

2024 Herb Market Report • Lemon Verbena Herb Profile • ABC's 2025 Botanical Excellence Awards
ABC's New Sustainability Resources • BAPP Receives NBJ Award • Turmeric/Boswellia & Exercise Pain

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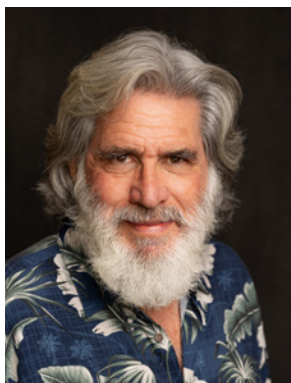
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dear reader

This issue features our annual *HerbalGram* Herb Market Report, which shows a 5.4% increase in 2024 US retail sales of herbal supplements compared to 2023. For the 11th consecutive year, *HerbalGram* Managing Editor Tyler Smith has compiled and interpreted sales data provided by our co-author colleagues at SPINS, the Chicago-based market research firm, and *Nutrition Business Journal* (NBJ), the dietary supplement industry publication from Informa. Our thanks to Carly Lang from SPINS and Erika Craft from NBJ for their collaboration.

We also present profiles of the recipients of the American Botanical Council's (ABC's) 2025 Botanical Excellence Awards, which were announced in March at the annual ABC Celebration in Anaheim, California.

These awards honor individuals and organizations that have made significant contributions to the herb and medicinal plant community.

Speaking of awards, we are grateful to the editors of NBJ for presenting the ABC-AHP-NCNPR Botanical Adulterants Prevention Program (BAPP) with its 2025 Efforts on Behalf of the Industry Award. BAPP — which ABC launched in 2011 with Roy Upton, RH (AHG), at the American Herbal Pharmacopoeia (AHP) and Ikhlas Khan, PhD, at the National Center for Natural Products Research (NCNPR) at the University of Mississippi — has received six awards from three leading natural products industry trade publications. Through its peer-reviewed publications, BAPP equips members of the herb and dietary supplement industry with tools to detect and prevent the purchase of adulterated and fraudulent botanical ingredients.

ABC will begin its 38th year of herbal research and education in November 2025, and for 30 of those years, we've been blessed with the exemplary plant-centric dedication of Gayle Engels, ABC's special projects director. Gayle has covered a wide range of activities during her three decades at ABC, from managing much of the ABC website and setting up ABC's internship program for pharmacy and dietetic students to overseeing ABC's herb gardens and much more. Fortunately for ABC, our members, and the herbal community, Gayle will continue to share her herbal expertise in the years ahead.

As part of our ongoing HerbalGram40 Project and Fund, ABC has launched two new resources to help members and registered website users access our extensive publications and other content on medicinal plant conservation and sustainability. The ABC Botanical Conservation, Sustainability, and Regeneration (CSR) webpage features links to relevant content from more than 40 years of *HerbalGram*, along with ABC HerbClips and other ABC publications. ABC Board of Trustees President Josef Brinckmann, a leading expert on global botanical sustainability and conservation, provides summaries and commentary on recent publications in this field. Selected summaries are distributed in our new Botanical Environmental Education Resources Report (BEERR) — a monthly newsletter for all ABC members and registered users. The ABC Botanical CSR page also includes links to more than 30 nonprofit organizations working in this important area, including the Sustainable Herbs Initiative, United Plant Savers, FairWild Foundation, and many others.

The South American medicinal and culinary herb lemon verbena is our profiled herb this issue. Known for its strongly lemon-scented leaves and gentle calming and digestive effects, lemon verbena has been valued for centuries from the Andes to Europe, and researchers continue to explore its antioxidant, anti-inflammatory, and sleep-promoting properties. *HerbalGram's* Herb Profiles are the product of the continued excellent work of Marisa Williams, ND, RH (AHG), and Aaron Jenks, PhD, at Traditional Medicinals.

In December 2021, we published an article announcing that the Green Farmacy Garden in Fulton, Maryland — the farmstead of ethnobotanist and ABC co-founding trustee Jim Duke, PhD (1929–2017), and his wife, botanist and artist Peggy Duke (1931–2021) — was for sale. That article drew the attention of the Maryland-based nonprofit Community Ecology Institute (CEI), which purchased and now stewards the property. In this issue, CEI has provided an overview of its work preserving and enhancing the property's extensive herb gardens and beautiful natural features, and creating an impressive herbal educational center that honors Jim and Peggy's legacy. Our thanks to CEI Founder and Executive Director Chiara D'Amore, PhD, and co-author Veri Tas for their update on this herbal treasure.

Finally, we mark the passing of admired naturopathic doctor, herbalist, and midwife Mary Bove, ND, RH (AHG), who received the 2025 ABC Fredi Kronenberg Excellence in Research and Education in Botanicals for Women's Health Award, as noted in this issue. We also remember journalist and dedicated natural health advocate James Gormley.

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HERBALGRAM

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46 US Sales of Herbal Supplements Increase 5.4% in 2024

By Tyler Smith, Carly Lang, and Erika Craft

In 2024, total sales of herbal dietary supplements in the United States grew by 5.4% to a record \$13.2 billion, according to data from *Nutrition Business Journal* (NBJ). In our annual Herb Market Report, *HerbalGram*, in partnership with NBJ (part of Informa's New Hope Network) and SPINS (a leading source for natural products retail analytics), profiles the top-selling and fastest-growing herbal or fungal dietary supplements in mainstream and natural retail outlets in 2024. From steady favorites like psyllium (*Plantago ovata*, Plantaginaceae) and turmeric (*Curcuma longa*, Zingiberaceae) to increasingly popular mushrooms and algae, the report tracks which ingredients gained ground and which lost momentum, examining potential factors that may be driving growth or contributing to sales declines. It highlights how consumer priorities such as healthy aging, brain and heart health, and a growing interest in liver support and menopause relief are reshaping the herbal marketplace in a post-pandemic era.

Left to right:

Ginkgo *Ginkgo biloba*
Psyllium *Plantago ovata*
Mullein *Verbascum thapsus*
Aloe *Aloe vera*

Photos by Steven Foster
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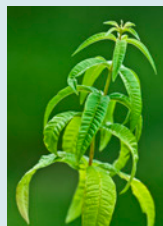
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On the Cover

Lemon verbena *Aloysia citrodora*
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Lemon Verbena

Aloysia citrodora Palau

Family: Verbenaceae

By Marisa Williams, ND, RH (AHG), and Aaron Jenks, PhD

INTRODUCTION

Lemon verbena (*Aloysia citrodora*) is a fragrant perennial herb that is well-known and named for its strongly lemon (*Citrus × limon*, Rutaceae)-scented foliage. A member of the verbena family (Verbenaceae) and native to South America, lemon verbena is cultivated in temperate to tropical climates around the world for medicinal and culinary uses and as an ornamental.¹⁻³

Lemon verbena *Aloysia citrodora*
Photo by Steven Foster ©2025 ABC

The American Herbal Products Association's (AHPA's) *Herbs of Commerce*, 3rd edition (2023), lists “lemon verbena” as the plant's Standardized Common Name (SCN) and “verbena” as the Other Common Name (OCN).⁴ Many common names for lemon verbena specifically refer to the strongly aromatic nature of the plant, including cedron (in Spanish, *cedrón*).^{1,5} Cedron is linguistically, but not botanically, related to cedar (*Cedrus* spp.), an aromatic tree in the pine family (Pinaceae), as both are derived from *kedros* (κέδρος), the Greek word for cedar. Another common name for lemon verbena in Spanish is *cidrón* (or *cidrao* in Portuguese), which translates to “citron” in English, a nod to the citrus-like fragrance of the foliage. Lemon verbena's vernacular names *Hierba Luisa*, *Maria Luisa*, *hierba de la princesa*, *herbaluisa*, *luisa*, and *luisa de Chile* refer to Princess Maria Luisa of Parma (1751–1819), in whose honor lemon verbena (i.e., *Aloysia*, meaning “of Luisa” in Latin) was first named.⁶⁻⁸ The plant has many other common names throughout Central and South America, including *alegría*, *poleo de Castilla*, *saca ojo*, and *zorrillo*.^{3,8,9}

The native range of *A. citrodora* is from northern Argentina to southern Bolivia and adjacent Paraguay, where it is primarily distributed locally to abundantly in the arid bushland of dry inter-Andean valleys at elevations between 2,300 m and 3,250 m (about 7,500 ft to 10,700 ft).^{1,3,10} It is widely cultivated in and around its native range and beyond.

Lemon verbena is a woody shrub that grows from 1.5 m (5 ft) to as much as 7 m (23 ft) in height. The petiolate leaves are lanceolate and entire (or occasionally serrated in some populations within its native range) and grow to a length of up to 7.5 cm (3 in) from striated stems and in whorls of three or, occasionally, in opposite pairs. The flowers are small, with white to pale lavender corollas up to 5 mm long, and grow in short racemes clustered together into loose inflorescences that are apical and paniculate.^{1,10} The genus *Aloysia* contains 41 accepted species native to

subtropical North and South America, from the United States to Argentina and Chile.³ *Aloysia* is most closely related to the genus *Lippia* (Verbenaceae), in which lemon verbena was once classified.¹¹

The strongly lemon-scented leaves are commonly used in folk medicine and traditional systems of healing and as a culinary and beverage ingredient throughout the Western Hemisphere¹ and beyond.^{12–14} Lemon verbena is mildly sedating and has digestive properties.^{15,16} In modern Western herbalism, lemon verbena is considered a gentle sedative, antispasmodic, and febrifuge (a medicine to reduce fever),¹⁷ and although *A. citrodora* is by far the most commonly used species in the genus *Aloysia*, two other species (*A. polystachya*, commonly called “burrito,” and *A. gratissima*, known as “cedron de monte”) are used in folk medicine for similar purposes.^{1,18,19}

Lemon verbena is cultivated and produced commercially in Argentina, Austria, Chile, Colombia, Cyprus, Ecuador, Egypt, France, Iran, Italy, Malawi, Mexico, Morocco, New Zealand, Paraguay, Portugal, Spain, Switzerland, the United Kingdom, the United States,²⁰ and reportedly elsewhere (e.g., in Algeria, Hungary, and Israel).^{17,21} Organic lemon verbena, as certified by the US Department of Agriculture, is produced primarily in the United States, Mexico, and Egypt, but certified organic lemon verbena is also cultivated in Albania, Argentina, Brazil, Colombia, Lebanon, and South Africa.²² Within the United States, certified organic lemon verbena cultivation is based primarily in Vermont, California, and New Jersey but is also reported in Colorado, Connecticut, Hawaii, Illinois, Kentucky, Maryland, New Hampshire, North Carolina, Oregon, Pennsylvania, Washington, West Virginia, and Wisconsin.²² Lemon verbena is not listed in AHPA’s *Tonnage Surveys of Select Botanicals Produced in North America, 2018–2023*,²³ so its production volume in North America is difficult to track or estimate. Commercial cultivation data are also limited outside of North America, but in 1997, 63 hectares (about 0.24 square miles) were commercially cultivated in Chile.²¹

HISTORY AND CULTURAL SIGNIFICANCE

In 1784, Spanish botanist and physician Antonio Palau y Verdera (1734–1793) first described lemon verbena as *Aloysia citrodora* from cultivated specimens in Madrid.^{6,24} Although subsequent authors described this species as belonging to other genera (i.e., *Lippia* and *Verbena*), the binomial that Palau first proposed is taxonomically valid, accepted, and still in use.^{3,11} From Madrid’s Real Jardín Botánico (Royal Botanical Garden), Palau taught botany and co-authored instructional course materials as a proponent of Swedish biologist Carl Linnaeus’ (1707–1778) system of classification.^{11,25} Over the course of several years beginning in 1784, Palau translated Linnaeus’ *Species Plantarum* into Spanish and, in an added appendix to the first of those folios, included an illustration and description (protologue) for *A. citrodora*.^{11,24} The specific epithet *citrodora* is from the Latin *citrus* (“lemon”) and *odoro* (“perfuming”) and refers to the species’ characteristic lemon aroma.^{1,11} (This is often

erroneously written as “*citriodora*” in scientific literature and other publications.^{6,11}) Palau gave lemon verbena the generic name *Aloysia* (“of Luisa” in Latin) to honor patron of the arts Maria Luisa of Parma, who later became queen consort of Spain in 1788 as the wife of Charles IV of Spain (1748–1819).^{1,11}

Lemon verbena was introduced to Europe in the mid- to late 18th century,⁷ and by 1784, it was cultivated in England¹⁵ and Spain.¹¹ While the species was praised for its bold and pleasant aroma and became widely grown in gardens in continental Europe and the British Isles, it was relatively unused as a medicinal agent, although it was noted to make a refreshing tea with sedative, febrifuge, and digestive actions.^{15,26} Perhaps this relative lack of use was due to its somewhat mild actions, comparable to lemon balm (*Melissa officinalis*, Lamiaceae) and mints (*Mentha* spp., Lamiaceae), European herbs that were already widely known and used.¹⁵ This was not the case in Americas, where the medicinal properties of lemon verbena were well-known and the herb was widely consumed and appreciated as a beverage with therapeutic benefits.^{1,2,7}

Traditional medicinal uses of lemon verbena are well documented. For gastrointestinal complaints, it is taken as a digestive, antispasmodic, carminative (to relieve flatulence), anti-diarrheal, and anti-nausea agent.^{1,2,5,7,15,27–31} For agitation and nervous disorders, lemon verbena is taken as a hypnotic and mild sedative and as a relaxant to soothe and calm anxiety. It is also considered mildly pain-relieving and an effective treatment for dizziness, vertigo, and fainting spells.^{1,2,5,7,27,32} It is also highly regarded for its respiratory benefits, including its anti-asthmatic and expectorant properties.^{1,2,5,7,28,29,32} In South America, it is commonly taken as a cardiogenic to relieve heart palpitations and for hypotensive effects.^{1,2,5,7} The traditional use of lemon verbena for a wide variety of ailments reflects its value as a safe, generally mild tonic, particularly for supporting the nervous and digestive systems.¹⁷

Lemon verbena has also been used as a healing or protective agent, both physically and supernaturally.³³ In the Andes and in Mexico, it is used to treat *susto* (literally “fright”), often described as “spiritual fright” or “soul loss.” *Susto* is a folk illness precipitated by a shocking or startling occurrence that disrupts emotional or spiritual homeostasis and results in depression, dejection, and a host of accompanying psychosomatic and physical ailments. Treatment of *susto* typically involves traditional cleansing rituals performed by a healer using fragrant herbs such as lemon verbena or *Salvia* species (Lamiaceae), followed by prescriptive consumption of infusions of the same plants.^{7,34,35} The reported apotropaic (repelling negative forces or bad luck) and protective properties of lemon verbena have also been used to ward off nightmares and evil spirits by placing the herb in a pillow or hanging it by the bed. Lemon verbena has been used as an adjunct to amplify “magical operations” and as a strewing herb (i.e., an herb placed on the floor and stepped on to release volatile oils into the air, imparting a fragrant aroma and ostensibly purifying rooms and buildings).³³

Lemon verbena is used to add flavor and aroma to beverages and foods,³⁶ including puddings, desserts, fruit salads, and jams, and to marinate fish and poultry.^{1,7,37} In France, lemon verbena tisane is commonly available in restaurants as “Verveine odorante,”¹⁷ and the herb is a well-known ingredient of French herbal liqueurs and vermouths.³⁸ In South America, it is used as a flavoring for yerba maté (*Ilex paraguariensis*, Aquifoliaceae), as an ingredient in sodas,^{1,5} and in Argentinian liquors and *mistelas* (sweet fortified wines).^{1,7} In Ecuador, it has been used to flavor the mildly alcoholic fermented corn (*Zea mays*, Poaceae) beverages known as *chicha*, and in the preparation of *colada morada*, beverages made from fruit

and corn.^{1,7,18} In Morocco, lemon verbena is a component of a commonly consumed infusion beverage called *Zhourat*.³⁹

Lemon verbena’s widespread use in food and beverages is largely due to its fragrant volatile oil, which gives the plant its characteristic aroma.⁴⁰⁻⁴² The primary aromatic component is citral (a yellow liquid consisting of two stereoisomers, geranial and neral),^{5,43} but additional terpenes add a flowery note to the flavor and aroma beyond the lemon-scented citral.³⁶ This complex suite of aromatic constituents distinguishes lemon verbena from other citral-containing species, such as lemongrass (*Cymbopogon* spp., Poaceae) and lemon myrtle (*Backhousia citriodora*, Myrtaceae).^{36,44,45}

Lemon verbena *Aloysia citrodora*
Photo by Steven Foster ©2025 ABC



Citral, whether isolated from lemon verbena and other botanicals or chemically synthesized, is used to flavor foods and beverages.⁴⁶ It has also been used as an insect repellent,¹ perhaps due to its demonstrated pheromonal effects on insects.⁴⁷ Like many aromatic compounds with complex pheromonal interactions, citral has also been used in perfumery and cosmetics.^{1,46}

CURRENT AUTHORIZED USES IN COSMETICS, FOODS, AND MEDICINES

In the United States, lemon verbena (listed as “*Lippia citriodora* HBK”) and lemon verbena oil are listed as safe and approved substances added to food and for use as flavoring agents or adjuvants, as per US Food and Drug Administration (FDA) regulation 21 CFR §172.510: *Natural flavoring substances and natural substances used in conjunction with flavors*.^{48,49} Citral is also approved for use as a flavoring agent or adjuvant and is listed as Generally Recognized As Safe (GRAS) in 21 CFR §182.60: *Synthetic flavoring substances and adjuvants*.^{49,50} The US Environmental Protection Agency (EPA) regulation 40 CFR §180.1, which concerns pesticide chemical residues in food, lists “Verbena, lemon” as “*Aloysia citriodora* Palau” in the edible flowers section, providing evidence of use of this species as a conventional food in the United States.⁵¹

In Argentina, a quality standards monograph was published in the eighth edition of *Farmacopea Argentina* for “Cedron leaf,” defined as “whole or fragmented leaves of *Aloysia citriodora* [sic] Palau (Verbenaceae).”⁵²

In Canada, “Lemon verbena leaf” and “Lemon verbena (*Lippia citriodora*) extract” (of the flower and herb) are approved for use as non-medicinal components as flavor enhancers. Other permitted uses include “Lippia Citriodora Flower Water” (as a distillation preparation) as a non-medicinal fragrance ingredient, “Lippia Citriodora Leaf Extract” as a non-medicinal astringent, and “Lippia Citriodora Leaf Oil” (leaf essential oil) as a non-medicinal masking agent.⁵³ At the time of this writing (February 2025), approximately 24 licensed Natural Health Products (NHPs) contained lemon verbena as a non-medicinal flavor ingredient in Canada.⁵⁴ Lemon verbena leaves are considered food in Canada. Health Canada has determined that lemon verbena leaves for tea usage are “non-novel” pursuant to Division B.28 of the Food and Drug Regulations. Non-novel designation means that an “ingredient has a history of safe use as a food.”⁵⁵

In the European Union (EU), the *European Pharmacopoeia* (PhEur) quality standards monograph for Lemon verbena leaf (*Verbenae citriodora folium*) lists *A. citriodora* Palau (syns. *Aloysia triphylla* (L’Hér.) Kuntze, *Verbena triphylla* L’Hér., and *Lippia citriodora* Kunth) as the accepted species and whole or fragmented, dried leaves as the accepted plant parts.⁵⁶ Lemon verbena leaf may be used as an active ingredient of registered traditional herbal medicinal products (THMPs). As noted in the European Medicines Agency (EMA) EU herbal monograph for lemon verbena leaf, the authorized indication statements for prod-

uct labeling are “Traditional herbal medicinal product for relief of mild symptoms of mental stress and to aid sleep” and “Traditional herbal medicinal product for symptomatic treatment of mild gastrointestinal complaints including bloating and flatulence.”⁵⁷

For use in cosmetic products in the EU, the defined substances “Lippia Citrodora Water,” “Lippia Citrodora Leaf Water,” “Lippia Citrodora Flower Water,” “Lippia Citrodora Leaf/Flower Oil,” “Lippia Citrodora Flower/Leaf/Stem Oil,” and “Lippia Citrodora Flower/Leaf/Stem Water” are authorized for fragrance functions. “Lippia Citrodora Flower/Leaf/Stem Extract” is authorized for skin-conditioning function, and “Lippia Citrodora Leaf Oil,” “Lippia Citrodora Leaf/Flower Oil,” and “Lippia Citrodora Flower/Leaf/Stem Oil” are authorized for perfuming function.⁵⁸ Lemon verbena essential oil is permissible as a fragrance ingredient in cosmetics per EU Regulation (EC) No 1223/2009 (Annex II and III), with certain restrictions (i.e., only lemon verbena absolute is allowable).⁵⁹

Additionally, lemon verbena is listed as a Common Ingredient for Herbal and Fruit Infusions (HFIs) in Annex 3 of *Tea and Herbal Infusions Europe: Compendium of Guidelines for Herbal and Fruit Infusions* and defined as “whole or cut, dried leaves and upper shoot regions from the verbena family (Verbenaceae) *Aloysia citriodora* [sic] Palau (syn. *Lippia triphylla* (L’Hér.) Kuntze).” The compendium also notes that “The serrate leaves have a lemon-like smell and taste.”⁶⁰

MODERN RESEARCH

The primary essential oil compounds reported in lemon verbena are geranial (citral A), neral (citral B), limonene, geraniol, linalool, and 1,8-cineole (eucalyptol). Other key compounds reported are sesquiterpenes (e.g., β -caryophyllene and spathulenol), phenylpropanoid glycosides (e.g., verbascoside and isoverbascoside), and flavonoids (e.g., luteolin 7-*O*-glucoside, luteolin 7-*O*-diglucuronide).^{5,61-63} The essential oil composition varies depending on plant part, maturity, genotype, and environmental and harvesting conditions.⁶² Concentration levels of phenylpropanoids (mainly verbascoside and isoverbascoside), a group of active compounds of interest in research, vary significantly depending on whether the material comes from South America, Europe, or Africa (personal communication, Fran Cremades [technical and operations director, Monteloder Ltd.; Elche, Spain], July 8, 2025).

In pre-clinical studies, lemon verbena leaf has demonstrated anxiolytic, sedative, antioxidant, anti-spasmodic, anti-inflammatory, and antimicrobial pharmacological activities.⁵ In one study, an aqueous extract of lemon verbena leaves showed sedative effects in mice, and the authors suggested this may involve the gamma-aminobutyric acid A (GABA-A) receptor. This conclusion was based on findings that the extract’s sedative effect was decreased by flumazenil (a competitive antagonist at the benzodiazepine-binding site on the GABA-A receptor).⁶⁴⁻⁶⁶

Lemon verbena leaves are generally well-tolerated when used appropriately and in accordance with recommended indications, preparation types, and dosage levels.^{57,67} Consuming products with lemon verbena may affect mental alertness tasks, such as driving, and potentiate drowsiness when taken with alcohol or other products with sedative properties.⁵⁷ Based on the limited number of toxicity studies, aqueous extracts of lemon verbena leaf have not shown safety concerns when used for appropriate indications and at recommended dosages.⁶¹ Potential skin-irritant properties of lemon verbena essential oil have been reported.^{1,7} When lemon verbena essential oil is used topically (e.g., in cosmetics), there is a moderate risk of skin sensitization,⁶⁸ but lemon verbena absolute is non-phototoxic.^{68,69}

Clinical studies on lemon verbena have focused on exercise endurance and recovery, markers of inflammation, and, more recently, sleep quality. Table 1 summarizes clinical studies on lemon verbena and highlights its potential benefits.

ADULTERATION AND SUBSTITUTION

Lemon verbena and European vervain (*Verbena officinalis*) are both members of the Verbenaceae family,⁷⁶ and both species are frequently referred to as “verbena.” This can lead to confusion and the inadvertent substitution of *A. citrodora* with *Verbena* species, especially those found in commerce (e.g., *V. officinalis* and *V. hastata*).^{4,77}

The current PhEur quality standards monograph for Lemon verbena leaf (*Verbenae citriodoraefolium*) includes a thin-layer chromatography botanical identification method,

Table 1. Selected Clinical Studies On Lemon Verbena

Publication and Year	Study Design	Interventions	Outcome
Funes et al 2011 ⁷⁰	R, DB N = 15 Evaluated the effects of lemon verbena extract on exercise performance and serum levels of neutrophils, muscle damage markers, and cytokines in healthy men over 21 days	Treatment group: 3 capsules/day of lemon verbena extract ^a (total of 1,800 mg/day) (n = 8) Placebo group: 3 capsules/day of microcrystalline cellulose (n = 7) Both groups performed 90-minute running sessions 3x/week Lab markers, including serum markers (CPK, Mgb, AST, ALT, GGT), neutrophil antioxidant enzymes (CAT, GPx, GRed, SOD), MPO, an oxidative stress marker (MDA), and cytokines (IL-6, IL-1 β , TNF- α), were evaluated at baseline and end of study	No significant differences between groups in exercise performance. In the treatment group, decreased exercise-induced oxidative stress in neutrophils, decreased serum transaminases, and decreases in cytokine markers, demonstrating improvement in muscle-recovery parameters Authors did not report adverse effects
Mauriz et al 2015 ⁷¹	R, DB, PC N = 30 Evaluated the effects of lemon verbena extract on inflammatory markers in people with multiple sclerosis (MS) over 28 days	Treatment groups: before breakfast, 1 capsule/day containing 600 mg of lemon verbena extract ^b Placebo groups: before breakfast, 1 capsule/day containing microcrystalline cellulose Treatment group subdivided by MS presentation type, each sub-group had assigned placebo. Sub-groups: primary progressive (n = 3, treatment; n = 2, placebo), secondary progressive (n = 8, treatment; n = 9, placebo), and relapsing-remitting (n = 5, treatment; n = 5, placebo). The authors inconsistently report the secondary progressive sub-group size: they list 8 and 9 participants in the treatment and placebo groups, respectively (17 total), but state a total of 15 participants elsewhere in the paper Inflammatory serum markers, including CRP and cytokines (IFN- γ , IL-12, IL-23, IL-6, TNF- α , TGF- β , IL-4, and IL-10), were evaluated at baseline and end of study	In the secondary progressive sub-group, CRP was significantly lower in treatment group compared to placebo group, demonstrating anti-inflammatory potential. IFN- γ levels decreased in all treatment groups, and IL-12 decreased in relapsing-remitting treatment group. Anti-inflammatory cytokines (IL-4 and IL-10) increased in secondary progressive treatment group Authors did not report adverse effects
Afrasiabian et al 2018 ⁶⁵	R, DB, PC N = 100 Evaluated the effects of lemon verbena syrup in people with insomnia over 4 weeks	Treatment group: 1 hour before bedtime, 10 cc of lemon verbena leaf syrup ^c (n = 47) Placebo group: 1 hour before bedtime, placebo syrup (n = 43) Sleep parameters (PSQI and ISI) were evaluated at baseline, 2 weeks, and 4 weeks. Adverse effects were monitored during study	PSQI score (which evaluates sleep latency, habitual sleep, daytime dysfunction related to poor sleep, and subjective sleep quality) improved significantly in the treatment group at 4 weeks. ISI score also improved significantly at 4 weeks, demonstrating improvements in sleep quality Mild and transient side effects were reported: 6 in the treatment group (restlessness, tremor, sleepiness, localized itching) and 2 in the control group (diarrhea, sleepiness) A total of 3 participants in the treatment group and 7 participants in the placebo group did not complete the study due to lack of follow-up

Publication and Year	Study Design	Interventions	Outcome
Buchwald-Werner et al 2018 ⁷²	R, DB, PC, PG N = 44 Evaluated the effects of lemon verbena extract on muscle strength and recovery after exhaustive exercise protocol in healthy participants (22-50 years old) over 15 days	Treatment group: in the morning, 2 capsules/day of lemon verbena leaf extract ^d (total of 400 mg/day) (n = 22) Placebo group: in the morning, 2 capsules/day of maltodextrin (n = 22) Participants were instructed to take treatment or placebo capsules for 10 days before, on the day of, and 4 days after exhaustive exercise test (an intensive jumping exercise protocol) Evaluated isometric muscle strength of quadriceps (MVC), muscle damage marker (CK), oxidative stress marker (GPx), IL-6, and subjective muscle soreness pre- and post-exhaustive exercise test, followed by safety and tolerability assessments	Muscle strength loss was significantly less after exercise in the treatment group compared to placebo. Other trend data points reported improvement with GPx, and participants reported less pain with movement. No differences noted in CK and IL-6 levels A total of 40 participants completed the study (4 discontinued before the exercise test, 3 with common cold symptoms and 1 due to individual decision) Authors reported adverse effects were not serious or related to intervention
Angiolillo et al 2021 ⁷³	OL, single-arm, phase 1 clinical study N = 12 Evaluated the effects of lemon verbena extract on lipid and oxidative markers in people with hypercholesterolemia (average age of 58) over 16 weeks	Treatment group: 1 capsule/day of 100 mg of lemon verbena leaf extract ^e TC, HDL-C, LDL-C, TG, GLU, CPK, AST, and ALT were measured at 4 weeks, 8 weeks, and 16 weeks	Compared to baseline levels, significant decrease in TC at 16 weeks, significant increase in HDL only at 8 weeks, and mild, non-significant decreases in TG and LDL at 8 and 16 weeks No adverse effects were reported
Haryalchi et al 2022 ⁷⁴	R, single-blind N = 84 Evaluated the aromatherapeutic effects of lemon verbena essential oil on anxiety levels before cesarean section in women (18-40 years old)	Treatment group: 30 minutes before surgery, aromatherapy using 3 drops of lemon verbena essential oil on cotton in sealed cans at 10 cm from the nose (n = 42) Placebo group: 30 minutes before surgery, "aromatherapy" using distilled water (n = 42) Anxiety levels were assessed before and 5 minutes after aromatherapy by STAI, vital signs, and pain severity scale	In the treatment group, preoperative anxiety levels were significantly less, blood pressure, respiratory and heart rate reduced compared to the placebo group. No significant changes on pain scale between groups No adverse effects were reported in the study
Martínez-Rodríguez et al 2022 ⁶⁶	R, DB, PC N = 40 Evaluated the effects of lemon verbena extract on quality of sleep and stress levels in people (average age of 38) experiencing moderate to high levels of stress and poor sleep quality over 8 weeks with a 4-week washout period	Treatment group: 1-2 hours before sleeping, 1 capsule/day containing 400 mg of lemon verbena leaf extract ^f and 150 mg of excipient (microcrystalline cellulose) (n = 20) Placebo group: 1-2 hours before sleeping, 1 capsule/day containing 150 mg of excipient (n = 20) Body composition, self-assessments (PSQI, PSS), blood pressure, cortisol levels, electrocardiogram, and Fitbit sleep monitoring evaluated at each of 3 study visits	For perceived stress levels, no significant difference between groups at 1 month but a significant improvement in the treatment group at 2 months, and these improvements were maintained after the washout period. Cortisol levels paralleled the findings of the perceived stress levels, with a decrease in cortisol levels in the treatment group at 2 months compared to baseline. Sleep quality improved overall, with a stronger effect in female participants Authors reported no adverse effects
Pérez-Piñero et al 2024 ⁷⁵	R, DB, PC N = 71 Evaluated the effects of lemon verbena extract on sleep quality in healthy participants with sleep challenges over 90 days	Treatment group: 1 hour before sleeping, 1 capsule/day containing 400 mg of lemon verbena leaf extract ^f and 150 mg of excipient (n = 33) Placebo group: 1 hour before sleeping, 1 capsule/day containing excipient (cellulose microcrystalline and maltodextrin) (n = 38) Sleep quality was assessed by VAS, PSQI, actigraphy (wearable device to monitor sleep activity), plasma morning cortisol, and nocturnal melatonin levels at baseline, mid-study (45 days), and end of study (90 days)	Significant improvements in sleep quality (VAS scores) and significant improvements in sleep latency and sleep efficiency (PSQI scores) were reported in the treatment group compared to placebo. Actigraphy showed significant improvements in sleep latency, sleep efficiency, wakefulness after sleep onset, and number of awakenings; no changes in cortisol levels; and significant increase in melatonin levels were noted in treatment group compared to placebo The authors reported no adverse effects related to the treatment

B = blinded; C = controlled; DB = double-blind; OL = open-label; PC = placebo-controlled; R = randomized; PG = parallel-group; CPK = creatine phosphokinase; Mgb = myoglobin; AST = aspartate aminotransferase; ALT = alanine aminotransferase; GGT = gamma-glutamyltransferase; CAT = catalase; GPx = glutathione peroxidase; GRed = glutathione reductase; MDA = malondialdehyde; SOD = superoxide dismutase; MPO = myeloperoxidase; CRP = c-reactive protein; PSQI = Pittsburgh Sleep Quality Index; ISI = Insomnia Severity Index; MVC = maximal voluntary contraction; CK = creatine kinase; GPx = glutathione peroxidase; IL-6 = interleukin-6; IL-1 β = interleukin-1 beta; TNF- α = tumor necrosis factor alpha; IFN- γ = interferon gamma; TGF- β = transforming growth factor beta; TC = total cholesterol; HDL-C = high-density lipoprotein cholesterol; LDL-C = low-density lipoprotein cholesterol; TG = triglycerides; GLU = glucose; STAI = State-Trait Anxiety Inventory; PSS = Perceived Stress Scale; VAS = Visual Analogue Scale

^a Lemon verbena extract (10% verbascoside, solvent not reported) provided by Monteloeder S.L. (Monteloeder, Ltd.; Elche, Spain)

^b Lemon verbena extract (PLX[®]; 10% verbascoside, solvent not reported), manufactured by Monteloeder S.L. (Monteloeder, Ltd.; Elche, Spain)

^c Lemon verbena leaf syrup (total essential oil: 1.66 mg/10 mL, flavonoid quercetin: 3.22 mg/10 mL) prepared by the researchers (5 g of botanically verified lemon verbena leaves were boiled in 330 mL of water, then reduced to slow boiling; once 200 cc of solution remained, the solution was filtered and 140 g of sugar was added to meet a volume of 120 cc). Placebo syrup was prepared by adding 140 g of sugar to 330 cc of water and boiling to 120 cc.

^d Lemon verbena leaf extract (Recoverben[®]; proprietary aqueous native extract standardized to >18% polyphenols) provided by Vital Solutions GmbH (Langenfeld, Germany)

^e Lemon verbena leaf extract (PLX[®]*; 23% phenylpropanoids, solvent not reported) provided by Monteloeder S.L. (Monteloeder, Ltd.; Elche, Spain)

^f Lemon verbena leaf extract (PLX[®]; also known as RelaxPLX[®]; purified extract standardized to a minimum of 24% verbascoside and 28% total phenylpropanoids, solvent not reported) provided by Monteloeder S.L. (Monteloeder, Ltd.; Elche, Spain)

which can help distinguish the material from European vervain (*Verbenae herba*).⁵⁶ The PhEur monograph for Verbena herb also lists organoleptic characteristics, noting that a “lemon-like odour indicates the presence of *Aloysia citrodora*.”⁷⁷



Lemon verbena *Aloysia citrodora*
Photo by Steven Foster ©2025 ABC

SUSTAINABILITY AND FUTURE OUTLOOK

Lemon verbena is widely cultivated around the world, especially in Central and South America, parts of Africa, and the Mediterranean, and it does not appear to be threatened or at risk in its native range due to overharvesting. The species is not subject to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)⁷⁸ and has not been assessed according to the International Union for Conservation of Nature (IUCN) Red List categories and criteria.⁷⁹ FairWild Foundation does not list any suppliers that currently provide FairWild®-certified lemon verbena leaf.⁸⁰

Aloysia citrodora displays considerable genetic diversity, with northwestern Argentina recognized as the species' center of diversity and likely region of origin. This genetic diversity contributes partly to the variability in essential oil content within the species.⁸¹ Differences in chemical profiles can be linked to specific chemotypes and cultivars, as well as regional variations in climate, soil conditions, and cultivation and harvesting practices.⁴⁰⁻⁴²

While the global market for lemon verbena appears stable and growing, its long-term sustainability may be threatened by competition from other, potentially more profitable but less sustainable agricultural practices. In Paraguay, for example, it is reported that the expansion of soybean (*Glycine max*, Fabaceae) crops has displaced other agricultural activities, including areas of land formerly dedicated to lemon verbena cultivation. This transition to soybean plantations not only poses a threat to future lemon verbena crops but also contributes to deforestation and the displacement of rural communities (personal communication, Fran Cremades, July 8, 2025). When assessing the comparative market value of alternative crops, consideration should also be given to sustainability. Lemon verbena is a perennial herb well-suited to low-intensity, organic farming practices that can support rural livelihoods. It is hoped that the future outlook for this gentle herb remains bright. HG

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American Botanical Council Presents 2025 Botanical Excellence Awards at 20th Annual Celebration

By ABC Staff

Editor's note: Distinguished naturopathic practitioner, midwife, author, and educator Mary Bove, ND — the recipient of the 2025 ABC Fredi Kronenberg Excellence in Research and Education in Botanicals for Women's Health Award — died on June 9, 2025. An in-depth exploration of her life and achievements can be found in the In Memoriam section of this issue.

The American Botanical Council (ABC) presented eight Botanical Excellence Awards during its 20th annual ABC Celebration and Awards ceremony in March 2025. Established in 2006, these awards recognize individuals and organizations for their exceptional contributions to the global herbal community. The event also highlighted ABC's accomplishments in 2024.

Held at the Hilton Anaheim during the annual Natural Products Expo West trade show and conference in Anaheim, California, the ceremony brought together Celebration Sponsors, ABC Sponsor Members, supporters of the ABC-AHP-NCNPR Botanical Adulterants Prevention Program (BAPP) and ABC's Adopt-an-Herb Program, and other members of the herbal community.

Books on Ethnobotany and Plant-based Organic Chemistry Receive ABC Duke Awards

ABC presented its 2025 James A. Duke Excellence in Botanical Literature Awards in both the reference/technical and consumer/popular categories. The recipient of the reference/technical award is *Organic Chemistry: Miracles from Plants* (CRC Press, 2024) by Jeffrey J. Deakin, PhD, FRSC. The recipient of the consumer/popular award is *The Heart and Its Healing Plants: Traditional Herbal Remedies and Modern Heart Conditions* (Healing Arts Press, 2024) by Wolf-Dieter Storl, PhD.

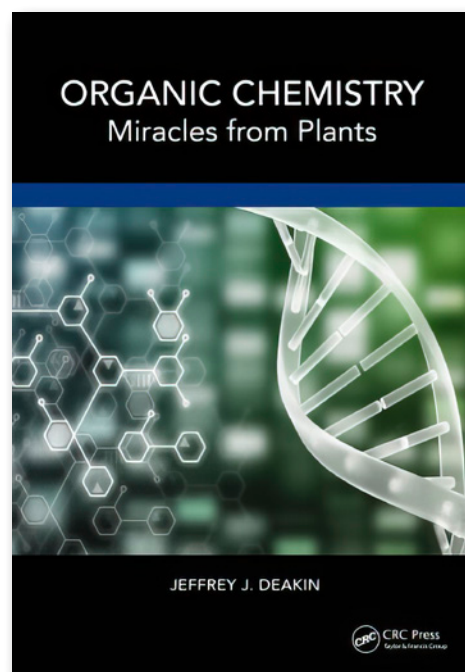
ABC presents the Duke Award annually to books that contribute significantly to medicinal plant-related literature and the fields of botany, taxonomy, ethnobotany, ethnopharmacology, pharmacognosy, phytomedicine, and other related disciplines. The award was created in 2006 to honor economic botanist, ethnobotanist, and author James A. Duke, PhD (1929–2017). Duke's career achievements included decades of work as the lead medicinal plant expert at the United States Department of Agriculture and the authorship or co-authorship of more than 30 reference and consumer books. Among his many other activities and positions, he was a co-founder of ABC and served on its Board of Trustees.



Reference/Technical Category

Organic Chemistry: Miracles from Plants is an accessible introduction to the chemistry of important, naturally occurring substances derived from plants. Inspired by his previous book on the topic, *Botanical Miracles: Chemistry of Plants that Changed the World* (co-authored with the late Raymond Cooper, PhD; CRC Press, 2016), Deakin aimed to distill the concepts introduced in that book for an undergraduate audience. Deakin, who has spent his career as the head of physics and chemistry departments and in education services throughout the United Kingdom, wanted to challenge and encourage more students to study the chemistry of natural products.

"I feel honored to receive recognition from the American Botanical Council and am delighted to accept its 2025 James A. Duke Award for my book *Organic Chemistry*," said Deakin. "I am particularly pleased that I am seen to be fulfilling my aims



in writing the book: That is, to produce an engaging and readable exploration of the roles plants play in human lives and to create an accessible and reliable introduction to the field of organic chemistry,” he continued. “Human benefit from the organic chemistry of plants is incalculable in terms of health, food, comfort, and security. Indeed, the future well-being of humanity rests in significant measure upon a responsible relationship with the plant kingdom in order to maintain natural environmental balance in the Earth’s atmosphere and oceans.”

ABC Chief Science Officer Stefan Gafner, PhD, said: “The book *Organic Chemistry* combines storytelling with lessons in chemistry using constituents from natural sources as examples. The beauty of the book is that topics that are generally very complex, such as stereochemistry or nuclear magnetic resonance spectroscopy, are explained in an approachable manner. The book may not turn everyone into an organic chemistry aficionado, but for those who need to study chemistry or want to learn more about the history, use, and makeup of natural products, it is a great way to learn.”

Consumer/Popular Category

In *The Heart and Its Healing Plants*, Storl, an ethnobotanist and anthropologist, examines lore and herbal practices related to supporting and healing the heart. Traditional teachings from early European cultures, Indigenous tribes, and other civilizations from around the world describe an ancient understanding of the heart as both an organ and the home of the soul and reflect cultural paradigms around health and healing. The book also includes a *materia medica* of plants that have been used since

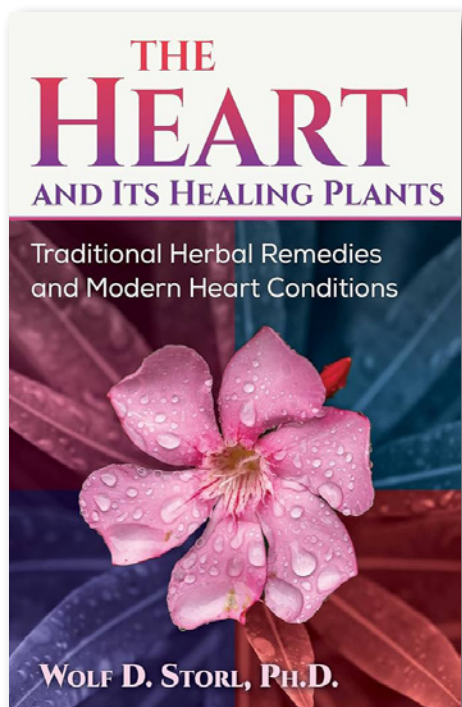
antiquity to treat heart ailments, as well as a holistic view of the heart and heart disease for the modern-day herbalist.

“Plants have been trustworthy healers for us and animal organisms since the beginning of life’s evolution; they alone can harness the sun’s light and clothe it in earthly matter,” said Storl. “I’m really happy to receive this award. For many years, I have been a fan of James Duke.”

“*The Heart and Its Healing Plants* is a thoroughly researched, well-written account of old and current herbal remedies for heart conditions,” said Gafner. “The chapters describing the connection between heart ailments and emotional and spiritual well-being in European cultures really make Storl’s talent in storytelling and his expertise in anthropology shine. Jim Duke would have loved to read this book.”

Honorable Mentions

As in previous years, ABC also named honorable mentions in each category to reflect the diverse selection of excellent works considered for the award. The honorable mention in the reference/technical category is *Ganoderma: Cultivation, Chemistry and Medicinal Applications*, Volume 1 (CRC Press, 2024) by Krishnendu Acharya, PhD, and Somanjana Khatua, PhD, eds. In the consumer/popular category, the honorable mention is *Devoured: The Extraordinary Story of Kudzu, the Vine that Ate the South* (LSU Press, 2024) by Ayurella Horn-Muller.



ABC James A. Duke Award Recipients*	
2025:	Reference/technical: <i>Organic Chemistry: Miracles from Plants</i> Consumer/popular: <i>The Heart and Its Healing Plants: Traditional Herbal Remedies and Modern Heart Conditions</i>
2024:	Reference/technical: <i>American Herbal Products Association’s Herbs of Commerce</i> , 3rd edition Consumer/popular: <i>Psychonauts: Drugs and the Making of the Modern Mind</i>
2023:	Reference/technical: <i>Medicinal Herbs in Primary Care: An Evidence-Guided Reference for Healthcare Providers</i> Consumer/popular: <i>Ginseng Diggers: A History of Root and Herb Gathering in Appalachia</i>
2022:	Reference/technical: <i>A History of the Korean Ginseng Industry</i> Consumer/popular: <i>The Plant Hunter: A Scientist’s Quest for Nature’s Next Medicines</i>
2021:	<i>Christopher Hobbs’s Medicinal Mushrooms</i>
2019:	<i>Flora of the Voynich Codex: An Exploration of Aztec Plants</i>
2018:	<i>Ethnopharmacologic Search for Psychoactive Drugs</i> , Vols. I and II
2017:	Reference/technical: <i>Chinese Medicinal Plants, Herbal Drugs and Substitutes</i> Consumer/popular: <i>Joseph Banks’ Florilegium</i>
2016:	<i>Handbook of Essential Oils</i> , 2nd edition
2015:	<i>Clinical Aromatherapy</i> , 3rd edition
2014:	<i>Ancient Pathways, Ancestral Knowledge</i>
2013:	<i>Principles and Practice of Phytotherapy</i> , 2nd edition
2012:	Reference/technical: <i>Medicinal Plants and the Legacy of Richard E. Schultes</i> Consumer/popular: <i>Smoke Signals</i>
2011:	Reference/technical: <i>American Herbal Pharmacopoeia: Botanical Pharmacognosy</i> Consumer/popular: <i>Healing Spices</i>
2010:	<i>Botanical Medicine for Women’s Health</i>
2009:	<i>An Oak Spring Herbaria</i>
2008:	<i>Mabberley’s Plant Book</i> , 3rd edition
2007:	Google Book Search
2006:	<i>Medicinal Spices</i>
2005:	<i>The Essential Guide to Herbal Safety</i>

* In some years, ABC presents the Duke Award to two books: one in the reference/technical category and the other in the consumer/popular category.

G. N. Qazi Receives ABC Farnsworth Award

ABC presented its 2025 ABC Norman R. Farnsworth Excellence in Botanical Research Award to Ghulam Nabi Qazi, PhD, the director general and CEO of Hamdard Institute of Medical Sciences and Research (HIMSR) in New Delhi, India. Qazi has more than 40 years of research experience and expertise in biochemistry, microbial biotechnology, bioprospecting of natural products, quality control, and clinical validation of traditional Indian herbal medicines, among other areas.

ABC presents the annual award, named in honor of the internationally respected professor Norman R. Farnsworth, PhD (1930–2011), to an individual who has made significant research contributions in the fields of pharmacognosy (the study of drugs of natural origin, usually from plants), ethnobotany, ethnopharmacology, or other scientific disciplines related to medicinal plants. Farnsworth was a widely published and internationally renowned research professor of pharmacognosy, a senior university scholar in the University of Illinois at Chicago’s College of Pharmacy, and one of the founding members of ABC’s Board of Trustees.

“I am grateful and feel honored by this recognition of my contributions to the knowledge of natural products science and the development of standardized products,” Qazi said in a pre-recorded acceptance speech.

Qazi received his master’s degree in biochemistry and his PhD in microbiology from Maharaja Sayajirao University of Baroda in Vadodara, India. He conducted postdoctoral research in biochemical engineering at Technical University Dortmund in Dortmund, Germany.

Qazi has been with HIMSR since 2016. The institute, which he helped establish, focuses on medical education for both undergraduates and graduate students and is affiliated with Jamia Hamdard University (JHU) in New Delhi. Previously, Qazi was the vice chancellor of JHU, where he worked from 2008 to 2016. As vice chancellor, Qazi worked to integrate Unani medicine into pharmacy curricula. Unani is one of the traditional medicine systems of India, focusing on the uses of herbs and medicinal plants from the Greco-Arabic tradition. At JHU, Qazi oversaw the completion of more than 30 graduate students’ PhDs.

ABC Norman R. Farnsworth Award Recipients

- 2025: G. N. Qazi, PhD
- 2024: Robin Marles, PhD
- 2023: Michael Heinrich, PhD
- 2022: Guido Pauli, PhD
- 2021: Paula N. Brown, PhD
- 2019: Rachel Mata, PhD
- 2018: Otto Sticher, PhD
- 2017: Raphael Mechoulam, PhD
- 2016: Ameenah Gurib-Fakim, PhD
- 2015: John T. Arnason, PhD
- 2014: Harry Fong, PhD
- 2013: Gordon Cragg, PhD
- 2012: De-An Guo, PhD
- 2011: Djaja Soejarto, PhD
- 2010: A. Douglas Kinghorn, PhD
- 2009: Rudolf Bauer, PhD
- 2008: Ikhlas Khan, PhD
- 2007: Hildebert Wagner, PhD
- 2006: Edzard Ernst, MD, PhD
- 2005: Joseph Betz, PhD

Before his time at JHU, Qazi was the senior director of the Council of Scientific and Industrial Research–Indian Institute of Integrative Medicine (CSIR–IIIM) in Jammu, India, from 2000 to 2008. This government research institute is tasked with discovering “new drugs and therapeutic approaches from natural products, both of plant and microbial origin, enabled by biotechnology, to develop technologies, drugs, and products of high value for the national and international markets,” according to its website.

At CSIR–IIIM, Qazi had several notable research accomplishments, including the isolation and characterization of a group of withanolides and withaferin molecules from the root of one of India’s most famous medicinal plants — ashwagandha (*Withania somnifera*, Solanaceae) — and boswellic acids from frankincense gum obtained from

boswellia (*Boswellia serrata*, Burseraceae). In an email acknowledging his receipt of the 2025 ABC Farnsworth Award, Qazi referred to these achievements as “a source of professional satisfaction” and “a significant and fascinating addition to the knowledge repository of bioactive natural materials for pharmaceutical research.”



Qazi is or has been a part of several educational or scientific committees in India. He was the chairman of both the Drugs and Pharmaceutical Research Programme and the Unani Pharmacopoeia Committee of the Government of India and a member of the Scientific Advisory Committee of the Indian Pharmacopoeia Commission. Among many medicinal plant research journal editorial boards and related advisory and editorial positions, Qazi has been a longtime member of the ABC Advisory Board.

Throughout his career, Qazi has authored or co-authored several book chapters and more than 250 research papers in scientific journals. He also holds more than 60 international patents and has been an invited lecturer on fermentation technology and genetic engineering at universities and institutes around the world.

“India is a vast storehouse of medicinal plants that have been used for centuries, if not millennia, in traditional medicinal systems, and recent years have seen much scientific and clinical research on their safety and therapeutic benefits,” said ABC Founder and Executive Director Mark Blumenthal. “In the past decades, Dr. Qazi has been one of the key Indian scientists who have been a formative and

driving force in the development of modern research on Indian medicinal plants. If Norman Farnsworth were still alive today, I am quite certain that he would wholeheartedly approve of ABC's recognition of Dr. Qazi's immense body of scientific research."

Gafner said: "I am thrilled that a scientist from India has been selected as this year's ABC Farnsworth awardee. Dr. Qazi has laid part of the scientific foundation on which our current understanding and therapeutic use of important medicinal plants like ashwagandha, boswellia, and picrorhiza [*Picrorhiza* spp., Plantaginaceae]. In my opinion, his research has been among the most impactful for the herbal medicine community, especially as it relates to plants used in traditional systems of Indian medicine."

Korea Ginseng Corporation Receives ABC Tyler Award

ABC presented the 2025 ABC Varro E. Tyler Commercial Investment in Phytomedicinal Research Award to the Korea Ginseng Corporation (KGC), a global health and beauty company based in Seoul, South Korea, which specializes in products containing Korean red ginseng (*Panax ginseng*, Araliaceae) root, its preparations, and other natural ingredients.

The ABC Tyler Award was named in honor of one of the most respected North American scientists in late-20th-century herbal medicine and pharmacognosy. Professor Varro E. Tyler, PhD (1926–2001), was vice president of academic affairs and dean at Purdue University's School of Pharmacy and Pharmacal Sciences and an early member of the ABC Board of Trustees. He was also the senior author of six editions of a leading pharmacognosy textbook in the United States, as well as numerous other professional and popular books and academic articles. Tyler envisioned a rational phytomedicinal healthcare sector that valued the appropriate evaluation of a phytomedicinal product's quality, safety, and efficacy.

"I sincerely and truly thank [Mark Blumenthal] and the ABC Board of Trustees and staff for this great honor," said Seung-ho Lee, director of KGC's Laboratory of Efficacy Research, in a pre-recorded acceptance speech. "For many decades, KGC has been dedicated to conducting more than 100 extensive clinical studies, and this award recognizes our commitment to scientific research on Korean red ginseng."

KGC is a leading producer of Korean red ginseng products for the wellness and skincare industries and is known for its flagship brand, JungKwanJang® (formerly called CheongKwanJang®), as well as its other brands, EVERYTIME®, GOODBASE®, and DONGINBI®. The company was founded as Samjungkwa in 1899 when the Korean Empire established a state-controlled system to regulate and promote ginseng production. (Jung-



Blumenthal, Yun-beom Lee, PhD, of Korea Ginseng Corporation, and Gafner

KOREA GINSENG CORP

KwanJang roughly translates as “products rightfully made in government-supervised factories.”) The company was formally established as the Korea Ginseng Corporation a century later, in 1999.

Over the years, KGC has become a world-renowned authority in Korean red ginseng and has expanded its research, cultivation, and distribution efforts to bring high-quality, science-based products to the international market.

“This achievement is thanks to our 150 dedicated researchers at the R&D headquarters in Korea, who continuously strive for scientific advancements, and the researchers in the United States, who actively exchange insights with us,” Lee said. “We strongly believe that scientific validation is essential to [help people] maintain a healthy lifestyle.”

KGC is committed to scientific research and invests extensively in human clinical studies to validate the potential health benefits of Korean red ginseng. Through collaborations with research institutions and in-house laboratories, KGC is actively exploring the herb's effects on energy, immunity, cognitive function, and overall wellness. KGC's focus on rigorous testing helps ensure that its products maintain high standards of quality and activity.

According to its website, KGC has conducted more than 330 human, animal, or laboratory studies on Korean red ginseng. Human clinical trials have evaluated the effects of Korean red ginseng supplementation on various conditions and in different populations, including postmenopausal women, adults with hypertension, and women with cold hypersensitivity in the hands and feet.

ABC Varro E. Tyler Award Recipients

- 2025: Korea Ginseng Corporation
- 2024: Euromed
- 2023: Sabinsa Corporation
- 2022: Max Zeller Söhne AG
- 2021: Swedish Herbal Institute
- 2019: Jaguar Health/Napo Pharmaceuticals
- 2018: GW Pharmaceuticals
- 2017: Pharmatoka
- 2016: Brassica Protection Products
- 2015: MediHerb/Integria Healthcare
- 2014: SFI Flordis International
- 2013: Wakunaga Pharmaceutical Company
- 2012: Horphag Research
- 2011: Bioforce AG
- 2010: New Chapter
- 2009: Bionorica AG
- 2008: Indena SpA
- 2007: Dr. Willmar Schwabe Pharmaceuticals

Other clinical and pre-clinical studies of KGC products have found that Korean red ginseng may help improve lower urinary tract symptoms in men, physical fatigue after high-intensity exercise, markers of immune health, and cognition in individuals with high stress levels.

“We are proud to support research in natural herbs, and we will continue our efforts to develop scientifically proven herbal solutions for health and wellness,” Lee added.

“Throughout my 50-plus years in the herb and medicinal plant industry and community, ginseng — both Asian and American [*Panax quinquefolius*] — has always been at the top of my research interest and my personal use,” said Blumenthal. “Since 1980, I have had the good fortune to travel to Korea on at least three occasions to attend ginseng research conferences and visit ginseng growing fields and the ultra-modern processing facilities for Korean red ginseng. As a result, I have become increasingly impressed with the production of and the extensive research on Korean red ginseng.”

Gafner added: “The amount of human clinical studies supported by KGC is truly impressive. In my 12-plus years at ABC, I have never seen such an extensive list of clinical studies carried out by one company, most of them documenting the many health benefits of Korean red ginseng for the consumer. What impresses me even more is that the company has also published studies for which the use of ginseng did not lead to a tangible improvement in patients. The publishing of such information is a testament to KGC’s transparency in their research and their commitment to good science.”

Mary Bove Receives ABC Kronenberg Award

ABC presented its 2025 Fredi Kronenberg Excellence in Research and Education in Botanicals for Women’s Health Award to Mary Bove, ND (1955–2025), who practiced naturopathic family medicine, herbal medicine, and midwifery for more than 30 years. After that, Bove consulted, lectured, wrote, and taught on topics including naturopathic medicine, botanical medicine, pediatrics, natural pregnancy and childbirth, traditional food medicine, and mind-body healing. She died on June 9, 2025, after having received the award in March.



Mary Bove with the ABC Fredi Kronenberg Award

ABC Fredi Kronenberg Award Recipients

- 2025: Mary Bove, ND
- 2024: Hellen Oketch-Rabah, PhD
- 2023: Leanna Standish, PhD, ND, LAc, FABNO
- 2022: Gail Mahady, PhD
- 2021: Tori Hudson, ND
- 2019: Mary Hardy, MD
- 2018: Aviva Romm, MD
- 2017: Tieraona Low Dog, MD

The ABC Fredi Kronenberg Award was created in 2018 and named in honor of distinguished researcher, educator, and longtime ABC Board of Trustees member Fredi Kronenberg, PhD (1950–2017). Kronenberg dedicated her professional life to the study of medicinal plants and phyto-medicines for women’s health conditions. She was particularly interested in botanicals, such as black cohosh (*Actaea racemosa*, Ranunculaceae), for the treatment of menopausal symptoms.

Kronenberg was a champion of integrative medicine and co-founded the Richard and Hinda Rosenthal Center for Complementary and Alternative Medicine at Columbia University — the first complementary and alternative medicine (CAM) program at an Ivy League university and the first government-funded CAM research and educational center. For 10 years, she also co-directed an onsite five-day continuing education course in botanical medicine for physicians and other health care providers.

“I am grateful and honored to receive this award recognizing my commitment to my work, women, and the plants,” Bove wrote. “As a naturopathic physician, midwife, medical herbalist, and teacher, my message has reached many ears. I hope to see this message carry on and reach many more ears, and receiving this award will help achieve that.”

Tieraona Low Dog, MD, who received the inaugural ABC Kronenberg Award for 2017 and who is now a member of ABC’s Board of Trustees, endorsed Bove for the award. “For more than three decades, Mary Bove, ND, was a beloved midwife, herbalist, naturopathic physician, and educator, caring for thousands of people who sought her guidance in using natural medicine for their families,” Low Dog wrote. “Her book, *An Encyclopedia of Natural Healing for Children and Infants*, has helped many parents, and more than a few pediatricians, feel confident in using herbal medicines for even the youngest among us. While many sought her out for her knowledge and clinical acumen, it was her warm and down-to-earth way of moving in the world that made her a treasure in our community. Dr. Kronenberg would be delighted that Dr. Bove received this award in her honor.”

More information about Mary Bove’s life and legacy can be found in her obituary on pages 75–79 of this issue.

Anthony Cunningham Receives ABC Foster Award

ABC presented its 2025 Steven Foster Botanical Conservation and Sustainability Award to Anthony “Tony” B. Cunningham, PhD, an internationally respected ethnobotanist, ethnoecologist, conservationist, artist, and adjunct professor at Murdoch University in Western Australia.

The ABC Steven Foster Award was established in 2022 and is named in honor of botanist, author, and photographer Steven Foster (1957–2022). It commemorates his many years of professional interest, writing, and advocacy work in this field. The award recognizes an individual, nonprofit organization, or commercial herb company that is committed to sustainable and/or regenerative practices in the botanical industry or wider community. Recipients actively address botanical conservation and sustainability issues and contribute to a broader understanding of cultural and biological diversity, soil health, climate change, economic justice, and more. They also demonstrate appreciation for the beauty of the natural world.

Foster had more than 40 years of experience in the sustainability and conservation of herbs and medicinal plants. He served on ABC’s Board of Trustees for more than two decades (including 10 years as chair) and was ABC’s key consultant and content contributor for its former Sustainable Herbs Program, which is now the independent Sustainable Herbs Initiative. Foster advocated for botanical industry trade resolutions to protect threatened medicinal botanicals and was a founding member of the advisory board of the United Plant Savers (Ups), a nonprofit plant conservation organization, which was the inaugural recipient of the ABC Foster Award in 2022.

“I admired Steven’s amazing photos of herbs and medicinal plants long before I got to meet him at botanical meetings in the United States,” Cunningham wrote. “Although from different parts of the world, we shared a common interest in conservation and sustainable use of medicinal plants. I am honoured, therefore, to receive the ABC Steven Foster Botanical Conservation and Sustainability Award for 2025.”

Cunningham has 45 years of experience focusing on the use and trade of natural resources, including understanding value chain analyses and creating practical conservation solutions related to local livelihoods and sustainable use. He has taught students in Australia, China, India, Papua New Guinea, South Africa, Uganda, and the United States (University of Hawai’i) and has mentored master’s and doctoral students from diverse cultural backgrounds, including those from China, Fiji, Indonesia, Kenya, South Africa, Tanzania, and Uganda. He has worked in Africa, Asia, and Australia, and, to a lesser extent, in the South Pacific and Arabian Peninsula.

Cunningham’s primary interests include multiscale links between people and natural resource use, as well as how local community/conservation conflicts can be avoided

through informed land-use planning and sustainable resource use. He has authored or co-authored more than 150 publications (mainly in English, but also translated to Chinese, French, Italian, and Spanish). His book on plant resource management, *Applied Ethnobotany: People, Wild Plant Use & Conservation* (Earthscan, 2001), is widely used at universities around the world and is available in English, Spanish (2002), and Chinese (2004).

Over the past 45 years, Cunningham has established strong links with international organizations, particularly in China, Indonesia, and across Africa. He has a 35-year connection with the Kunming Institute of Botany (KIB) in Kunming, Yunnan, China, and a 20-year connection with the Chengdu Institute of Biology (CIB) in Chengdu, Sichuan, China, both of which are members of the Chinese Academy of Sciences. In 2004, he was named the Gerrit Wilder Chair in Botany at the University of Hawai’i. Between 1995 and 2002, he was an

honorary staff member at Makerere University in Kampala, Uganda.

Cunningham was president of the International Society of Ethnobiology (ISE) (1992–1994); an ISE board member (1990–1992 and 1995–1997); a board member of the Center for Biodiversity and Indigenous Knowledge (CBIK) in Yunnan, China (2001–2004); and co-chair of the Medicinal Plant Specialist Group (MPSG) of the International Union for Conservation of Nature’s (IUCN’s) Species Survival Commission (SSC) (1993–1998). Most of his life has been spent working with local people, including traditional healers, basket makers, traditional textile producers, and woodcarvers, to develop practical solutions to resource management problems.

In 2016, the Society for Ethnobotany (SEB, formerly called the Society for Economic Botany) recognized his experience through its Distinguished Ethnobotanist award (formerly called the Distinguished Economic Botanist award) as a lifetime achievement.

Cunningham received a bachelor’s degree in botany and entomology from the University of Natal (now part of the University of KwaZulu-Natal) in Pietermaritzburg, South Africa, in 1977, a bachelor’s degree in entomology from Rhodes University in Grahamstown (now Makhanda),

ABC Steven Foster Award Recipients

2025: Anthony Cunningham, PhD
 2024: Danna Leaman, PhD
 2023: FairWild Foundation
 2022: United Plant Savers



Tony Cunningham

South Africa, in 1978, a PhD in botany from the University of Cape Town in 1985, and a master's degree in social science from the University of Natal in Durban, South Africa, in 1993.

ABC has recognized Cunningham's contributions to botanical and environmental sciences for decades. In *HerbalGram* issue 43 in 1998, Steven Foster reviewed the 1997 project report "Trade in *Prunus africana* and the Implementation of CITES," which Cunningham co-authored. In his review, Foster wrote, "Given its thorough treatment of the subject with clear recommendations and strategies for long-term development of *P. africana* [Rosaceae] supplies, the report serves as a model for other phytomedicine source plant conservation efforts."

In a review of Cunningham's book *Applied Ethnobotany* in *HerbalGram* issue 59 in 2003, ethnobotanist Steven R. King, PhD, wrote, "In summary, this is a must-have manual for anyone working with people and plant resources. It is especially useful for anyone associated with the management of national parks or protected areas anywhere in the world." In *HerbalGram* issue 85 in 2010, Cunningham and Josef Brinckmann, the current president of ABC's Board of Trustees, wrote an article, "'Cinderella' Schisandra: A Project Linking Conservation and Local Livelihoods in the Upper Yangtze Ecoregion of China," which also featured Cunningham's plant and landscape photography.

"Tony is not only an internationally renowned ethnobotanist and ethnoecologist but also a fine artist and photographer," wrote Brinckmann, who endorsed Cunningham for the award. "I met Tony in the early 2000s through a German government-supported steering group that was tasked with drafting the first 'International Standard for the Sustainable Wild Collection of Medicinal and Aromatic Plants' (ISSC-MAP), which relied on Tony's prior resource assessment experience. The steering group involved participants from the German Federal Agency for Nature Conservation (BfN), the World Wide Fund for Nature (WWF), IUCN's MSPG, TRAFFIC, and the herbal industry.

"Over the decades, Tony has worked tirelessly, carrying out field research and studies for nature conservation NGOs, governmental CITES authorities, and United Nations agencies, in recent years focusing on highly traded MAP species in the *Boswellia*, *Commiphora* [Bursaceae], *Griffonia* [Fabaceae], *Prunus*, and *Rhodiola* [Crassulaceae] genera, among others," Brinckmann added. "It has indeed been an honor and a privilege for me to learn so much from Tony as he generously invited me to collaborate with him on

projects including an EU-China Biodiversity Programme project, 'Sustainable Management of Traditional Medicinal Plants in the High-Biodiversity Landscapes of Upper Yangtze Eco-region' (2007–2011), and, more recently, CITES-related research for the German BfN and also the CITES Secretariat."

Chris Kilham Receives ABC Champion Award

ABC presented its 2025 Champion Award to Chris Kilham, a botanical medicine hunter, author, educator, and yogi. The ABC Champion Award was established in 2015 and is given to individuals who have contributed significant time and/or funds to support ABC's science-based nonprofit research and educational mission, publications, and programs.

For more than 25 years, Kilham has generously donated his time, ethnobotanical knowledge, and herbal expertise to support ABC's mission. He has

ABC Champion Award Recipients

- 2025: Chris Kilham
- 2024: Mark Plotkin, PhD
- 2023: Christine Burdick-Bell
- 2022: Steven Foster (posthumously)
- 2021: Jerry Cott, PhD
- 2019: Thomas Brendler, PhD
- 2018: Jim Emme
- 2017: Dick Griffin
- 2016: Josef Brinckmann
- 2015: Ed Smith
- 2014: Terry Lemerond



served as a source and peer reviewer for many articles in ABC's quarterly peer-reviewed journal *HerbalGram* and other ABC publications and has authored compelling and informative feature articles. Several of these are reader-friendly travelogs in which Kilham provides firsthand accounts of the status of various medicinally and culturally important plants from diverse locations around the world. He also frequently contributes original photographs for *HerbalGram*.

Kilham's *HerbalGram* articles include "Tamanu Oil: A Tropical Topical Remedy" in issue 63 (2004), "In the Land of Kesum" in issue 115 (2017), "Ayahuasca Vine Harvesting in the Peruvian Amazon" in issue 120 (2018), "A Preliminary Sustainability Report of Ayahuasca Vine in the Peruvian Amazon" in issue 123 (2019), "The Rising and Falling Fortunes of Vanuatu Kava" in issue 128 (2020), "Rhodiola Harvest in the 'Mountains of Heaven': The Uighur Traders of Xinjiang" in issue 131 (2021), and "Close Encounters of the Hops Kind" in issue 143 (2025).

"It is my great delight to be awarded the 2025 ABC Champion Award," Kilham said. "It means a great deal to me. For many years, I've had the good fortune and privilege to contribute to some of the publications and programs of ABC. This is not only an organization, but it is also a mission — a mission that brings together many people from around the world with diverse abilities, experience, and visions, all moving to help establish botanicals in their rightful place. I'm delighted to be part of the mix, and I can't adequately express how much this honor means to me."

In 1995, Kilham founded Medicine Hunter Inc. "to promote natural, plant-based medicines, to protect the natural environment, and to support indigenous cultures." He has conducted medicinal plant research and sustainable botanical sourcing in more than 45 countries and works with botanical companies to develop and popularize traditional plant-based food and medicinal products.

The New York Times has called Kilham "part David Attenborough, part Indiana Jones," and he has appeared on more than 1,500 radio programs and more than 500 TV programs worldwide. As a TV correspondent and guest, Kilham speaks about medicine hunting, traditional botanical medicines, nutraceuticals, psychoactive plants, environmental and cultural preservation, and related topics for broad and diverse audiences. He was a special guest, correspondent, and weekly contributing writer for FOX News Health for nine years and a regular guest on The Dr. Oz Show.

His latest book, *The Lotus and The Bud: Cannabis, Consciousness, and Yoga Practice* (Park Street Press, 2021), is an in-depth guide to combining the practice of yoga with cannabis (*Cannabis sativa*, Cannabaceae).

As a consultant for Groupe Berkem, a botanical extraction and science innovation company in Bordeaux, France, Kilham works on chain of trade, botanical field exploration, new product development, marketing, and communications. The company has developed portfolios of botanical

extracts for a wide range of health needs, and Kilham is involved with many of these botanicals.

Working with the Royal Botanic Gardens, Kew, in London, Kilham is providing a large library of images from his decades of field research for the Kew digital image database. Focusing on medicinal and other beneficial plants, people who work with them, and the places from which they originate, Kilham's image database is intended to provide Kew researchers with visual materials for publications, presentations, and more.

Kilham is also explorer-in-residence for Purity Products, a company that offers health-promoting herbal concepts that he supports. These products are largely based on Kilham's findings on botanical expeditions. For six years, he served as brand ambassador for KSM-66 Ashwagandha®, a leading ashwagandha root extract.

For 21 years, Kilham conducted medicinal plant research for PureWorld Botanicals of New Jersey and then Naturex of Avignon, France (now part of Givaudan), one of the leading botanical extraction companies in the world. On the company's behalf, he headed new botanical discovery, helped develop sustainability programs, and created videos, presentations, and other communications about medicinal plants. He is widely known throughout the botanical, natural health, and sustainability sectors for his global explorations.

In the course of his work, Kilham has traveled more than four million miles and spent countless days and nights away from home. He has fire-walked in the South Pacific, been made an honorary chief on Pentecost island in Vanuatu in the South Pacific, enjoyed a post as Honorary Consul to the United States on behalf of Vanuatu in the late 1990s, has made good friends all around the world, roamed rainforests and mountains, made friends with a prince, embarked on ceremonial journeys with shamans, and explored wild places from deserts to rivers.

Kilham graduated with a Bachelor of Arts in mind/body disciplines, a major involving Eastern and Western natural health modalities, from the University of Massachusetts Amherst (UMass Amherst) in 1975. From 2000 to 2014, he returned to the university, where he taught the popular ethnobotany course "The Shaman's Pharmacy." From 2011 to 2014, he led that course as an immersive experience in the Peruvian Amazon.

An avid body surfer and adventure traveler, Kilham lives and works in Massachusetts with his wife, cultural activist Zoe Helene. They travel the world on Medicine Hunter expeditions and work together to promote plant medicines, environmental protection, and cultural preservation.

"I have known Chris since our early years in the herb and natural products industry in the late 1970s," said Blumenthal. "I had a wholesale herb company in Austin, Texas, and Chris worked in the herb department of a large natural food store, Bread & Circus, in Massachusetts. That later became the first Whole Foods Market store in New England. During that time, I remember Chris's passion for herbs and medicinal plants. He created various formulas

that were ahead of their time for the fledgling industry.

“Over the years, I’ve watched him grow his interest in and dedication to the herbal conservation, research, and healing agenda — now for more than 40 years,” Blumenthal added. “And, during much of that time, Chris has been a strong and energetic supporter of the nonprofit research and educational mission of ABC, to the point where he has become one of the most frequent contributors of articles for ABC’s publications. There is no question that Chris is a true champion for the herbs and rightfully deserves to be recognized with the 2025 ABC Champion Award.”

Michael Moore Posthumously Receives ABC Community Builder Award

ABC awarded its 2025 Mark Blumenthal Herbal Community Builder Award to Michael Moore (1941–2009), the founder of the Southwest School of Botanical Medicine. This is the first time ABC has given this award posthumously.

The ABC Mark Blumenthal Herbal Community Builder Award is named for ABC’s founder and executive direc-

ABC Mark Blumenthal Herbal Community Builder Award Recipients

- 2025: Michael Moore (posthumously)
- 2024: David Winston, RH (AHG)
- 2023: Mimi Hernandez, RH (AHG)
- 2022: Emily Ruff
- 2021: Michael McGuffin
- 2019: Mary Blue, Kathryn Langelier, and Nicole Telkes
- 2018: Larry and Linnea Wardwell
- 2017: Jon Benninger
- 2016: Ikhlas Khan, PhD
- 2015: Michael Tierra
- 2014: Loren Israelsen
- 2013: Sara Katz
- 2012: Rosemary Gladstar

tor, who has been involved in the North American and international herbal medicine movement for more than 50 years. The ABC Blumenthal Award is given annually to individuals who have played a significant role in creating a sense of connection and community among herbalists, botanical researchers, members of the herb and natural products communities and industries, and others who work with medicinal and aromatic plants.

Moore’s teachings directly reached hundreds of students, and, through their own schools and his books, thousands more. He shared his extensive knowledge and expertise in herbal medicine using the medicinal plants of the desert Southwest. He loved learning and research and amassed a large collection of old herbals and works of the Eclectic physicians of 19th- and early 20th-century North America. In addition to many clinical manuals, Moore edited or authored books including *Medicinal Plants of the Mountain West* (Museum of New Mexico Press, 1979), *Medicinal Plants of the Desert and Canyon West* (Museum of New Mexico Press, 1989), and *Medicinal Plants of the Pacific West* (Red Crane Press, 1993).

“I first met Michael Moore in his small herb shop, Herbs Etc., in Santa Fe, New Mexico, in the early 1970s, and I attended some of his lectures over the next 30 years,” said Blumenthal. “I consider him a strong and positive influence on not only my own interest in and dedication to herbal medicine, but as one of the most inspirational and powerful influences in the modern herbal and herbalist movement.”

In ABC’s memorial tribute to Moore in 2009, Blumenthal is quoted as saying: “I was struck by his biker-Buddha appearance, and as I got to know him over the years, I saw him manifest traits of both. Michael was a larger-than-life figure in the lives of many people. He became the ‘godfather’ of the American herbal movement, at least among the hundreds of herbalists he trained.”

Moore’s class notes, teachings, his collection of *materia medica*, and other educational resources from the 1990s through 2009 have been revised and streamlined by



Michael Moore

Remembering Michael Moore (1941–2009)

Moore's former students, many of whom are now educators themselves, continue his legacy of generosity and wisdom. Some of those students, his friends, and colleagues recalled his impact on their own paths to herbalism and the inspiration he left them.

7Song, director of the Northeast School of Botanical Medicine and director of holistic medicine at the Ithaca Free clinic, wrote: "Michael Moore was one of my most important and influential herbal mentors. I appreciated his practical, science-based approach to herbal medicine and enthusiasm for the plants themselves."

Steven Dentali, PhD, industry consultant, wrote: "I walked into a Michael Moore herb class on a cold Santa Fe winter night. The class discussion turned to tincturing ocotillo (*Fouquieria splendens*, Fouquieriaceae) bark and I offered that a high ethanol concentration would be needed. He gave me a quizzical look and suggested I stop by Herbs Etc., his retail store, the next day. For six weeks, he put me to work alongside Daniel Gagnon, paying me with cash out of the till at the end of each day. Looking for direction as I embarked on laboratory study with access to a bioassay screen, Michael provided me with a dozen Southwest desert herbs known for traditional antimicrobial use, and one other noted for cardiac activity. That 'control' herb was the only one devoid of antimicrobial activity. Further work on two of the twelve, white sage (*Salvia apiana*, Lamiaceae) and narrow-leaf yerba santa (*Eriodictyon angustifolium*, Boraginaceae), became my ticket out of grad school."

Daniel Gagnon, RH (AHG), former owner and operator of Herbs, Etc., wrote: "Michael Moore was my teacher, mentor, and employer from 1979 to 1982. On October 13, 1982, I purchased Michael's Santa Fe-based retail store, Herbs, Etc. His inspiration propelled me to manufacture and distribute herbal medicines nationwide for the next 42 years. During my time working with him, Michael often had his nose in herbal books and literature. He used the information he gleaned as a jumping-off point to explore the herbal medicine world. His knowledge was altogether cerebral, experiential, and organoleptic (senses derived)... His herbal knowledge continues to shine a light on American herbal medicine and will do so for years to come."

Rosemary Gladstar, the "Godmother of Modern Herbalism" and founder of United Plant Savers, wrote: "Michael Moore is a legend amongst herbalists and certainly deserves the Mark Blumenthal Community Award for all that he contributed and still contributes to the herbal community. He was renowned for being a brilliant herbalist, practitioner, and teacher. Michael founded one of the most respected herb schools in the country, which continues to offer long distance learning programs and classes as well as hundreds of hours of free resources. His books are classics and still considered necessary reading material in many herb programs. Certainly, in mine! We can also thank him for bringing to light the teachings of the Eclectic herbal practitioners who had such a profound effect on American herbalism."

"But I think what is most lasting about Michael's legacy is that he was just so uniquely himself," Gladstar continued. "There was no one else like him, or who even came close. He was funny, warm, witty, incredibly smart, not very patient, sometimes grumpy, but always kind and caring. The thing is, you can tell a good herbal teacher by their students, and those students who had the good fortune to study with Michael are great herbalists."

Phyllis Hogan, herbalist and founder of Winter Sun Trading Company in Flagstaff, Arizona, and a close friend of Moore's, wrote: "Driving with Michael in his old Volkswagen van on the back roads looking for plants remain my fondest memory of him. We'd be on our way to or from the surrounding desert with burlap bags reserved for the harvest of yerba mansa (*Anemopsis californica*, Saururaceae), poleo mint (*Mentha pulegium*, Lamiaceae) or oshá (*Ligusticum porteri*, Apiaceae) roots, all to supply our small herb stores. In those days, Michael and I were both merchants and supplied our stores mostly with plants he and I collected from Arizona, New Mexico, Colorado, and California. We had plant-filled burlap sacks and soiled notebooks, filled with precious plant knowledge that we had gained from whatever particular trip — notebooks I still refer to 35 years later."

Catherine Hunziker, president of WishGarden Herbs, wrote: "They say some people leave footprints in your life, but Michael Moore? He laid out a whole path forward for me. As a great teacher, Michael masterfully blended ancient plant wisdom with modern science in a way that resonated deeply with me. And, as such, Michael Moore played a key role in who I became as an herbalist and formulator. I owe so much to him on so many levels. Michael wasn't just a teacher; he was a bridge between worlds. His practical wisdom still guides my hands with every formula I create — one leaf at a time."

Feather Jones, RH (AHG), clinical herbalist and educator, wrote: "Michael's classroom was the hillside, mountain meadow, and desert wash. For well over 30 years, my graduates have gone on and started schools of their own and, knowingly or unknowingly, continue his legacy. His contribution to herbal wisdom will be passed down through future generations of herbalists."

JoAnn Sanchez, RH (AHG), director of the Western Herbalism program at the Southwest Institute of Healing Arts, wrote: "I believe we have Michael Moore to thank, more than any herbalist of our time, for reawakening deep knowledge of the plants of the desert southwest and the mountain west. These plants have a place in our medicine bags because of him. He gave us an understanding of their pharmacology, habitat, harvesting techniques, delivery systems, and lay and clinical knowledge. It is fulfilling to me that throughout my career, my students listened to him by way of tapes and video and got to be entertained by his writing as they learned enriching lore and applications of our southwestern plants."

Stuart Watts, LAc, DOM, founder of the Academy of Oriental Medicine at Austin and co-founder with Moore of the Southwest Acupuncture College in New Mexico, wrote: "Michael was a blessing to the planet. He was uncanny in his ability to find most plants. We would drive along and suddenly, he would stop, pull over and say, 'on the other side of the ridge is some yerba buena [*Clinopodium douglasii*, Lamiaceae]; and, sure enough, even though [it was] out of sight, there it was.... He affected so many people in positive ways."

Ginger Webb, founder of Sacred Journey School of Herbalism, wrote: "I studied with Michael Moore in 1999, and it changed my life forever. Previously, I knew a few things about a few herbs. After studying with Michael, I understood the craft of herbalism and how inextricably people and plants are connected. Michael's gifts included not just his sheer genius, but his ability to convey complicated ideas about plants, plant constituents, human physiology, and patterns of health and disease. I am proud to carry on his legacy of teaching populist herbalism."

the nonprofit Southwest School of Botanical Medicine, which is dedicated to preserving his memory and ensuring continued access to his teachings. The organization received funding from the American Herbal Products Association's Education and Research on Botanicals Foundation (AHPA ERB) to assist with this project.

Alkemist Labs, Amin Wasserman Gurnani, Applied Food Sciences, Brassica Protection Products, Cepham, Eurofins, Euromed, Gaia Herbs, Herb Pharm, Indena, Informa, Nature's Way, NOW Foods, Pharmatoka, RFI, RT Specialty, Sabinsa, Talati, Terry Naturally/EuroPharma, and the United Natural Products Alliance. HG

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For more details on joining the program and access to the free publications produced to date, please see www.botanicaladulterants.org or contact Denise Meikel at denise@herbalgram.org.



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Gayle Engels Reflects on 30 Years with the American Botanical Council

By Hannah Bauman

If American Botanical Council (ABC) Special Projects Director Gayle Engels could go back in time to her first day at ABC on May 8, 1995, and tell her younger self one thing, what would it be?

“Never ask the universe for a challenge,” she said, laughing, “for you will surely get one.”

From her start as sales manager in 1995, Engels has witnessed the evolution of the organization from its beginnings in ABC Founder and Executive Director Mark Blumenthal’s house to its current status as a leading nonprofit in the botanical medicine community, nestled at the historical 2.5-acre Case Mill Homestead in East Austin, Texas.

In 1995, “all correspondence was done via postal mail or fax until we got one general email address and an online presence,” Engels said. “*HerbalGram* had a book catalog in the middle. HerbClip was mailed to subscribers. It was a simpler time, but not for long.”

Since the advent of its first email address, ABC has expanded its web presence, much of which Engels oversees. ABC’s website now includes the vast HerbMedPro database with more than 160,000 entries covering more than 265 herbs, fungi, and other plant-derived substances; 144 issues of the peer-reviewed journal *HerbalGram*; almost 10,000 HerbClip research summaries; archives of the monthly newsletter HerbaleGram going back to 2004; and more.

“ABC is unique,” Engels said. “No other organization does what ABC does, or at least, not the way ABC does it.”

Engels came to ABC with a degree in secondary school education, along with experience in publishing and nursery and greenhouse management, and she found that she could grow alongside ABC. In her current role, she oversees ABC’s website development and administration, education department, and themed gardens at ABC’s headquarters. She also serves as the national coordinator for HerbDay. HerbDay, held on the first Saturday in May, is a celebration of herbs and herbalism that was conceived by a coalition of nonprofits, including ABC, in 2006. Engels manages HerbDay’s website and social media and coordinates the activities and speakers for ABC’s HerbDay event.

Engels reflects proudly on her accomplishment of curating ABC’s former retail sales catalog of more than 600 herbal publications, CDs, and videos, many of which were hard to find in the pre-Amazon, pre-direct shipping era. Her commitment to meeting the needs of ABC’s members and others is evident through her projects at ABC, most notably ABC’s website. The website has gone through several iterations from its initial launch in 1995 to its current form, which launched in January 2021 and was the culmination of several years of development, designing, and testing.¹



Gayle Engels

Although she had a solid foundation in botany and horticulture from her time working in nurseries, Engels has found that learning plant science, including chemistry and pharmacognosy, to teach dietetic and pharmacy interns and write ABC articles, while challenging, has been one of the greatest rewards of working at ABC.

In addition to her web-based projects, Engels has also written numerous articles for ABC publications, including almost 100 articles for *HerbalGram*, starting with issue 42 in 1998. For many years, she authored or co-authored the Herb Profiles at the beginning of each issue — articles that quickly expanded from one-page treatments to multi-page, more comprehensive reviews.

“What hasn’t changed, for me at least, is the ‘family’ feeling,” Engels said. She described the early days of ABC as “working from home with your family,” where everyone ate lunch around the kitchen table and staff meetings were held in the living room of Blumenthal’s home before the purchase of the Case Mill Homestead in 1997. Despite changes caused by the COVID-19 pandemic and the transition of many ABC employees to fully remote positions, she still feels supported by her coworkers, a feeling she attributes to the long tenure of most ABC staff, as well as members of the ABC Board of Trustees and ABC Advisory Board.

Engels’ time at ABC has shaped the way she approached leadership as she moved from sales manager to special projects director, due to ABC’s structure and Blumenthal’s mentorship and support.

Engels at an ABC community garden work day
Photo courtesy of Sarah Niedzialkowski

“ABC decided early on to speak of its departments as ‘teams’ to encourage agency among its staff and be sure that everyone has a voice if they want it,” she said. “Leadership and teamwork are not always easy. Each of us is different, and we have to meet people where they are if we want to work well together. Good leaders collaborate with their team and support a positive team dynamic. They are open to honest input and firm in their commitment to the greater good of the organization and the people who are part of it.”

Blumenthal praises Engels for her dedication to ABC, its members, and its gardens. “I clearly remember the day I first met Gayle 30 years ago,” he said. “She had applied for a position at ABC, and I was super impressed with her background, much of which was highly relevant to ABC’s mission. She had a degree in education, experience managing a plant nursery, and managed the circulation of three Texas-based magazines. Bingo! I hired her on the spot, and I’ve never regretted that decision.

“Gayle is and for the past 30 years has been a true asset for ABC and for the entire medicinal plant community,” Blumenthal added. “Her passion for and knowledge of herbs and medicinal plants are not only commendable, they’re inspiring. Her contributions to ABC and our international community are extensive, and I look forward to more years of constructive herbal activities with her.”

Having witnessed changes in the organization for 30 years, Engels sees more on the horizon and hopes that ABC will continue to embrace technological changes as an increasingly internet-based organization. Yet, as technology marches on, she has not forgotten the organization’s true mission.

“Health care is increasingly expensive and hard to access for some,” she said. “It is essential that people know about the alternatives that are part of integrative health care and that they have options. More people are already using medicinal plants than ever before. US supplement sales have increased every year but one over the last 21 years. In times of economic struggle and uncertainty, people often choose to use more natural options to care for themselves and their families. I hope that ABC can continue to provide trusted, accurate information for its members.”

Engels is grateful to ABC for supporting her passion for plants, sometimes in unexpected ways. “When I interviewed with Mark and went through orientation with my then-team leader, Julie Weismann, no one mentioned that



ABC sponsored ethnobotanical tours to different rainforest locations and that ABC employees got to go on one of these tours for free in order of seniority,” she said. In 1998, she fulfilled her dream of visiting the Peruvian Amazon and Machu Picchu.

She has also had the opportunity to learn from herbalists from around the United States, including author, botanist, and photographer Steven Foster (1957–2022) and herbalist Madalene Hill (1913–2009). In 2019, she was honored with the Herb Society of America’s inaugural Madalene Hill Award for Excellence in Herbal Education, in recognition of her commitment to education and deep knowledge of herbs.²

“ABC has assisted me in becoming a true plant nerd,” Engels said. “It has given me the opportunity to try and keep up to date with the ever-changing taxonomy of and research on plants, and to continue to explore and expand my knowledge of growing, harvesting, and working with our green allies.... My life is about learning and sharing, and ABC has supported me in that from the very beginning.

“When I was younger, I never thought I would find an organization that I would stay with for 30 years, so it feels pretty amazing,” she concluded. “It has never been boring, and it hasn’t always been easy, but I look forward to what the coming years will bring.” HG

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ABC Introduces New Botanical Conservation, Sustainability, and Regeneration Webpage and BEERR Newsletter

The nonprofit expands its nearly 40-year commitment to education on botanical sustainability

By ABC Staff

In July 2025, the American Botanical Council (ABC) launched two major educational resources for the global herb and medicinal plant community: a new webpage on Botanical Conservation, Sustainability, and Regeneration (CSR),¹ and a companion newsletter featuring curated summaries and original commentary on the latest scientific and related publications in this important field.

The new ABC Botanical CSR webpage serves as a dynamic hub for relevant resources, including:

- Articles on botanical conservation and sustainability from ABC's extensive catalog of educational content, including videos and feature articles from its award-winning peer-reviewed journal, *HerbalGram*. Highlights include "The Effects of Climate Change on Medicinal and Aromatic Plants" (MAPs) feature in issue 81 (2009) and its follow-up in issue 124 (2019), the cover story on goldenseal (*Hydrastis canadensis*, Ranunculaceae) in *HerbalGram* issue 119 (2018), the late Steven Foster's (1957–2022) cover article on lady's slipper (*Cypripedium* spp., Orchidaceae) in issue 131 (2021), and many more.
- An annotated directory of more than 30 US and international nonprofit and intergovernmental organizations that work in the CSR space. Each listing includes a summary of the organization and a link to its website, spotlighting groups such as the Sustainable Herbs Initiative (formerly the ABC Sustainable Herbs Program), United Plant Savers, the FairWild Foundation, and many others.
- Curated summaries of recent articles on conservation, sustainability, and regenerative farming practices related to MAPs.

To keep pace with the growing body of scientific literature being published in peer-reviewed journals and other outlets, ABC has also launched a newsletter for its members, featuring selected summaries and links to recent publications. A full list of links will be available on ABC's Botanical CSR webpage.

The newsletter, titled the Botanical Environmental Education Resources Report (BEERR), is compiled and written by Josef Brinckmann, an internationally recognized expert on conservation and sustainability topics related to MAPs. Brinckmann, who is currently president of ABC's Board of Trustees, has more than 45 years of experience in the herb and medicinal plant industry and formerly served as vice president of research and development and vice president of sustainability at Traditional Medicinals (Sebastopol, California).



"There is an increasing number of articles published in journals of the environmental and social sciences, as well as in sustainable development project reports from nature conservation organizations, which provide timely insights for organizations and businesses in the MAP sector, including those in botanical production

and trade," said Brinckmann. "Through the BEERR newsletter, ABC will contribute to building greater awareness by extending the reach of important information on the state of the herbs we rely on from around the world."

ABC Founder and Executive Director Mark Blumenthal added: "This new educational project is part of ABC and *HerbalGram*'s 40-plus years of commitment to conservation and sustainable development of MAPs. Since some of the very earliest issues of our journal *HerbalGram*, back when it was still a newsletter in the 1980s, we have informed members of the herb industry and extended medicinal plant community about the need to research and employ sustainable practices for the conservation of wild medicinal plants of commercial importance."

The new ABC Botanical CSR page and BEERR newsletter are designed to promote and support the work of other nonprofit organizations and programs. They are available to all ABC members and registered users of ABC's website, www.herbalgram.org (registration is free). ABC members will receive the full version of BEERR, including all original commentary, while registered users will receive a limited version.

The ABC Botanical CSR webpage and BEERR newsletter have been made possible by generous grants from Inaugural Underwriters, including herbalist Ed Smith and Sierra Vista Farms of southern New Mexico. ABC Sponsor Members, members of the herb, herbal tea, medicinal plant, and dietary supplement industries, and other interested parties are invited to contact ABC Development Director Denise Meikel (development@herbalgram.org) to discuss becoming Inaugural Underwriters of these new educational initiatives. HG

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BAPP Publishes New Bulletin on Adulteration and Mislabeling of Echinacea Ingredients and Products

Bulletin summarizes reports of undeclared Echinacea species and plant parts, and adulteration with Cistanche species

By ABC Staff

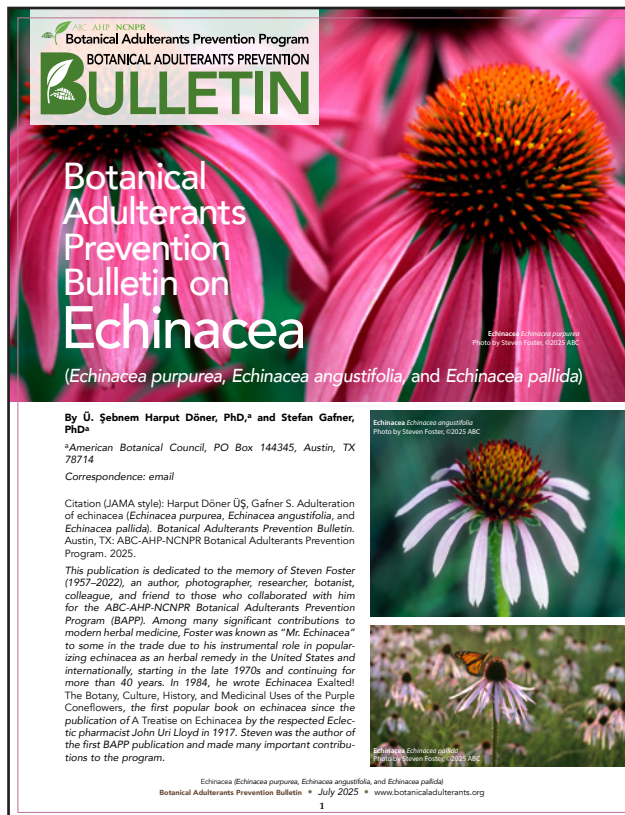
In July 2025, the ABC-AHP-NCNPR Botanical Adulterants Prevention Program (BAPP) announced the publication of a new Botanical Adulterants Prevention Bulletin (BAPB) on echinacea (*Echinacea purpurea*, *E. angustifolia*, and *E. pallida*, Asteraceae) roots and herb (aerial parts).¹

Preparations made from the roots or aerial parts of *E. purpurea*, or the roots of *E. angustifolia* and *E. pallida*, are widely used for the prevention and treatment of upper respiratory tract infections. Echinacea is also included in topical applications to improve wound healing. In 2024, echinacea-based supplements ranked 17th and 16th, respectively, among the top-selling herbal dietary supplements in the US mainstream and natural retail channels, with more than \$35 million in combined sales.²

Echinacea roots have a long history of being adulterated. Formerly, the roots of so-called “American feverfew” (*Parthenium integrifolium*, Asteraceae),* also known as prairie dock, were the main adulterant of *Echinacea* spp. roots.³ However, recent publications on the authenticity of echinacea preparations have not reported any adulteration with *P. integrifolium*. Most herbal products claiming to contain echinacea do, in fact, contain echinacea. However, sometimes the wrong *Echinacea* species (i.e., not the one on the label) is used, or mixtures of species are found in products claiming to be made from a single species. Other issues include the admixture of undeclared leaf extracts with root extracts, products that are mostly made of excipients (flowing agents and/or other manufacturing processing aids), and the adulteration of *E. angustifolia* extracts with extracts of *Cistanche* species (Orobanchaceae).

The new BAPP bulletin was written by Ü. Şebnem Harput Döner, PhD, an expert in natural products chemistry and pharmacology in Istanbul, Türkiye, and Stefan Gafner, PhD, chief science officer of the American Botanical Council (ABC) and director of BAPP. The bulletin summarizes scientific data on adulteration and mislabeling of echinacea roots and herb and provides information about the uses, sourcing, supply chain, and market size of echinacea, along with a brief overview of its taxonomy, chemistry, and common methods of analysis. Twenty-five experts in quality control of medicinal plants from nonprofit educational and research organizations, contract analytical laboratories, academia, botanical gardens, and the herb industry in the United States and internationally reviewed the bulletin before publication.

Gafner explained: “Most authenticity issues with echinacea dietary supplement products may be due to inadvertent blending of two *Echinacea* species in the same batch, or admixture of some aerial parts with roots. Nevertheless, there are some cases of economically motivated (i.e., intentional) adulteration. In particular, several industry members have noticed the sale of extracts of *Cistanche* species labeled as *Echinacea angustifolia*. Since desert broomrape (*Cistanche deserticola*), which is used in traditional Chinese medicine, is listed in CITES Appendix II,** the trade of this plant is limited and requires a permit. Therefore, manufacturers that inadvertently sell desert broomrape as echinacea are



* The common name American feverfew should not be confused with another plant called “feverfew” (*Tanacetum parthenium*, Asteraceae), which is relatively popular in the herb trade. Though members of the same plant family, they have different chemistries and biological activities.

** CITES is the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Appendix II includes species that are not necessarily threatened with extinction but that may become threatened if trade is not closely controlled.



Echinacea Echinacea purpurea
Photo by Steven Foster ©2025 ABC

violating not only current Good Manufacturing Practices for dietary supplements but also CITES regulations.”

ABC Founder and Executive Director Mark Blumenthal said: “A native American medicinal plant, echinacea is one of the most popular herbs used therapeutically in North America. Some species of echinacea (e.g., *E. purpurea*) are relatively easy to grow commercially and inexpensive, so there is usually not much motivation for intentional adulteration and fraud. The new echinacea bulletin is a useful quality control resource to aid members of the global herb and dietary supplement industry in setting appropriate identity specifications for echinacea ingredients.”

The BAPP echinacea bulletin is the 31st publication in the series of BAPBs and BAPP’s 96th peer-reviewed document. As with all BAPP publications, the BAPBs are freely accessible on BAPP’s homepage on the ABC website (registration required).

About the ABC-AHP-NCNPR Botanical Adulterants Prevention Program

The ABC-AHP (American Herbal Pharmacopoeia)-NCNPR (National Center for Natural Products Research at the University of Mississippi) BAPP is an international consortium of nonprofit professional organizations, analytical laboratories, research centers, industry trade associations, industry members, and other parties with interest in herbs and medicinal plants. BAPP advises industry, researchers, health professionals, government agencies, the media, and the public about the various challenges related to adulterated botanical ingredients in international commerce. To date, more than 200 US and international parties have financially supported or otherwise endorsed BAPP. HG

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BAPP Receives *Nutrition Business Journal's* Efforts on Behalf of the Industry Award

NBJ editor-in-chief calls BAPP a 'game-changing driver of quality'

By ABC Staff

The *Nutrition Business Journal* (NBJ), a natural products industry publication of Informa's New Hope Network, announced in June 2025 that the ABC-AHP-NCNPR Botanical Adulterants Prevention Program (BAPP) is the recipient of its Efforts on Behalf of the Industry Award. The award recognizes individuals or organizations making significant contributions to the nutraceutical and dietary supplement industries in the United States.^{1,2}

"With constant updates on the latest threats of adulteration in a complex global supply chain and a steady cadence of reports to guide the testing that detects adulteration, BAPP has emerged as a game-changing driver of quality," wrote Rick Polito, editor-in-chief of NBJ.¹ "The program's 'Burn It, Don't Return It' demand that brands and co-manufacturers take test-failing ingredients* out of the supply chain is an example of the kind of fearless voice that BAPP has become and another sign of why it deserves NBJ's Efforts on Behalf of the Industry Award."

BAPP's mission is to educate industry members about plant- and fungus-derived ingredient adulteration and help them properly authenticate these ingredients, thereby helping to ensure that only authentic ingredients are used in consumer health products. BAPP conducts research about how botanical ingredients are adulterated — either accidentally or, more often, intentionally — and which analytical laboratory methods are best suited to detect different types of adulteration. In collaboration with the National Center for Natural Products Research (NCNPR) at the University of Mississippi and other organizations, BAPP also promotes analytical investigations into the quality of commercial herbal dietary supplements sold worldwide.

BAPP "was designed as a positive initiative to bring awareness to this issue, as without awareness, no improvements can be made," wrote Roy Upton, RH (AHG), DipAyu, president of the nonprofit American Herbal Pharmacopoeia (AHP), a BAPP partner, in an email. "By educating the industry on why adulteration happens and providing tools for how to detect it, we empower those who strive to do the right thing and shine a light on those ingredients that require the most scrutiny. We are grateful for NBJ's acknowledgement of the value of our work."

Mark Blumenthal, founder and executive director of the American Botanical Council (ABC) and founder of BAPP, wrote:

I thank Bill Giebler, Rick Polito, the NBJ team, and awards judges for honoring the unique and much-needed work that BAPP has done since its inception in early 2011. The work of BAPP —



now with 96 peer-reviewed documents that are freely accessible, including the BAPP Best Practices SOP for the Disposal / Destruction of Irreparably Defective Articles — is an essential body of quality and authenticity resources designed to enhance consumer health by alerting members of the herb industry about types of adulteration and fraud, and how to protect companies from being victimized by preventing the purchase of fraudulent ingredients and removing 'irreparably defective articles' from the supply chain.

Ikhlas Khan, PhD, director of the NCNPR, added that "BAPP has been addressing the issue of quality, which certainly affects the safety and efficacy of the products. Making industry and consumers aware of these issues hopefully will help reduce quality concerns. We are delighted to receive this recognition."

This is the second time that NBJ has recognized BAPP for its nonprofit research and educational work. In 2014, ABC (including BAPP) was honored with the NBJ Education Award for its "refreshing willingness to ruffle some feathers with a series of well-researched reports on adulteration," according to the editors of NBJ.³

BAPP has also received recognition from other leading industry publications. In 2023, the BAPP Best Practices SOP received the Editors' Award for Industry Initiative

* Failing tests in this case means that the analytical results establish the ingredient as irreparably defective by both supplier and buyer (i.e., it cannot be legally reconditioned for intended human or animal use anywhere).

of the Year from NutraIngredients-USA (NIU). In 2019, the NIU editors gave the same award to BAPP for its leadership in the herb and dietary supplement industry. *Nutritional Outlook* also honored BAPP with its Best of the Industry award in the “Service Provider” category in 2021 and the “Industry Leader” category in 2016.

BAPP’s 96 extensively peer-reviewed publications include 31 Botanical Adulterants Prevention Bulletins, 16 Laboratory Guidance Documents, 13 *HerbalGram* and *HerbalEgram* articles (including one on excessive dilution of botanical extracts),⁴ and 32 Botanical Adulterants Monitor newsletters. BAPP has also produced a systematic literature review estimating the extent of adulteration of five popular ingredients,⁵ a review of the strategies used by fraudulent suppliers to deceive common analytical laboratory methods⁶ and the BAPP Best Practices SOP.⁷

Blumenthal added: “I want to thank all of our financial underwriters and endorsing organizations for their continued support of this vital program. Without them, it would be impossible to do this work.”

ABC’s Chief Science Officer and BAPP Director Stefan Gafner, PhD, said: “This is such a great honor. I feel privileged to work with so many talented people because of BAPP. The award also belongs to the more than 50 authors and more than 220 peer reviewers who have given their time to write or review BAPP’s publications. This has truly become a global initiative, with BAPP publications having more than 95,000 reads by researchers in more than 100 countries.” HG

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The Green Farmacy Garden Flourishes with the Community Ecology Institute

By Chiara D'Amore, PhD, and Veri Tas

In December 2022, the Community Ecology Institute (CEI) was honored to become the new owner and steward of the Green Farmacy Garden,^{1,2} a unique six-acre teaching garden in Fulton, Maryland, located on the former homestead of world-renowned ethnobotanist James A. Duke, PhD (1929–2017), and his wife, Peggy-Ann Wetmore Kessler Duke (1931–2021), a botanist and accomplished botanical illustrator. CEI first learned about the opportunity to acquire the property after it was featured in a December 2021 *HerbalEgram* article about the Maryland University of Integrative Health's search for a new owner for the garden.³

The Dukes curated a collection of more than 300 plant species traditionally used for their medicinal properties. The garden beds are arranged in plots representing human health conditions, each featuring plants that have been used or studied for that condition. The garden's structure echoes that of Jim Duke's best-selling book *The Green Pharmacy* (Rodale, 1997). With more than 100 entries, the work explores plants used around the world for these common health concerns.

CEI was founded in 2016 with a mission to cultivate communities where people and nature thrive together. The organization provides intergenerational experiential education that benefits human and environmental health, a focus that made the Green Farmacy Garden a natural fit for CEI's work. Since purchasing the Green Farmacy Garden, CEI has hosted more than 80 community events at the property, reaching more than 1,000 people. These experiences have included guided foraging walks, a monthly herbal medicine series, discussion-based "Climate Cafes," and workshops on topics such as mushroom log inoculation, Caribbean ethnobotany, weaving baskets with wisteria (*Wisteria* spp., Fabaceae), and ecosystem restoration.

In 2024, the nonprofit Chesapeake Bay Trust (CBT), which awards millions of dollars in grant funding each year to organizations of the Chesapeake Bay region, awarded CEI a grant to support stewardship of the Green Farmacy Garden. Focused on community outreach and woodland and water restoration, the grant has funded more than 10 free educational events for the community. These events engaged participants in hands-on activities to implement what they learned about ecological practices and empowered them to bring these practices back to their homes and neighborhoods. Workshop topics have included birding resources and habitat enhancement, how to plant live willow (*Salix* spp., Salicaceae) stakes to mitigate streambed erosion, invasive plant identification and the best removal practices, and the importance and identification of insects.

The CBT grant also funded many woodland and water restoration projects at the Green Farmacy Garden. More than 3,000 square feet of invasive plants were removed, and more than 230 native herbaceous plants and 130 trees were added. In the woods, 11 "garden beds" were established to increase native plant biodiversity. Along the drier areas of



Community Ecology Institute

the steep terraced garden, log erosion barriers were installed to help slow the flow of stormwater, allowing it to soak into the garden instead of rushing downhill. At the overflow points of both ponds on the property, small native plant gardens were installed to help capture excess water.

Throughout 2024, and continuing into the 2025 growing seasons, CEI has slowly but steadily integrated its seven core experiential education programs beyond CEI's original Freetown Farm campus in Columbia, Maryland, and into the beautiful Green Farmacy Garden property. CEI's Community of Families in Nature program hosts preschool and elementary-aged children and their caregivers at the garden for nature explorations several times each season. CEI's Roots & Wings Learning Community program also involves field trips to the garden, enabling elementary- and middle-school-aged participants to learn about medicinal plants, foraging, and ecosystem restoration. CEI's Green SEEDS internship program brings high school and college students to the garden to learn more advanced knowledge on these topics and to help complete specific supervised projects, such as planting native edible and medicinal plants.

Further, CEI's Nourishing Gardens program is working in tandem with its EcoStewards Volunteers program to transform the foundation planting around the house into an ecologically beneficial garden with a focus on native edible and medicinal plants, including blueberries (*Vaccinium* spp., Ericaceae), strawberries (*Fragaria* spp., Rosaceae), and American wintergreen (*Gaultheria procumbens*, Ericaceae).

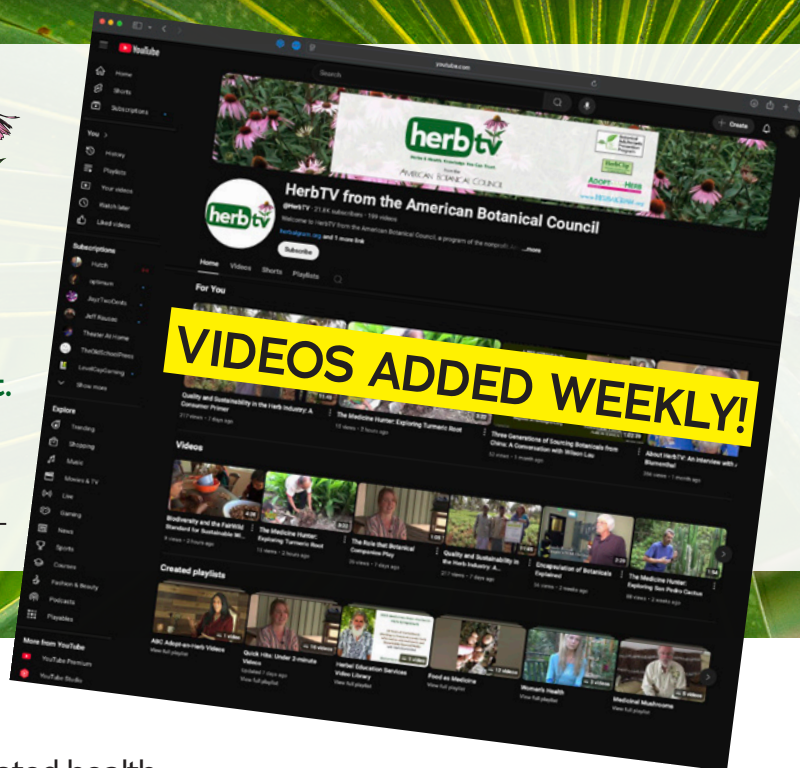
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To provide easy access to the content, HerbTV features playlists organized by category and health conditions, as well as ABC's new Adopt-an-Herb videos, videos and webinars on herbal sustainability, and other videos from reliable sources outside of ABC.

youtube.com/herbtv

Saw Palmetto: Safe and Effective Herb for Men's Urinary Health

Do you or someone you love suffer from Benign Prostatic Hyperplasia (BPH) aka an enlarged prostate?

A majority of men over age 50 are far too familiar with its bothersome, often inconvenient effects. Learn how saw palmetto can provide help in this new educational video, the second in ABC's Adopt-an-Herb Video Program!



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subscribe!

CEI's overarching Sustainable Skills Workshops program and Agroecology in Action program are also increasingly represented at the Green Pharmacy Garden.

The CEI leadership team is happy to have received new grants from CBT and the government of Howard County, Maryland, to support its work at the Green Pharmacy Garden in 2025. Some priorities associated with these grants include:

- Maintaining four large, terraced gardens to care for the unique medicinal plant species in a way that reduces erosion and increases soil health and water infiltration
- Growing six species of native medicinal plants that will be distributed directly to community partners and members
- Creating new agroecological growing spaces where the selected native plant species will be grown for later harvesting and distribution
- Planting demonstration conservation landscapes, including a food forest and medicinal plant pollinator meadow, which will increase water infiltration, reduce runoff, and showcase practices that people can apply to their own properties

In addition to carefully stewarding the gardens, woods, meadows, and ponds, CEI has also secured a Maryland State Bond Bill that is supporting improvements to the property's house. This includes making the structure more accessible for the community, creating an ADA-compliant bathroom, and renovating the primary classroom to increase capacity and functionality. Several more modest capital projects to refresh the house are planned for 2025, all with a focus on making the most of this special property for the Howard County community and visitors who have a love for medicinal plants.

Throughout all these CEI initiatives, the garden's medicinal plants remain the central focus of onsite education. All public events include an overview of the garden's history, Jim and Peggy's work and legacy, and, whenever possible, a visit to the terraces.

Now in its 27th season, the garden continues to evolve. Due to changing weather patterns, several species were lost recently, including a willow tree, patchouli (*Pogostemon cablin*, Lamiaceae), and the unique devil's walking stick (*Aralia spinosa*, Araliaceae), whose dramatic silhouette had for years provided a visual focal point in one of the terraces. Encouragingly, the *Aralia* has sent up several root suckers that the garden staff hope will allow it to live on.

Recent additions to the terraces include myoga/Japanese ginger (*Zingiber mioga*, Zingiberaceae), mimosa tree (*Albizia julibrissin*, Fabaceae), Damask rose (*Rosa × damascena*, Rosaceae), and a dwarf orange tree (*Citrus × sinensis*, Rutaceae). CEI also enthusiastically welcomed the return of the common milkweed (*Asclepias syriaca*, Apocynaceae), a monarch butterfly host, human food, and Indigenous medicinal species.

Grant-funded wildlife cameras have enabled documentation of diverse local wildlife browsing the garden and visiting the pond, including foxes, herons, groundhogs, deer, a raccoon family, and wild turkeys, along with numerous other bird species. CEI's stewardship continues to expand, diversify, and interweave the community connected by the Green Pharmacy Garden.

The garden welcomes visitors from across the Mid-Atlantic region and beyond. Upcoming events, including workshops, volunteer sessions, and more, are posted on CEI's website.⁴ The institute's stewardship of this beautiful property requires \$100,000 per year to maintain. The organization is counting on the herbal medicine community to help ensure lasting care of Jim and Peggy Duke's magical Green Pharmacy Garden. Interested parties can explore corporate or organizational sponsorships by writing to giving@cei.earth. HG

Chiara D'Amore, PhD, is the founder and executive director of the Community Ecology Institute. She has a PhD in sustainability education and a master's degree in environmental science and engineering, as well as a permaculture design certificate. She has worked as an adjunct professor and researcher and as an environmental consultant who has served clients such as the United Nations and US Environmental Protection Agency. Her work focuses on fostering community health through innovative program design and implementation. She is the co-author of *Growing an Edible Landscape: How to Transform Your Outdoor Space into a Food Garden* (Cool Springs Press, 2024).

Veri Tas is a passionate plant enthusiast, permaculture practitioner, needs-responsive community educator, and lifelong learner who has been part of the Green Pharmacy Garden stewardship team for several years, with a focus on communications and educational events.

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Chinese Chaste Tree and Ginger Supplement May Help Improve Joint Comfort

Reviewed: Kalman D, Srivastava S, Desale A, et al. A randomized placebo-controlled dose-response trial of Muvz™ for knee and low-back support in physically active adults. *Drug Des Devel Ther.* February 2025;19:811-825. doi: 10.2147/DDDT.S486836.

By Dani Hoots

Musculoskeletal conditions, which affect bones, joints, muscles, and connective tissues, impact an estimated 1.71 billion people worldwide and are a leading cause of chronic pain and disability. Risk factors include low physical activity, age, smoking, and other lifestyle factors. Among the most common and burdensome of these conditions is lower back pain, which significantly affects both physical and mental well-being and is a major contributor to early retirement.

Chinese chaste tree (CCT; *Vitex negundo*, Lamiaceae) and ginger (*Zingiber officinale*, Zingiberaceae) both have demonstrated analgesic and anti-inflammatory properties. Previous research suggests that a combination of these herbs may help reduce discomfort associated with joint and back issues at daily doses of 200 mg or 400 mg. In this study, researchers conducted a randomized, double-blind, placebo-controlled, parallel-group, multicenter clinical trial to evaluate the effects of a CCT-ginger blend on musculoskeletal health, mobility, and joint discomfort in physically active adults experiencing mild joint issues.

Study Details

The study was conducted at six orthopedic clinics in Maharashtra, India, between April 2023 and January 2024. Adults aged 40 to 60 years with a body mass index (BMI) between 24.9 and 29.9 kg/m² were eligible if they had a history of knee or joint-related lower back discomfort (e.g., due to osteoarthritis) during moderate physical activity and reported a Pain Numeric Rating Scale (P-NRS) score of 60 or greater in either area. The Musculoskeletal Health Ques-

tionnaire (MSK-HQ) and International Physical Activity Questionnaire–Short Form (IPAQ-SF) were also used at screening to assess musculoskeletal status and activity levels. Exclusion criteria included debilitating pain at rest, non-joint-related pain (e.g., muscle strain or nerve pain), joint space narrowing, bone deformity, large osteophytes (bone spurs), sclerosis (hardening of tissue), uncontrolled hypertension or type 2 diabetes, and pregnancy, lactation, or use of oral contraceptives, among others.

Before randomization, participants completed the P-NRS at screening, and the joint with the highest reported pain was designated as the index joint for follow-up assessments. All participants first completed a seven-day placebo run-in phase, and those whose pain improved during this time — indicating a strong placebo response — were excluded to “avoid the influence of placebo responders,” according to the authors.

A total of 157 participants met eligibility criteria and were randomized into one of three groups: placebo (n = 54), low dose (n = 50), or high dose (n = 53). The investigational product, Muvz™ (ENovate Biolife; Mumbai,



Chinese chaste tree *Vitex negundo*
Photo by Steven Foster ©2025 ABC

Study Details: At a Glance

Study Design	Randomized, double-blind, placebo-controlled, parallel-group, multicenter clinical trial
Duration	90 days
Participants	157 adults with a history of knee or joint-related lower back discomfort during moderate physical activity
Intervention	Muvz™ (ENovate Biolife; Mumbai, India), containing a proprietary blend of Chinese chaste tree and ginger extracts
Control	Microcrystalline cellulose
Disclosures	One author is associated with Vedic Lifesciences (Mumbai, India), a contract research organization. The remaining authors declared no conflicts of interest.

India), contained a 200-mg proprietary blend of standardized extracts of CCT leaves and ginger rhizomes, and the placebo consisted of 200 mg of microcrystalline cellulose. Participants in the placebo and low-dose groups took one capsule daily (200 mg/day) for 90 days, while the high-dose group took two capsules daily (400 mg/day). Acetaminophen (500 mg) was provided as rescue medication for intolerable pain.

Baseline assessments included demographics, medical history, vital signs, clinical examination, and physical activity levels. Follow-up visits occurred on days 30, 60, and 90. The primary outcome — overall musculoskeletal health — was assessed using the MSK-HQ. Secondary outcomes included joint discomfort after physical activity (assessed using the P-NRS), physical activity levels (determined by the IPAQ-SF), quality of life (measured by the EQ-5D-5L questionnaire), and range of motion (measured via goniometry). All questionnaires were completed at baseline and each study visit, while range of motion was assessed only at baseline and day 90. Safety assessments included vital signs, adverse event monitoring, and blood tests for liver enzyme levels and creatinine.

Five participants in the low-dose group, three in the high-dose group, and one in the placebo group withdrew or were lost to follow-up. The overall mean age was 48 years, and the mean BMI was 26.95 kg/m². Baseline characteristics were similar across all groups.

Results

After 90 days, both the low-dose and high-dose groups demonstrated significant improvements in overall MSK-HQ scores compared to the placebo group ($P < 0.0001$ for both). Significant improvements were also observed in multiple MSK-HQ domains in both treatment groups, including pain during the day and night, physical function, physical activity, pain interference with daily activities, ability to perform daily tasks independently, sleep and fatigue, and overall quality of life ($P < 0.0001$ for all). Emotional well-being also improved significantly in both dosage groups ($P = 0.0001$), as did confidence in self-managing pain ($P = 0.0042$ for the high-dose group and $P = 0.0060$ for the low-dose group), compared to baseline.

Joint discomfort was significantly reduced after 90 days in both treatment groups compared to placebo ($P < 0.0001$ for both). Flexion range of motion also improved significantly in the high-dose ($P < 0.0001$) and low-dose ($P = 0.0037$) groups, though no significant differences were observed between the two treatment groups for extension range of motion. Quality of life was significantly improved in both treatment groups compared to placebo ($P < 0.0001$ for both) after 90 days.

Acetaminophen use differed significantly among groups ($P = 0.0138$), with both treatment groups requiring less rescue medication than the placebo group throughout the trial. All vital signs and laboratory safety parameters remained within normal limits. A total of 37 adverse events were reported: 15 in the high-dose group, 9 in the low-dose group, and 13 in the placebo group. All events were deemed unrelated to the study product.

Conclusion

Study limitations included the exclusion of individuals with severe joint discomfort and the focus on participants with only knee or joint-related lower back pain. The authors recommended further research to address these limitations and explore broader applications. HG



Ginger *Zingiber officinale*
Photo by Steven Foster ©2025 ABC

Turmeric-Boswellia Product Reduces Exercise-Induced Acute Musculoskeletal Pain

Reviewed: Kare SK, Girish HR, Gupta A. Modulation of affective and sensory qualities of acute nociceptive pain by *Curcuma longa* and *Boswellia serrata* extract formulation: A randomized, double-blind, placebo-controlled design in subjects with exercise-induced acute musculoskeletal pain. *Cureus*. January 2025;17(1):e77204. doi: 10.7759/cureus.77204.

By Dani Hoots

Musculoskeletal pain (MSP), such as that caused by exercise, can affect muscles, bones, joints, ligaments, and tendons. Pain quality can differ depending on the type — nociceptive (caused by tissue damage) or neuropathic (caused by nerve damage or dysfunction) — the severity of the injury, and individual sensitivity to pain, as well as psychological or cultural factors.

Turmeric (*Curcuma longa*, Zingiberaceae) and boswellia (*Boswellia serrata*, Burseraceae) have demonstrated analgesic and anti-inflammatory effects in previous clinical trials. This randomized, placebo-controlled, multicenter clinical trial evaluated the efficacy of a turmeric and boswellia combination product on acute nociceptive pain from exercise-induced MSP.

Participants and Materials

This study was conducted from August to October 2020 at six different hospitals in India. Eligible participants were adults aged 18 to 65 who had developed acute MSP due to exercise within the previous 24 hours, with a numerical rating score of 5 or greater (indicating moderate to severe pain). Individuals with arthritis, acute muscle spasms that required parenteral therapy or surgery, grade-2 and grade-3 sprains or strains, or hospitalization due to pain were excluded.

Participants (N = 232) were randomly assigned to the test group or the placebo group (116 in each). There were no significant differences between groups in terms of age, height, and weight.

The test product was Rhuleave-K® (Arjuna Natural Pvt Ltd.; Kerala, India), a soft gel capsule containing turmeric and boswellia extracts in black sesame (*Sesamum indicum*, Pedaliaceae) seed oil. The turmeric extract was standardized to at least 26.6% curcuminoids, and the boswellia extract to at least 1% acetyl keto-boswellic acid. The placebo capsules, also provided by Arjuna, were similar in color and size. Participants took two 500-mg capsules of either the test product or the placebo on the test day.

Study Details: At a Glance

Study Design	Randomized, double-blind, placebo-controlled clinical trial
Duration	Single study visit (six hours)
Participants	232 adults with moderate to severe musculoskeletal pain from exercise
Intervention	Rhuleave-K® (Arjuna Natural Pvt. Ltd.; Kerala, India), a soft gel capsule containing turmeric and boswellia extracts in black sesame seed oil
Control	Placebo similar in color and size
Disclosures	Arjuna Natural Pvt. Ltd. provided the study materials. The authors declared no conflicts of interest.

Study Design and Assessments

This single-visit study included an initial baseline questionnaire, administration of the test product or placebo, and a follow-up assessment six hours later. Pain was assessed using the Short-Form McGill Pain Questionnaire (SF-MPQ), which includes 15 descriptive terms: 11 sensory (e.g., “aching”) and four affective (e.g., “tiring-exhausting”). Participants could choose as many

Boswellia Boswellia serrata
Photo by Steven Foster ©2025 ABC

descriptors as needed to characterize each pain location. Each selected term was rated on a four-point scale from 0 (none) to 3 (severe), and the intensity scores were summed to calculate a total SF-MPQ score. For example, a subject reporting “aching” back pain (rated severe = 3) and “throbbing” wrist pain (rated mild = 1) would have a total SF-MPQ score of 4.

Participants also rated their overall pain using two additional tools: a visual analog scale (VAS), where they marked a point on a 100-mm line from “no pain” to “worst possible pain” (allowing for precise distinctions in pain intensity), and the Present Pain Intensity (PPI) scale, which ranks pain from 1 (mild) to 5 (excruciating). Pain reports were grouped into five anatomical categories for analysis: (1) general MSP, (2) head and neck, (3) upper limb, (4) trunk, and (5) lower limb. No participants were excluded from the analysis.

Results

A total of 10 participants reported general pain, 14 reported head and neck pain, 76 had lower limb pain, 85 had trunk pain, and 47 reported upper limb pain. At baseline, there were no significant differences in pain scores between groups on any of the measures (VAS, PPI, and SF-MPQ).

Across all MSP categories, the test and placebo groups primarily reported “tender” and “aching” pain. Six hours after supplementation, the test group showed a significantly greater reduction in overall pain intensity compared to the placebo group, as assessed by the VAS and PPI ($P < 0.001$ for both). The test group also showed significantly lower total SF-MPQ scores after six hours compared to placebo ($P < 0.001$), with significant reductions in both sensory ($P = 0.03$) and affective ($P < 0.001$) domain scores.

General MSP

At baseline, the most frequently reported description for general MSP was “shooting” in the placebo group and “tender” in the test group. Six hours after supplementation, there was a significant reduction in both sensory ($P = 0.03$) and affective ($P < 0.001$) domains in the test group compared to placebo.

Head and neck pain

For baseline head and neck pain, the placebo group most commonly described “shooting,” “cramping,” and “aching” pain, and the test group reported “hot-burning” and “aching” pain. Six hours after supplementation, pain reports reduced significantly by 100% for all descriptors in the test group, compared to no changes in the placebo group.

Lower limb pain

In patients with lower limb pain at baseline, the placebo group mainly described “tender” and “tiring-exhausting” pain, while the test group reported “aching” and “tiring-exhausting” pain (“tiring-exhausting” pain is



Turmeric *Curcuma longa*
Photo by Steven Foster ©2025 ABC

in the affective domain). Six hours after supplementation, a significant reduction in reported pain was observed in the test group, whereas the placebo group showed very little pain reduction.

Trunk pain

In the trunk pain category, the placebo group reported “aching,” “tender,” and “tiring-exhausting” lower back pain and the test group “tender,” “tiring-exhausting,” and “punishing-cruel” lower back pain (“punishing-cruel” is also in the affective domain). Six hours after supplementation, the test group had a 100% improvement in the “tender” and “punishing-cruel” categories. There were no significant changes in the placebo group.

Upper limb pain

For upper limb pain, the placebo group reported “hot-burning,” “aching,” “tender,” and “sickening” pain at baseline, and the test group described “shooting” and “tiring-exhausting” pain. A 100% decrease in pain was reported in the test group six hours after supplementation, whereas the placebo group experienced a slight increase in pain.

VAS, PPI, and total SF-MPQ scores

After six hours, the test group showed a significant reduction in overall pain intensity compared to the placebo group, as measured by the VAS ($P < 0.001$), PPI ($P < 0.001$), and total SF-MPQ scores ($P < 0.001$).

Conclusion

The authors concluded that this turmeric and boswellia formulation significantly reduced both sensory and affective pain in people with acute, exercise-induced MSP. The authors noted the main limitation was the use of only subjective data. Further studies incorporating biomarkers are needed. HG

Clinical Study Shows Olive Leaf Extract Improves Postmenopausal Symptoms

Reviewed: Imperatrice M, Lasfar A, van Kalker CAJ, Troost F. Olive leaf extract supplementation improves postmenopausal symptoms: A randomized, double-blind, placebo-controlled parallel study on postmenopausal women. *Nutrients*. November 2024;16(22):3879. doi: 10.3390/nu16223879.

By Mariann Garner-Wizard

Most women in developed countries spend 20 to 40 years in a postmenopausal state. Menopause is marked by the cessation of estradiol and progesterone production by the ovaries and is often accompanied by physical, emotional, and urogenital symptoms with significant health impacts. Hormone replacement therapy (HRT) is one of the most common medical treatments for menopause-related symptoms (including those in the peri- and postmenopausal phases), but it is frequently linked to serious adverse effects. As a result, natural therapies are gaining popularity.

Phytoestrogens — plant compounds structurally similar to 17- β -estradiol, the primary female sex hormone — can bind to estrogen receptors (ERs) and exert estrogen-like effects. Oleuropein, a secoiridoid glycoside found in olive (*Olea europaea*, Oleaceae) leaves, and its hydrolysis product hydroxytyrosol (HT), share structural features with estradiol, suggesting they may also bind to ERs and produce estrogenic activity.

Reduced estrogen levels during menopause contribute to bone loss and disrupt lipid metabolism. As estrogen declines, LDL-C levels rise, promoting arterial plaque buildup and increasing cardiovascular risk, while triglyceride (TG) levels often peak during the menopausal transition. Olive leaf extract (OLE) has shown potential to help maintain bone mineral density (BMD) and support healthier lipid profiles in postmenopausal women.

The authors conducted a randomized, double-blind, placebo-controlled clinical trial to assess the effects of OLE supplementation on quality of life (QoL), body composition, muscle strength, and blood lipid profiles in postmenopausal women.

Study Details

Healthy postmenopausal women with a body mass index (BMI) of less than 35 kg/m² were recruited through newspaper advertisements and social media. Exclusion criteria included use of HRT, antibiotics, or supplements that could

Study Details: At a Glance	
Study Design	Randomized, double-blind, placebo-controlled clinical trial
Duration	Six weeks
Participants	62 women (47–70 years of age) experiencing postmenopause
Intervention	Bonolive® (BioActor BV; Maastricht, the Netherlands), an olive leaf extract standardized to contain 100 mg of oleuropein
Control	Cellulose placebo
Disclosures	Two authors were employed by BioActor BV, and one is listed as an inventor on a BioActor BV patent. All other authors reported no conflicts of interest.

influence study outcomes within three months prior to enrollment (except for calcium and vitamin D at stable daily doses); smoking; alcohol or drug abuse; history of breast cancer; surgical metal implants; and gastric bypass surgery.

The clinical trial was conducted at the University of Maastricht (UM; Maastricht, the Netherlands) from January 2023 through May 2024. Of the 77 postmenopausal women screened, 62 (aged 47–70 years) were enrolled and randomly assigned to take either a 250-mg OLE capsule (n = 31) or a 250-mg placebo containing cellulose (n = 31) once daily. The test product was Bonolive® (BioActor BV; Maastricht, the Netherlands), an OLE derived from Spanish Manzanilla olive leaves and standardized to contain 100 mg of oleuropein. The dosage was based on previous research evaluating Bonolive's effects on lipid profiles and bone health.

Participants visited the UM Metabolic Research Unit at baseline, 6 weeks, and 12 weeks. They were instructed to maintain their usual diet and to avoid strenuous exercise and alcohol the day before each visit. Fasting blood samples were collected at all three time points to assess lipid profiles. Participants also completed the Menopause-Specific Quality of Life (MENQoL) questionnaire, the Hot Flash Interference (HFI) scale, and the International Physical Activity

Olive *Olea europaea*
Photo by Steven Foster ©2025 ABC



Questionnaire – Long Form (IPAQ–L), and underwent isometric handgrip strength testing. Dual-energy X-ray absorptiometry (DXA) was performed at baseline and week 12 to evaluate body composition.

Baseline characteristics were comparable between groups. Two participants in the OLE group withdrew: one after the baseline visit and one at week 6. The OLE product was well-tolerated, with no serious adverse events or protocol deviations reported.

Results

After 12 weeks, MENQoL sub-scores in the vasomotor, physical, psychosocial, and sexual domains did not differ significantly between groups. However, overall MENQoL scores were significantly lower in the OLE group compared to the placebo group ($P = 0.027$), indicating an improved quality of life. A trend toward a time \times treatment interaction — i.e., a difference in how treatment affected physical symptoms over time (from baseline to 6 and 12 weeks) — was observed in the physical domain ($P = 0.058$).

No significant changes were found in HFI or IPAQ–L scores. DXA results, adjusted for BMI as a potential confounder, showed no significant effects on fat mass or fat-free mass. However, BMD in the right arm was significantly higher in the OLE group at 12 weeks ($P = 0.019$), with a trend toward improvement in the right ribs ($P = 0.055$).

Handgrip strength showed no significant differences in either hand, although a trend for a time \times treatment interaction was observed in the right hand ($P = 0.055$).

Triglyceride (TG) levels and the TG/high-density lipoprotein cholesterol (HDL-C) ratio were significantly lower in the OLE group compared to placebo ($P = 0.019$ and $P = 0.029$, respectively). No significant differences were observed between groups in total cholesterol, HDL-C, LDL-C, or the TC/HDL-C ratio.

Conclusion

The effects of OLE on menopausal symptoms had not been previously reported. In this study, MENQoL scores improved after six weeks of OLE supplementation and remained stable through 12 weeks. This improvement may be attributed to the phytoestrogenic activity of OLE.

While estrogen binding to ER- α is associated with increased cell proliferation and breast cancer risk, binding to ER- β may counteract these effects. Phytoestrogens can bind both receptor subtypes but tend to preferentially activate ER- β , which may contribute to their more favorable safety profile compared to estrogen or HRT.

Further in vitro studies are warranted to explore OLE's molecular effects on estrogen receptors, as well as oleuropein's impact on BMD and lipid metabolism. A longer intervention period may be needed to observe more pronounced clinical outcomes. HG

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	 VIDEO FEATURE Milk Thistle <i>Silybum marianum</i>		Reishi Mushroom <i>Ganoderma lucidum</i>
	Fig <i>Ficus carica</i>		Echinacea <i>Echinacea spp.</i>
	Dandelion <i>Taraxacum officinale</i>		Valerian <i>Valeriana officinalis</i>
	Rose Hip <i>Rosa canina</i>		American Elder Berry <i>Sambucus canadensis</i>
	Alfalfa <i>Medicago sativa</i>		
	Lemon Verbena <i>Aloysia citrodora</i>		Stinging Nettle <i>Urtica dioica</i>
	Asian Ginseng <i>Panax ginseng</i>		Maca <i>Lepidium meyenii</i>
	Sceletium <i>Sceletium tortuosum</i>		Ginkgo <i>Ginkgo biloba</i>
	Acacia Gum <i>Acacia senegal</i> (syn. <i>Senegalia senegal</i>), <i>Acacia seyal</i> (syn. <i>Vachellia seyal</i>)		Holy Basil <i>Ocimum tenuiflorum</i>
	Oat <i>Avena sativa</i>		Andrographis <i>Andrographis paniculata</i>
	Saffron <i>Crocus sativus</i>		Bergamot <i>Citrus bergamia</i>
	Propolis		Kesum <i>Persicaria minor</i>
	Turmeric <i>Curcuma longa</i>		Tongkat Ali <i>Eurycoma longifolia</i>

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Herbal Adopters

 NEW ADOPTER! Yaupon <i>Ilex vomitoria</i>	 European Elder Berry <i>Sambucus nigra</i>
 NEW ADOPTER! Yarrow <i>Achillea millefolium</i>	 Tart Cherry <i>Prunus cerasus</i>
 NEW ADOPTER! Kratom <i>Mitragyna speciosa</i>	 Black Currant <i>Ribes nigrum</i>
 NEW ADOPTER! Reindeer Lichen <i>Cladonia rangiferina</i>	 Purple Corn <i>Zea mays</i>
 NEW ADOPTER! Mullein <i>Verbascum thapsus</i>	 Indian Frankincense <i>Boswellia serrata</i>
 Devil's Claw <i>Harpagophytum spp.</i>	 Senna <i>Senna alexandrina</i>
 Hibiscus <i>Hibiscus sabdariffa</i>	 Cranberry <i>Vaccinium macrocarpon</i>
 Kava <i>Piper methysticum</i>	 Broccoli <i>Brassica oleracea Broccoli Group</i>
 Rhodiola <i>Rhodiola rosea</i>	 Peppermint <i>Mentha x piperita</i>
 Nopal/Prickly Pear <i>Opuntia ficus-indica</i>	 Birch <i>Betula spp.</i>
 Sophora Japonica <i>Styphnolobium japonicum</i>	 Bilberry <i>Vaccinium myrtillus</i>
 Monk Fruit <i>Siraitia grosvenorii</i>	 California Poppy <i>Eschscholzia californica</i>
 Lavender <i>Lavandula angustifolia</i>	 Lemon Balm <i>Melissa officinalis</i>
 Pomegranate <i>Punica granatum</i>	 Saw Palmetto <i>Serenoa repens</i>
 Ashwagandha <i>Withania somnifera</i>	 Hops <i>Humulus lupulus</i>

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US Sales of Herbal Supplements Increase 5.4% in 2024

Healthy aging and foundational wellness drive consumer demand, with continued interest in cognitive and cardiovascular health and emerging focus on liver support and menopause

By Tyler Smith,^a Carly Lang,^b and Erika Craft^c

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Total retail sales of herbal dietary supplements in the United States reached an estimated \$13.231 billion in 2024 — a 5.4% increase over 2023, according to *Nutrition Business Journal* (NBJ). This marks the highest annual sales on record and the second consecutive year of growth, following a brief decline in 2022 (Table 1). While the surge in demand during the peak of the COVID-19 pandemic has subsided, consumer interest in herbal products for a range of health goals — from emerging areas like liver health to those associated with healthy aging — continues to drive growth across market channels.

The sales data discussed in this report were provided by NBJ, a natural products industry publication of Informa's New Hope Network, and SPINS, a leading provider of retail consumer insights, analytics, and consulting for the natural products industry. NBJ supplied estimates of total annual sales of herbal supplements, as well as total sales in three market channels (mass market; natural, health food, and specialty; and direct sales) and sales by product type (single-herb supplements vs. combination formulas). SPINS provided sales data for the 40 top-selling herbal and fungal ingredients in the mainstream retail channel (i.e., the multi-outlet channel, powered by the market research and technology company Circana) and the natural (now called “natural expanded”) retail channel. Channel definitions are included in Table 2.

Among the three primary retail channels tracked by NBJ, the direct-to-consumer segment once again led in overall sales, totaling \$7.503 billion in 2024 — a 6.8% increase from the previous year. The mass market channel (which includes supermarkets, drugstores, and other large retailers) also experienced strong growth, rising 4.9% to reach \$2.607 billion in sales. The natural, health food, and specialty channel saw a more modest increase of 2.7%, totaling \$3.121 billion in 2024.

This report focuses on the top-selling ingredients in SPINS' mainstream and natural expanded retail channels, highlighting those with significant sales increases and decreases in 2024. It also identifies several notable trends (both emerging and declining), offering context for the evolving herbal supplement market in the post-pandemic era.



Sales figures in this report refer exclusively to US retail sales of dietary supplements in which the herbal or fungal ingredient (or derivative thereof) is the primary functional ingredient. The data exclude herbal teas, cosmetics, and other products that are not legally considered dietary supplements.* All estimates reflect sales during the 52-week period ending December 31, 2024.

MAINSTREAM CHANNEL

Top Sales: Psyllium

In 2024, for the third consecutive year, psyllium (*Plantago ovata*, Plantaginaceae) maintained its position as the top-selling herbal supplement ingredient in mainstream retail outlets. Before that, in 2020 and 2021, elder (*Sambucus nigra* and *S. canadensis*, Viburnaceae) berry was the top-selling ingredient in this channel. Sales of psyllium-containing supplements in 2024 reached an estimated \$289.5 million, a 2.3% decrease from 2023. Since 2021, psyllium sales have remained relatively stable, with steady annual growth from 2021 to 2023. Unlike many ingredients that experienced sharp fluctuations during and after the pandemic, sales of

* Cannabidiol (CBD) is included in these data, despite the US Food and Drug Administration (FDA) not currently recognizing it as a legal dietary supplement ingredient.

psyllium have remained relatively consistent, highlighting its continued importance to consumers.

Psyllium is a soluble fiber derived from the seed husks of the psyllium plant, which is also known as ispaghula. Native to India and parts of the Mediterranean, it has been traditionally used as a laxative and digestive aid, to help regulate blood pressure, and for minor skin irritations.^{1,2} Today, psyllium is commonly used to support digestive regularity and is often marketed for its cholesterol-lowering properties, as well as its potential benefits for glycemic control and supporting heart health. It is widely available in fiber supplements as powders, capsules, and in other formulations.

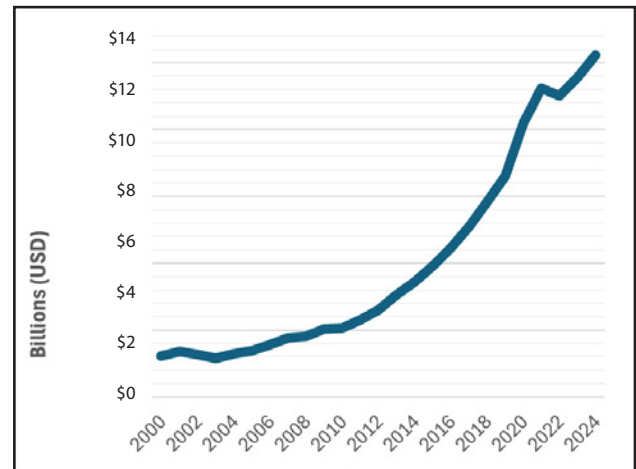
In the United States, psyllium is permitted for use in both dietary supplements and certain nonprescription/over-the-counter (OTC) drug products, which are subject to different regulations. As a dietary supplement ingredient, psyllium is regulated as a food under the Dietary Supplement Health and Education Act of 1994 (DSHEA) and may be used in products that make structure-function claims (e.g., “fiber maintains bowel regularity”).^{3,4} Psyllium is also an approved active ingredient in some OTC products (e.g., bulk-forming laxatives) that are regulated as drugs by the US Food and Drug Administration (FDA). OTC psyllium products — sales of which are not included in this report — can have separate disease-related claims like “helps relieve constipation” or “helps lower cholesterol.”^{4,5}

Psyllium husk is one of the few botanical ingredients permitted to carry an FDA-authorized health claim related to cardiovascular disease; soy (*Glycine max*, Fabaceae) protein is another. On qualifying conventional foods and dietary supplements, the FDA allows the claim: “Diets

low in saturated fat and cholesterol that include 7 grams of soluble fiber from psyllium husk per day may reduce the risk of heart disease.” To use an authorized health claim, an ingredient must meet strict requirements regarding supporting scientific data, underscoring the strength of the supporting evidence.^{6,7}

In 2024, cardiovascular health and digestive health remained the top-selling “health focus” categories for psyllium supplements, accounting for

Figure 1. Total US Retail Sales of Herbal Supplements (2000–2024)



Source: Nutrition Business Journal

63.8% and 17.9% of total psyllium sales, respectively (see “Health Focuses and Label Statements” sidebar). Although psyllium is most commonly associated with heart and digestive health, sales in both categories declined slightly. Sales of psyllium products for cardiovascular health decreased by 3.7% to \$183.1 million, while sales of digestive health products remained relatively unchanged, with a 0.2% decrease to \$51.3 million.

Psyllium dietary supplements with “non-specific” label statements (e.g., general wellness claims such as “supports

Table 1. Total US Retail Sales of Herbal Supplements*

Year	Total Sales	% Change
2024	\$13.231 billion	5.4%
2023	\$12.551 billion	4.4%
2022	\$12.018 billion	-1.8%
2021	\$12.241 billion	9.6%
2020	\$11.168 billion	17.2%
2019	\$9.530 billion	8.6%
2018	\$8.778 billion	8.9%
2017	\$8.057 billion	8.1%
2016	\$7.452 billion	7.7%
2015	\$6.922 billion	7.5%

Source: Nutrition Business Journal

* Includes sales in all channels. NBJ primary research includes NBJ surveys of supplement manufacturers, distributors, MLM firms, mail order, internet, and raw material and ingredient supply companies, as well as interviews with major retailers (Walmart, Costco, etc.), manufacturers, suppliers, and industry experts. Secondary sources include Circana, SPINS, Natural, Nielsen, Natural Foods Merchandiser, Insight, public company report data, and other published material.



overall health”) ranked third in overall psyllium sales, as was the case in 2023. Non-specific supplements made up 7% of psyllium sales in 2024 and increased by 16% from the previous year — the largest percentage increase of any psyllium health focus category — to reach approximately \$20 million.

Despite their modest sales decrease, psyllium supplements marketed for cardiovascular health remained the largest category of these products by far. In recent years, consumers have increasingly viewed heart health as a top wellness priority, and several factors, including a focus on healthy aging and longevity, are shaping this trend.

Rising rates of cardiovascular disease, the leading cause of death in the United States since 1950,⁸ continue to drive demand for supplements that help manage cholesterol, blood pressure, and other aspects of heart health.^{9,10} At the same time, many younger consumers — particularly those in Generation Z, who seem to be adopting healthier lifestyles than previous generations¹¹ — are proactively turning to dietary supplements to help maintain their health.^{9,12}

This cross-generational interest in heart health is likely bolstered by ready access to detailed personal health data. Wearables, such as smartwatches and fitness trackers, enable consumers to check their heart rate, heart rate variability, blood pressure, steps, and other parameters at a glance. Other tools, such as DNA-based health assessments and on-demand lab testing, provide additional insights and can empower consumers to take actions to improve or maintain their cardiovascular health.¹⁰

Rising costs of and skepticism surrounding conventional pharmaceuticals may also be contributing to the popularity of heart health supplements. According to a 2024 Cleveland

Health Focuses and Label Statements

SPINS uses the term “health focus” to describe and categorize health-related statements on product labels. An herbal dietary supplement with the text “Can help support regularity” on its label, for example, would be placed in the “digestive health” category. Other health focus categories include immune health, cardiovascular health, cleanse and detox, weight loss, and blood sugar support, among many others.

Per US regulations, dietary supplement labels are not permitted to include any statements that suggest the product can diagnose, treat, cure, or prevent any disease. In a few cases, the US Food and Drug Administration (FDA) has authorized disease-prevention claims for herbal ingredients with supporting scientific evidence that meets specific criteria. (Such pre-approved health claims are authorized under the Nutrition Labeling and Education Act of 1990.) Dietary supplements that contain psyllium seed husk, for example, can mention an “association between [consumption of] soluble fiber from psyllium seed husk and reduced risk of coronary heart disease.”

Dietary supplements are permitted to make “structure/function” claims, which describe how an ingredient may affect the normal structure or function of the human body, if the manufacturer submits appropriate documentation and notifies the FDA within 30 days of marketing the supplement.¹

Reference

1. Label claims for conventional foods and dietary supplements. US Food and Drug Administration website. Available at: www.fda.gov/food/food-labeling-nutrition/label-claims-conventional-foods-and-dietary-supplements. Accessed June 23, 2025.

Table 2. US Retail Channel Definitions*

	SPINS	<i>Nutrition Business Journal</i>
Mainstream Retail Channels	Multi-Outlet Channel (powered by IRI) Covers grocery outlets (stores with \$2 million+ total annual sales), drug outlets (chains and independent stores), and selected retailers across mass merchandisers, including Walmart, club, dollar, and military stores representing more than 110,000 retail locations.	Mass Market Channel Includes food/grocery, drug, mass merchandise, and club and convenience stores (e.g., Walmart, Costco, etc.).
Natural Retail Channels	Natural Expanded Channel Includes full-format stores with \$2 million+ in annual sales and 30% or more of UPC-coded sales from Health and Wellness Index (HWI) and 15% or more from Natural Product Index (NPI) Universe. It includes co-ops, associations, independents, and large regional chains (excluding Whole Foods Market and Trader Joe’s). This channel represents more than \$44 billion in total sales and encompasses more than 2,500 stores.	Natural, Health Food, and Specialty Channel Includes supplement and specialty retail outlets, including Whole Foods Market (estimates), GNC, sports nutrition stores, etc.
Direct Sales		Includes direct-to-consumer sales from the internet (e.g., e-commerce websites such as Amazon.com and Walmart.com, among many others), direct-selling media (TV, radio, and print publications), health practitioners, and multilevel marketing (MLM) or network marketing firms (US sales only).

* The sales discussed in this article pertain to those involving herbal, fungal, and related dietary supplements. They generally do not include herbs sold as teas and beverages, as ingredients in conventional foods, or as ingredients in natural personal care and cosmetic products.

Clinic survey of 1,000 people in the United States, 97% of respondents said they believe that supplements can improve heart health, and 84% said, if given the choice, they would “rather take supplements than prescribed medication to improve their heart health.”¹³

Dietary supplements with ingredients and label statements supported by clinical research are of particular interest to an increasingly well-informed consumer base.^{10,14} The FDA acknowledges “significant scientific agreement” regarding psyllium’s effects on some aspects of cardiovascular health,⁷ and, as of June 2025, PubMed had more than 175 human clinical trials associated with this ingredient.¹⁵ Recent systematic reviews have found that psyllium husk supplementation is associated with significantly improved total cholesterol and low-density lipoprotein cholesterol levels,¹⁶ as well as reductions in fasting blood sugar, hemoglobin A1C, and systolic blood pressure.¹⁷

Top Sales Increase: ‘Mushrooms (Other)’

In 2024, sales of “mushrooms (other)” supplements were ranked 26th in the mainstream retail channel and reached approximately \$15.7 million. This corresponds to a 75.8%

increase over 2023 and is the largest percentage gain of any top 40 ingredient in this channel. SPINS’ mushrooms (other) category includes sales of various functional mushroom products, such as those containing lion’s mane (*Hericium erinaceus*, Hericiaceae), that are not reported individually. Supplements containing chaga (*Inonotus obliquus*, Hymenochaetaceae), cordyceps (*Ophiocordyceps sinensis* syn. *Cordyceps sinensis*, Ophiocordycipitaceae), and reishi (*Ganoderma lucidum*, Ganodermataceae), for example, are tracked separately and individually.

The mainstream sales growth for mushrooms (other) in 2024 continues the strong upward trend that began in the late 2010s for this ingredient category. In less than a decade, annual sales in the mainstream channel have grown more than 100-fold, from approximately \$138,000 in 2018 to more than \$15 million in 2024, with sales more than doubling each year in 2019, 2020, and 2023. Despite this robust growth, mushrooms (other) entered the mainstream channel’s top 40 list for the first time in 2024, after ranking 43rd and narrowly missing the list in 2023. In the natural retail channel, this category has been well established for years, ranking among the top 10 ingredients since 2019.



Lion’s mane *Hericium erinaceus*
Photo ©2025 Matthew Magruder



Cordyceps *Ophiocordyceps sinensis*
Photo by Steven Foster ©2025 ABC



Reishi *Ganoderma lucidum*
Photo by Steven Foster ©2025 ABC

(HerbalGram first mentioned the “shroom boom” in its 2019 Herb Market Report,¹⁸ and an article on this topic — “The Mushroom Moment” by ethnobotanist Mark Plotkin, PhD — was the cover story of issue 139 in 2024.¹⁹)

The rapid growth of mushroom products mirrors the mainstream success of other once-niche botanicals — such as ashwagandha (*Withania somnifera*, Solanaceae), elder berry, and turmeric (*Curcuma longa*, Zingiberaceae) — and shows how ingredients once favored mostly by so-called “core shoppers” in the natural channel can gain traction with a broader consumer base.

In 2024, cognitive health was the top-selling health focus for mushroom (other) supplements in the mainstream channel, accounting for nearly half of the total sales of these products. Sales of cognitive health-related mushroom (other) supplements more than doubled, increasing by 114.5%

from \$3.57 million in 2023 to \$7.65 million in 2024. Products with non-specific health focuses accounted for nearly one-third of mushroom (other) product sales in 2024, growing by 93.8% to a total of \$4.57 million. Although a small percentage of overall sales, mushroom (other) supplements with an “unknown” health focus, which may include products with vague or missing label statements, experienced the largest percentage growth, rising 435% to \$34,668. Immune health accounted for just 6.1% of category sales in 2024 and grew by a modest 18.9% from 2023, while cold and flu-specific products declined 51.9% to \$15,283. Sales of mushroom (other) products marketed for mood support also grew by 49.6% over the previous year, though total sales in that category remained relatively small (\$16,376).

The heightened interest in supplements for cognitive health is not limited to a single age group.²⁰ As Americans are living longer and dementia rates are rising,²¹ older adults may be seeking products to support memory and help maintain optimal long-term brain function. Younger consumers appear to be drawn to supplements that promote sharper focus, especially as they navigate digital fatigue and mental burnout.^{22,23}

According to a December 2022 survey by Cigna, nearly all (98%) of Gen Z respondents reported experiencing at least some symptoms of burnout.²⁴ (Some research suggests that older adults are less vulnerable to burnout in general.²⁵)

The widespread interest in mushroom supplements for mental performance is reinforced by social media, where wellness influencers and lifestyle content creators regularly promote mushroom products.²⁶ Consumers increasingly favor formulations such as powders, beverages, and gummies that are marketed as natural, minimally processed, and easy to incorporate into daily routines.²⁷

While consumers are turning to social media platforms for potential cognitive health solutions, social media itself

is widely cited as a contributing factor in perceived cognitive issues. In the past decade, researchers have reported correlations between heavy social media use and reduced attention, verbal intelligence, and short-term memory function.^{28,29} Fittingly, the 2024 Oxford University Press Word of the Year was “brain rot,” defined as “the supposed deterioration of a person’s mental or intellectual state, especially viewed as the result of overconsumption of material (now particularly online content) considered to be trivial or unchallenging.” According to Oxford, the online usage frequency of this term jumped by 230% from 2023 to 2024.³⁰

Once associated primarily with memory, cognitive health supplements (often referred to as nootropics) are now used to address a wider range of concerns. This expanded use reflects a growing interest in mental performance as consumers increasingly seek products that also support stress management, energy levels, and overall cognitive well-being. Multi-ingredient blends that support several aspects of cognitive function have become especially attractive to consumers seeking comprehensive benefits.²² As such, many mushroom blends are labeled with non-specific language that can include terms like “clarity,” “vitality,” or “balance.” These products may appeal to consumers who are seeking a general cognitive or wellness “boost” without targeting a specific condition.

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Table 3. Total Herbal Supplement Sales in US by Retail Channel

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	% Change from 2023
Mass Market	\$1.204 billion	\$1.336 billion	\$1.449 billion	\$1.558 billion	\$1.704 billion	\$2.131 billion	\$2.205 billion	\$2.350 billion	\$2.484 billion	\$2.607 billion	4.9%
Natural, Health Food, and Specialty	\$2.356 billion	\$2.506 billion	\$2.624 billion	\$2.804 billion	\$2.904 billion	\$2.950 billion	\$2.992 billion	\$2.984 billion	\$3.040 billion	\$3.121 billion	2.7%
Direct Sales	\$3.363 billion	\$3.609 billion	\$3.984 billion	\$4.408 billion	\$4.913 billion	\$6.076 billion	\$7.033 billion	\$6.674 billion	\$7.027 billion	\$7.503 billion	6.8%

Source: Nutrition Business Journal

Calculating Percentage Change

The percentage sales changes from 2023 to 2024 included in this report are based on updated 2023 sales data provided by SPINS in May 2025. These updated numbers may differ from the figures published in the 2023 Herb Market Report, as SPINS periodically revises past data when new information becomes available or when sales are reclassified.

Most of these routine changes reflect small adjustments. However, due to changes in private label coding, the revised 2023 sales figures for several ingredients in the mainstream retail channel changed by more than 30%. As a result, the percentage changes for these ingredients may appear incorrect when compared to the sales totals published in the 2023 Herb Market Report.

The ingredients with 2023 sales changes above 30% are noted below:

	Sales in 2023 Herb Market Report	Updated 2023 Sales Data	% Change
St. John's wort	\$6,174,737.57	\$26,476,198	328.9%
Ginkgo	\$33,114,457	\$22,686,313	-31.5%
Cinnamon	\$25,559,120	\$17,740,841	-30.6%

Source: SPINS

Adaptogens

Similarly vague marketing language can be found on supplements labeled as adaptogens, which are typically defined as substances that help the body adapt to stress.³¹ Adaptogen sales in 2024 were largely positive across channels, particularly in the natural retail space. In the mainstream channel, sales of ashwagandha (*Withania somnifera*, Solanaceae) grew by 13.8%, while maca (*Lepidium meyenii*, Brassicaceae) increased by 7.1%. At the same time, rhodiola (*Rhodiola rosea*, Crassulaceae) and bacopa (*Bacopa monnieri*, Plantaginaceae) declined by 13.0% and 11.6%, respectively. In contrast, the natural expanded channel saw a 30.4% sales increase for rhodiola, along with modest gains of 2.5% for ginseng, a category that includes both Asian ginseng (*Panax ginseng*, Araliaceae) and American ginseng (*P. quinquefolius*). Sales of schisandra (*Schisandra chinensis*, Schisandraceae), although not among the top 40 ingredients in the natural channel, also had a 22.3% increase.

Other Notable Sales Increases

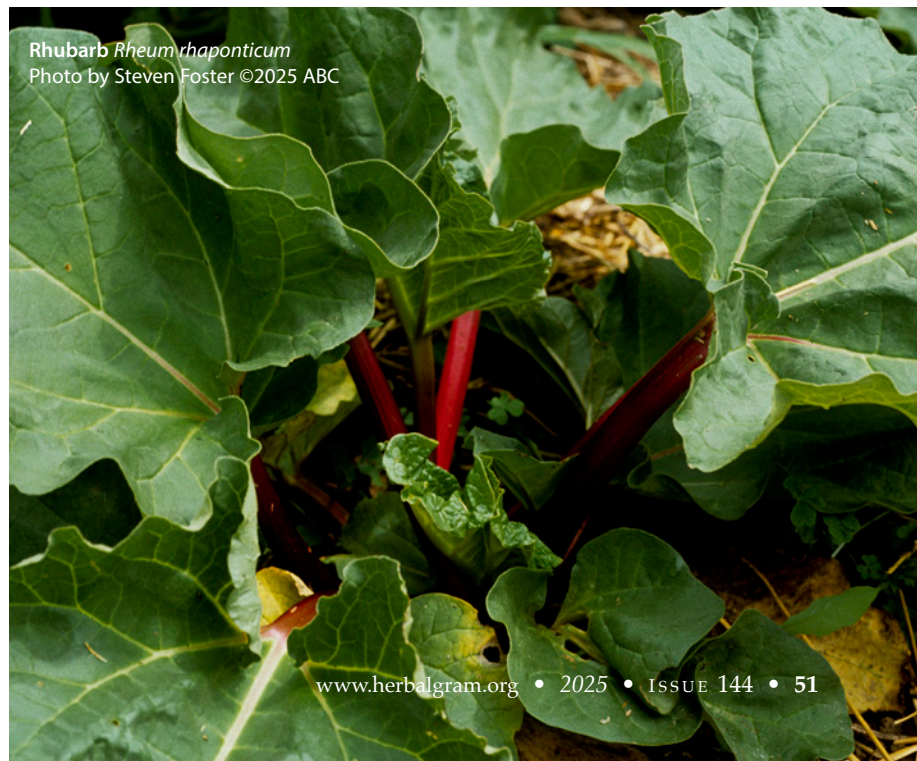
Three other ingredients in the 2024 mainstream channel experienced sales increases of 20% or greater: beet root (*Beta vulgaris*, Amaranthaceae; +67.7%), rhubarb (*Rheum rhabonticum*, Polygonaceae; +29.7%), and St. John's wort (*Hypericum perforatum*, Hypericaceae; +24.0%).

The 24.0% sales increase for St. John's wort in 2024 was calculated using an updated sales figure for 2023 that was significantly different from the one published in *HerbalGram's* 2023 Herb Market Report. This was due to an internal change in private label coding of SPINS data, as is sometimes the case. Coding changes also affected mainstream sales totals for ginkgo (*Ginkgo biloba*, Ginkgoaceae) and cinnamon (*Cinnamomum* spp., Lauraceae). (See "Calculating Percentage Change" sidebar.)

Rhubarb

Rhubarb first appeared on the mainstream channel's top 40 herbal supplement ingredients list in 2021, ranking 39th, after sales more than doubled from 2020. The herb experienced two years of sales declines in 2022 and 2023, but it climbed to rank 29 in 2024, after a 29.7% sales increase to \$12.8 million. This marks the highest sales ever recorded for this ingredient in mainstream retail stores and the third-largest percentage sales gain in this channel in 2024.

Nearly 78% of rhubarb supplement sales in 2024 were attributed to products marketed for menopause support, totaling approximately \$10 million, a 21.5% increase from the previous year. Notable gains were also observed in the cleanse and detox (257%) category, which accounted for a small percentage of total sales, as well as in the digestive health (70.8%) category — the second-largest health focus



Rhubarb *Rheum rhabonticum*
Photo by Steven Foster ©2025 ABC



Ginkgo Ginkgo biloba
Photo by Steven Foster ©2025 ABC



Turmeric Curcuma longa
Photo by Steven Foster ©2025 ABC

category for rhubarb supplements. Both of these categories saw increased consumer interest in 2024.

Rhubarb products marketed for digestive health generated roughly \$2.8 million. This spike suggests increased consumer interest in one of rhubarb’s most established traditional uses: for gastrointestinal support. Rhubarb root and rhizome have been used in traditional Chinese medicine (TCM) for millennia, primarily as a laxative. One of the earliest known TCM texts, *The Herbal Classic of Shen Nong*, describes the use of rhubarb for treating diarrhea, and it remains a common remedy for digestive issues, particularly constipation.^{32,33}

The rise in rhubarb supplement sales for menopause support in 2024 reflects both growing consumer demand and a broader cultural shift toward more open conversations about midlife health.³⁴ An estimated 1.3 million women in the United States enter menopause each year, and more than half report symptoms such as hot flashes, mood swings, and sleep disturbances. With a growing number of women in the typical menopausal age range (45–56), interest has increased in plant-based alternatives to conventional hormone therapy, especially among women in Generation X.^{35,36} Other herbs traditionally used for menopause support also saw sales increases in 2024, including red clover (*Trifolium pratense*, Fabaceae), which was not a top-40 mainstream ingredient. This herb saw sales nearly double (94.1%), further underscoring the momentum in the mainstream menopause market.³⁷

Top Sales Decrease: Ginkgo

Given the strong mainstream interest in cognitive health products, it may be surprising that ginkgo — a well-known herbal preparation closely associated with memory support — experienced the largest sales decline in the 2024 mainstream retail channel. Ginkgo sales, which ranked 25th, totaled \$15.8 million in 2024, a 30.4% decrease from 2023. However, this decrease is primarily due to a change in SPINS’ private label coding, as noted earlier. As was the case for St. John’s wort and cinnamon, the percentage decrease for ginkgo was calculated using an updated sales total for 2023, which was significantly different from the one published in the 2023 Herb Market Report. However, several other factors may have contributed to the decline in ginkgo sales, including normalizing market conditions and shifts in consumer attitudes.

Mainstream sales of ginkgo supplements had been increasing steadily for more than a decade. A larger-than-normal sales increase in 2023 suggests that the drop in 2024 may be a simple market correction. The sales spike

in 2023 could have been related to lingering pandemic-related concerns about “brain fog,” increased attention to age-related cognitive decline, or several positive ginkgo-related research findings published in 2023, including meta-analyses related to Alzheimer’s disease³⁸ and mild cognitive impairment,³⁹ among other potential reasons.

Despite its strong scientific evidence and history of safe use, ginkgo appears to be losing some relevance among mainstream US consumers. The herb faces competition from increasingly well-known nootropic ingredients,

such as certain mushroom species and ashwagandha (which has documented cognitive effects but is better known as an adaptogen⁴⁰). These ingredients are commonly available in popular formats, including gummies and drink powders, which are convenient and may align better with wellness branding and market-

ing.⁴¹ Ginkgo is typically available in capsule and tablet form, which may be less appealing, especially to younger consumers and others experiencing “pill fatigue.”

The decline in ginkgo sales may also reflect increased consumer skepticism of products lacking clinical support. The most credible evidence of ginkgo’s cognitive benefits is associated with a single product, EGb761® (Dr. Willmar Schwabe GmbH & Co. KG; Karlsruhe, Germany), which has an approximately 50:1 concentration of leaf to extract and standardized levels of constituents. In general, other ginkgo products, such as raw leaf powders and non-standardized extracts that dominate much of the market, do not have the same level of supporting scientific evidence.

Other Notable Sales Decreases

Four other ingredients in the 2024 mainstream channel had sales decreases greater than 20%: wheatgrass/barley grass (*Triticum aestivum/Hordeum vulgare*, Poaceae; -29.3%), oat (*Avena sativa*, Poaceae; -26.9%), goji berry (*Lycium barbarum*, Solanaceae; -22.7%), and elder berry (-21.0%).

NATURAL EXPANDED CHANNEL

Top Sales: Turmeric

For the third consecutive year, turmeric was the top-selling herbal supplement ingredient in natural retail stores, with sales totaling \$37.1 million in 2024 — a 1.7% decrease from 2023. (This category also includes sales of curcuminoid-rich extracts, as discussed later.) Turmeric was ranked first in sales in seven of the 11 years from 2014 to 2024, reflecting its enduring popularity among natural products consumers. Sales grew rapidly throughout much of the 2010s, peaking in 2018 at approximately \$51.2 million, before entering a period of gradual decline and then stabi-

The rise in rhubarb supplement sales for menopause support in 2024 reflects both growing consumer demand and a broader cultural shift toward more open conversations about midlife health.

lizing. Although CBD surpassed turmeric as the top-selling herbal supplement in this channel from 2018 to 2021, turmeric regained the top position in 2022 and has maintained it through 2024.

In contrast, sales of turmeric in the mainstream channel have been relatively more consistent and continue to rise. From 2015 to 2024, mainstream sales of this ingredient increased from \$15.7 million to nearly \$141.8 million — a more-than-ninefold increase. Sales grew every year during this period, with especially sharp gains from 2017 to 2018 (nearly tripling), and they have remained steady since then. This shift suggests that turmeric has moved beyond its original audience and has found sustained interest, including for emerging uses, among mainstream consumers.

Turmeric has been used for centuries as both a culinary spice and a medicinal herb in traditional medical systems, including Ayurveda, Unani, and traditional Chinese medicine. The vibrant orange-yellow spice has been used historically to support digestion, liver function, joint health, wound healing, and for other benefits, and is considered a general tonic in many cultures.⁴² Today, turmeric supplements commonly include extracts with standardized levels of curcuminoids — often considered the primary active compounds in turmeric rhizome — and are sold in various forms, such as capsules, powders, and functional beverages. These compounds have been widely studied for their antioxidant and anti-inflammatory properties.

In 2024, turmeric supplements sold in the natural channel continued to be most strongly associated with pain and inflammation, accounting for 55.1% of total sales, despite a 3.7% decline in this category from 2023. Turmeric products labeled for joint health, the third-largest health focus

category (12.9% of sales), dropped by 9.4%. Meanwhile, several smaller but growing categories have gained traction: liver support saw a significant 291.2% increase, reaching nearly 2% of total sales, while cardiovascular health rose 15% to represent 1.2% of sales. Non-specific products, the second-largest health focus category, accounted for 13.6% of sales and grew modestly by 2.5%, suggesting that many consumers in the natural channel may be seeking turmeric products for broader benefits.

The nearly 300% increase in sales of turmeric products marketed for liver support in 2024 stands out against the otherwise flat or declining health focus categories, including core areas such as pain and inflammation and joint health. This surge may be related to the growing popularity of “detox” drinks on social media, emerging research on turmeric and liver health, and potentially even negative publicity in 2024.

Turmeric was featured prominently in some of 2024’s trending “liver-cleansing” detox drinks on platforms like TikTok and Instagram.⁴³ Influencers have promoted turmeric for its ability to “flush out toxins” and “cleanse the blood” — unscientific claims that have contributed to its inclusion in viral detox drink recipes.^{44,45} Turmeric water (or *haldi* water), for example, a traditional Ayurvedic preparation typically consumed in the morning, gained visibility in 2024 as a simple daily detox ritual.⁴⁶

A study published in *The American Journal of Gastroenterology* in early 2025 described a “thriving market for liver supplements, despite limited scientific evidence supporting their efficacy.” The authors reported that many of the top-ranked liver health products they analyzed, most of which included turmeric, often featured “bold health claims, high consumer satisfaction, and significant sales.”⁴⁷



Elder berry *Sambucus nigra*
Photo by Steven Foster ©2025 ABC

Table 4. Top-Selling Herbal Supplements in 2024 — US Mainstream Channel

Rank	Primary Ingredient	Latin Binomial	Total Sales	% Change from 2023
1	Psyllium ^a	<i>Plantago ovata</i>	\$289,451,642	-2.3%
2	Elder berry	<i>Sambucus nigra</i> and <i>S. canadensis</i>	\$145,219,327	-21.0%
3	Ashwagandha	<i>Withania somnifera</i>	\$144,458,792	13.8%
4	Turmeric ^b	<i>Curcuma longa</i>	\$141,789,971	-2.9%
5	Beet root	<i>Beta vulgaris</i>	\$116,990,908	67.7%
6	Apple cider vinegar	<i>Malus</i> spp.	\$91,102,277	-18.3%
7	Cranberry	<i>Vaccinium macrocarpon</i>	\$74,443,505	-0.2%
8	Wheatgrass / Barley grass	<i>Triticum aestivum</i> / <i>Hordeum vulgare</i>	\$46,855,081	-29.3%
9	Ginger	<i>Zingiber officinale</i>	\$44,605,997	-12.2%
10	Green tea	<i>Camellia sinensis</i>	\$42,703,927	-4.4%
11	Fenugreek	<i>Trigonella foenum-graecum</i>	\$37,724,038	-5.8%
12	Maca	<i>Lepidium meyenii</i>	\$35,187,955	7.1%
13	St. John's wort	<i>Hypericum perforatum</i>	\$32,821,231	24.0%
14	Ivy leaf	<i>Hedera helix</i>	\$31,410,351	-15.6%
15	Guarana	<i>Paullinia cupana</i>	\$26,852,160	-6.6%
16	Saw palmetto	<i>Serenoa repens</i>	\$26,149,194	-11.4%
17	Echinacea	<i>Echinacea angustifolia</i> , <i>E. pallida</i> , and <i>E. purpurea</i>	\$25,812,341	-13.6%
18	Milk thistle	<i>Silybum marianum</i>	\$20,696,159	-2.4%
19	Garlic	<i>Allium sativum</i>	\$19,109,250	-9.8%
20	Cinnamon	<i>Cinnamomum</i> spp.	\$19,093,497	7.6%
21	Aloe	<i>Aloe vera</i>	\$18,295,617	-8.9%
22	Flax seed / Flax oil	<i>Linum usitatissimum</i>	\$17,250,115	-14.7%
23	Black cohosh	<i>Actaea racemosa</i>	\$16,810,891	-16.8%
24	Senna ^c	<i>Senna alexandrina</i>	\$16,719,138	2.0%
25	Ginkgo	<i>Ginkgo biloba</i>	\$15,781,227	-30.4%
26	Mushrooms (other)	—	\$15,651,639	75.8%
27	Pumpkin	<i>Cucurbita pepo</i>	\$14,383,908	-12.5%
28	Horny goat weed	<i>Epimedium</i> spp.	\$13,891,001	4.8%
29	Rhubarb	<i>Rheum rhaponticum</i>	\$12,765,322	29.7%
30	Goji berry	<i>Lycium barbarum</i>	\$11,982,377	-22.7%
31	Yohimbe	<i>Corynanthe johimbe</i> syn. <i>Pausinystalia johimbe</i>	\$11,285,346	-17.4%
32	Valerian	<i>Valeriana officinalis</i>	\$10,191,153	-11.1%
33	Red yeast rice ^d	—	\$9,650,922	-12.2%
34	Bacopa	<i>Bacopa monnieri</i>	\$8,849,732	-11.6%
35	Dandelion	<i>Taraxacum officinale</i>	\$8,428,030	-7.5%
36	Rhodiola	<i>Rhodiola rosea</i>	\$8,165,815	-13.0%
37	Oat	<i>Avena sativa</i>	\$7,905,688	-26.9%
38	Nigella	<i>Nigella sativa</i>	\$7,737,997	7.7%
39	Chamomile	<i>Matricaria chamomilla</i>	\$7,651,336	8.6%
40	Ginseng	<i>Panax</i> spp.	\$7,361,814	-9.0%

Source: SPINS (52 weeks ending December 31, 2024)

^a Excludes over-the-counter (OTC) drugs containing psyllium.

^b Includes standardized turmeric extracts with high levels of curcumin.

^c Excludes OTC laxative drugs containing senna or sennosides.

^d Red yeast rice is fermented with the yeast *Monascus purpureus*.

Table 5. Top-Selling Herbal Supplements in 2024 — US Natural Expanded Channel

Rank	Primary Ingredient	Latin Binomial	Total Sales	% Change from 2023
1	Turmeric ^a	<i>Curcuma longa</i>	\$37,102,858	-1.7%
2	Mushrooms (other)	—	\$27,550,554	14.4%
3	Cannabidiol (CBD)	<i>Cannabis sativa</i>	\$26,030,245	-17.0%
4	Elder berry	<i>Sambucus nigra</i> and <i>S. canadensis</i>	\$22,828,748	-7.8%
5	Ashwagandha	<i>Withania somnifera</i>	\$21,247,633	6.0%
6	Algae (other)	—	\$19,516,621	131.7%
7	Milk thistle	<i>Silybum marianum</i>	\$19,003,953	33.9%
8	Oregano ^b	<i>Origanum vulgare</i>	\$14,834,516	23.6%
9	Aloe	<i>Aloe vera</i>	\$13,582,274	0.9%
10	Psyllium ^c	<i>Plantago ovata</i>	\$13,569,545	2.6%
11	Wheatgrass / Barley grass	<i>Triticum aestivum</i> / <i>Hordeum vulgare</i>	\$11,353,832	-26.0%
12	Beet root	<i>Beta vulgaris</i>	\$11,259,142	11.6%
13	Flax seed and/or oil	<i>Linum usitatissimum</i>	\$10,541,844	-4.4%
14	Quercetin ^d	—	\$10,095,895	-5.2%
15	Barberry	<i>Berberis vulgaris</i>	\$9,935,820	17.6%
16	Echinacea	<i>Echinacea angustifolia</i> , <i>E. pallida</i> , and <i>E. purpurea</i>	\$9,262,297	4.1%
17	Spirulina / Blue-green algae ^e	<i>Arthrospira platensis</i> and <i>A. maxima</i> / —	\$8,369,963	3.8%
18	Saw palmetto	<i>Serenoa repens</i>	\$8,178,134	-1.0%
19	Nigella	<i>Nigella sativa</i>	\$7,855,392	-2.2%
20	Cranberry	<i>Vaccinium macrocarpon</i>	\$7,381,922	-2.8%
21	Maca	<i>Lepidium meyenii</i>	\$7,144,925	-1.4%
22	Valerian	<i>Valeriana officinalis</i>	\$6,737,142	-4.2%
23	Chlorophyll / chlorella	— / <i>Chlorella vulgaris</i>	\$6,469,019	-3.8%
24	Reishi mushroom	<i>Ganoderma lucidum</i>	\$6,368,523	18.2%
25	Garlic	<i>Allium sativum</i>	\$5,806,780	-6.6%
26	Kava	<i>Piper methysticum</i>	\$5,528,569	4.8%
27	Echinacea / goldenseal combo	<i>Echinacea</i> spp. / <i>Hydrastis canadensis</i>	\$5,444,440	3.1%
28	Ginkgo	<i>Ginkgo biloba</i>	\$4,854,179	-0.8%
29	Resveratrol ^f	—	\$4,255,819	2.4%
30	Moringa	<i>Moringa oleifera</i>	\$4,201,532	39.2%
31	Apple cider vinegar	<i>Malus</i> spp.	\$4,095,338	-14.5%
32	Ginger	<i>Zingiber officinale</i>	\$3,803,554	-1.2%
33	Cherry	<i>Prunus</i> spp.	\$3,724,472	2.6%
34	Rhodiola	<i>Rhodiola rosea</i>	\$3,709,859	30.4%
35	Mullein	<i>Verbascum thapsus</i>	\$3,706,019	45.1%
36	Chaga mushroom	<i>Inonotus obliquus</i>	\$3,594,046	23.6%
37	Red yeast rice ^g	—	\$3,469,919	0.8%
38	Ginseng	<i>Panax</i> spp.	\$3,396,758	2.5%
39	Horsetail	<i>Equisetum</i> spp.	\$3,159,963	-14.6%
40	Cordyceps mushroom	<i>Ophiocordyceps sinensis</i> syn. <i>Cordyceps sinensis</i>	\$3,147,065	-4.8%

Source: SPINS (52 weeks ending December 31, 2024)

^a Includes standardized turmeric extracts with high levels of curcumin.

^b Includes products labeled as containing oregano oil and oregano leaf tinctures.

^c Excludes over-the-counter (OTC) drugs containing psyllium.

^d Quercetin is a flavonoid found in various plants, such as onions (*Allium cepa*) and berries.

^e Blue-green algae belong to the phylum Cyanobacteria.

^f Resveratrol is an antioxidant found in various plants, such as grapes (*Vitis vinifera*), berries, and Japanese knotweed (*Polygonum cuspidatum*) roots.

^g Red yeast rice is fermented with the yeast *Monascus purpureus*.

Researchers continue to investigate the effects of turmeric and curcumin on the liver. Several meta-analyses published in 2024 highlighted curcumin’s potential benefits for liver health, including one review that noted improvements in liver-related markers (e.g., liver enzymes and triglycerides) in people with non-alcoholic fatty liver disease.⁴⁸ Other 2024 reviews emphasized curcumin’s role in supporting liver function by reducing inflammation and oxidative stress.^{49,50}

Paradoxically, media coverage in 2024 linking turmeric to liver injury may have heightened public awareness of the herb’s effects on liver health. One widely cited study, published in *JAMA Network Open* in August 2024, extrapolated survey data to suggest potential hepatotoxicity risks associated with six herbal supplement ingredients, including turmeric.⁵¹ Several media outlets subsequently ran alarmist headlines, presenting the estimates as direct evidence that millions were at risk of liver damage from these botanicals. However, as the American Botanical Council explained in an August 2024 press release,⁵² the study overstated toxicity concerns, misrepresented usage data, and failed to include important context — particularly regarding the frequency of liver-related adverse events and how those rates compare to conventional medications.⁵³

Top Sales Increase: Algae (Other)

Algae (other), which ranked sixth in the natural expanded retail channel, had the greatest percentage sales increase in this channel in 2024, with sales growing by approximately 131.7% to a total of \$19.5 million — up from \$7.6 million in 2023. This marks the fourth consecutive year of double-digit growth for the category. Like the mushrooms (other) category, algae (other) captures sales of algae-based dietary supplements, such as those containing sea moss (*Chondrus crispus*, Gigartinales), that are not individually tracked by SPINS. (This excludes supplements with spirulina/blue-green algae or chlorophyll/chlorella as the primary ingredient, as these are tracked separately.) Sales of algae (other) in natural retail outlets have increased substantially over the past decade, from an estimated \$1.7 million in 2014 to more than \$19 million in 2024. In contrast, 2024 sales of spirulina (+3.8%) and chlorophyll/chlorella (–3.8%) remained relatively flat, suggesting that the gains in the algae (other) category may be driven

by products featuring multiple algae species (e.g., blends) or lesser-known species that fall in the “other” category (e.g., *Dunaliella salina*, Dunaliellaceae; a beta-carotene-rich species of algae).

“Algae” is a broad term that refers to a diverse group of photosynthetic organisms ranging from microscopic single-celled species to large seaweeds. Algae are typically classified by color — green, red, or brown — and each type has a distinct profile of vitamins, minerals (e.g., iodine), carotenoids, and omega-3 fatty acids. These constituents are associated with a range of potential health benefits, including support for cardiovascular, immune, joint, and eye health.⁵⁴ Green algae like chlorella are rich in beta-carotene, lutein, and zeaxanthin, which are linked to visual and antioxidant



Sea moss *Chondrus crispus*
Photo by Steven Foster ©2025 ABC



Mullein *Verbascum thapsus*
Photo by Steven Foster ©2025 ABC



Oregano *Origanum vulgare*
Photo by Steven Foster ©2025 ABC

benefits.⁵⁵ Some red algae produce porphyran, a polysaccharide that has shown cholesterol-lowering, antiviral, and anticoagulant effects in lab and animal studies. All brown algae contain fucoxanthin, a carotenoid with anti-inflammatory, antioxidant, and anti-obesity properties, and some species also contain alginates, an ingredient in certain antacids.^{56,57} Although human studies are limited in general, preclinical research findings for some of these algae components are promising.

In 2024, more than 82% of algae (other) supplement sales in natural retail stores were attributed to products with non-specific health claims — a category that saw a 187.1% increase from the previous year. This majority share suggests that most consumers are purchasing these algae products for general wellness rather than for targeted support. The next-largest segments — private label and unknown health focus — accounted for just 7.6% and 6.6% of total sales, respectively. Sales in categories with more defined health focuses remained small by comparison. While products marketed for performance accounted for only 0.21% of total sales (corresponding to just over \$40,000 in sales), they experienced the largest year-over-year growth of 684.1%.

The more than doubling of sales of algae (other) supplements in 2024 may have been driven partly by growing visibility on social media platforms, especially TikTok. Sea moss, also known as Irish moss, became one of the year's breakout wellness trends. Although interest in sea moss, a type of red algae, had been growing for several years, influencers and celebrities continued to promote sea moss gel, capsules, and powders in 2024 for a wide range of potential benefits, including improved digestion, increased energy, and immune support.⁵⁸ Hashtags like #seamoss and #seamossgel have amassed hundreds of thousands of views on TikTok, with videos frequently showing preparation tips and enthusiastic personal testimonials.⁵⁹⁻⁶¹ While many of the claimed benefits are unverified or anecdotal, the exposure likely helped position algae as a trending “superfood” ingredient. (Although algae [other] was not among the 40 top-selling ingredients in the 2024 mainstream retail channel, sales in that channel also grew substantially, by 27.7%.)

Premium green powders like AG1® (formerly known as Athletic Greens; Carson City, Nevada) continued to gain attention in 2024 through social media, podcasts, and other digital platforms, often through paid promotions.⁶² These products are typically marketed as convenient, “all-in-one” nutritional solutions with antioxidants, vitamins, minerals, adaptogens, probiotics, and other ingredients, and many are offered via subscription. Maintaining proper nutrition likely took on newfound importance for many consumers in 2024, as the use of appetite-suppressing GLP-1 agonists such as semaglutide increased significantly in the United States.⁶³ Although AG1 includes only spirulina and chlorella (in terms of algae ingredients) and is therefore not counted in SPINS' algae (other) category,⁶⁴ its popularity — alongside other top algae-containing blends from brands like Bloom (Austin, Texas) and Huel (Tring, England)⁶⁵ — has likely helped to increase the acceptance of algae as a functional ingredient.



Wheatgrass *Triticum aestivum*
Photo by Steven Foster ©2025 ABC

Other Notable Increases

Six other ingredients in the 2024 natural retail channel had sales increases greater than 20%: mullein (*Verbascum thapsus*, Scrophulariaceae; 45.1%), moringa (*Moringa oleifera*, Moringaceae; 39.2%), milk thistle (*Silybum marianum*, Asteraceae; 33.9%), rhodiola (30.4%), chaga (23.6%), and oregano (*Origanum vulgare*, Lamiaceae; 23.6%).

Top Sales Decrease: Wheatgrass/Barley Grass

Wheatgrass/barley grass, which ranked 11th, experienced the sharpest sales decline among the top 40 ingredients in the natural expanded retail channel in 2024, with sales dropping 26.0% from the previous year to \$11.4 million. It was the only item in this channel to have a sales decrease of more than 20% in 2024. Once a top 10 ingredient in this channel (and the second-best seller from 2014 through 2017), sales of wheatgrass/barley grass have lost momentum over the past decade, falling by more than 50% since peaking at \$23.1 million in 2015.

“Wheatgrass” and “barley grass” refer to the young green shoots of these cereal grains that are harvested before the seed heads develop.⁶⁶ Commonly sold as

powders, tablets, or liquid shots made from the fresh-pressed juices, these supplements are often promoted as nutrient-dense superfoods rich in antioxidants, chlorophyll, vitamins, and minerals. Wheatgrass is especially high in vitamins C and E, glutathione (an antioxidant), and amino acids, and is typically marketed for digestive and immune health support.⁶⁷ Barley grass offers similar benefits and may positively impact cholesterol and body weight, though human studies are limited.^{66,68}

Sales of wheatgrass and barley grass supplements in the natural expanded channel declined across nearly all major health focus categories in 2024. The majority of sales (82.0%) were attributed to products with non-specific health claims and those marketed for “cleanse and detox” support — both of which saw significant declines from the previous year (–25.0% and –22.5%, respectively). Energy support, cognitive health, and immune health also experienced sharp decreases (–41.7%, –49.2%, and –72.3%, respectively). These declines are notable, given the overall popularity of detox-related products in 2024, suggesting that consumers may be shifting away from well-known ingredients such as wheatgrass in favor of newer, trending ingredients and formats.

	Single-Herb Supplements			Combination Herbal Supplements		
	Total Sales (in Billions)	% of Total Sales	Change from Previous Year	Total Sales (in Billions)	% of Total Sales	Change from Previous Year
2024	\$6.657	50.3%	3.7%	\$6.574	49.7%	7.2%
2023	\$6.417	51.1%	3.3%	\$6.134	48.9%	5.7%
2022	\$6.214	51.7%	-2.3%	\$5.803	48.3%	-1.3%
2021	\$6.360	52.0%	5.8%	\$5.881	48.0%	14.0%
2020	\$6.009	53.8%	11.5%	\$5.159	46.2%	24.6%
2019	\$5.390	56.6%	6.3%	\$4.139	43.4%	11.7%
2018	\$5.072	57.8%	6.6%	\$3.705	42.2%	12.4%
2017	\$4.759	59.1%	5.6%	\$3.298	40.9%	11.9%
2016	\$4.505	60.5%	6.1%	\$2.947	39.5%	10.1%
2015	\$4.245	61.3%	5.5%	\$2.677	38.7%	10.7%

Source: Nutrition Business Journal

DIRECT SALES

Direct-to-consumer sales of herbal supplements rose by 6.8% in 2024, reaching \$7.5 billion, according to data from NBJ. This is the channel’s strongest growth since 2021, following a 5.3% increase in 2023 and a 5.1% decline in 2022 — the first drop since 2008. The brief dip in 2022 likely reflected a market correction after unusually high online sales during the pandemic. Still, the direct sales channel has consistently outperformed both the mass market channel and the natural/specialty channel (individually and combined) for at least two decades.

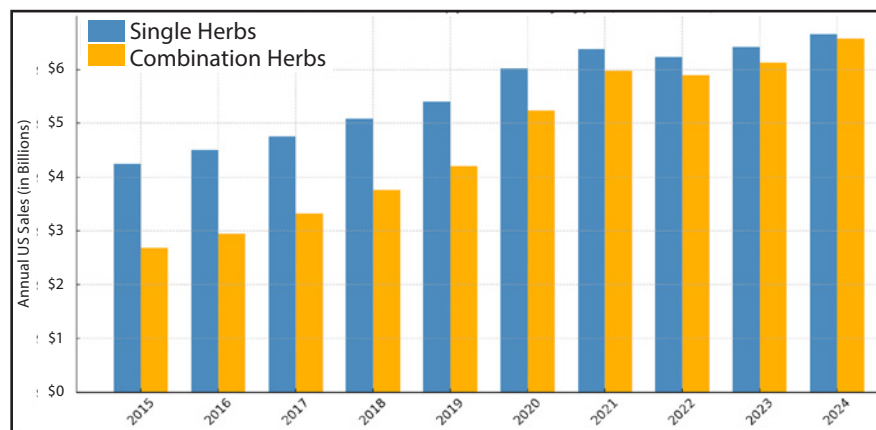
NBJ’s direct sales category includes purchases made through online platforms (e.g., Amazon, Walmart), direct media (TV, radio, and print), health practitioners, and multi-level marketing companies. Besides the enduring appeal of online shopping, the rise in subscription-based wellness products, especially those associated with emerging trends, likely also contributed to direct sales growth in 2024.

SALES BY PRODUCT TYPE: SINGLE VS. COMBINATION

Continuing a longstanding trend, sales growth of combination herbal supplements in 2024 remained higher than that of single-herb supplements. According to NBJ data, combination formulas grew by 7.2% in 2024, reaching \$6.57 billion in sales. In contrast, sales of single-herb products grew by 3.7%, totaling \$6.66 billion. As a result, the market share gap between the two categories continued to narrow, and sales are now roughly equal (50.3% for single-herb products and 49.7% for combination formulas).

Combination products are gaining popularity among consumers seeking convenient wellness options with multi-

Figure 2. Total US Retail Sales of Herbal Supplements by Type (2015–2024)



Source: Nutrition Business Journal

ple benefits. These formulas typically appeal to people with more general health goals, such as nutritional support, rather than specific conditions. Meanwhile, single-ingredient products, which once had a much larger market share, now face increased competition from these lifestyle-oriented formulations. However, single-ingredient products continue to represent slightly more than half of all herbal supplement sales and remain vital for ingredient-conscious shoppers who prefer targeted products.

CONCLUSION

After a rare decline in 2022, US sales of herbal supplements rebounded in 2023, prompting cautious optimism among industry experts for a return to the market segment’s longstanding growth trend. The 5.4% increase in 2024 supports that outlook and suggests a shift back to the moderate, steady expansion seen in the early 2010s, when sales grew by an average of 5.3% (2010–2013). Rather than being driven by short-term surges in certain categories (e.g., immune health products), the sales growth in 2024 seems to reflect sustained consumer interest in healthy aging and practical, long-term wellness support.



Aloe Aloe vera
Photo by Steven Foster ©2025 ABC

Mainstay ingredients such as psyllium and turmeric maintained their top positions in the mainstream and natural expanded retail channels, respectively, as several other well-established herbs (e.g., ginkgo, wheatgrass) experienced sharp declines in 2024. This shows that recognition and alignment with common health goals alone are not always sufficient to ensure continued success. In 2024, some herbs gained renewed relevance when marketed for emerging consumer priorities, such as turmeric for liver health and rhubarb for menopause, demonstrating how evolving wellness goals can shape how well-known herbs are presented in the marketplace.

In 2024, sales of functional mushroom and algae supplements continued to increase, fueled by consumer demand for convenient, multifunctional wellness options. These products, including popular mushroom coffee substitutes and sea moss blends, are marketed as easy additions to daily routines and benefit from high visibility on social media platforms.

Merriam-Webster's 2024 Word of the Year, "polarization," captured the general sense of disconnection and overstimulation that seemed to pervade much of the year.⁶⁹ Amid political divisions and digital overload, consumers spent a record amount on herbal supplements — not only for stress relief and focus, but also to support foundational health needs like cardiovascular and cognitive function, areas with broad, cross-generational relevance. As people continue to seek stability and practical support during uncertain times, herbal products that offer multiple benefits and convenience seem well-positioned to remain cornerstones of the dietary supplements market. HG

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Barberry *Berberis vulgaris*
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Saw palmetto *Serenoa repens*
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Horsetail *Equisetum* spp.
Photo by Steven Foster ©2025 ABC

Valerian *Valeriana officinalis*
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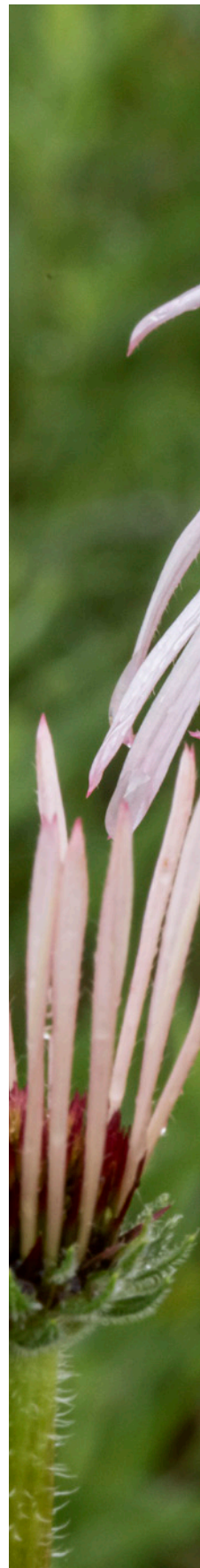


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Garlic *Allium sativum*
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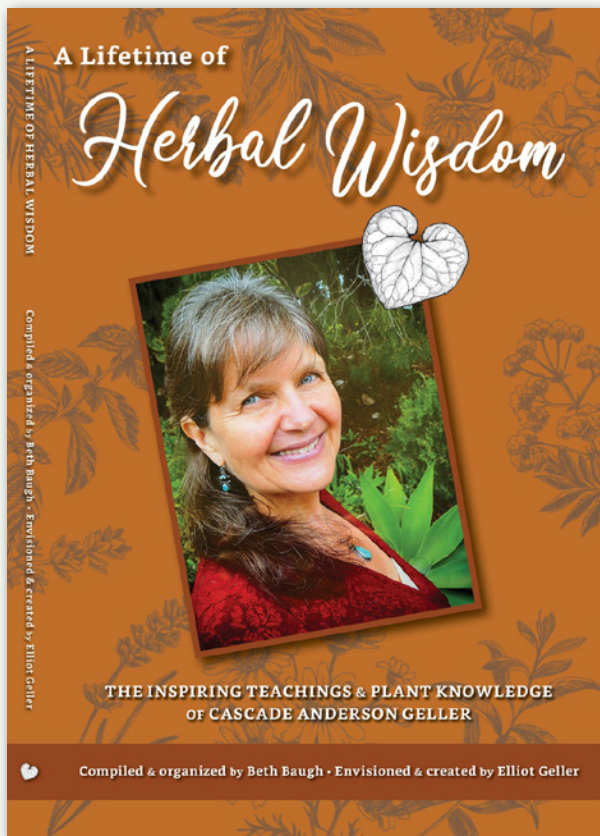


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Echinacea pallida
Photo by Steven Foster ©2025 ABC



A Lifetime of Herbal Wisdom: The Inspiring Teachings and Plant Knowledge of Cascade Anderson Geller by Beth Baugh and Elliot Geller. Portland, OR: Elliot Geller; 2024. Softcover, 455 pages. ISBN: 9798350965247. \$35.00.

By Gayle Engels

I did not know herbalist, educator, and environmental activist Cascade Anderson Geller (1954–2013) as long or as well as I would have liked, but I recognized her as a kindred spirit the first time we met, in the early 2000s. She was an inspiration in her herbalism, but also in environmental activism, a “holder of nature” who modeled living one’s spiritual beliefs. She died on HerbDay, May 4, 2013, while I was celebrating the connection of people and plants with a few hundred like-minded people. I think of her often, and always on HerbDay. When I saw this book, *A Lifetime of Herbal Wisdom: The Inspiring Teachings and Plant Knowledge of Cascade Anderson Geller*, I ordered it immediately, knowing it would become a constant companion that I would refer to often.

It took me a long time to read and review this book, partly because I did not want it to end. I kept hearing particular sections, like the one on dandelion (*Taraxacum officinale*, Asteraceae), in Cascade’s own voice.

A Lifetime of Herbal Wisdom was compiled and organized by editor Beth Baugh based on extensive tran-

scripts of Cascade’s teachings and writings. Elliot Geller, Cascade’s husband, envisioned, created, and published the book.

The book is divided into eight chapters. The first, “Inspirational Roots,” recounts Cascade’s memories of growing up with her southern Appalachian parents and grandparents and how that shaped her life. Raised in Michigan, where she learned her mother’s healing ways, she spent the summers in northern Georgia, “where the Appalachian Mountains come to a rest,” learning from her grandparents how to use some of the more than 2,000 Indigenous plant species in that region. She said that none of her ancestors would have called themselves herbalists — harvesting medicine and food from nature was simply a way of life for “hill people.” It is through these familial connections that Cascade became wise in the old ways at such a young age. Her father, a union organizer, helped kindle her environmental activism. Her herbalism and activism went hand in hand, and this is evident in the book.

The first chapter is rounded out by a short discussion of 24 common Appalachian plants and how Cascade’s mother used them. Some of the stories are about common uses of popular herbs, while others highlight lesser-known herbs and remedies. All are interesting, especially the ones that include direct quotes from her mother.

In the second chapter, “Travels,” Cascade’s love and respect for the lands and people she visited shine. Whether she was in Europe, Nepal, India, or the Americas, she followed her parents’ appeal to “respect everything.” As her friend Joanna Priestley wrote: “She knew what was right for our planet, for the plants and animals, and her community and city... She walked the path of deep integrity and matched it with a lens of deep clarity” (page 84).

Chapter three, titled “Plants I Have Known and Loved,” includes 62 species. (The genus *Mentha* is covered in a separate section.) This chapter makes up about one quarter of the book and addresses one of Cascade’s main missions: “to connect people with herbs to help them get more familiar with the earth and the plants.” Readers will primarily find information about traditional uses in each of these plant entries. It is not that Cascade was anti-science, but she did not punctuate her teachings with scientific citations. Rather, she weaved some science with the traditional knowledge in a seamless, easy-to-understand way.

In her discussion of chamomile (*Matricaria chamomilla*, Asteraceae) — an herb that I have been rediscovering recently — she refers to it as a “stimulating relaxant” because it relaxes and strengthens the nervous system while stimulating the gut. To get the full effect of the plant, Cascade recommends steeping the flowers until the infusion is strong to the point of bitterness, a tip that I have confirmed through my own use. She also advises pairing internal use of a plant with external applications (e.g., using a chamomile poultice in conjunction with an infusion or tincture).

These are a few other takeaways from chapter three that I found interesting. Some relate to specific plants and are what many of us consider common knowledge, but they may be new to others.

- Black cohosh (*Actaea racemosa*, Ranunculaceae), when combined with lobelia (*Lobelia* spp., Campanulaceae) and peppermint (*Mentha × piperita*, Lamiaceae) essential oils and applied to the neck, is good for “when you are feeling impatient with those around you.”
- Coffee (*Coffea* spp., Rubiaceae) is a nervine that is more stimulating than relaxing. It is good for pain if not used every day. And because it is dehydrating, for every cup of coffee, one should drink an equal amount of water.
- Ginger (*Zingiber officinale*, Zingiberaceae) will potentize echinacea (*Echinacea* spp., Asteraceae).
- Marshmallow (*Althaea officinalis*, Malvaceae) leaves and flowers can be used in infusions the same way as the root. Also, marshmallow root mucilage can double as a natural hair gel.

Chapter three also includes general insights and practical guidance that reflect Cascade’s wisdom and respect for the herbal tradition.

- Herbs that are easy to grow and abundant in nature typically have a short shelf life.
- Buy and store herbs in as whole a form as possible — they will keep better.
- It is good when a plant wanes in popularity because it gives a break to the wild populations. I remember when Cascade told me this about ephedra (*Ephedra* spp., Ephedraceae), and I think about it every time a plant gets negative press and loses its standing in the marketplace.
- Keep the plants that are special to you near your front door.

“Plant Preparations and Formulas,” the fourth chapter, includes definitions of different types of herbal preparations and some recipes that Cascade used regularly. It is a how-to guide for budding herbalists but may also be of interest to advanced herbalists. The chapter contains instructions for creating tea blends (with eight recipes), preparing liquid extracts such as tinctures, making elixirs, and infusing oils and salves (with accompanying recipes). It also includes discussions of poultices, liniments, and essential, volatile, or ethereal oils; how to use dried, powdered herbs in different forms; instructions for formulating, compounding, and case management; and an inventory of what is needed for a medicine-making room.

Chapter five, “Body Systems,” addresses types of formulations that are appropriate for specific issues in different body systems. For example, the section on the digestive system discusses tonics, inflammation, and motion sickness and features herbal formulations that can help with related conditions. The musculo-

skeletal section includes anti-inflammatory treatment strategies that go beyond herbs. Each of these sections is filled with information that comes from Cascade’s many years of clinical experience and teaching.

This chapter has information that falls outside the realm of herbalism. There is some crossover with chapter seven, “Cascade’s Healthy Habits.” In Cascade’s philosophy, the body is a holistic system. No herb will solve a health issue without proper rest, exercise, and nutrition. She was a proponent of flushing the nasal passage with distilled water two or three times per day for a person with allergies when their allergens are in the air. She also suggests eye washes. Feeling sick? Put a warm cloth soaked in an aromatic tea on your face and lie down. As Cascade says, “It stops your world, which is what you need to do when you are sick.” Among the old-time folk medicine guidelines she provides are some that may seem eccentric or even unimaginable in our current landscape (e.g., rinsing your face daily with the same number of splashes as your age). There is no scientific proof one way or the other for some of them. I invite readers to decide for themselves.

“Family Medicine,” the sixth chapter, has specific strategies for various populations — children, teenagers, women, men, people undergoing midlife transitions, elders, and pets. These strategies are less about herbs and more about how to deal with situations such as teaching children about a healthy diet, teenage rebellion, and the sluggish digestion that elders often experience. This chapter reads like the guidelines your wise granny might have written — if she was as cool and knowledgeable as Cascade was.

For me, reading the final chapter, “Healing Stories (of 11 Favorite Plants),” felt like a little parting gift. It is a short chapter, and the stories are not extensive. It was like sitting on the porch listening to Cascade share just a little bit more wisdom before she had to leave to go do whatever was next on her schedule.

In the foreword to *A Lifetime of Herbal Wisdom*, Rosemary Gladstar suggests that when thinking of companions who are gone, we should not “say with sadness that they left us behind, but rather say with gratitude that they once were with us.” I would add that, in the case of Cascade, she helped light the path ahead. HG

Gayle Engels is the special projects director of the American Botanical Council, where she has worked since 1995. She coordinates the development and maintenance of ABC’s website, manages special projects, writes for ABC’s publications and website, and supervises the organization’s educational efforts and garden development.

Doctors by Nature: How Ants, Apes and Other Animals Heal Themselves by Jaap de Roode. Princeton, NJ: Princeton University Press; 2025. ISBN: 9780691239248. Hardcover, 264 pages. \$27.95.

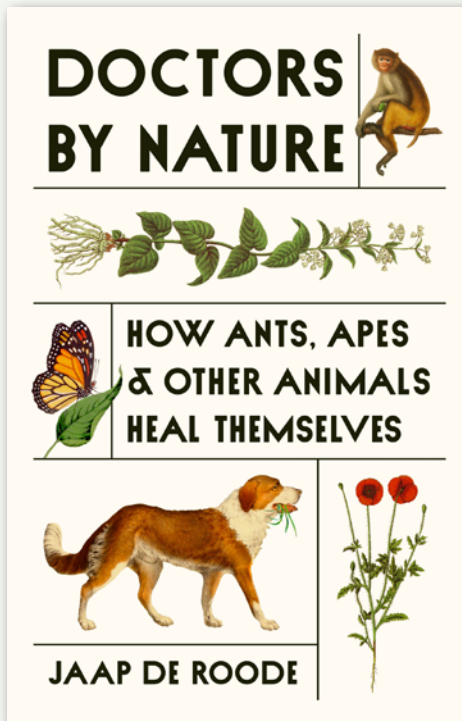
By Mark J. Plotkin, PhD

Humans have long claimed superiority over other species, insisting that only *Homo sapiens* makes and uses tools (except that chimpanzees use sticks to extract termites from mounds), has complex languages (news to the whales), has culture (orca pods have distinctive hunting techniques), demonstrates empathy (elephants assist injured members of their herd), and plans for the future (many mammals and other animals store food for the winter).

In his excellent new book, *Doctors by Nature*, Dutch biologist Jaap de Roode, PhD, begins an early chapter with a quote from 1894 by eminent physician Sir William Osler, MD (1849–1919), one of the founders of Johns Hopkins Hospital: “The desire to take medicine is one feature which distinguishes man, the animal, from his fellow creatures.” De Roode spends the rest of the book demonstrating why Osler’s claim ranks with Lord Kelvin’s (1824–1907) assessment that “radio has no future” and Steve Ballmer’s prediction that there’s “no chance that the iPhone is going to get any significant market share.”

In the United States, a nation with more than 120 million house pets, it should come as little surprise that animals know how to use plants as medicine — many Americans have seen a sick dog eat grass or a cat frolic in a pile of catnip (*Nepeta cataria*, Lamiaceae). What is most stunning about de Roode’s book is the sheer breadth of species that self-medicate with plants (and, to a lesser extent, fungi), from ants and wolves to baboons and woolly bear caterpillars.

Zoopharmacognosy — the study of how animals use plants and fungi medicinally — emerged as a discipline in the latter half of the 20th century, shaped by early insights from two scientific titans: English primatologist, zoologist, and anthropologist Jane Goodall, PhD, and American evolutionary ecologist Dan Janzen, PhD (although English primatologist and anthropologist Richard Wrangham, PhD, who has worked with Goodall, and American biochemist Eloy Rodriguez, PhD, are credited with actually coining the term in the 1980s). In the 1960s, Goodall, who likely has spent more time living with wild chimpanzees than anyone before her, noticed that chimpanzee droppings sometimes contained unchewed leaves of *Aspilia plurisetata* (Asteraceae).



Shortly thereafter, Janzen began investigating whether animals might be using toxic plant compounds medicinally. Though his field research took place mostly in Costa Rica, Janzen pored through scientific accounts from British India that described civet cats, colobus monkeys, elephants, jackals, and tigers consuming certain plants to control internal parasites. In one memorable example, Janzen noted that two-horned rhinos devoured so much tannin-rich bark of the *Cerriops* (Rhizophoraceae) mangrove that it turned their urine dark orange — and then pointed out that the antifungal and antiprotozoal drug clioquinol (once sold under the trade names Cortin and Entero-Vioform) is roughly 50% tannin.

Primatologist Michael Huffman, PhD, DSc, of Kyoto University, also played an important role in the emerging field of zoopharmacog-

nosy. In November 1987, Huffman was studying a small group of chimpanzees in Mahale Mountains National Park in western Tanzania. Huffman was accompanied by his guide, friend, and mentor, Mohamedi Seifu Kalunde of the nearby Tongwe people, who was also a senior game officer and traditional healer. They noticed that an ill, elderly chimpanzee they had named Chausiku began chewing and sucking the pith of *Vernonia amygdalina* (Asteraceae), a bitter plant that healthy chimpanzees are not known to consume. When they spotted the fully recovered Chausiku the next day, Kalunde told the already astonished Huffman that the Tongwe people use the same plant to treat a host of ailments, including diarrhea, intestinal parasites, and malaria.

Although this story has been recounted in several venues (including my book *Medicine Quest: In Search of Nature’s Healing Secrets*, published by Viking Penguin in 2000), de Roode presents the story in greater detail than any previous account. He notes that research on bonobos, chimpanzees, and gorillas has revealed that these African great apes use at least 40 different plant species for medicinal purposes.

Just as intriguing from an ethnobotanical perspective is how animal wisdom can be passed on to humans. As de Roode recounts:

“During the time that [Kalunde] worked with Huffman, [the Tanzanian] also developed a new treatment for diarrhea based on observations of chimpanzees who swallow leaves of a plant called *mbefu* (*Trema orientalis*) [Cannabaceae] to expel the same worms that were treated with *Vernonia amygdalina*. He crushed the leaves, made a concoction, and then treated people with diarrhea.”

In cases like these, de Roode may have helped answer one of the great questions of ethnobotany: How did Indigenous peoples come to learn so many of nature's healing secrets?

In later chapters, the author demonstrates that medicinal plant use is by no means restricted to African primates. In parts of tropical Asia, humans and elephants have lived in a symbiotic relationship for thousands of years. While the elephants are typically used for transport and logging assistance, they often roam the landscape in search of food and medicinal plants. Once again, the herders (known as "mahouts") learn about and use some of the plants employed medicinally by elephants, and vice versa. It is an ethnobotanical, zoopharmacognostic two-way street.

A major strength of *Doctors by Nature* is that the author does not focus solely on mammals. De Roode, a Dutch-born professor of biology at Emory University in Atlanta, Georgia, specializes in entomology and infectious diseases, offering a fresh perspective on the invertebrate world. He explores how monarch butterflies choose toxic milkweed (*Asclepias* spp., Apocynaceae) when infected by parasites, how fruit flies seek out atropine-containing plants to kill parasitic worms in their larvae, and how wood ants carry antimicrobial resins into the nest to control bacteria and fungi.

De Roode cites numerous laboratory experiments, since it is easier to analyze how invertebrates use medicinal and toxic plants in the laboratory than with chimpanzees and elephants. His conclusions, based on field observations, information from Indigenous colleagues, and lab results, make for a compelling read.

In case after case, de Roode explains how both vertebrates and invertebrates employ plants medicinally, either for prevention or treatment. The writing is clear and crisp, and the author takes readers on a tour of the animal kingdom, the plant kingdom, and most of the world's continents.

I do have one minor quibble with this book: It does not discuss how animals use plants or fungi for wound treatment or for inducing altered states — psychonauts and oenophiles seeking more information on the Stoned Ape Theory or the Drunken Monkey Hypothesis, for example, need to look elsewhere. De Roode recommends the superb 2002 book *Wild Health: How Animals Keep Themselves Well and What We Can Learn from Them* (Houghton Mifflin) by Cindy Engel, PhD, for a broader overview of some of these fascinating behaviors.

De Roode has produced a book that is wide-ranging and deeply compelling. I recommend that anyone interested in any of these many topics — animal behavior, the origins of shamanic medicine, what it means to be human — read this and Engel's classic work and hungrily await more articles, films, and books on these extraordinary discoveries. HG

Mark J. Plotkin, PhD, is the co-founder and president of the Amazon Conservation Team and the host of the podcast "Plants of the Gods: Hallucinogens, Healing, Culture and Conservation."

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James John Gormley 1963–2024

By Hannah Bauman

Journalist, editor, and consultant James Gormley died on August 14, 2024, at his home in Delray Beach, Florida, at age 61. Gormley's writing focused on natural health and wellness, including the dietary supplement and natural products industry. He worked closely with former "Nader's Raider" Jim Turner (1940–2022) at Citizens for Health, a nonprofit consumer advocacy organization dedicated to protecting access to natural health choices.¹ At the time of his death, Gormley was the president and senior policy advisor at Citizens for Health and a writer/editor at Gormley Natural Products Industry (NPI) Consulting.

Gormley was born on April 10, 1963, in Montréal and raised in New York City, the only child of Audrey and Edward Gormley. He received a degree in English literature from Queens College at the City University of New York (CUNY). From 1993 to 1994, he worked as an assistant managing editor for *The American Journal of Surgery*. His first position in the natural products community was as editor-in-chief of *Better Nutrition* magazine from 1995 to 2002. At *Better Nutrition*, he helped expand the readership and circulation of the magazine to more than one million people and received nine GAMMA Awards for General Excellence and Best Editorial Commentary.

At *Better Nutrition*, Gormley championed more science-centered reporting and developed his lifelong interest in health advocacy. He regularly spoke at industry events and gave numerous interviews for radio programs and television segments on the morning show *Good Day New York*. In 2001, he traveled to Beijing to attend the China International Conference on Traditional Eating Patterns, a global conference focused on developing effective dietary messaging to reduce obesity rates.

From 2002 to 2006, Gormley was the scientific liaison and advisor to Nutrition21 (Saddle Brook, New Jersey), a dietary supplement developer and marketer. He continued to write extensively, creating white papers, website copy, trade papers, and more for the company. In this role, he took a more active interest in dietary supplement legislation, crafting regulatory submissions and safety dossiers for the company, lobbying congressional representatives, and assembling generally recognized as safe (GRAS) self-affirmation panels. It was during this time that he joined Citizens for Health as a senior policy analyst after meeting with Turner at a symposium held at CUNY in 2004.



James Gormley

From 2006 to 2008, Gormley served as the editorial director at VRM Media, where he oversaw the editorial, art, and production of three natural products industry-focused magazines: *Vitamin Retailer*, *Nutrition Industry Executive*, and *Organic Products Retailer*. Under his leadership, the publications established strong online presences and launched e-newsletters. After a brief stint in 2008 as associate director of global communications at Solgar, Inc. (Leonia, New Jersey), Gormley served as the editor of *Journal of Drugs in Dermatology* from 2009 to 2011. As part of his duties, he created the Derm Matters blog, which he wrote and produced. Derm Matters was named "One of the Best Dermatology Blogs" by *Plastic Surgery Practice*; recognized as one of the "Top 6 Dermatology Blogs" by Bertalan Mesko, MD, PhD; and

received the HAL Medical Blog Award for Must-Read Blog in Health & Medicine.

In 2011, Gormley founded his consultancy company, Gormley NPI, which specialized in writing and editing services. He continued to write and edit for multiple natural products industry publications, including *Food & Beverage Insider*, *Nutraceuticals World*, *Natural Practitioner*, *Nutritional Outlook*, *Natural Products Insider* (now *SupplySide Supplement Journal*), *WholeFoods Magazine*, and *Vitamin Retailer*. He also wrote articles for consumer magazines such as *Alive*, *Consumers Digest*, and *Forbes*.

In addition to his work as a consultant, Gormley was also the author of six books. His most recent title was *Health at Gunpoint: The FDA's Silent War Against Health Freedom* (Square One, 2013), a criticism of the US Food and Drug Administration's (FDA's) handling of dietary supplement regulation and legislation. In 2014, he received an Excellence in Health Journalism award from Emord & Associates, a law firm that represents hundreds of companies, groups, and individuals in the natural health, alternative medicine, and dietary supplement sectors.

Over the course of his career, Gormley served on several boards, commissions, and working groups. Starting in 2004, he was a managing board member of the Natural Health Research Institute, which began as a Citizens for Health project in 2002 before becoming an independent nonprofit in 2008. He also represented the Council for Responsible Nutrition at the United Nations' Codex Alimentarius Commission in Paris and Rome in 2005. The following year, he chaired the AOAC Chromium Picolinate and Hexavalent Chromium Method Validation Working Group. From 2011 to 2020, he was a member of the editorial advisory board of *Nutritional Outlook* and

was a voting member of the NSF Joint Committee on Dietary Supplements from 2012 until his death.

During his time at Citizens for Health, Gormley worked with Turner and Turner's partner, Betsy Lehrfeld, on consumer awareness campaigns addressing issues such as artificial sweeteners, high-fructose corn syrup, trans fats, and genetically modified organisms (GMOs). He also organized a successful petition against the FDA's proposed New Dietary Ingredient draft guidance in 2011. He was a regular co-host for the *Citizens for Health Radio Show*.

Brenda Porter-Rockwell, editorial manager at Citizens for Health, worked closely with Gormley for more than a decade, starting at VRM Media. "Professionally, I admired James' commitment to the natural products industry," she wrote (email, June 29, 2025). "After leaving VRM, James stayed connected to the natural products industry as an industry consultant. He ... remained a tireless advocate for the work of Citizens for Health. Personally, over the years, James became a mentor to me, and I called on him for career advice more than once. I will always remember James as a great writer and editor and as someone who saw the bright side in everyone."

In an email to members on August 21, 2024, United Natural Products Alliance President Loren Israelsen wrote: "He was always professional, disciplined and focused in his work. Losing James really is such a loss for our community and to the cause of health freedom."

Lehrfeld, now serving as president of Citizens for Health and a principal in the Washington, DC, law firm Swankin

& Turner, was quoted in *Vitamin Retailer* as saying, "James was incredibly kind and funny, and passionate about preserving access to natural health options.... James never ceased to help us pursue a broadened local and national dialogue on behalf of everyday citizens about natural health."²

The American Herbal Products Association released a member update on August 20, 2024, announcing Gormley's death, calling him "a prominent advocate for health freedom" and a "cornerstone voice of the natural products industry."³

Gormley is survived by his two children, Natalia and Julian, and their mother, Juana. HG

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Mary Louise Bove 1955–2025

By Connor Yearsley

Mary Bove, ND, RH (AHG), a beloved naturopathic physician, herbalist, midwife, educator, author, and more, died from cancer at her home, which she called her "slice of heaven," in Colebrook, New Hampshire, on June 9, 2025, at age 70.^{1,2}

She had 50 years of experience with medicinal plants and, for more than 30 years, practiced naturopathic family medicine, herbal medicine, and midwifery, including through her longstanding practice in Brattleboro, Vermont. After retiring from practice, Bove consulted, lectured, wrote, and taught on topics including naturopathic medicine, botanical medicine, pediatrics, natural pregnancy and childbirth, traditional medicinal foods, and mind-body healing. Those who knew her remember her enthusiasm, devotion, passion, kindness, empathy, and more (see sidebar).

Mary Bove with her granddaughter, Chloe, in March 2020
Photo courtesy of Bill Chioffi



Friends, Family, and Colleagues Remember Mary Bove

Linnea Wardwell, who, with her husband Larry, has organized and promoted herb conferences, including Medicines from the Earth and the Southwest Conference on Botanical Medicine, for more than 30 years, wrote (email, June 13, 2025):

The news of Mary Bove's untimely passing came as a shock. She was a true force of nature in the herbal world, freely sharing her healing wisdom and love of plants with so many. She was all of this and more: midwife, herbalist, educator, healer, skier, author, pediatrician, storyteller, formulator, gardener, adventurer, lecturer, mother, grandmother, and friend. Throughout her remarkable life as a practitioner and teacher, her youthful enthusiasm for plants and their lessons never waned.

In her 2024 keynote at Medicines from the Earth, her stories reflected a life fully devoted to the plants, and her voice crackled with joy and passion. We treasure her words from that afternoon. "There are many unspoken lessons from the plants if we open ourselves to them," Mary said. "If we think we will [hear only] with our ears, we will be limited. But if we hear with our hearts, with every cell, with intention, you will be surprised how often they will speak to you." Mary's teachings live on in her books, recordings, and in all our hearts.

Bill Chioffi, herbalist and chief operating officer of Nammex (a Canadian company that provides a range of organic mushroom extracts), who worked with Bove at Gaia Herbs, wrote (email, June 13, 2025):

I am crushed by the loss of my dear friend Mary. She brought thousands of babies into the world through her practice and inspired the next generation of herbalists and NDs. I am grateful to have been her student, colleague, and friend. Mary loved the outdoors, skiing, hiking, and foraging, especially in Vermont, my home state and the location of her long practice. It is difficult to walk in the woods without thinking of her as I stare at the last chunk of chaga (*Inonotus obliquus*, Hymenochaetales) canker she gifted me. Every time I see an elder (*Sambucus canadensis*, Viburnaceae) flower, I will think of Mary preparing her fritters from them. Nurturing, sweet, and filled with love — that's how I will remember "Doc Bove."

Rosemary Gladstar, author and the "godmother of American herbalism," wrote (email, June 18, 2025):

Mary was a star, a light, in the lives of all who knew her. Not only a kind, compassionate person, she was a gifted healer, teacher, and mentor. While her list of accomplishments in the field of botanical medicine is great, what stands out most about Mary were her endless enthusiasm for plants and people and her gift of making herbal

knowledge accessible and available to everyone. I will miss her kindness, warmth, and empathic spirit, but her teachings will continue to inspire and influence generations of herbalists to come. She leaves behind a trail of stardust that will continue to light our paths.

Amanda McQuade Crawford, MFT, herbalist and psychotherapist who practices integrative health care at her Phyto-Humana clinics in Ojai and Ventura, California, wrote (email, June 23, 2025):

Mary brought laughter and brilliance to all of us. She was a star pupil when we were students at the School of Herbal Medicine in Tunbridge Wells, England. Her life was already full, with theater and adult responsibilities, yet she came to every class with forethought and organization. She aced every test. She was funny and big-hearted, especially to me, the only other American in a sea of Brits. At times, Mary knew the study materials better than a few of our instructors, yet used her questions in class to invite us all in, quite the opposite of seeking attention. Her father was a doctor, she explained at tea breaks. She had already been immersed in the scientific method while seeking new vistas for medicine. She made an art of remaining curious and open.

After the weekend that Mary [gave birth to] her daughter Amelia, she came Monday morning for an Anatomy & Physiology quiz and aced it. We fellow students were floored. I told her if I had just had a baby, I would not have come to school for a final exam. This was just a quiz! She laughed. For her, staying up to speed with giving birth and studying for every assignment seemed easy. I sometimes babysat for Amelia and Will. Many of us were penniless students, yet she created a home that felt luxuriously cozy.

Mary brought the best of clinical practice to conferences. She was fearless yet kind when challenging herbal dogma that our communities needed to reevaluate. I learned anew from her that critical thinking meant questioning all manner of authority. I have corrected my own mistaken takes on natural medicine thanks to her. She brought great love to this lifetime we all share. I will continue to honor Mary Bove wherever she shines now.

Jillian Stansbury, ND, naturopathic physician, ethnobotanist, and author who practices in Battle Ground, Washington, and is on the faculty of the National University of Natural Medicine, wrote (email, June 24, 2025):

Mary was one of my best friends, and I know how many others considered their connection to the good doctor to be profoundly golden. I called her "MaryGold" and sent countless letters addressed to "Marvellous Mary-

Gold." Peoples' sentiments have poured in reporting that Mary was their "lighthouse" and their "sacred anchor" and that she "hung the moon" for them. Mary was generous in sharing her wisdom and had the rare skill of deep soulful listening, always offering a kind supportive word and insightful perspective. She would instantly "get" you, remember your name, story, or struggle, then check in on how things were going the next time she saw you — the mark of a genuine healer. Her open heart, thoughtful handmade gifts, impressive medical and midwifery skills, and joyful twinkling eyes reveal her sparkling spirit. Mary was a true medicine woman whose memory will be cherished by the many hundreds of us mourning the loss of Marvelous MaryGold.

Angela McElwee, chairperson of the board of Charlotte's Web (a B Corporation™ that produces and distributes innovative hemp-based CBD wellness products) and former CEO of Gaia Herbs, wrote (email, July 1, 2025):

When I learned of Mary's passing, my mind took me immediately to the myriad farm walks we shared, her witty and grounded lectures, and to a sunset we enjoyed in the valerian (*Valeriana officinalis*, Caprifoliaceae) fields at the Gaia Herbs Farm in Brevard, North Carolina, in 2018. We skipped a team dinner that night in favor of "frolicking," and her joy knew no bounds. We giggled, played, sat in stillness, drank in the sunset, and then gently picked flowers out of each other's hair. She was a kind and patient teacher and friend to so many, and her brilliant herbal children's formulations helped our daughters and thousands of others through early childhood.... Her life was a gift to anyone who knew her.

Ric Scalzo, founder and former CEO of Gaia Herbs, benefactor of the Ric Scalzo Institute for Botanical Research at Sonoran University of Health Sciences, founder of Kokora Inc. (a supplement brand that focuses on regenerative organic farming at its farm in Costa Rica), and member of ABC's Advisory Board, wrote (email, July 5, 2025):

It is with deep reverence and sadness that I remember the life of Dr. Mary Bove. Her life touched so many people of all generations. As a naturopathic midwife, she assisted thousands of births. As a naturopathic medical herbalist, she shared countless teachings and formulations for herbal home care that will touch generations to come. As a lover of life, living, and learning, she inspired us all to be present in the gift of receptivity and reciprocity. As I write this short tribute with tears of sadness in my heart and the beautiful memories of working so closely with her, I also know that her life will remain an inspiration for us all to honor and practice with the same values and integrity that Mary lived so effortlessly.

Will and Amelia, Bove's children, wrote (email, July 10, 2025):

The mark our mother left on the world and everyone she crossed paths with was profound. She was always willing to share her wisdom and lend a helping hand. She was our rock and the matriarch of our family. Her departure has left an unmeasurable hole in our hearts, and the way we miss her is indescribable. Reflecting on all the tools, strength, and wisdom she gave us and the experiences we had with her, she embodied herself within all of us. She continues to live on through our memories, laughter, love, light, and healing. She will be by our side every time we surround ourselves with the beauty and wonders that Mother Nature has to offer. Apart from spending time with family and friends, she found her comfort and peace among nature. In herbs and happiness, we will love our mum eternally.

Molly Niedermeyer, ND, LM, naturopathic physician and midwife who practices at Emerald City Naturopathic Clinic in Seattle, wrote (email, July 16, 2025):

I met Mary Bove the first weeks she started at Bastyr University, when she was a student and I was a faculty member, chair of the Midwifery Department, and dean of naturopathic medicine. She saw her "other calling" to be a birth attendant, and she became my midwifery student. We became close friends, as you end up spending long hours together at births, and, because our children were similar ages, we also celebrated many events together (Easter egg hunts, Halloween, etc.). Although this relationship started as mentor and student, she brought so much more to my life. First, she grew my 20-tincture pharmacy to well over 100 different herbs/plants. She expanded my botanical medicine knowledge exponentially, allowing me to appreciate the plants in a more holistic and broad view. She was an accomplished physician and midwife who became my colleague soon after her graduation.

More importantly for me, she was my "sister from a different mother" as we matured through our lives. She was an equally accomplished skier (a joy we shared), gardener, and confidant, and she had a wild hair. One of my fondest memories was one time we were deep in conversation, sharing a wonderful bottle of pinot noir, and we knocked it over, spilling some on the table. She promptly got up and licked the table, as she was not going to waste one drop of that wonderful nectar. We laughed so hard. We often laughed, and now I am crying as I miss her. In naturopathic medicine, health is defined as "freedom from limitation," and I know she is finally free of her limitations.

Bove was born in Las Vegas, Nevada, on April 27, 1955, to Louis and Dorothy Bove and was one of four children. At a young age, her mother introduced her to the world of scents with the rose (*Rosa* spp., Rosaceae) jar that sat on a shelf in their living room. The blue-and-white porcelain jar was filled with rose petals sprinkled with orris (*Iris* spp., Iridaceae) root and contained three tiny vials of essential oils: sandalwood (*Santalum* spp., Santalaceae), frankincense (*Boswellia* spp., Burseraceae), and patchouli (*Pogostemon cablin*, Lamiaceae). “I loved being the one to add a drop of oil every so often to refresh the scent,” Bove wrote in a 2018 blog post.³ “This started a spark which ignited years later when I was a young woman of 20.

“I remember my excitement when I read [English herbalist] Juliette de Bairacli Levy’s book *Common Herbs for Natural Health* [Faber & Faber, London, 1974], recognizing my need to walk the herbal path,” Bove added.³ “So I went to the plants, watched them in their habitat, discovered what they looked like when they popped out of the ground in the spring, observed the shape of the leaf or color of the flower, who their neighboring plants might be, or what the dry seed pod or stem might look like in the dead of winter. By being in nature, observing her cycles, and listening to the plants, I started to ‘know’ and I found people who could teach me.”

In 1977, Bove earned a bachelor’s degree in clinical psychology from Trinity College of Vermont in Burlington, Vermont. The same year, after spending a month at an herbal gathering in Alert Bay, British Columbia, Canada, with medicine woman Norma Myers (1919–1988) of Green Shores Herbal College, Bove knew she was going to be an herbalist. She returned home to Portland, Maine, where she opened and operated a retail herb store, Hippocratic Herbarium, which sold dry herbs, books, and herbal products (1978–1981).

“I started reading every herb book or publication I could get my hands on, teaching classes at the community center, giving talks to the local garden clubs, taking herb walks in the parks, and growing herbs at a local farm,” Bove wrote.³ “My kitchen was filled with drying herbs, little bottles, macerating potions, mortars and pestles, and my notebooks were filled with herbal recipes. Things took off for me at this point, as I was truly on the herbal path.”

Bove lectured and taught herbal topics through regional organizations in southern Maine from 1979 to 1984. And, in the early 1980s, at Ram Island Farm in Cape Elizabeth,



Mary Bove

Maine, she cultivated organic medicinal and culinary herbs and flowers and managed retail, wholesale, and mail-order sales throughout the United States.

In 1987, she earned a diploma of phytotherapy from the School of Herbal Medicine in Tunbridge Wells, England, where she learned from noted Dutch-born herbalist Hein Zeylstra (d. 2001), and, in 1988, became an elected member of the National Institute of Medical Herbalists (NIMH), which was established in 1864 in London. She received a doctorate of naturopathic medicine (ND) from Bastyr University in Seattle in 1990 and a certificate of midwifery from Bastyr University in 1991. She was also a Registered Herbalist of the American Herbalists Guild (AHG).

At Bastyr University, Bove was a member of the teaching faculty in the Botanical Medicine Department and Midwifery Department (1989–1993), the co-chair of the Midwifery Department (1991–1992), and chair of the Botanical Medicine Department (1991–1993). At Evergreen Natural Health Clinic in Seattle, she practiced general naturopathic medicine, specializing in gynecology, midwifery, and pediatrics (1990–1993).

Then, for more than 20 years, she owned and managed the Brattleboro Naturopathic Clinic in Brattleboro, Vermont, where she practiced general family medicine, naturopathic midwifery, and pediatrics (1993–2014).

Bove’s book *An Encyclopedia of Natural Healing for Children and Infants* (Keats Publishing, 1996; 2nd ed., 2001) is a leading reference on natural pediatric medicine and covers more than 50 childhood illnesses and herbs that are useful for treatment. The book also includes nutrition guidelines for infants and children, tips for boosting children’s immune systems, and information on harvesting, drying, storing, and preparing medicinal herbs.

With Linda Costarella, ND, Bove also co-authored the book *Herbs for Women’s Health: Herbal Help for the Female Cycle from PMS to Menopause* (Keats Publishing, 1997). For *Better Nutrition* magazine, Bove wrote a monthly column from 2004 to 2006 focusing on women’s and children’s health. She was also a lecturer and speaker at various international conferences and symposia on herbs, midwifery, and naturopathy.

For more than 35 years, Bove contributed significantly to the mission of Gaia Herbs, a company previously based in Massachusetts and now in Brevard, North Carolina, where she was involved with education and develop-

ment of GaiaKids® Supplement Collection for children (1996–2014). As an educator and formulator for Gaia Herbs from 2014 to 2019, she was involved in formulating herbal supplement products and educating sales representatives, staff, consumers, and professional health care providers through lectures, webinars, and podcasts.

“Mary was not only a treasured part of the Gaia Herbs community, but also a profound force in the broader world of botanical medicine and women’s health,” according to a tribute published on Gaia Herbs’ website shortly after Bove’s death.² “She believed in the power of plants to help women thrive through the seasons of life, and that belief lives on in the Gaia Herbs women’s health line, and some of our beloved adrenal and nootropic formulas, which she helped formulate with thoughtful intention and decades of experience.

“Her expertise was matched only by her presence,” Gaia Herbs’ tribute added.² “She embodied joy, connection, and wisdom and was a delight to everyone who encountered her. Her teachings will continue to ripple outward, shaping the lives and practices of thousands who were touched by her wisdom.”

Bove also consulted for BioSan Laboratories, Inc. (the former producer of the brands MegaFood® and Innate® Response Formulas) in Derry, New Hampshire, where she was involved with botanical and nutritional formulation and education (2003–2011).

She was an adjunct faculty member at the Tai Sophia Institute (now the Maryland University of Integrative Health) in Laurel, Maryland (2003–2010), The Scottish School of Herbal Medicine in Glasgow, Scotland (2004–2010), and the Massachusetts College of Pharmacy and Health Sciences in Boston (2008–2010). Beginning in 2014, she worked as a freelance writer, lecturer, and educator, and she continued consulting for natural and botanical supplement companies, focusing on botanical formulation, education, and research.

At the 2024 Medicines from the Earth Herb Symposium in Black Mountain, North Carolina, Bove gave an autobiographical keynote address, “Inspired by Herbs: The Herbal Journey of a Modern-Day Herbalist,” which is available online.¹ And, in March 2025, she received the American Botanical Council’s (ABC’s) Fredi Kronenberg Excellence in Research and Education in Botanicals for Women’s Health Award for her “decades-long trailblazing commitment to and passion for herbal medicine, naturopathy, and women’s health.”⁴

Mary Bove is survived by her daughter, Amelia Ann Dias; her son, William Wallace Winship IV; her two grandchildren, Chloe and Olivia Dias; her siblings, Andrew, Mike, Ann, Matt, and Greg; and her cats, Comet, Camden, and Elsa. A celebration of life for Bove is planned for October 11, 2025, at Ram Island Farm in Cape Elizabeth, Maine. HG

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FROM THE FIELD

A tea (*Camellia sinensis*, Theaceae) harvester in Sichuan Province in China.

Photo by Chris Kilham



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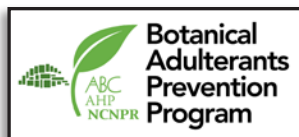
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