Likewise, each group had a statistically significant difference in the ESR and VAS (all P<0.005) compared to baseline, but not among groups; curcumin extract had the highest percentage change of the 3 groups for VAS (59.9%). There was also a statistically significant change in ACR scores in all 3 treatment groups (all P<0.05), but no difference among them. The authors report that the percent- age change in ACR was greatest for curcumin. CRP showed a significant change only in the curcumin (P<0.05). Adverse events were reported more frequently in the diclofen- ac sodium group and included itching and swelling around the eyes, dizziness of vision, and worsening of the condition. Adverse events reported in the curcumin group were mild fever and throat infection (which are not necessarily associated with the use of the curcumin).

This pilot study shows that BCM-95 curcumin reduced DAS28 and ACR scores in patients with RA alone or in combi- nation with diclofenac sodium. It also showed that intake levels of 500 mg twice daily for 8 weeks yielded few adverse effects. The mechanism for this action is not known but is purported to be due to the effect of curcumin on multiple signaling pathways involved with pain and inflammation. The authors reported that BCM-95 curcumin was selected for use in this study based on its enhanced absorption, which has been shown in 2 previously published human studies to have up to 7 times increased absorption than generic 95% curcumin turmeric extracts based on area under the curve (AUC) and 10 times the serum peak of generic 95% curcumin extracts. 1,2

The authors conclude by asserting that BCM-95 curcumin extract was the superior treatment in this study, based on its efficacy equaling the prescription drug diclofenac sodium on DAS28 and ACR scores, combined with its superior safety and lower adverse effect profile. What can be said is that this proprie- tary curcumin extract had a similar effectiveness to the prescrip- tion drug diclofenac sodium with few adverse side effects. Larger studies will help to shed light on these findings.

—Risa Schulman, PhD

References
Acute bronchitis is a common childhood illness. Although 99.5% of the cases are caused by viruses, about one-third of patients are prescribed antibiotics. Studies have shown that antibiotic therapy is mostly ineffective in acute bronchitis, unless the pathogen is of bacterial origin and known by lab test. A therapeutic alternative in the first-line treatment of acute bronchitis is EPs 7630 (the active ingredient of the product Umckaloabo®; ISO Arzneimittel; Erfurt, Germany), which has been approved in Germany for use in children aged 1 year and older and in adults. EPs 7630 is an herbal drug preparation from the roots of Pelargonium sidoides (Geraniaceae) (1:8-10; extraction solvent: ethanol 11% [w/w]). These authors conducted a randomized, double-blind, placebo-controlled clinical trial to demonstrate the efficacy and tolerability of EPs 7630 in children and adolescents suffering from acute bronchitis.

The pharmacological activities of EPs 7630 and its components, which include antipotentialities and immune modulatory capabilities, have been demonstrated in vitro. The immunomodulatory activities are mainly mediated by the release of tumor necrosis factor-alpha and nitric oxides, the stimulation of interferon-beta, and the increase in natural killer cell activity.

This study was conducted between March and May 2006 in 11 Russian pediatric centers. Patients who met the inclusion criteria were randomly allocated to one of 2 treatment groups. Following a baseline examination and subjective evaluations, the patients were scheduled for follow-up examinations on days 3-5 (visit 2) and day 7 (visit 3).

To be included, the patients had to be aged 1 to 18 years and suffering from acute bronchitis with symptoms starting ≤ 48 hours before inclusion in the study and a total score of bronchitis-specific symptoms (BSS) ≥ 5 points at the time of screening. A total of 220 patients were randomized to receive EPs 7630 (n=111) or placebo (n=109) as follows: 10 drops 3 times daily for patients aged 1 to 6 years; 20 drops 3 times daily for patients aged 6 to 12 years; or 30 drops 3 times daily for patients aged > 12 to 18 years for 7 consecutive days.

No significant differences were noted at baseline between the groups for demographic and anthropometric data. Concomitant medication was taken by 6.3% of patients in the EPs 7630 group and 10.1% in the placebo group. Acetaminophen use was allowed and did not differ between groups. Antibiotics were taken by 5 patients in the EPs 7630 group and 3 patients in the placebo group.

The primary efficacy variable was the change in the BSS total score from day 0 to day 7. The BSS total score comprised 3 items, including “coughing,” “pulmonary rales at auscultation,” and “dyspnea.” At each visit, those symptoms were scored according to a 5-point verbal rating scale from 0 (“not present”) to 4 (“very severe”).

From baseline to day 7, the mean BSS total score decreased by 4.4±1.6 points in the EPs 7630 group compared with 2.9±1.4 points in the placebo group. A continuous decrease in the mean BSS total score between baseline and day 7 was observed in both groups, but scores were significantly better with EPs 7630 than placebo after 3-5 and 7 days: EPs 7630 versus placebo day 0: 6.0±1.6 vs. 8.0±1.5; day 3-5: 3.6±1.4 vs. 4.3±1.4; day 7: 1.6±1.4 vs. 2.9±1.4 (P<0.0001 for days 3-5 and day 7, respectively).

For individual symptoms, “coughing” and “pulmonary rales at auscultation,” the mean decrease in BSS between day 0 and day 7 was more pronounced in the EPs 7630 group compared with the placebo group (P<0.0001). “Dyspnea” (difficult breathing; shortness of breath) showed a nonsignificant advantage for EPs 7630.

Regarding general symptoms, “lack of appetite” was significantly improved in the EPs 7630 group (P<0.0001) at day 7. Among other secondary efficacy variables were the response rates defined as BSS total score of < 5 points at day 7 (criterion 1); decrease in BSS total score by at least 4 points from day 0 to day 7 (criterion 2); and BSS total score < 3 at day 7 combined with a decrease in BSS total score by at least 4 points from day 0 to day 7 (criterion 3).

Response rates at day 7 were considerably higher in the EPs 7630 group compared with the placebo group. For all 3 response criteria, a statistically significant difference was observed for the EPs 7630 group (P=0.0001 for each). The treatment effect occurred significantly earlier in the EPs 7630 group compared with the placebo group (P=0.0001).

Evaluation of treatment outcome by the investigator and satisfaction of patients with treatment were each significantly better in the EPs 7630 group compared with the placebo (P=0.0001 for both).

Three adverse events were observed in two of the 111 patients in the EPs 7630 group, but a causal relationship was excluded in all 3 cases. Clinical laboratory parameters showed only marginal group differences.

These results support the efficacy, tolerability, and safety of the herbal drug preparation EPs 7630 in children and adolescents aged 1-18 years suffering from acute bronchitis. This confirms a previously published observational study in children ages 0-12 years.

According to the authors, the treatment benefit was most pronounced for the symptoms “coughing” and “rals at auscultation,” which could be explained by the improvement of ciliary bearing as found in vitro. They suggest that this could be an important mode of action independent of antibacterial activity as most episodes of acute bronchitis are caused by viruses, as previously noted.

The authors point out that even in diseases requiring antimicrobial therapy, initial treatment with EPs 7630 could “bridge the time between presentation of the patient and the final decision on an appropriate antibiotic, thus reducing the risk of uncritical antibiotic treatment.”

A previous systematic review of 6 clinical trials on EPs 7630 used by patients with bronchitis concluded there is “encouraging evidence from currently available data that P. sidoides is effective compared to placebo for patients with acute bronchitis.”

This study was supported by Schwabe Pharmaceuticals, Karlsruhe, Germany.
Effect of Ginger on Acute and Delayed Chemotherapy-Induced Nausea and Vomiting


For those suffering from cancer, the adverse side effects of nausea and vomiting from chemotherapy drugs can be an additional and disruptive burden. This chemotherapy-induced nausea and vomiting (CINV) can generally occur either during the initial 24 hours from chemotherapy (acute), 24 hours after chemotherapy (delayed), or as a result of association with chemotherapy in cancer patients (anticipatory). Antagonists of 5-hydroxytryptamine 3 (5-HT3) receptors are commonly used antiemetic drugs but do not help all patients; additionally, these drugs have limited efficacy for treating delayed and anticipatory CINV, necessitating alternative treatment options.

Ginger (*Zingiber officinale*, Zingiberaceae) root has been used traditionally as a spice and for gastrointestinal problems in many parts of the world. Although previous studies report several mechanisms for the antiemetic activity of ginger root, including antagonism of 5-HT3 receptors, clinical trials of its use are not entirely in agreement. This pilot, randomized, open-label, clinical trial investigated the use of ginger root along with standard anti-emetic drugs in treating acute and delayed CINV in advanced breast cancer patients in initial chemotherapy.

This trial took place at the Oncology Unit of Baqiyatallah Hospital, Tehran, Iran. Included patients were undergoing initial chemotherapy (mostly a combination of the moderately emesis-causing chemotherapy drugs doxorubicin, epirubicin, and cyclophosphamide) with a diagnosis of advanced breast cancer. The included patients were not pregnant or lactating, and none were undergoing radiation treatments. Patients enrolled in another trial, who had a bone marrow or stem cell transplantation, or who had other serious illness or suffered from motion sickness were excluded. Enrolled patients were randomly assigned to either a ginger group taking 1.5 g/day of ginger in 3 doses every 8 hours along with the standard antiemetic drugs granisetron (5-HT3 antagonist) and dexamethasone, or a control group taking just the pharmacological.

The Iran Herb Medical Society prepared and validated the ginger, but the authors give no description as to how preparation and validation were accomplished. The ginger root (dried and powdered) was encapsulated in 500 mg amounts and manufactured by Razak Laboratories Corporation, Tehran, Iran. The first dose of ginger or placebo was given 30 minutes after the chemotherapy treatment and continued for 4 days with day 1 indicating when chemotherapy started. Patients were asked to eat easily digestible foods and avoid nausea-causing foods. No examples are given. To assess frequency, duration, and distress of nausea, vomiting, and retching, the Rhodes Index of Nausea, Vomiting, and Retching (RINVR) was used. This scale consists of 8 questions with a score ranging from 0 (no symptoms) to 3 (highest severity). The prevalence and severity of nausea, vomiting, and retching were measured during the first 6 hours after chemotherapy treatment, during the 6-24 hours after chemotherapy, and during days 2, 3, and 4. Patients filled out the RINVR questionnaire daily and also mentioned any adverse side effects.

Of a total of 100 enrolled female patients with an average age of 51.83 ± 9.18 years, 22 were lost to follow-up or were dropped due to non-compliance. This resulted in n=37 in the ginger group and n=41 in the control group who completed the study. During the 6-24 hours after chemothera-6py treatment, the prevalence of nausea was significantly reduced in the ginger group as opposed to the control group (59.5% vs. 59.5%, respectively; P>0.01). During the first 6 hours after chemo- therapy, as well as on days 2, 3, and 4, no significant differences were observed with the prevalence of nausea, vomiting, and retching between groups. Also, there were no significant differences between the other average RINVR scores for nausea, vomiting, and retching between groups. Lastly, there was no difference between the number of patients experiencing symptoms of various severity as measured by the RINVR.

In summary, the ginger group experienced a significant reduction in the prevalence of nausea in the ginger group in the initial 6 hours after chemotherapy (17%), as well as on day 2 (10%) may still be clinically relevant. Weaknesses of the study include an underpowered sample size, no use of treatment blinding, and the fact that all patients had a lower-than-expected severity and prevalence of CINV. Also, the study design of using ginger in conjunction with established antiemetic medication may have induced a “floor effect” and suppressed between-group differences. Future clinical trials with ginger supplementation on its own are needed with stronger designs. Despite these problems, this study suggests that ginger remains a robust candidate for the treatment of CINV in cancer patients.

—Amy C. Keller, PhD

References


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A medicinal plant garden at the University of Kansas (KU) is among the newest of its kind at college and university campuses in the United States and Canada. The garden, installed at the KU School of Pharmacy, introduces and reminds students, as well as faculty and the public, that many of the pharmaceutical drugs used today are based on the medicinal properties of plants.

Introduction
Historically and presently, there has been and is a need for campus medicinal plant gardens. In 1928, 25 gardens were identified in the Pharmacy Headquarters Bulletin (a national trade publication).1 Today, a number of university gardens are in place, and they range widely in size, scope, and emphasis on research and/or education — and there may be fewer gardens that emphasize medicinal plants than there were nearly 100 years ago. Some medicinal gardens, such as the University of Washington-Seattle Medicinal Herb Garden, established in 1911, have deep histories.*

Medicinal gardens, whatever their size, emphasis, and form, serve as significant resources for any campus. The KU garden focuses particularly on native medicinal plants, as such gardens do the following:

• provide physical material for teaching on medicinal plants;
• highlight the ongoing need for the study of medicinal plants, particularly those native to the region;
• directly promote the value of these plants to human health and thereby lend support to efforts to conserve the plants' native habitats;
• and in some cases, provide examples of how native plants can be integrated or even used as the basis for gardens in conventional settings (reducing the need for high inputs and providing further support for plant and land conservation).

The KU School of Pharmacy garden, inaugurated in 2011, serves as a case study of the establishment of a university medicinal garden on campus — one with a distinct purpose and a strong connection to the historical study of medicinal plants and to an earlier medicinal garden at the same university.

Overview of the Garden
The School of Pharmacy medicinal plant garden is designed for education and highlights the historical uses of about 60 species of plants, most of them native to the Midwest and Great Plains region. It is strategically situated on the sunny south patio just outside the school’s café, where traffic is relatively high and close to ample parking, thus providing an opportunity for the public to see, touch, and smell these medicinal plants.

The pharmacy garden was designed by faculty, staff, undergraduate students, and graduate students of the Native Medicinal Plant Research Program, which studies the medicinal chemistry of plants native to the Midwest and Great Plains. The botany arm of the program is led by coauthor Kelly Kindscher, PhD; a senior assistant professor of botany at KU. The program is supported by a grant from the National Science Foundation (NSF).

By Kirsten Bosnak, MFA, MS; Kelly Kindscher, PhD; Rachel Caff, MA, and Barbara N. Timmermann, PhD

* Editor’s note: The first medicinal university plant garden still extant in its original location is the garden at the University of Padua in Italy, established in 1545. HerbalGram article available at: http://cms.herbalgram.org/herbalgram/issue77/article3212.html

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With self-guided tours in mind, program faculty and staff have given personal tours of the garden to student and community groups. The medicinal garden has been a great addition to the school,” said Ken Audia, PhD, dean of the KU School of Pharmacy. “To @oparka participants who visited the garden, KU students are more likely to go on to visit the plants in the wild. The garden is a great classroom for teaching about medicinal plants, their biologically active compounds and their effects on human health. Pharmacy students get exposed to the real plants and learn to recognize them in their natural setting. As the discipline of pharma macognosy is no longer part of pharmacy curricula, I am able to introduce our students to the important role that plants have played in traditional and modern medicine.”

Dr. Timmermann was not the first KU faculty member to ask for a medicinal garden. Her request, and much of the research and other activity carried out through the Native Medicinal Plant Research Program, echoes the work of Lucius Sayre, the first faculty member and first dean of the KU School of Pharmacy. Sayre came to the university in 1885 from Philadelphia. He studied the medicinal chemistry of plants, including Echinacea angustifolia (Asteraceae), native to the Great Plains. His study of Echinacea helped provide background and historical information for later research on E. angustifolia in the Kindscher lab, including study of its population structure and the sustainability of wild harvest in Kansas. Beginning in 1913, Sayre campaigned for the domestic commercial production of medicinal plants, particularly those suited to particular regional climates, to reduce US dependence on Europe for medicinal plants and other medicines: “When we consider the many tons of these plants consumed in the United States in making preparations such as tinctures, fluid extracts and medicated plasters, it becomes evident that the supply, if furnished by our own country, would not only be a profitable undertaking, but would put us in an independent position.”

Sayre also worked vigorously for the addition of a medicinal plant garden on campus and was turned down repeatedly. After visiting numerous pharmacy school medicinal plant gardens (including those in Philadelphia, Montana, Nebraska, Wisconsin, and Minneapolis) he noted how pleased he was to visit the University of Minnesota-Minneapolis medicinal plant garden because of its size and advanced greenhouse. However, he expressed disappointment that KU would not allow the concept for a medicinal plant garden to come before the university legislature. As a result, the school would remain “…very backward in this most worthy enterprise.”

The earliest known documentation in KU records of its first campus medicinal plant garden is from the March 1927 issue of the University of Kansas Alumni Magazine. The garden, known as the KU Drug Garden, was featured in a photograph with a caption listing the plants included. Sayre

**Plants in the KU School of Pharmacy Medicinal Garden**

The garden contains nearly 60 species, divided into 5 themed beds.

**Plants in the genus Echinacea (purple coneflower)**

- Narrow-leaved purple coneflower (E. angustifolia)
- Yopoka purple coneflower (E. atrorubens)
- Smooth purple coneflower (E. leucone)
- Pale purple coneflower (E. pallida)
- Bush’s purple coneflower (E. paradoxus)
- Eastern purple coneflower (E.purpurea)
- Sanguin purple coneflower (E. sanguinea)
- Wavelate purple coneflower (E. simulata)
- Tennessee purple coneflower (E. tennesseensis)

**Plants in the genus Asclepias (milkweed)**

- Antelope horns, spider milkweed (A. asperula)
- Broadleaf milkweed (A. speciosa)
- Narrow-leaved purple coneflower (Echinacea angustifolia)
- Rattlesnake master (Eryngium yuccifolium)
- Rosennie (Eupatorium perfoliatum)
- Flowering spurge (Euphorbia corollata)

**Great Plants in the United States Pharmacopeia and National Formulary**

- Yarrow (Achillea millefolium)
- Calfamus, or sweet marjoram (Calamintha)
- Dogbane (Apocynum cannabinum)
- Butterfly milkweed (Asclepias tuberosa)
- Wild indigo (Baptisia tinctoria)
- Narrow-leaved purple coneflower (Echinacea angustifolia)

**Research Program. This funding covered costs associated with locating sources for and purchasing plant materials, as well as tools, soil amendments, and wages for students who maintain the garden.**

An extensive, high-quality signage system includes a main informational panel, measuring approximately 2 by-5 feet, set directly across from the entrance into the café, which describes the purpose and historical basis for the garden. Each of 5 individually themed beds is explained with a smaller panel, and 4-by-6 inch signs provide information on each individual plant. The signage system, which makes the garden a true educational tool, was provided through the Gail Heim Memorial Fund (at KU Endowment, the university’s private foundation) for the School of Pharmacy. In addition to the signage presentation, which was designed

**Curlycup gumweed (Grindelia squarrosa)**
- American alumroot (Heuchera americana)
- Bicvein (Monarda fistulosa)
- Mad-dog skullcap (Scutellaria lateriflora)
- Maryland snipa (Senna manitibanda)
- Blue virenia (Verbena hastata)
- Culve’s root (Veronicastrum virginicum)
- Eastern pasqueflower (Pulsatilla patens)

**Plants from the 1920s KU Drug Garden Honoring L. E. Sayre**

Marshmallow (Althaea officinalis)
- Absinthe, or wormwood (Artemisia absinthium)
- Lamb’squarter (Chenopodium album)
- Job’s tears (Coix lacryma-jobi)
- Fogflax (Digitalis purpurea)
- Cottonwood (Populus balsamifera)
- Rue (Ruta graveolens)

**Tea and scented medicinal plants**

- Chives (Allium schoenoprasum)
- Tarragon (Artemisia dracunculus)
- Sweet fennel (Foeniculum vulgare)
- Lavender (Lavandula angustifolia)
- Lemon balm (Melissa officinalis)
- Water mint (Mentha aquatica)
- Beemhead (Monarda fistulosa)
- Catnip (Nepeta cataria)
- Marjoram (Oregano marjorana)
- Oregano (Oregano vulgare)
- Sifter mountainmint (Pycnanthemum tenuilolium)
- Rosemary (Rosmarinus officinalis)
- Sage (Salvia officinalis)
- Thyme (Thymus vulgaris)

**To see this list with the text of informational signage on historical medicinal uses, visit http://nativetplants.ku.edu/pharmacygarden**

Howard University, Washington, DC
Massachusetts College of Pharmacy, Boston, MA
W.J. Real Botanical Garden, Michigan State University
Meharry Medical College, Nashville, TN
Montana State University, Missoula, MT
Pittsburgh College of Pharmacy and Science
Purdue University, West Lafayette, IN
South Dakota State College, Brookings
St. Louis College of Pharmacy, MO
University of Buffalo, NY
University of Florida, Gainesville
University of Kansas, Lawrence
University of Iowa, Iowa City
University of Minnesota, Minneapolis
University of Nebraska
University of North Carolina
University of Oklahoma, Norman
University of Tennessee, Memphis
University of Texas, Austin
University of Washington, Pullman
University of Washington, Seattle
University of Wisconsin, Madison
Valparaso University, IN
West Virginia University, Morgantown
Western Reserve University, Cleveland

**Medicinal Gardens at Schools of Pharmacy in 1928, as Listed in Pharmacy Headquarters Bulletin**

- University of Maryland, Baltimore
- University of Missouri, St. Louis
- University of Pittsburgh, Pittsburgh
- University of Tennessee, Knoxville
- University of Washington, Seattle
- University of Wisconsin, Madison
- Western Reserve University, Cleveland

**Dr. Timmermann, PhD, principal investigator of the Native Medicinal Plant Research Program, echoes the work of Lucius Sayre, the first faculty member and first dean of the KU School of Pharmacy. Sayre came to the university in 1885 from Philadelphia. He studied the medicinal chemistry of plants, including Echinacea angustifolia (Asteraceae), native to the Great Plains. His study of Echinacea helped provide background and historical information for later research on E. angustifolia in the Kindscher lab, including study of its population structure and the sustainability of wild harvest in Kansas.**
had died 2 years earlier; it is not known whether any garden was established during his lifetime.

Planning the Garden
Space for the current pharmacy garden, set aside in 2010 as part of the overall landscape for the new School of Pharmacy building, comprised three 5-by-10 foot beds. The botany staff who designed the garden requested additional space, consisting of a 3-foot-deep area along about 50 feet of the patio sidewalk. This made it possible to develop a scheme of 5 distinct beds with different themes.

The group believed it was important to feature plants with at least one of 2 key attributes: (1) those that would be of particular interest to pharmacy students and faculty, and (2) medicinal plants native to the region. Sourcing plants also was a factor in choosing species. Some were grown in the university greenhouse from seed that was collected from the wild or purchased from specialty suppliers. Others were transplanted from the program’s research garden or other parts of the KU Field Station. Some of the more traditional medicinal plants and those better known as culinary herbs were purchased.

Quinn Long, a botanist and ecologist with the Missouri Botanical Garden, worked with the Native Medicinal Plant Research Program for a year just after he completed his doctoral degree at KU. He was responsible for sourcing most of the plant material for the garden.

“While some of the species in the garden could be acquired readily from most neighborhood garden centers, others were much more difficult to track down,” Long said. “We received mature plant material from sources from Oregon to Ontario and many points in between. With some species, we could not find mature plant material anywhere despite our efforts, so we propagated these species from seed, much of which we harvested.”

Planting Day
The KU School of Pharmacy medicinal plant garden was promoted through a public planting event that drew more than 100 participants and made the local newspaper. Staff of the Native Medicinal Plant Research Program worked together with pharmacy students in planning the event, and about 20 pharmacy students, along with other volunteers, helped install the garden on May 3, 2011.

Echinacea E. tennesseensis. Photo ©2012 Kirsten Bosnak
Because the garden’s location is so prominent, the university expected the garden as a whole to be attractive immediately. This meant that most of the plants needed to be large enough to make a visual impact right away. But many native prairie plants spend their first year building root systems, and the plants themselves are not very full until at least their second growing season. Therefore, the botany staff had to consider both immediate visual impact and long-term educational value; ultimately, they chose to include some important prairie species, even if they knew those plants would be quite small in their first year.

Many themes are present in the garden, but the staff narrowed them to five because of limited space. To preserve the significant historical connection to Lucius Sayre’s work, 1 bed was set aside in the garden for the 20 beds devoted to species in the native to the Great Plains. Finally, 2 beds are devoted to species in the many of which are better known as culinary herbs; three of the 14 species in this bed are mints (Lamiaceae) native to the Midwest and Great Plains. Finally, 2 beds are devoted to species in the genera Echinacea (purple coneflowers, Asteraceae) and Alceps (willows, Alcpeaeidae), respectively. Echinacea was selected because, historically and currently, it is the most important medicinal plant in Kansas and the region. Asclepias, on the other hand, was chosen because new medicinal plant compounds have been discovered in several species by the Timmermann laboratory.15

As for the plant selections, one bed is dedicated by Monarch Watch — another KU research program — which also emphasizes milkweeds because monarch caterpillars depend on them for food. Several students working with the medicinal plant program, including Kim Scherman, a senior in English and journalism who was involved with the garden from its earliest design stages, “It’s been inspiring and educational for me to see the pharmacist become so involved in the program.” Scherman said. “As a student assistant with the program, I have had a part in its development and maintenance — and I’ve seen just how many people it has affected. Students, faculty, staff, and community members were present for the public planting. To see their engagement and excitement about these plants made me proud of what we had created.”

I’ve been documenting this garden, taking pictures, and helping to develop the signage for each bed. It’s been a multimedia experience for me, and it has given me real-world experience in creating a garden from the ground up.”

While the prominent site of the garden adds to its visibility, it also presented challenges due to the heavy, sticky clay soils left behind from the farming before the project. Furthermore, the extremely high southern sun exposure is made even more intense by the reflective surfaces of the building itself and the concrete patio. In its initial 17 months, it was extremely hot and dry, but a heavy layer of mulch and vigilant watering by student assistants in the Native Medicinal Plant Research Program allowed most of the plants to make it through the first few years safely.

Into Year Two

Even after only 1 year, the pharmacy garden has attracted the interest of students, the public, and the media, bringing positive attention to the School of Pharmacy and the university. Staff of the Native American Medicinal Plant Research Program continue to receive requests for tours.

With regard to the maintenance of the garden, several of the plants need special handling, such as cotton (Gossypium hirsutum, Malvaceae; likely included in the 1920s KU Drug Garden because of the use of cotton balls in the pharmaceutical profession). These annuals must be replaced each year and can be germinated from seed in the KU greenhouse. Mints, highly important medicinal plants in this garden, but also highly aggressive, naturally grow out of bounds if not contained. Several native species of milkweed (Asclepias) — the Great Plains plant most widely used for medicinal purposes by Native American tribes — tend to struggle in the clay soils of this new building site as they are just outside their native range, and therefore must be watched carefully. Overall, the plants are thriving in their second year and becoming well established. So far, there has been no vandalism.

Looking forward, members of the program plan to include a few additional species of particular interest, specifically those found to have value as research models or in the Gold Reseach-Inducing program’s own chemistry research labs. The garden has been established as a permanent part of the campus landscape and will serve as an important tool for teaching about medicines and about university history for many years to come.

Acknowledgments

We thank the School of Pharmacy, the students, staff, and faculty who care for the medicinal gardens at the School of Pharmacy following an academic career of almost 25 years at the University of Arizona. Since 1999, I have served as director of the NIH-funded Center for Cancer Experimental Therapeutics, a Center of Biomedical Research Excellence. I acknowledge the electron microscopy and histology staff at the University of Arizona’s College of Medicine and the American Cancer Society for support. I also acknowledge the students and staff members who have contributed to the garden’s development over the past few years and who have been instrumental in its success. Finally, I would like to express my gratitude to the many people who have supported the garden over the years, including the students, faculty, staff, and visitors who have participated in its development and maintenance.

Additional University Campus Medicinal Gardens* Founding dates, when known, are indicated in parentheses.

University of California Botanical Garden at Berkeley (1890) — This public educational garden includes a Chinese Medicinal Herb Garden (1987) with more than 100 herbs, as well as the Herb Garden, which is organized according to plant uses.

Georgetown University Urban Herbs Garden, Washington, DC — This public educational garden includes edible, medicinal, and ornamental plants of both Western and Asian origins.

University of Georgia, Athens — Gardens include the Latin American Ethnobotanical Garden (1996) for educational gardens with culturally important Latin American and Caribbean plants, and the Herb and Phythic Garden.

Haskell Indian Nations University Garden of Healing, Lawrence, Kansas (2002) — This public educational garden includes Great Plains edible and medicinal plants.

University of Hawaii Windward Community College Bioprocessing Medicinal Garden Complex (2002) — This research-oriented complex includes 3 facilities: the medicinal garden (with plants from Asia and the Pacific Islands as well as North America); the aquaponic system, and a bioprocessing facility for students to make marketable medicinal extracts.

University of Illinois at Chicago Dorothy Bradley Atkins Medicinal Plant Garden (1999) — This public educational garden contains more than 120 species of medicinal plants of importance in modern pharmacy and medicine, and those of importance in traditional systems of medicine.

Nova Southeastern University Healing and Medicinal Garden, Fort Lauderdale-Davie, Florida (2007) — This public environmental garden features a Reflexology Pathway surrounded by more than 200 medicinal plant species.

University of Massachusetts-Amherst Medicinal Herb Garden (2011) — This small public educational garden is at the entrance to the University Health Center.

University of Michigan Ann Arbor and Berrien Springs — This public educational garden includes 8,000 square feet and contains more than 80 medicinal plants (1996) — This public educational garden holds more than 150 species of culturally important Native American plants.

University of Montana University Center Garden, Missoula (1996) — This public educational garden contains edible and medicinal plants used in Asian, European, and Native American cultures.

University of Nebraska’s Botanical Gardens, Lincoln (1996) — This public educational garden includes edible and medicinal plants used in Asian, European, and Native American cultures.

University of North Florida South Florida, Tampa (2010) — This medicinal plant garden occupies a 160-square-foot area in the larger University Botanical Gardens.

Temple University, Philadelphia (2011) — This 250-square-foot community garden is open to the public.

University of Utah Red Butte Garden, Salt Lake City (1990) — This public educational garden encompasses 8,000 square feet and contains more than 80 medicinal plant species.

*This list is not necessarily exhaustive; every effort was made to develop a comprehensive list of gardens focusing on medicinal plants at US colleges and universities.
New Research Supports Synthetic Origin of DMAA in Supplements

By Tyler Smith

In recent years, DMAA has become a popular component of pre-workout supplements for its stimulant-like effects. Sales of such supplements reached $100 million dollars in 2011, according to Nutrition Business Journal. However, worldwide reports of adverse events associated with DMAA-containing supplements have brought the compound’s safety — and origin — into focus. Under the Dietary Supplements Health and Education Act of 1994 (DSHEA), a dietary supplement is considered adulterated unless its constituents are naturally occurring substances that existed in the human diet prior to 1994.4 Recent studies, however, have failed to detect DMAA — otherwise known as methylhexaneamine (MHA) — in authenticated samples of geranium oils, stems, and leaves.5,6

Controversy over the origin None of the samples, authenticated or commercial, was found to contain MHA. “The data show that none of the authenticated P. graveolens essential oils or plant material, nor any commercial volatile oil of Pelargonium (geranium oil) contain MHA at detectable levels (limit of detection: 10 [parts per billion]),” the study concluded.6

By comparing the unique ratios of the chemical forms of DMAA in the 13 consumer supplements to 2 synthetic DMAA standards purchased from analytical chemical reference standards suppliers Sigma-Aldrich (Milwaukee, WI) and Chroma-Des (Irvine, CA), Armstrong determined that it is “unlikely that the DMAA in supplements originates from natural sources such as geranium oils.” DMAA was found in the supplements to be indistinguishable from the synthetic forms of the chemical, both of which contained equal amounts of the two non-superimposable isomers — a strong indication of the molecule’s synthetic origin.5 This analysis contains the only scientific investigation thus far to systematically evaluate the various chemical forms of DMAA in order to determine the true origin of the compound.

A study published in June in the Journal of Analytical Toxicology provides further evidence of DMAA’s synthetic origin.6 “The bottom line is that the synthetic molecule is there, is synthetic, not natural,” said lead author Mahmoud ElSohly, a professor in the School of Pharmacy at the University of Mississippi (oral communication, June 5, 2012). The study, supported in part by the US Anti-Doping Agency (USADA), analyzed 20 commercial geranium oils. 3 authenticated geranium oil samples and 3 commercial samples of geranium leaves and stems for the presence of MHA (DMAA). Each authenticated sample was derived from Pelargonium graveolens, not to be confused with species from Geranium, an entirely separate genus.

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Authenticated leaves and oil of P. graveolens were obtained from the Indian Institute of Integrative Medicine, a natural products research organization based in Jammu, India. Additional leaves and stems were obtained from the medicinal plants garden at the National Center for Natural Products Research at the University of Mississippi. “All authenticated samples (plant material and volatile oil) were analyzed for MHA by gas chromatography-mass spectrometry (GC-MS), liquid chromatography-tandem mass spectrometry (LC-MS/MS) and liquid chromatography-high-resolution mass spectrometry (LC-QTOF-MS) methods,” the authors explained in the paper.6

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For comparison purposes, researchers also measured the amount of DMAA in 3 MHA-containing dietary supplements purchased from GNC.com on December 1, 2011. “The dietary supplements that contained MHA as one of their ingredients (allegedly from geranium or geranium stems) contained large amounts of MHA,” the authors wrote. “All of these products contained more than 1 mg MHA per g of dietary supplement. Each of the supplements contained more than 250 g of supplement material per bottle, which would require at least 250 mg of MHA per bottle of supplement.”6

A simple calculation by the authors shows that this amount of MHA could not possibly be extracted from true geranium samples. “If MHA were to be present in the oil at 0.6% (i.e., 6mg MHA/mL oil), as reported [in the Ping et al. paper], and assuming that the leaves yield 0.1% oil, it would require approximately a kilogram of leaves to be harvested to prepare 6 mg of MHA. … [One] bottle of 100 capsules would require the processing of 167 kg [-370 lbs] of P. graveolens leaves for 167 mg of geranium oil!”6

American Botanical Council (ABC) Founder and Executive Director Mark Blumenthal issued a statement in an interview with Nutraingredients shortly after the publication of Dr. ElSohly’s paper (Ms. Blumenthal email to S. Daniells, June 26, 2012). “ABC has stated repeatedly that we have not seen any credible, published scientific evidence that DMAA (MHA) is found or detectable in Pelargonium graveolens,” he wrote. “The results of this new analysis further strengthen ABC’s previously-stated position. It may be seen as another nail — a big one — in the coffin of the DMAA-from-plants claims controversy.”

Organizations Take Action

The US Food and Drug Administration (FDA) became involved in the DMAA controversy on April 24, 2012, when it sent letters to 10 companies warning them that their DMAA-containing supplements are considered adulterated until they file a new dietary ingredient notification.7 The companies were given 15 business days to respond with details on how they plan to address the situation.

“Before marketing products containing DMAA, manufacturers and distributors have a responsibility under the law to provide evidence of the safety of their products,” Daniel Fabricant, PhD, director of FDA’s Dietary Supplements Program, is quoted as saying in an article from Nutraingredients-USA.

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In December of last year, following the deaths of 2 soldiers who used supplements with DMAA, the US military removed all such supplements from military exchanges around the world.

USPLabs, the Dallas, Texas company that sells the popular DMAA-containing pre-workout supplements Jack3d and OxyElite Pro, cites data from 7 short-term clinical studies — all of which are available on the company’s website in support of their products’ safety.12 Each study has shown that although DMAA may produce a mild and transient increase in systolic blood pressure, no other safety variables are affected,” the authors wrote in the report. “Kidney and liver function are unaffected and no serious adverse events are reported in any of the studies. These data clearly demonstrate that the dietary supplements Jack3d and OxyElite Pro which contain DMAA, are safe when used as directed and following all label directions and warnings.”

Further, USPLabs has alerted the media of a forthcoming paper in Analytical Chemistry Insights, in which the company claims will confirm the presence of DMAA in geranium plants obtained from China.13 The paper was not available at press time.

The Future of DMAA

Beginning in November 2011, class action lawsuits were filed against Florida-based supplement maker BPI Sports, alleg ing that its supplements contained unlabeled DMAA, which, according to the suit, has potentially life-threatening side effects. In February 2012, the law from Abby, Spanier, Rodd & Abrams LLP filed a class action lawsuit against supplement giant General Nutrition Centers (GNC), alleging it has been selling products with “wholly synthetic” — and therefore adulterated — DMAA.14 More recently, several countries have issued alerts warning consumers of the potential dangers of the chemical. Nutraingredients.com reported in July that the Therapeutic Goods Admin istration (TGA) of Australia added DMAA to its Schedule 9 list, which criminalizes the sale, distribution, use, or manufacturing of the chemical.15 In June, the Food Standards Aust ralia New Zealand (FSANZ) released a consumer warning about DMAA-containing sports supplements. “DMAA has been linked in other countries with various adverse health effects including high blood pressure and vomiting,” said FSANZ Deputy Chief Executive Office, Melanie Fisher, in the organization’s consumer warning.16 “Regulatory agen cies are working together to assess the products’ safety and therefore will seek assistance of the retail drug trade and even the consumer to withdraw the product.”

In June, the Finnish Food Safety Authority, Evira, followed Sweden and Denmark in clearing the market of DMAA-containing supplements. According to Evira, “Risk assessment by the Danish and Swedish Food Safety Authori ties shows that DMAA is not appropriate for human consumption due to its associated health risks.”17 In an article published on July 2, 2012, Natural Products Insider reported that the FDA recently confirmed to be a plant-derived compound. “We have no evidence for human health risk assessment by the Danish and Swedish Food Safety Authori ties that DMAA is not appropriate for human consumption due to its associated health risks.”17 In an article published on July 2, 2012, Natural Products Insider reported that the FDA recently confirmed to be a plant-derived compound. “We have no evidence for human health risk assessment by the Danish and Swedish Food Safety Authori ties that DMAA is not appropriate for human consumption due to its associated health risks.”17 In an article published on July 2, 2012, Natural Products Insider reported that the FDA recently confirmed to be a plant-derived compound. “We have no evidence for human health risk assessment by the Danish and Swedish Food Safety Authori ties that DMAA is not appropriate for human consumption due to its associated health risks.”17 In an article published on July 2, 2012, Natural Products Insider reported that the FDA recently confirmed to be a plant-derived compound. “We have no evidence for human health risk assessment by the Danish and Swedish Food Safety Authori ties that DMAA is not appropriate for human consumption due to its associated health risks.”17 In an article published on July 2, 2012, Natural Products Insider reported that the FDA recently confirmed to be a plant-derived compound. “We have no evidence for human health risk assessment by the Danish and Swedish Food Safety Authori ties that DMAA is not appropriate for human consumption due to its associated health risks.”17 In an article published on July 2, 2012, Natural Products Insider reported that the FDA recently confirmed to be a plant-derived compound. 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READING RUMPHIUS
The English Translation of The Ambonese Herbal,
The Most Important Translation of a Classic Herbal Publication in this Century
By Susan Murch, PhD

The Ambonese Herbal, the English translation of Herbarium Amboinense or Het Amboinsche kruidboek by Georgius Everhardus Rumphius, was unveiled at a special symposium at The Kampong of the National Tropical Botanical Garden (NTBG) in Coconut Grove, Florida, on February 5, 2011, and can now be purchased from Yale University Press. The English translation of The Ambonese Herbal, as it is commonly known, is among the most treasured and most complete works of botany and ethnobotany from the 17th century. The original work was made up of 7 volumes, each divided into books and further divided into chapters. Written in the elaborate Latin and Dutch of the 17th century, it contains descriptions of more than 1,300 plants and 811 full-page illustrations. The new translation is arranged in 6 volumes with species grouped together into families, organized again by books and chapters, and includes a comprehensive introduction that provides the reader with a historical narrative of the life of G.E. Rumphius and the Dutch expeditions to the Spice Islands of Indonesia as well as the tragedies and triumphs of the work itself. Beginning partway through Volume One and proceeding throughout all of Volume Five are Rumphius’s descriptions of the Ambonese plants with comments on their uses and their roles in society. These volumes are extensively annotated with explanations for the translation or interpretation of specific Dutch words, contextual meanings, modern botanical nomenclature, and a wealth of information about the plants and the culture. More than 2 dozen experts from around the world have contributed their knowledge to specific sections of the text and to the annotations. The final, 6th volume contains an index of the plants, topics, and context that makes searching for specific information efficient and effective.

Georgius Everhardus Rumphius (1627-1702) was born in Wolfersheim in the eastern region of Hesse, now central Germany. The Thirty Years War was waging and soldiers from opposing camps were quartered in local houses. People were regularly robbed, marginalized, and killed and 1 year after Rumphius’s birth, the plague came to Wolfersheim. It returned 7 years later and by 1648, the population of Wolfersheim had been reduced from about 5,000 to 38 adults and 16 children. For Rumphius’s family, survival came as his father began a business repairing and restoring the buildings damaged by the war. He moved the family to Hanau in 1637 and it was there that Rumphius received his education at the Gymnasium Illustre, finishing in 1645, when he was 18.

After schooling, Rumphius became a mercenary and many details of his adventures are richly described in Volume One of The Ambonese Herbal, which also contains a detailed historical perspective and context of the times. In 1652, Rumphius joined the Dutch East India Company (VOC; Verenigde Oost-Indische Compagnie) under the name “Jeurianen Rumpf from Hanau.” The VOC was possibly the largest employer in the world at the time, with 6,700 employees in 1625 — 3,200 of them onboard ships managing the trade of nutmeg (Myristica fragrans, Myristicaceae) cloves (Syzygium aromaticum, Myrtaceae), and cinnamon (Cinnamomum zeylanicum, Lauraceae). Rumphius was a soldier with a 5-year contract and he sailed for the East Indies on December 26, 1652, aboard the Mayden. The voyage of the Mayden was very successful by VOC standards, arriving in Java after 6 months with a loss of only 9 people. This was a remarkable success since unaccountable casualties, tropical diseases, malaria, typhus, and dysentery were common and it was normal for half of those who sailed to perish on the voyage.

By the beginning of 1654, Rumphius had arrived on the island of Amboon, the center of the spice trade in Indonesia and he soon began his work there. Rumphius stayed on Amboon throughout the rest of his career, transitioning from soldier to merchant and eventually to the second-in-command of the VOC offices. By all accounts, Rumphius was an effective manager and a loyal servant to the VOC. The Rumphius, as it is commonly known, is among the most treasured and most complete works of botany and ethnobotany from the 17th century.
accounts, he was well-liked and respected, but his true passion was writing manuscripts describing the flora and fauna of the island. He married a local woman named Susanna who shared her knowledge of the use of plants — he named an orchid *Plu savannae* “in memory of her who during her life was my first companion and assistant in the finding of herbs and plants.” 2

In 1670, he lost his sight at the age of 42, most likely as a result of glaucoma simplex but the VOC, made arrangements so that he could continue his work and, undeterred, Rumphius trained a series of secretaries, including his son Paulus Augustus, to take dictation. To work with the secretaries, he had to change his writing style and he began to dictate in Dutch rather than write in his own rather formalLatin. The VOC provided illustrators to help with the effort and the work continued for many years.

In February 1674, Ambon was devastated by an earthquake and 2,322 people lost their lives, including Rumphius’s wife and daughter as well as members of their household. More tragedy came in 1687 when a fire spread through the town, destroying Rumphius’s library, collections, and many manuscripts. Only parts of *Herbarium Amboinense* were saved and Rumphius had to redictate the lost chapters to his assistants from memory. In 1690, the first 6 books were sent on the ship *Waterman* to the VOC, but the ship was sunk in a battle with the French. Fortunately, the books had been copied in Batavia and the copies were sent shortly after with all of the volumes arriving at the VOC headquarters in Europe by 1703.

Rumphius died on May 19, 1702, at the age of 75 — a remarkable age for a European living in the tropics. The manuscripts were kept in the VOC company vaults until 1735 when Johannes Burman was allowed to prepare them for publication. Burman meticulously translated passages of Dutch back into Latin and prepared the illustrations. Only 500 copies were printed.

Reading Rumphius is a joy of discovery. Descriptions are organized by the common names of the plants in Ambon and the nearby Spice Islands with annotations to possible species identifications. There are surprising and remakable packets of information almost in every section, even with respect to plants many botanists will think we know so well. We have been conducting research on breadfruit (*Artocarpus altilis*, Moraceae) in collaboration with the NTBG for nearly 10 years. Our research has described the seasons of fruit production, 3 the propagation of the trees, 4, 5 the botanical description of different varieties, 6 the nutritional composition of the fruit, 7 and some of the ethno-botanical uses. It was fascinating to find references to the species in *Volumes One through Five of The Ambonese Herbal*. Organized by botanical group are detailed descriptions of "The Jack Tree" (*Artocarpus integer*), "The Tsjampadaha Tree" (A. *champeden*), "The Cotton Soccus Tree" (A. *altilis*), "The Seed

**Bringing Rumphius to the Modern Age**

*Mrs. Loy McCandless Marks (1905-1995)*

Loy McCandless Marks was a bibliophile, a woman for whom books were the focus of a deeply felt emotion, an expression of an important part of the Marks’ personalities, an enlargement and intensification of their lives. Throughout her life, Mrs. Marks collected exceptional and rare botanical books, including one original printing of *The Ambonese Herbal*. Botanists such as Joseph Rock and Horace Clay provided Mrs. Marks with advice for her collection and nurtured her passion for tropical and subtropical botany and horticulture. Joseph Rock named the plant *Clemontia loyana* (Campanulaceae) in honor of Mrs. Marks and described her as “an ardent lover and grower of plants who is especially interested in the preservation of Hawaiian plants.”

The National Tropical Botanical Garden acquired Mrs. Marks’ collection of exceptional books from the estate in 1997.

**The Loy McCandless Marks Botanical Library**

In recognition of Mrs. Marks’ generosity as well as her role in the creation of the NTBG, the entire collection of books at NTBG’s research headquarters has been named The Loy McCandless Marks Botanical Library. The main reference library comprises 11,000 titles, more than 15,000 physical volumes, 1,200 serials, 2,500 reprints, and close to 3,000 botanical prints. Unpublished materials, such as field collectors’ notebooks, are also part of the library’s collections, as are the correspondence and working papers of botanists, horticulturists, and educators. Original botanical art, including some prepared for use in the NTBG’s scientific publications, illuminates and augments the botanical record and the holdings of the library. Slide and photographic print collections include roughly 8,000 historical images and 16,000 images of Hawaiian and Pacific island plants and people. Approximately 400 rare books are housed in a secure, climate-controlled vault in the Juliet Rice Wichman Botanical Research Center that opened in 2008.

![Image courtesy of Yale University Press.](www.herbalgram.org\issue95\53)
This is the true treasure of knowledge it contains but also the future research it will inspire. The translation is not only accurate but is also well written, entertaining, and informative. The annotations make the reading more enjoyable and the stories contained within are invaluable.

References

"Eu Yan Sang has come a long way from its humble beginnings 133 years ago," said Joanna Wong, the company's general manager of brand management and corporate communications (email, April 5, 2012). "Today it has become a household name in Asia. It is one of the largest TCM groups in South East Asia at the forefront to create safe, quality products and services that promote life-long wellness."

In 1873, a man named Eu Kong emigrated from China to what was then British Malaya, where he soon opened a small grocery store selling daily necessities to the community's many tin mine laborers. Kong also offered remittance and letter-carrying services so that the workers could communicate with and send money to their families in China. Due to harsh living conditions, the tin miners were commonly in poor health, and Kong sold Chinese herbs and medicines to care for them, which Wong said earned him the trust of the community.

"Eu Kong [was] not a physician," said Wong. "He's just a businessman who cares greatly for his workforce’s health and welfare."

Kong’s only son, who inherited the business in his early teens, was also a successful businessman in the tin-mining and rubber plantation industries and expanded Eu Yan Sang’s reach with stores in Hong Kong and southern China (Guangzhou). It was Eu Tong Sen, said Wong, who incorporated more TCM remedies into the store’s operations, first by providing the local herb Combretum sondaicum (Combretaceae) leaf as a treatment for opium addiction in the early 1900s.

Modern Operations

As a global integrative healthcare and wellness company, Eu Yan Sang has grown immensely since its inception. In addition to its approximately 300 retail stores, it also operates 24 TCM clinics in Singapore and Malaysia and 2 integrative medical centers in Hong Kong. These facilities provide herbal prescription services, acupuncture, cupping, therapeutic massage, scraping (a rubbing of the skin to treat stagnation of the blood), bone-setting, and chiropractic care. Its commercial remedies range from the bestselling, multi-herb formulation Bak Foong Pills for menstrual cramping and postnatal nourishment to Eu Yan Sang Sleep Formula Granules for insomnia that are based on a classical TCM formula dating back to the Han Dynasty (206 BCE - 220 CE). Eu Yan Sang also sells numerous Chinese herbs in bulk, as well as "health foods" such as herbal jellies and tonic wines.
While a large part of TCM consists of herbal formulations prepared by TCM practitioners for each individual patient to treat his or her specific conditions, mass-produced herbal products (which are based on a fixed formula and delivered in a specific form) such as the many sold by Eu Yan Sang, “enjoy a very long history as part of the TCM system,” said Chun-Tao Che, PhD, the Norman R. Farnsworth Professor of Pharmacognosy in the College of Pharmacy at the University of Illinois in Chicago (email, June 12, 2012). “In general, these TCM products are self-prescribed for treating mild and chronic conditions, or used as ‘tonics’ to correct minor ‘sub-health’ conditions.”

Eu Yan Sang operates during a time when many herbal and food products from Asia have a negative reputation abroad due to reports of adulteration and contamination, as reflected in the Washington Post’s recent article on Australian officials’ detection of endangered animals parts and toxic plants in seized samples of TCM remedies from China.5

But what sets Eu Yan Sang apart from many other TCM and herbal products companies — aside from its numerous stores and clinicals spanning several countries — is that the company aims to adhere to very strict quality and safety standards.6 In 2008, the company developed the Eu Yan Sang Good Agronomic Practices for Herbs Certification Scheme, which its website describes as the world’s first safety control scheme for TCM herbs.7 According to this plan, the company must source all raw herbs used in its products from independently certified suppliers. The scheme itself is audited by Agrifood Technologies, a commercial branch of Singapore’s Agri-Food and Veterinary Authority that evaluates suppliers’ production systems, good agricultural practices, post-harvest handling and processing practices, and documentation, records, management, and product quality control systems. Herbs that successfully pass through the scheme feature labels on their packaging that indicate their certified status to consumers.

Additionally, Eu Yan Sang’s 2 manufacturing facilities are certified according to Good Manufacturing Practices (GMPs), and the factory in Hong Kong is certified for its GMPs by the Australian Therapeutic Goods Administration.8 All herbs must first undergo chromatographic “fingerprinting” in order to identify and/or determine regional species and any past processing or possible toxic contents.9 “Herbal quality is of prime importance for the herbal industries as well as the consumers,” said Professor Che. “We all have great concerns about negative issues such as adulteration and contamination. It is therefore crucial to obtain good-quality materials from reliable suppliers. While it is often difficult and impractical to deal directly with plant growers or upstream dealers inside China, a reliable channel such as Eu Yan Sang will play a crucial gatekeeping role to help ensure the quality of the materials we obtain. I consider Eu Yan Sang a reputable and reliable supplier of TCM herbs and a key commercial partner in TCM.” Eu Yan Sang also conducts and supports significant research on TCM herbs. In the 1990s, the company created a research and development department, and has since collaborated with several hospitals and universities to study its products. It also worked with TCM experts in China and Hong Kong to create a new TCM treatment for colds and flu, and with the School of Chinese Medicine of Hong Kong Baptist University it published An Illustrated Chinese Materia Medica in Hong Kong with the aim of establishing what the company calls an industry platform for the standardization and modernization of the TCM sector.9

Eu Yan Sang has been presented with so many awards that the company organizes them on its website according to year.10 Some of the prizes include the 2010 and 2011 Most Favoured Premium Hundred-Year TCM Brand Award from the Hong Kong Traditional Chinese Medicine Association, the 2009-2010 Manning’s Hall Limited Professional TCM Product Award for Bo Ying Compound, the Trusted Retailers in the TCM category (voted by readers) from Guang Zhou Daily News, and the 2007 China Leading Quality Enterprise Association Award for a Top 10 Brand in the Medicine Category.

Despite the company’s success, the board and staff of Eu Yan Sang — which is currently run by Robert, Richard, and Clifford Eu, great grandsons of founder Eu Kong — realize the importance of staying current to consumers today is essential to its growth. “Though Eu Yan Sang has withstood the tide of time with over a century of heritage,” said Wong, “the Group recognizes that staying current to consumers today is essential to its growth. It adopts a scientific approach to validate and harness nature, and at the same time, adheres to the value of humanity while embracing progress and change.”11

References


Herb Supplement Sales Increase 4.5% in 2011

Despite Still-Weak Economy, Herb Sales Continue Multi-Year Growth

By Mark Blumenthal1, Ashley Lindstrom2, Carla Ooyen2, and Mary Ellen Lynch3

1 American Botanical Council, Austin, Texas, USA
2 Nutrition Business Journal, New Hope Natural Media, Boulder, Colorado, USA
3 SPINS, Schaumburg, Illinois, USA

Sales of herbs and botanical dietary supplements in the United States increased an estimated total of 4.5% in 2011 according to SymphonyIRI Group’s “Nutrition Business Journal,” a leading market research service licensed to track and forecast trends in the natural products industry.

"Despite still relatively weak economic conditions in the United States and worldwide, this total sales growth is greater than the increase in sales noted in the previous Herb Report for the year 2010 — the initially stated increase being pegged at 3.3%, then later revised upward to mere 0.2%, due to sales data that was obtained and evaluated after press time for the 2010 report. (This was due primarily to poorer-than-expected performance in the direct-to-consumer channels — data that became available after publication date.) The 2011 increase marks the 8th year in a row since 2004 in which herb sales increased over the previous year (Table 2).

As has been the case in previous years, total herb supplement sales in the different market channels vary according to statistics provided by market research firms, from a strong 6.9% in the mainstream market (Food, Drug, and Mass Market retail stores, FDM), to an even stronger 9.9% in the natural channel.

Mainstream Channel — Food, Drug, and Mass Market (FDM)

In the FDM channel for 2011, a total sales level of $579,286,600 was calculated by the Chicago-based research firm SymphonyIRI — an increase of $23,601,300 over sales of $555,925,300 in 2010 (Table 3). In general, the FDM channel represents mainstream acceptance and success of numerous popular herbs, e.g., bilberry fruit extract, black cohosh root, ginkgo leaf extract, Asian ginseng root (with some American ginseng sales probably mixed into the statistics as merely “ginseng”), milk thistle, saw palmetto berry, St. John’s wort herb extract, and others. Sales statistics for SymphonyIRI, as shown in Table 3, are based on sales from chain drug and food stores, and other mass-market retailers, but do not include warehouse buying clubs (e.g., Costco, Sam’s), or convenience stores (e.g., 7-Eleven). As such, the FDM channel sales in Table 3 reflect a significant, but not total portion of this channel, possibly in the range of up to 50%, but this is merely an educated guess estimate. Insofar as Wal-Mart is considered the largest retail outlet for dietary supplement sales in the US, the sales percentage in Wal-Mart is a considerable, but unreported, portion of total FDM sales.

The increase in last year’s FDM sales was pushed by strong, double-digit increases in the following top-20 herbs, according to SymphonyIRI: cranberry (+13.43%), soy (+10.21%), milk thistle seed (+4.01%), valerian root (+23.02%), ginger (+3.46%), and aloe vera gel preparations (+7.13%). Herbs showing strong increases in the top 21-40 rankings (the first time HerbalGram has reported these “second-tier” rankings, per Table 3) include kelp (+49.05%), alfalfa (+4.99%), dong quai root (+42.10%), eleuthero root (+14.62%), and licorice root (+17.75%).

Sales increases were not uniform across the board, with some herbs experiencing significant declines in the FDM market, according to the SymphonyIRI statistics. These include maca root (-62.03%), echinacea aerial parts and/or root (-43.62%), garlic (-39.99%), and horse chestnut seed extract (-25.73%).

Compared to the SymphonyIRI data, SPINS provides a slightly different sales picture in the FDM channel, based largely on data supplied by Nielsen (Table 4e [online only]), with a calculated total growth rate of 3.9% on sales of $443,329,845.

As an example of the complexity of any analysis of this segment, an SPINS analysis for the total sales of herbal DS in the US total mainstream/FDM channel (including estimated sales in buyers’ clubs and convenience stores, including Wal-Mart, Sam’s Club, Costco, etc) shows that herbal DS sales grew at a lower rate than those reported by either IRI or SPINS/Nielsen — i.e., an NBI-calculated increase growth estimate at 2.9% in 2011, down slightly from NBI’s estimate of 4.0% in 2010.

As was noted in last year’s publication of this annual report, many of the most popular herbs sold in the FDM market are either conventional foods and/or common spices. These include (in order of their rankings) cranberry, soy, garlic, green tea, bilberry, ginger, kelp, cayenne pepper, and barley. Other “edible” or food-oriented herbs include grape seed, elderberry, kelp, spiritulina, and maca root.

Also, as expressed in last year’s report, the top-ranking sales of single herbal DS in both the FDM and natural channels represents a long-noted trend of consumer interest in many of the more well-researched herbs that have become relatively familiar due to a growing body of scientific and clinical research conducted on them. These include the following, as noted in order of ranking for sales in the FDM channel (Table 3): cranberry, saw palmetto, garlic, ginkgo, echinacea, milk thistle, black cohosh, Asian ginseng, green tea, etc.

A dynamic that was discussed in the report of the 2010 market is the actual determination of herbs that constitute the top 20 in sales as compiled by SymphonyIRI (top-40 herbs in this report reflecting a significant increase of 6.9%) (Table 3). As was noted below, it is noteworthy to see horehound (Marrubium vulgare, Lamiacae) as the top-selling herb in the SPINS FDM rankings (which include singles, herbal combinations, food supplements, and miscellaneous supplements) — reportedly generating $68,785,692 in sales in 2011! This again raises the question as to whether ABC should be stating that horehound is one of the top-selling herbs in the United States, a statement that would probably be met with considerable curiosity, if not skepticism, by many market veterans.

As we stated last year, horehound has never been listed as a top-selling herbal supplement in any previous HerbalGram/Herb Report in either the FDM channel (as measured by SymphonyIRI) or the natural channel. Digging deeper, SPINS revealed that this herb is the primary ingredient in several Ricola® (Ricola AG; Laufen, Switzerland) cough or throat drops, which are included in its natural channel coding. According to 2008, 2009, and 2010 SPINS data powered by Nielsen data, within their data-collection parameters, horehound sales — which include the Ricola products for which SPINS assigned horehound as a primary ingredient, and other dietary supplement products for which SPINS identified horehound as the main (or only) ingredient — have been significant and showing a trend of growth, bringing in a total of $58.7 million in 2008, $64.7 million in 2009, $63.5 million in 2010, and $68.8 million in 2011.

Horehound is a well-known traditional folk remedy for sore throats, but there has been little modern research on this herb and ABC is unaware of any published clinical trials supporting its efficacy for cough or for soothing a sore throat. A few studies have suggested efficacy of horehound-containing herb combinations in humans and horses, but studies on horehound alone are lacking.

Table 1. Total Estimated Herbal Dietary Supplement Sales in All Channels, 2000-2011

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<th>Year</th>
<th>Total Sales (Millions USD)</th>
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<td>2011</td>
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Table 2. Total Estimated Herbal Dietary Supplement Sales by Channel for 2010 & 2011

<table>
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<th>Channel Sales Smil</th>
<th>2010 (USD)</th>
<th>2011 (USD)</th>
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</tr>
<tr>
<td>Natural &amp; Health Food#</td>
<td>1,663</td>
<td>1,786</td>
<td>5.5%</td>
</tr>
<tr>
<td>Direct Sales#</td>
<td>2,469</td>
<td>2,578</td>
<td>4.4%</td>
</tr>
<tr>
<td>Total</td>
<td>$5,052</td>
<td>$5,278</td>
<td>4.5%</td>
</tr>
</tbody>
</table>


* 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 herbs and herbs sold thru Multiklev (MLM) or network marketing, representing firms like Advocare, Herballife, MonaVie, Nature’s Sunshine, NuClain (Pharmcians), Nutrilite (Amway/Quicksift), Shaklee, etc.
### Table 3: The 40 Top-Selling Herbal Dietary Supplements in the Food, Drug, and Mass Market Channel in the United States for 2011 (per SymphonyIRI)*

<table>
<thead>
<tr>
<th>Herb†</th>
<th>Latin name</th>
<th>US Dollar Sales</th>
<th>% Change 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranberry</td>
<td>Vaccinium macrocarpon</td>
<td>$40,112,500</td>
<td>13.43</td>
</tr>
<tr>
<td>Soy</td>
<td>Glycine max</td>
<td>$18,611,700</td>
<td>10.21</td>
</tr>
<tr>
<td>Saw palmetto</td>
<td>Serenoa repens</td>
<td>$18,875,930</td>
<td>-5.97</td>
</tr>
<tr>
<td>Garlic</td>
<td>Allium sativum</td>
<td>$15,218,730</td>
<td>-9.21</td>
</tr>
<tr>
<td>Ginkgo</td>
<td>Ginkgo biloba</td>
<td>$14,628,650</td>
<td>1.88</td>
</tr>
<tr>
<td>Milk thistle</td>
<td>Silybum marianum</td>
<td>$12,834,460</td>
<td>14.01</td>
</tr>
<tr>
<td>Echinacea*</td>
<td>Echinacea spp.</td>
<td>$10,916,500</td>
<td>-14.62</td>
</tr>
<tr>
<td>Black cohosh root</td>
<td>Actaea racemosa§</td>
<td>$10,319,990</td>
<td>-5.51</td>
</tr>
<tr>
<td>St. John's wort</td>
<td>Hypericum perforatum</td>
<td>$8,439,300</td>
<td>-4.38</td>
</tr>
<tr>
<td>Ginseng</td>
<td>Panax ginseng</td>
<td>$6,596,372</td>
<td>-9.94</td>
</tr>
<tr>
<td>Valerian root</td>
<td>Valeriana officinalis</td>
<td>$5,455,633</td>
<td>23.02</td>
</tr>
<tr>
<td>Green tea</td>
<td>Camellia sinensis</td>
<td>$5,213,135</td>
<td>-8.83</td>
</tr>
<tr>
<td>Evening primrose</td>
<td>Onopordum biennis</td>
<td>$5,018,058</td>
<td>4.12</td>
</tr>
<tr>
<td>Horny goat weed</td>
<td>Epimedium spp.</td>
<td>$3,059,464</td>
<td>7.05</td>
</tr>
<tr>
<td>Bilberry</td>
<td>Vaccinium myrtillus</td>
<td>$1,382,448</td>
<td>-11.24</td>
</tr>
<tr>
<td>Ginger</td>
<td>Zingiber officinale</td>
<td>$1,370,807</td>
<td>13.48</td>
</tr>
<tr>
<td>Grape seed</td>
<td>Vitis vinifera</td>
<td>$1,261,907</td>
<td>-10.96</td>
</tr>
<tr>
<td>Elderberry</td>
<td>Sambucus nigra</td>
<td>$797,915</td>
<td>-14.99</td>
</tr>
<tr>
<td>Aloe vera</td>
<td>Aloe vera</td>
<td>$747,787</td>
<td>17.31</td>
</tr>
<tr>
<td>Yohimbe</td>
<td>Pausinystalia johimbe</td>
<td>$446,382</td>
<td>8.29</td>
</tr>
<tr>
<td>Kava kava</td>
<td>Piper methysticum</td>
<td>$336,486</td>
<td>61.77</td>
</tr>
<tr>
<td>Kelp</td>
<td>Laminaria digitata</td>
<td>$335,512</td>
<td>41.42</td>
</tr>
<tr>
<td>Spirulina</td>
<td>Arthrospira spp.</td>
<td>$299,684</td>
<td>26.49</td>
</tr>
<tr>
<td>Hawthorn</td>
<td>Crataegus spp.</td>
<td>$281,834</td>
<td>0.01</td>
</tr>
<tr>
<td>Cayenne</td>
<td>Capsicum annuum</td>
<td>$272,844</td>
<td>-49.05</td>
</tr>
<tr>
<td>Red clover</td>
<td>Trifolium pratense</td>
<td>$258,559</td>
<td>-23.71</td>
</tr>
<tr>
<td>Olive leaf</td>
<td>Olea europaea</td>
<td>$230,452</td>
<td>-4.09</td>
</tr>
<tr>
<td>Horse chestnut seed</td>
<td>Aesculus hippocastanum</td>
<td>$216,235</td>
<td>-25.73</td>
</tr>
<tr>
<td>Dandelion</td>
<td>Taraxacum spp.</td>
<td>$212,674</td>
<td>3.76</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>Medicago sativa</td>
<td>$190,615</td>
<td>45.99</td>
</tr>
<tr>
<td>Pygeum</td>
<td>Pinus pinaster</td>
<td>$139,619</td>
<td>-22.06</td>
</tr>
<tr>
<td>Dong Quai root</td>
<td>Angelica sinensis</td>
<td>$102,141</td>
<td>42.10</td>
</tr>
<tr>
<td>Feverfew leaf</td>
<td>Tanacetum parthenium</td>
<td>$102,071</td>
<td>6.38</td>
</tr>
<tr>
<td>Barley</td>
<td>Hordeum vulgare</td>
<td>$98,871</td>
<td>2.81</td>
</tr>
<tr>
<td>Cascade sagrada</td>
<td>Frangula purshiana</td>
<td>$90,111</td>
<td>-15.48</td>
</tr>
<tr>
<td>Eleuthero</td>
<td>Eleutherococcus senticosus</td>
<td>$77,507</td>
<td>14.62</td>
</tr>
<tr>
<td>Cat's claw</td>
<td>Uncaria tomentosa</td>
<td>$69,809</td>
<td>-11.15</td>
</tr>
<tr>
<td>Eyebright herb</td>
<td>Euphrasia spp.</td>
<td>$61,281</td>
<td>-10.43</td>
</tr>
<tr>
<td>Marigold</td>
<td>Lepidium meyenii</td>
<td>$57,560</td>
<td>-62.03</td>
</tr>
<tr>
<td>Licorice root</td>
<td>Glycyrrhiza spp.</td>
<td>$53,849</td>
<td>17.75</td>
</tr>
</tbody>
</table>

Total Herb Sales (including those not shown)** $379,286,600  6.90%  

* Source: SymphonyIRI Group, a Chicago-based market research firm. FDM Market Sales Data for Herbal Supplements, 52 weeks ending December 25, 2011. 
† Echinacea collectively refers to supplements made from roots and/or aerial parts of plants from 3 species in the genus Echinacea: E. angustifolia, E. pallida, and E. purpurea (new; added by MB; pls do-its-de-again daugger notation).  
‡ Synonym: Cimicifuga racemosa. 
§ It is not clear from the SymphonyIRI data whether this figure also includes the sale of American gingko root products (made from Panax quinquefolia); the sales of which are not as high as those of supplements made from Asian gingko (G. biloba). 
** These stats do not include info from Wal-Mart, warehouse club store (e.g., Costco, Sam’s, etc), or gas-station/convenience stores. 

### Table 5: The 20 Top-Selling Botanical Dietary Supplements in the Natural and Health Foods Channel in the United States in 2011 (per SPINS)**

<table>
<thead>
<tr>
<th>Herb†</th>
<th>Latin Name</th>
<th>US Dollar Sales</th>
<th>% Change 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Flax seed and/or oil</td>
<td>Linum usitatissimum</td>
<td>$18,138,051</td>
<td>-0.9</td>
</tr>
<tr>
<td>2. Grass (wheat or barley)</td>
<td>Triticum aestivum or Hordeum vulgare</td>
<td>$15,506,790</td>
<td>15.1</td>
</tr>
<tr>
<td>3. Turmeric</td>
<td>Curcuma longa</td>
<td>$12,571,697</td>
<td>20.1</td>
</tr>
<tr>
<td>4. Aloe vera</td>
<td>Aloe vera</td>
<td>$12,048,895</td>
<td>17.7</td>
</tr>
<tr>
<td>5. Milk thistle</td>
<td>Silybum marianum</td>
<td>$8,699,684</td>
<td>8.9</td>
</tr>
<tr>
<td>6. Spirulina blue-green algae</td>
<td>Arthrospira spp.</td>
<td>$8,275,770</td>
<td>22.4</td>
</tr>
<tr>
<td>7. Saw palmetto</td>
<td>Serenoa repens</td>
<td>$6,224,282</td>
<td>3.0</td>
</tr>
<tr>
<td>8. Elderberry</td>
<td>Sambucus nigra</td>
<td>$6,092,590</td>
<td>7.7</td>
</tr>
<tr>
<td>9. Echinacea§</td>
<td>Echinacea spp.</td>
<td>$5,681,419</td>
<td>4.7</td>
</tr>
<tr>
<td>10. Garlic</td>
<td>Allium sativum</td>
<td>$4,961,708</td>
<td>2.7</td>
</tr>
<tr>
<td>11. Cranberry</td>
<td>Vaccinium macrocarpon</td>
<td>$4,883,870</td>
<td>11.4</td>
</tr>
<tr>
<td>12. Valerian</td>
<td>Valeriana officinalis</td>
<td>$4,702,833</td>
<td>9.5</td>
</tr>
<tr>
<td>13. Chlorophyll/Chlorella§</td>
<td>NA/Chlorella vulgaris</td>
<td>$4,517,981</td>
<td>15.8</td>
</tr>
<tr>
<td>14. Echinacea-Goldenseal</td>
<td>Echinacea spp.</td>
<td>$4,218,051</td>
<td>4.3</td>
</tr>
<tr>
<td>15. Red yeast rice</td>
<td>Monascus purpureus</td>
<td>$4,200,420</td>
<td>-6.8</td>
</tr>
<tr>
<td>16. Stevia</td>
<td>Stevia rebaudiana</td>
<td>$4,199,917</td>
<td>10.4</td>
</tr>
<tr>
<td>17. Oregano</td>
<td>Origanum vulgare</td>
<td>$4,194,897</td>
<td>8.3</td>
</tr>
<tr>
<td>18. Ginngo</td>
<td>Ginkgo biloba</td>
<td>$4,057,666</td>
<td>4.1</td>
</tr>
<tr>
<td>20. Maca</td>
<td>Lepidium meyenii</td>
<td>$3,627,320</td>
<td>22.2</td>
</tr>
</tbody>
</table>

Subtotal top 20 herbs $140,652,044  
Subtotal all other herbs $110,560,405  
Total Herb Sales (including those not shown)** $251,212,449  9.0%  

* Source: SPINS Natural, 52 weeks ending December 24, 2011. Does not include Whole Foods Market. 
† Herb coded as primary ingredient. 
§ Echinacea collectively refers to supplements made from roots and/or aerial parts of plants from 3 species in the genus Echinacea: E. angustifolia, E. pallida, and E. purpurea. 
* Coding for this category includes chlorophyll or chlorella single or combo product. 
** Synonym: Cimicifuga racemosa.
Sales discussed in this article pertain only to those involving herbal dietary supplements, and do not include herbs sold as teas, beverages, or as ingredients in natural cosmetic products, including the so-called “cosmeceutical” products.

Table 6. Herb Sales by Category in All Channels: Singles (Monopreparations) vs. Combinations

<table>
<thead>
<tr>
<th>Category</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Single Herbs</td>
<td>3,334</td>
<td>3,382</td>
<td>3,497</td>
<td>3.4%</td>
</tr>
<tr>
<td>Total Combination Herbs</td>
<td>1,706</td>
<td>1,669</td>
<td>1,779</td>
<td>6.6%</td>
</tr>
<tr>
<td>Total Herbs</td>
<td>5,039</td>
<td>5,052</td>
<td>5,277</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

due to questions of its bioavailability and interest in a reversioned analogue called pterostilbene, according to Kerry Watson, manager of SPINS’ product library.

Sales compiled by SPINS for the natural channel do not include herb supplement sales from Whole Foods Market, the largest chain of natural food groceries in the United States. Accordingly, as is the case with the lack of sales reports from Wal-Mart in the aggregate for the FDM channel, these statistics for the natural channel represent a significant, but not total aggregate of herb supplement sales in natural food stores. NBJ has estimated 5.4% growth for the total natural channel in 2011, with its estimates attempting to include sales at those natural retailers (e.g., Whole Foods) not included by SPINS. Some estimates suggest that sales of herbal DS from Whole Foods might constitute as much as 50% of the entire natural channel’s sales, but such estimates are not confirmed. If such estimates are valid, sales for the total natural channel would be about 100% higher than those reported by SPINS in Table 5.

Direct Sales

Sales of herbal dietary supplements in the so-called direct sales channel include multi-level marketing companies (aka network marketing companies, e.g., Advocare, Herbalife, Mona-Vie, Morinda Bausch & Lomb, Nature’s Sunshine, Amway’s Nutrilite, Pharmaxene/NuSkin, Shaklee, and others), mail order and Internet sales companies (e.g., i-herb, Indian Botanic Gardens, Swanson’s, etc.), and healthcare practitioners. As shown in Table 1, further attesting to the overall robustness of the herbal supplement market in the past years, this segment experienced healthy growth of an estimated 4.4%, reflecting estimated sales from $2,469,000 in 2010 to $2,578,000 in 2011. As shown in Table 6, estimates for sales of single herbal DS in all channels of trade increased by 3.4% in 2011 over 2010, according to NBJ. This compares to a smaller growth rate of 1.5% in 2010 over 2009. Sales of combination formulations (usually marketed for a specific function or benefit, e.g., maintaining normal cholesterol levels, normal blood sugar levels, urinary tract or prostate health, etc.) increased 6.6% in 2011 compared to 2010, the first significant increase in sales of combinations since 2007.

Finally, it bears emphasis that sales discussed in this article pertain only to those involving herbal dietary supplements, and do not include herbs sold as teas, beverages, or as ingredients in natural cosmetic products, including the so-called “cosmeceutical” products. The SPINS natural channel data exclude herb combinations, herbal food supplements, and other miscellaneous drug products. The SPINS natural channel data exclude conventional food and beverage (e.g., herbal teas, ready-to-drink teas, and other herb-containing beverages, etc.), body care and cosmetics, and herbs sold in the general merchandise categories. Additionally, aggregate market channel totals compiled by NBJ also include single and combination herbal DS but none of the other non-DS categories just mentioned.

References


Keynote Speakers: Professor David Triggle (State University of New York) on Drug Discovery: Searching for biologically useful space in the chemical universe and Professor David Eisenberg (Harvard University) on using technology to explore the “Treasure House of Traditional Chinese Medicine”

Plenary lectures from Professor David J Adams (Royal Melbourne Institute of Technology), Mr Mark Blumenthal (American Botanical Council), Professor Alain Cuerrier (University of Montréal), Professor Pierre Haddad (University of Montréal), Professor Kieran Kirk (Australian National University), Professor Allan S. Y. Lau (University of Hong Kong) and Professor Gerald Zamponi (University of College)

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medicines work. One main challenge practitioners to a greater mechanistic historical and anecdotal uses of Ayurvedic understanding of herbs used in terms of herbal medicine into the modern medi-
cation on common Ayurvedic herbs. In Ayurvedic medicine in India. This book is a comprehensive collection of information on common Ayurvedic herbs. In addition to listing the major medicinal herbs of Ayurveda, the intention of this work is to provide background on the history of Ayurvedic medicine and the current standing of the modern practice of Ayurveda.

Bringing the practice of Ayurvedic herbal medicine into the modern medi-
cal practice can be a complex task. In general, there is a lack of knowledge and understanding of herbs used in terms of the modern scientific framework. The historical and anecdotal uses of Ayurvedic herbs and the efficacy of Ayurvedic herbs have withstood the test of time; however, modern medicine compels us practitioners to a greater mechanistic understanding about how these plant medicines work. One main challenge to understanding Ayurvedic herbs is that Ayurvedic medicine uses herbs in modern ways, from the formula of Ayurvedic medicine. Ayurveda.

The herbal nomenclature in this text is based on the last classical Ayurvedic treatise (Bhavaprakash). Bhavaprakash is a complete reference book for Indian medicines including herbs, minerals, and animal products compiled in the 16th-17th centuries. The authors note that there has been little effort to classify herbs based on traditional energetics since the publication of this text. There are 130 pages devoted to categorizing the nomenclature of Ayurvedic herbal medicines. Herbs from Ayurveda are often interchangeably called by their names in Latin, Sanskrit, and other Indian dialects — making it a confusing task for many herbalists. This space dedicated to nomenclature helps clarify potential confusion and allows the readers to easily cross-reference names. In addition to the aforementioned table, there is much more information presented in chart form. The tables in Chap-

ter 5 provide information to enable the practitioner to connect herbs and practi-
cal medicinal application. This section includes specific conditions each herb is used for and provides both the Sanskrit terminology and an English translation where required. In general, the list of uses for each herb is brief and seems limited to the most common conditions. This brev-

ty is due to the space constraints of presenting the information in tabu-

lar form. More space could have been devoted to relevant indications and uses of the herbs if the authors chose to omit columns that repeat nomenclature from multiple systems. In addition, it would be interesting and useful, perhaps in a future edition, to denote some of the classical or common formulations.

Chapter 6 jumps to the modern aspects of herbal medicine. The biochemistry of active constituents and modern pharmacognosy are presented here. This section provides an introduction to plant constituents for the novice herb user who could help a learned practitioner review the basics of this field.

After this review material, the tabular form is utilized again to link the Ayurvedic herbs with their chemical compo-

sition and plant parts used. It would have been useful for the authors to list the specific plant part(s) in which the varied constituents were present, instead of list-
ing constituents and plant parts in separate columns. Currently, practitioners who want to know which plant part to use for which condition would have to consult an additional resource. Chapter 10 classifies the herbs by modern phar-

macological actions — categories like expectorant, diuretic, and so on. This highlights the key herbs in the action categories, but is by no means exhaustive. For example, the only herbs mention-
ed as carminatives are dill (Anethum graveolens, Apiaceae), aniseed (Ferula assa-
foetida, Apiaceae), and fennel (Foeni-
culum vulgare, Apiaceae). Other nota-

table herbs with historical and research-

based evidence to support modern uses are not listed, including ginger (Zingiber officinale, Zingiberaceae), eucalyptus (Eucalyptus carterii, Myrtaceae), to name a few. Only Alnus primus (Fahaca) is listed in the "Anti-Parkin-

sen’s" section, and so the reader is not educated on the plethora of other effec-

tive Ayurvedic herbs that can benefit the nervous system. Going back, in Chapter 9 the author’s attempt to highlight modern scientific research to support the safety and efficacy of Ayurvedic herbs. The information is again presented in tabular form, and is a confusing mixture of toxicity data, medicinal actions, research data published on specific conditions, as well as drug-herb interactions, and herbs’ safety for use during pregnancy and in children. There are limitations in the scientific literature; it is likely not possi-

ble to present all of this information and we would not purchase and use each herb. However, it would be clearer
space in a selection of herbal products containing dietary supple- ments, vitamins, and conventional foods. Manufactur- ing quality herbal products requires technical expertise to procure and prepare botanicals for commercial use, which has fostered the re-emergence of pharmacog- nosy as a vital scientific discipline. "The sustainable interest in consumer botanical health products has generated a need for professional roles in diverse fields such as pharmacy, academia, industry, and regula- tory science. These roles need to be filled with qualified experts. And qualified experts need good reference textbooks."

The second edition of Fundamentals of Pharmacognosy and Phytotherapy provides authoritative information on botany, chemistry, and phytotherapy, as well as information on the importance of medic- inal plants in systems of today’s healthcare systems. A collaboration of 4 experts working together to develop a lecture series that integrates ethnobotany and ethnopharmacology, classical botanical pharmacognosy, natural product chemistry, phytochemistry, phytopharmacy, and medicinal botany — the textbook is a unique reference that covers the fundamentals of pharmacognosy with a ther- apy-oriented perspective. As such, it is a must-have reference for pharmacists, pharmacognosists, integrative healthcare practitioners, industry scientists, and regulators.

The book is divided into 2 major sections. The first, “Fundamentals of Pharmacognosy,” provides a comprehen- sive overview of the history and impor- tance of herbal products in pharmacy and medicine. This section covers concepts that provide the reader with a scien- tific foundation for understanding herbal products and includes relevant principles of botany and ethnobotany, the chem- istry of secondary metabolites pertinent to drug therapy, the characterization and standardization of phytomedicines and so-called nutraceuticals, and the use of medicinal plants in Asian systems of traditional medicine, as well as in West- ern complementary and alternative medici- ne.

The second section is dedicated to appli- cations of botanical products in pharmacy and medicine. Here, important botani- cal products are discussed by therapeutic categories and organized by body systems, e.g., gastrointestinal, cardiovascular, respira- tory, nervous, endocrine, reproductive, and musculoskeletal systems, as well as the urinary tract. For example, in the gastrointestinal section, the authors further divide the information into sub-sections based on particular conditions, such as constipa- tion, nausea and vomiting, and dyspepsia. Under each section is a list of the herbs pertinent to treating such conditions. Under “Constipation,” the authors describe the benefits of bulk-forming laxatives such as psyllium (Plantago psyllium), fenugreek (Trigonella foenum-graecum), linseed (flax; Linum usitatissimum), licorice (Glycyrrhiza glabra), and wheat bran (Triticum aestivum, Poaceae). The reader is given an overview of key herbal traditions from around the globe. The authors delve into the rich ancient heritage of herbal traditions of the Arabian Peninsula during and before the time of Prophet Muhammad. The herbal medicine back- ground is included in the introduction while the herbal monographs constitute the main body of the text. The book ends with descriptions of the technical terms included in the text and a general bibliography to augment the specific bibliographies included with each herb. There is also considerable cross-referencing of pharmacy, medicine, integra- tive medicine, including dietary supplements, comple- ments, and conventional medicine. It is also a valuable refer- ence textbook for industry profes- sionals who work with herbs to find answers to day-to-day questions easily. I anticipate that this book will become one of those well-used reference books that appear on the bookshelves of professors, healthcare practitioners, industry scientists, and regulators.

—Douglas ‘Duffy’ MacKay, ND
Vice President of Scientific
& Regulatory Affairs
Council for Responsible Nutrition

Encyclopedia of Islamic Herbal Medicine
by John A. Morrow, Jeffery,

The Encyclopedia of Islamic Herbal Medicine is comprised of 2 major sections that work well to provide a comprehensive overview of herbal medicine, followed by monographic descriptions of specific herbs used in the Arabian Peninsula during and before the time of Prophet Muhammad. The herbal medicine background is included in the introduction while the herbal monographs constitute the main body of the text. The book ends with descriptions of the technical terms included in the text and a general bibliography to augment the specific bibliographies included with each herb. There is also considerable cross-referencing of pharmacy, medicine, integrative medicine, including dietary supplements, comple- ments, and conventional medicine. It is also a valuable refer- ence textbook for industry profes-

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BOOK REVIEWS


The Fungal Phenome is an attractive-looking book with a pleasing overall design. The color pictures are high-quality, and the illustrations of mushroom and lichen species are detailed and informative. The book is well-written, with a clear and concise style that is easy to read.

The book begins with an introduction to the world of fungi, followed by a chapter on the biology of mushrooms and lichens, and then a chapter on the classification of fungi. The next chapter covers the identification of mushrooms and lichens, followed by chapters on the medicinal uses of mushrooms and lichens.

The book is well-researched, and the author has included a wealth of information on the uses of mushrooms and lichens in traditional and modern medicine. The author has also included a comprehensive list of references, which will be useful for readers who wish to delve deeper into the subject.

The book is highly recommended for anyone interested in the world of fungi, whether they are interested in the scientific or the more spiritual aspects.

—Ehab A. Abourashed, PhD

Department of Pharmaceutical Sciences

College of Pharmacy

Chicago State University

Chicago, IL

BOOK REVIEWS

A short note on Arabic and their traditional medicine practices that concern the holy city of Mecca. The book includes information on the Arabic language and the traditions of the Arabic people, as well as sources of errors and current trends in the field of Arabic herbal medicine. The book provides a comprehensive summary of the Arabic language, and discusses the relationship between Arabic and Islamic medicine.

In the 26-page introduction, the author provides a comprehensive summary of the Arabic language, and discusses the relationship between Arabic and Islamic medicine. The book includes information on the Arabic language and the traditions of the Arabic people, as well as sources of errors and current trends in the field of Arabic herbal medicine.

The writing style is typical of many scientific texts, with a focus on accuracy and precision. The book is intended to be a scientific treatise, but it is reasonable to expect that he or she might miss the mark as well, because practical instruction is seldom found in books and articles, but the information, point of view, and opinions of the author are clearly reflected in the material. That the book should be reduced by one-third to one-half and tightened up. The book clearly needs further editing, more focus, better and more consistent referencing, and more method and terminology. The book is not scientific, especially in terms of style. The writing is clearly not a conglomeration of disparate facts, but a thorough, well-written text. The book is a useful reference, and the author is clearly well-versed in the subject matter.

— and probably does not — reflect the humanistic philosophy of the new age. The approach used in the book is to be much too much on the way as far as how to provide medical financial aid to the poor, as well as the education of the poor. Authors of this kind of book are more effective. He does not address the many interesting issues related to the use of medical mushrooms, nor does he provide a comprehensive overview of the types of mushrooms and their uses. The book is not for the reader who is interested in the use of medical mushrooms for health, prevention of disease, and as adjuvants to treatment programs for various diseases of the person.

The summary of lichenization is interesting because the subject is not well represented in the literature. The author has not been more useful if better referenced. Some excellent scientific reviews are available in the literature. Unfortunately, the book binding is not well glued, and a few pages have come loose. The color pictures are clearly not such a short paragraph, or even a few sentences.

In truth, Robert Rogers did say in the introduction to this book that it was intended to be a scientific treatise, but he quotes a lot of scientific studies. If an individual is looking for a book that is highly technical, it is reasonable to expect that he or she might miss the mark as well, because practical instruction is seldom found in books and articles, but the information, point of view, and opinions of the author are clearly reflected in the material. That the book should be reduced by one-third to one-half and tightened up. The book clearly needs further editing, more focus, better and more consistent referencing, and more method and terminology. The book is not scientific, especially in terms of style. The writing is clearly not a conglomeration of disparate facts, but a thorough, well-written text. The book is a useful reference, and the author is clearly well-versed in the subject matter.

Still, since the literature on the medicinal and cultural uses of fungi and lichens is so widely dispersed, the book is worth while because, even though imperfect, Rogers puts in a tremendous amount of effort to bring a wide sample of literature together between 2 covers, and he does include reference to a great deal of the primary scientific literature, to his credit. Rogers also has written a book that the average reader would be hard-pressed to find. The color pictures are usually well executed, and the overall feel of the book. The cultural and

On August 13, 2007, an article in The New Yorker exposed the olive oil industry as one of the most corrupt on the face of the earth. Titled “Slippery Business,” the story by reporter Tom Mueller unmasked an industry awash in adulterated oil in an overt fraud perpetrated on unsuspecting and unknowing consumers who had come to rely on the consumption of olive oil for their health. The Italian city of Lucca is described as something like an olive oil chop shop, where tanks of substandard oil gush in from Turkey, Tunisia, and Egypt and are blended into a lie called “extra virgin olive oil.”

Mueller, who lives in Italy, now has expanded on that article with his book Extra Virginity: The Sublime and Scandalous World of Olive Oil. The title seems to mock the absurd-natural-religious/medical connotations of the term, as is the case when referring to the enigmatic and provocative term “extra virgin.”

If you have plans today to drizzle a salad with some of the contents of a bottle of olive oil labeled “extra virgin,” read this book first. It will make you angry and put you on guard the next time you see “extra virgin,” read this to drizzle a salad with enough.

The title seems to mock the absurd-natural-religious/medical connotations of the term, as is the case when referring to the enigmatic and provocative term “extra virgin.”


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New Book Profiles

**Herbal Antibiotics: Natural Alternatives for Treating Drug-Resistant Bacteria**


More than a decade after his first edition was published, Stephen Harrod Buhner has revised and expanded this intriguing book, which offers herbal solutions to the problem of drug-resistant bacteria. Buhner begins by explaining the issue in the ominously named first chapter, “The End of Antibiotics,” and breaks down the rest of the book into sections based on various types of herbal antibiotics — the systemic, which enter the bloodstream and reach virtually every part of the body; the localized nonsystemics, which are largely limited to the gastrointestinal tract; the botanical antibiotics, which are used in combination for a more pronounced effect. Additionally, the author includes a section on herbs that strengthen the immune system and a primer on making herbal medicines. [Editor’s note: As an ABC style convention, parenthetical references to book citations and previously discussed content are enclosed in this book as “herbal antimicrobial agent” or some similar term; we prefer to use the term “antibiotics” for conventional pharmaceutical drug preparations, usually derived from fungi.]

**Putting Down Roots: Gardening Insights from Wisconsin Early Settlers**


Putting Down Roots explores the evolution of 19th-century Wisconsin gardens from the perspective of its immigrant settlers. Features throughout the book are beautiful full-color images from “Old World Wisconsin,” a living history museum set on 576 acres in Waukesha County, which includes recreations of historically accurate gardens. The book is divided into 19 chapters, each of which explores various types of immigrant gardens — including: the Native American, the Scandinavian, the Catholic, and what makes them unique. Traditional 19th-century recipes are included in each section as well.

**The Consultation in Phytotherapy**

by Judith Sims. St. Paul, MN: Herbwise Press, 1995). The first edition was printed in 1990 when I wrote the second edition of my book, Medicinal Mushrooms in North America. The meaning of some common specific epithets is also worth noting. For example, the common name is usually given immediately before each scientific name (i.e., *Streptomyces griseus* users to scientific names for some well-known plants. Names used as examples are of medicinal plants throughout, making the course of interest and value to people interested in herbal medicine. The course includes almost 30 short audio tracks and a printed or PDF transcript, as well as a short post-test. Most of the explanations and examples are read by Sims herself, but there are two “drill” lists of answers read by herbalist and pharmacist Dr. Anita Cholewa, herbarium curator and collections manager at the Bell Museum of Natural History in Minneapolis, MN, and a sample of names read in the ancient Roman (Latin) style by a male speaker. Ultimately in the transcription. The pronunciation of names is reliably correct and audible. The book does not provide phonetic pronunciations in all sections, so the course cannot simply be read, but must be listened to carefully, and it should be practiced frequently. “Nothing works better than mindless drilling,” the introduction says, to help with proper pronunciation. So each track repeats each included name or epitaph once only, the user should be prepared to stop and repeat tracks as often as needed to become comfortable with the vocabulary presented.

The most confusing aspect of the course is the organization of the transcript. The beginning of a new track on the CD is usually indicated by a bold-faced heading in the text. The script does sometimes there is no indication of the break between tracks. Other flaws are very minor, e.g., in the pronunciation of names is reliably correct and audible. The book does not provide phonetic pronunciations in all sections, so the course cannot simply be read, but must be listened to carefully, and it should be practiced frequently. “Nothing works better than mindless drilling,” the introduction says, to help with proper pronunciation. So each track repeats each included name or epitaph once only, the user should be prepared to stop and repeat tracks as often as needed to become comfortable with the vocabulary presented.

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Shiu-ying Hu, PhD
1910–2012

On May 31st, 2012, the Chinese University of Hong Kong posted an obituary of Prof. Hu Shiu-ying (PhD Shiu-ying Hu), announcing the passing of the eminent economic botanist and taxonomist. She died at the age of 102 on May 22, 2012, at the Prince of Wales Hospital, Hong Kong. Her obituary appears on a website dedicated to the memory of her remarkable life and work.1

Dr. Hu, Emeritus Senior Research Fellow of the Arnold Arboretum of Harvard University, spent most of the last 20 years in Hong Kong, where she served as Honorary Professor of Chinese Medicine, Honorary Senior Research Fellow of the School of Life Sciences, and Senior College Tutor of Chung Chi College at the Chinese University of Hong Kong. In a career stretching nearly 8 decades, Dr. Hu was active past her 100th year. Dr. Hu became the leading expert and monographer of the genera *Philodendron* or mock orange (Hydrangeaceae), *Hemerocallis* or daylily (Iridaceae), *Paulownia* or princess-tree (Paulowniaceae), the mallow family (Malvaceae), and lily or holleys (Aquifoliaceae). Considered a leading world expert on holleys (Aquifoliaceae), the American Holly Society created an award in her name in 1992, for which Dr. Hu was the first recipient. She was affectionately nicknamed “Holly Hu.” In addition, Dr. Hu made significant contributions to the taxonomy of major plant families including the orchid family (Orchidaceae), mallow family (Malvaceae) and aster family (Asteraceae), among others. It is rare to read a paper on *Ephedra* (Ephedraceae), *Eucommia* (Eucommiaceae), *Lemnuris* (morning-glory, Convolvulaceae), *Penus* (gin-seng, Araliaceae), and other medicinal plant groups that does not contain citation to Dr. Hu’s various papers on those plants. In 2008, Dr. Hu was also the first, and so far only, recipient of the American Botanical Council’s Lifetime Achievement Award. 2,3

Dr. Hu was born in February 1910, during the Qing Dynasty in a small village on the southern bank of the ancient course of the Yellow River. In her magnus opus, *Food Plants of China*, she describes the farmland as poor in condition, “Everything was new.” She was raised in a communal homestead shared by descendants of her paternal grandparents. At times, the family survived by foraging for wild foods. Her mother gave birth to 3 daughters and 2 sons. Shiu-ying Hu and her brother were the only two who survived in a rural region of China with an infant mortality rate of 50%. Soon after her birth, Shiu Ying Hu fell ill, and her mother sent her father to a nearby village to obtain an herbal medicine to save the young girl’s life. Like most peasants in China, she had no shoes. He tied reeds to his feet to make the journey, and trudged through snow to get the herbal prescription that saved Dr. Hu’s life. When she began her botanical studies in the 1930s, Dr. Hu asked herself the question, “What is the herb that saved my life?” That question remained unanswered, but inspired Dr. Hu to apply herself to the study of plants to improve the well-being of rural people in China.

A stroke of good fortune provided a scholarship which allowed her to attend Mary Stevens Girl’s High School, a boarding school in Xinhou run by Presbyterian missionaries. After graduation, she attended Ginling College, a small liberal arts and sciences college in Nanjing. There, for the first time in her life, she enjoyed a bowl of rice. Although interested in agriculture courses, which were not offered, she studied biology and sociology in hopes that it would offer her the opportunity to pursue her cardinal interest — helping to serve the people in rural China.

After finishing her undergraduate degree at Ginling College in 1935, she began work toward a Master’s degree in botany at Lingnan University in Guangzhou. Among her teachers was Prof. F. A. McClure, a leading 20th-century botanical expert on bamboo. In pursuit of food and medicinal plants of rural peoples, she pursued her own personal experience.

Soon after finishing her Master’s degree in June 1937, the Sino-Japanese War broke out and Dr. Hu became a refugee. In January 1938 she arrived in Chengdu, Sichuan, having accepted a teaching position at West China Union University, where she remained for 8 years. Her monthly salary was 3 bushels of rice. During this period she collected plants in the Emei Mountains (Mt. Omei) famous for medicinal plants, and lived 2 summers with Sino-Tibetan ethnic groups including the Qiang and Jiarong. The JiARong live in the territory of the giant panda.4 Today colleagues find it remarkable that she collected plants in this remote and rugged region of China, which even now can be reached only by off-road vehicles or on horseback. She traveled on foot, sometimes alone in the wilderness for months at a time. During her long life, she collected over 180,000 herbarium specimens.5

In March 1946, Dr. Hu received a telegram from Radcliffe College inviting her to apply for a graduate fellowship for a doctoral program at Harvard University under Professor Emil J. Merrill, a leading American expert on Eastern Asiatic botany who in the early 1940’s had returned to the United States from the Philippines following the Japanese invasion. She received the fellowship, despite being told that Harvard “didn’t take girls.” Two American friends helped provide money for her travel to Boston. Dr. Hu arrived in the United States on August 2, 1946, with a small suitcase of clothes and 2 large suitcases of plant specimens. In *Food Plants of China* (2005), she wrote, “The change of lifestyles from China to America was to me like a complete metamorphosis is to insects. Everything was new.”

Dr. Hu was the last student of Professor Merrill, and was a student in the final class of Harvard University’s Gray Herbarium Director, Merritt Lyndon Fernald. In 1949, Dr. Hu received her doctorate, becoming the first Chinese-born woman to receive a PhD in botany from Harvard University. That was also the year that Mao Zedong’s victory over the Kuomintang in China’s Civil War resulted in the creation of the People’s Republic of China. Subsequently, China became closed to the West.

Upon graduation, Dr. Hu dreamed of working for the United States Department of Agriculture. However, she could not obtain a job...
Joseph M. Basset 1932–2012

Joseph M. Basset, a longtime leader in the natural products community who encouraged natu- ral health care therapists to work toward the passing of the Dietary Supplement Health and Education Act of 1994 (DSHEA), died June 6, 2012, from complica- tions related to a bladder and kidney infection.

During the early 1990s — a time when the US Food and Drug Administration (FDA) had been raiding alternative healthcare clin- ics and some health food stores, and Dr. Shiu-ying Hu was already training her students to develop her- bals for their own use — Professor Hu provided evidence to FDA that these herbs were safe and effective. She even took this evidence to the United Nations.1

Basset and his wife Pat owned Basset’s Health Food stores in Ohio and Michigan — sold dietary supplements and herbs, including several products formulated by Basset himself. He was also trained in numerous branches of nutritional and integrative therapies.1,4 Believing deeply in the power of natural products and pharmaceuticals, he was proposing to classify some herbs and nutritional supplements (herbs and amino acids) as drugs — Basset helped to organize a grassroots-level battle for what its proponents called “health freedom.”2 Regulations were being proposed to FDA broad regulating authority over dietary supplements,2 including the power to restrict what physicians and medical associations were permitted to say about the benefits of dietary supplements,2 which were at that time usually referred to as “food supplements.” Many feared that supplements would be taken off the market until being submitted to FDA and approved for therapeutic efficacy, similar to the process for pharmaceutical drugs.2

Basset, a Korean War veteran, is survived by his wife Pat Basset; children Joseph Jr., Sabrina Early, and Charmaine Bassett-Trost; and grandchildren. Professor Hu’s family has asked that in lieu of flowers, donations may be made to the Joseph M. Basset Memorial Fund of Nemenha Press at www.nemenhah.org.

References

—Lindsey Stafford Mador
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**Breakthroughs in Bioscience** is a series of articles on innovative biomedical research published by the Federation of American Societies for Experimental Biology. Its most recent publication, “Comparing Pain and Infection with Drugs From Nature’s Medicine Cabinet,” discusses the history of botanical-based or botanical-derived medicines—such as morphine (derived from the resin of poppy, Papaver somniferum, Papaveraceae)—and artemisinin, derived from sweet wormwood bush (Artemisia annua, Asteraceae)—in the treatment of chronic pain, infectious diseases, and bacterial infections like MRSA (Methicillin-resistant Staphylococcus aureus). Previous titles include “Monoclonal Antibodies,” “Viruses and Cancer,” and “Bone Bioengineering.” All articles in the series are illustrated and feature analysis on how certain medicines or therapies have impacted society. The articles can be downloaded for free from the Breakthroughs in Biosciences webpage. Available at: www.faseb.org/policy-and-government-affairs/publications/breakthrough-in-bioscience.aspx.

**Pet Poison Helpline,** a website supported by SafetyCall International, provides information on hundreds of household substances—including many medicinal and culinary herbs—that might harm a pet if ingested. The entry for chocolate, for example, notes that it is poisonous to cats and dogs, has a “generally mild to severe” level of toxicity, and also lists the numerous side effects and various products containing chocolate. Additional herbs on the list include castor (Ricinus communis, Euphorbiaceae), eucalyptus (Eucalyptus globulus, Myrtaceae), belladonna (Atropa belladonna, Solanaceae), lesser periwinkle (Vinca minor, Apocynaceae), and many more. Available at: www.petpoisonhelpline.com.

**Time to Talk Tips,** a series recently launched by the National Center for Complementary and Alternative Medicine (NCCAM), is part of an effort to encourage open communication between patients and healthcare providers on CAM products and practices. While the other resources within the Time to Talk campaign educate both patients and practitioners on how to open up on the important topic of herb, dietary supplement, and other CAM usage, the Time to Talk Tips provide additional information on the scientific evidence behind specific CAM therapies in order to “help ensure coordinated and safe care.” Each month, a new set of Tips is published on NCCAM’s website, discussing topics like the science behind natural products for cold and flu. If things consumers need to know about dietary supplements, and the evidence supporting complementary health practices for asthma. NCCAM also hosts monthly Twitter Chats that invite consumers to pose questions to qualified CAM experts. Available at: http://nccam.nih.gov/time totalk. The Supplemental is a new blog from the Council for Responsible Nutrition (CRN) Foundation that features educational information for consumers on how to use diet, supplements, and exercise to increase health and wellbeing. Authors of the blog’s entries include healthy lifestyle expert Andrea Mercell, fitness writer Carla Birnberg, registered dietitian Danielle Omar, Vice President of CRN’s Scientific and Regulatory Affairs Dufly MacKay, ND, and more. Articles discuss topics like encouraging a healthy lifestyle for men, optimizing nutrition at each meal, benefits of a healthy Body Mass Index (BMI), and detoxing and cleansing programs. Readers are encouraged to comment and leave questions for the blog’s experts, who will respond with answers and advice. Available at: http://lifesupplemented.org/the-supplemental/. The National Center for Complementary and Alternative Medicine (NCCAM) has launched a new research blog that aims to serve as a home for dialogue on NCCAM-funded science and the sometimes-controversial challenges surrounding CAM research. NCCAM Director Josephine P. Briggs, MD, authors many of the blog’s entries, which cover a variety of subjects such as her own interpretation on the meaning of “integrative” medicine and reflections from NIH’s recent Symposium on Advances in Pain Research. Additionally, NCCAM staff author blog entries on findings from numerous research projects supported by the Center, job openings, and other notices. Available at: http://nccam.nih.gov/research/blog.

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