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The Herbal Dispatch

A monthly publication of the Medicinal Botanical Program

The goal of this newsletter is to inform readers of the Program's educational, research and outreach activities and events; and of results of the latest research on the chemistry, cultivation, processing and preventive and therapeutic use of botanicals.

The views expressed in The Herbal Dispatch are those of the authors and do not necessarily reflect those of MSU or the Medicinal Botanical Program staff.

Authors are solely responsible for their articles.

Mario R. Morales
Editor/Publisher

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Fourth Spring Conference, 2 May 2009

On 2 May 2009, the Mountain State University Medicinal Botanicals Program and the West Virginia Herb Association will hold their fourth Spring Conference at O'Dell Hall, Mountain State University Beckley campus. The theme of the event is *Medicinal Plant Applications*. The conference is being sponsored by the USDA Agricultural Research Service.

This year the stress of the conference is on medicinal plant applications with topics such as Aromatherapy, Energy Medicine; Herbs for Women's Health Issues; Aphrodisiacs; Herbs for Diabetes Mellitus, Menopause, Cancer, and Obesity; Natural Cosmetics; Pain and Inflammation; Planting According to Moon Phases; Flower Essences; Diabetes and Diet; Kitchen Herbs; Healing Teas and Tinctures; and Cooking with Herbs.

The organizers selected speakers who are experts in the field of medicinal plant preparations and applications and who have spent years investigating the medicinal properties of plants and the ways to use them.

Schedule

The schedule has 2 concurrent sessions on a variety of topics on medicinal and aromatic plant preparations and applications (see [page 5](#)).



Registration for Participants

Cost: \$50. Please make check or money order payable to [Mountain State University](#) and mail it with form (on [page 6](#)) to:

Mountain State University
Medicinal Botanicals Program
P.O. Box 9003
Beckley, WV 25802-9003

Registration for Vendors

This is a great opportunity for vendors to promote their trade and create links for market development. The number of tables is limited so we encourage you to reserve early (Form on [page 6](#)). Tables cost \$10 ea if reserved before April 15th, and \$15 ea if reserved after April 15th. Fees are not refundable.

Lodging

Beckley has an abundance of hotels. Here are two that are affordable and close to campus:

Budget Inn
223 S Heber St; 304.253.8318

Microtel Inn & Suites
200 Woodlawn Ave; 304.255.2200

The intersection of Harper Road and I-64/I-77 has several hotels; here is information for two of them:

Holiday Inn
114 Dry Hill Rd; 304.252.2250

Super 8 Motel
2014 Harper Rd; 304.253.0802

Proceedings

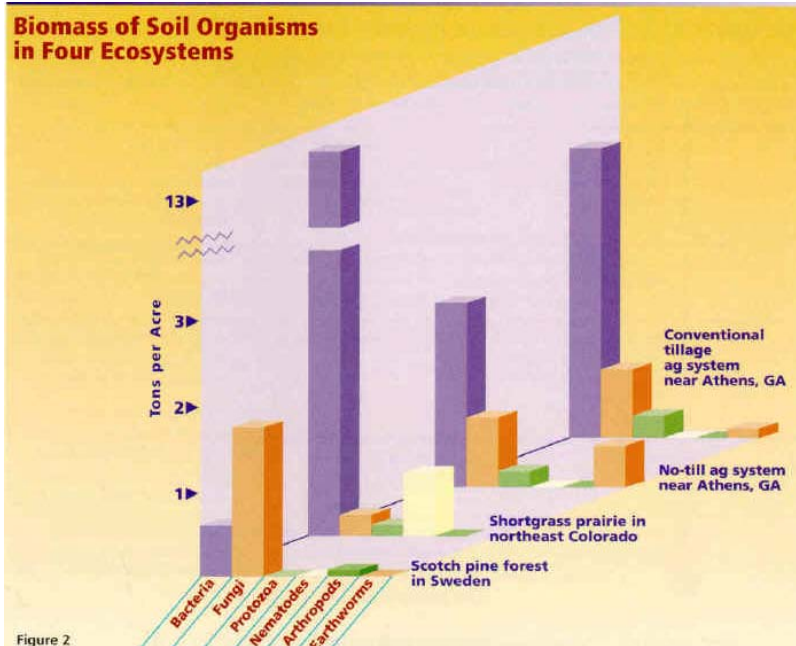
If you are concerned because you won't be able to attend concurrent presentations, do not worry. Presenters will provide manuscripts so that a proceedings book will be available a few months after the conference.

Contact for Information

Dean Myles, 304.929.1687,
email:
dmyles@mountainstate.edu.

Information and forms also at
www.mountainstate.edu/usda
or www.WVHERB.org.

The Soil Biology Primer-Part IV



CHAPTER 2: THE FOOD WEB & SOIL HEALTH

By Elaine R. Ingham
Oregon State University

How Do Food Webs Differ?

Each field, forest, or pasture

has a unique soil food web with a particular proportion of bacteria, fungi, and other groups, and a particular level of complexity within each group of organisms. These differences are the result of soil, vegetation, and climate factors, as well as land management

The ratio of fungi to bacteria is characteristic to the type of system. Grasslands and agricultural soils usually have bacterial-dominated food webs – that is, most biomass is in the form of bacteria. Highly productive agricultural soils tend to have ratios of fungal to

practices. (See figure of food webs in different ecosystems.)

Typical Food Web Structures

The “structure” of a food web is the composition and relative numbers of organisms in each group within the soil system. Each type of ecosystem has a characteristic food web structure (see table of typical numbers of organisms in soil). Some features of food web structures include:

bacterial biomass near 1:1 or somewhat less. Forests tend to have fungal-dominated food webs. The ratio of fungal to bacterial biomass may be 5:1 to 10:1 in a deciduous forest and 100:1 to 1000:1 in a coniferous forest.

Organisms reflect their food source. For example, protozoa are abundant where bacteria are plentiful. Where bacteria dominate over fungi, nematodes that eat bacteria are more numerous than nematodes that eat fungi.

Management practices change food webs. For example, in reduced tillage agricultural systems, the ratio of fungi to bacteria increases over time, and earthworms and arthropods become more plentiful.

How Is the Food Web Measured?

The measurement techniques used to characterize a food web include:

Counting. Organism groups, such as bacteria, protozoa, arthropods, etc.; or subgroups, such as bacterial-feeding, fungal-feeding, and predatory nematodes, are counted and through calculations, can be converted to biomass.

Direct counts – counting individual organisms with the naked eye or with a microscope. All organisms can be counted, or only the active ones that take up a fluorescent stain (Figure 3).

Plate counts – counting the number of bacterial or fungal colonies that grow from a soil sample.

Typical Numbers of Soil Organisms in Healthy Ecosystems			
	Agricultural Soils	Prairie Soils	Forest Soils
Bacteria	100 million to 1 billion.	100 million to 1 billion.	100 million to 1 billion.
Fungi	Several yards. (Dominated by vesicular-arbuscular mycorrhizal (VAM) fungi).	Tens to hundreds of yards. (Dominated by vesicular-arbuscular mycorrhizal (VAM) fungi).	Several hundred yards in deciduous forests. One to forty miles in coniferous forests (dominated by ectomycorrhizal fungi).
Protozoa	Several thousand flagellates and amoebae, one hundred to several hundred ciliates.	Several thousand flagellates and amoebae, one hundred to several hundred ciliates.	Several hundred thousand amoebae, fewer flagellates.
Nematodes	Ten to twenty bacterial-feeders. A few fungal-feeders. Few predatory nematodes.	Tens to several hundred.	Several hundred bacterial- and fungal-feeders. Many predatory nematodes.
Arthropods	Up to one hundred.	Five hundred to two thousand.	Ten to twenty-five thousand. Many more species than in agricultural soils.
Earthworms	Five to thirty. More in soils with high organic matter.	Ten to fifty. Arid or semi-arid areas may have none.	Ten to fifty in deciduous woodlands. Very few in coniferous forests.

Black Haw (*Viburnum prunifolium* L.)

**By David C. Carman
Grower and Collector
Princeton, West Virginia**

Honeysuckle family
(Caprifoliaceae)

Native deciduous shrub that grows to 30 feet in height under favorable conditions (commonly, 15 feet or less) and can be distinguished from its many close relatives by its one to three inch long leaves, which are opposite, slightly pointed, oval, glabrous, finely serrate, and dull green (not shiny).

Black haw is also known as sweethaw, blackhaw viburnum, cramp bark, staghorn, haw, sheepberry, sloe, shonny, and sloe-leaved viburnum. When I was a boy, my friends and I called the fruits "halls".

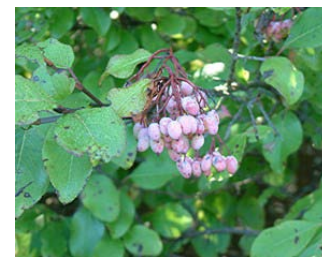
V. prunifolium prefers rocky, dry hillsides and is commonly seen growing in neglected fence row thickets.

Clusters of small white terminal flowers appear in May and develop over the summer to produce loose

clusters of sweet, shriveled, dark blue drupes (about raisin size), containing large, flat seeds. Fruits are readily consumed by birds and small boys.

This shrub has ornamental value and deserves to be used as such in landscaping.

Root and trunk bark have medicinal value. Modern research confirms uterine sedative properties. It has been used by Native Americans and others as a tonic and nervine, also for



uterine hemorrhage treatment, painful menses, miscarriage prevention, childbirth spasm relief, asthma, and diarrhea.

In 2008, buyers listed dry bark price at two dollars per pound, which has trended upward over the past few years.

US Diabetes Rate up 90% in Past Decade

*Will Dunham
Reuters, Oct 30, 2008*

The rate of new cases of diabetes soared by about 90 percent in the United States in the past decade, fueled by growing obesity and sedentary lifestyles, U.S. health officials said.

Diabetes experts said the findings show there is no end in sight to the diabetes epidemic.

Newly diagnosed cases of diabetes rose to 9.1 per 1,000 people annually between 2005 to 2007, up from 4.8 per 1,000 from 1995 to 1997, the Centers for Disease Control and Prevention said.

The most common form of diabetes, type-2, is closely linked to obesity and has become increasingly common in recent decades as more people become obese. An estimated 90 percent to 95 percent of the new cases are type-2 diabetes as opposed to type-1 diabetes, also called

juvenile diabetes.

The report, based on data from 33 states, also detailed regional variations, showing -- as other studies also have -- that the problem is most acute in the southern United States.

Experts say that losing even modest amounts of weight and getting more physical exercise can help prevent diabetes but many people are not taking these steps.

"The hope and the message is that if people are kind of changing their lifestyles, doing the things that are good for them, then hopefully we can reverse the trend," the CDC's Karen Kirtland, who led the study, said in a telephone interview.

American Diabetes Association spokesman Matt Petersen said: "Some day we'll see a leveling off of diabetes incidence if the obesity rate levels out. But clearly it hasn't started yet. We won't see the plateau in

type-2 diabetes for quite a while."

Nine of the 10 states with the highest rates of new cases were in the South: Alabama, Florida, Georgia, Kentucky, Louisiana, South Carolina, Tennessee, Texas and West Virginia, which had the highest rate among states at 12.7 per 1,000 people. Arizona was the only state in the highest 10 not in the South.

Minnesota had the lowest rate, at five per 1,000 people. The U.S. territory of Puerto Rico exceeded even West Virginia, with an annual new case rate of 12.8 per 1,000, the CDC said.

The report was released three days after U.S. researchers found that while doctors are using a wider array of newer, more costly drugs to treat diabetes, there is little long-term proof they work better than older, cheaper medications.

Some common medications include metformin, which is available generically and also known by the Bristol-Myers Squibb brand name Glucophage.

There are newer diabetes drugs in a class called glitazones, which include Takeda's Actos or pioglitazone, and GlaxoSmithKline Plc's Avandia, or rosiglitazone.

Avandia has been under fire over safety concerns, and the U.S. advocacy group Public Citizen on Thursday called for it to be banned. GlaxoSmithKline defended its safety.

The American Diabetes Association said 23.6 million U.S. children and adults -- about 8 percent of the population -- have diabetes.

Diabetics, whose blood sugar levels are too high, are at higher risk of heart disease, stroke, kidney damage and blindness.

Appalachian Plant Profile: Spice Bush

**By Dean Myles, Coordinator
Medicinal Botanicals Program
Mountain State University**

Lindera benzoin (L.) Blume is a small native shrub commonly known as northern spice bush or spice bush. Spice bush is a slow growing deciduous shrub reaching between 8 to 12 feet in height [1]. Spice bush has an alternate leaf and twig arrangement [2]. The 4 to 6 inch long leaves are simple, entire and aromatic. The leaves are obovate shaped with a glossy dark-green color above and paler below. The apex is acute and the base is cuneate (wedge-shaped). The aromatic twigs are greenish-brown in color with lenticels. The terminal bud is absent [3]. The small lateral buds are superposed (having an auxiliary flower bud), globose (round), and green in color. The bark is thin, greenish-brown in color and aromatic. Spice bush is dioecious (male and female flowers on separate plants), with the male flowers being larger and showier than the female ones. The spice-scented pale-yellow flowers form dense umbel clusters before the leaves flush. The ripe fruit is a red aromatic

drupe with an oval to oblong shape.

Although Spice bush wood has no commercial use, it has had a variety of traditional uses [4]. Many animals such as rabbits, raccoons, deer and over 20 bird species have been reported to browse the leaves and fruits. Spice bush is also a larval host for the Eastern Tiger Swallowtail, and Spice bush Swallowtail butterflies. Because spice bush inhabits fertile woodlands, early surveyor and settlers use it as an indicator plant for promising agricultural land. Medicinally, the leaves, twigs and dried fruits have been used. The Cherokee tribes used spice bush for female obstructions, colds, coughs, as a diaphoretic, a pulmonary aid, respiratory aid, and as a spring tonic [5]. The Creek tribes used spice bush as an analgesic, a diaphoretic, and as an emetic. The Iroquois tribes used spice bush for colds, as a febrifuge (fever reducer), as a panacea (cure-all), and for gonorrhea and syphilis. The Rappahannock tribe used spice bush as a gynecological aid. The Cherokee, Creek, Chippewa, Iroquois, and

Rappahannock tribes utilizes spice bush for beverages, and as a spice.

Spice bush can be found growing throughout its range in rich moist woodlands. The pH range is 4.5-6.5. Spice bush can grow on a variety of forest soils. Propagation is from seed [6]. Seeds require a warm-cold stratification regime to germinate. Sowing in the fall permits seed to undergo warm stratification prior to winter. Seeds should be stratified for 90-120 days at 41°F. Germination rate is about 25%. Seeds can be sown in permanent locals or in seed beds for two years before transplanting. Spice bush is considered to be secure within its natural range with the exception of Maine where it is listed as "Special Concern" [1]. Remember to contact your local native plant program or the National Plants Database at <http://plants.usda.gov/> for species status.

1. USDA Plants Database *Lindera benzoin* Accessed 3/5/09 at <http://plants.usda.gov>
2. Preston, R.J. 1989 **North American Trees** Iowa



- State University Press, Ames, Iowa
3. Strausbaugh, P. D., Core E., 1978 **Flora of West Virginia** Seneca Books, Inc., Morgantown, WV
 4. Nesom, G. NRCS Plant Guide: *Lindera benzoin* Accessed on 3/6/09 at http://plants.usda.gov/plantguide/pdf/pg_libe3.pdf
 5. Native American Ethnobotanical Database *Lindera benzoin* University of Michigan-Dearborn. Accessed on 3/5/09 at <http://herb.umd.umich.edu/>
 6. Native Seed Germination Database *Lindera benzoin* Accessed on 3/6/09 at http://www.nativeplantnetw.ork.org/network/view.asp?p_rotocol_id=516,1313
- Photograph courtesy of: Tennessee Vascular Plants Atlas at <http://tenn.bio.utk.edu/vascular/database>

Appalachian Academy of Herbal Medicine Herb Walk

On Sunday April 5th, the students at the Appalachian Academy of Herbal Medicine enjoyed an herb walk in the New River National Park near Prince. The walk, guided by Dr. Amjad and Dean Myles, directed the students through in-depth discussions on historical uses, identification characteristics, and habitat and cultivation requirements.

Students observed many of West Virginia's spring ephemerals including Dutchman's breeches (*Dicentra cucullaria*) squirrel corn (*Dicentra canadensis*), trout lilies (*Erythronium americanum*), cut-leaved toothwort (*Dentaria laciniata*), red trillium (*Trillium erectum*), twin leaf, (*Jeffersonia diphylla*), blood root

(*Sanguinaria canadensis*), dwarf larkspur (*Delphinium tricornis*), spring beauty (*Claytonia virginica*), hepatica (*Hepatica acutiloba*), miterwort (*Mitella diphylla*), bellwort (*Uvularia grandiflora*), toadshade (*Trillium sessile*), violets, and many other little woodland wild flowers, **all** in full bloom. A few other medicinal plants identified

were black cohosh (*Cimicifuga racemosa*), spicebush (*Lindera benzoin*), mullein (*Verbascum thapsus*), cleavers (*Galium aparine*), wild ginger (*Asarum canadense*) and foam flower (*Tiarella cordifolia*). For information on the Appalachian Academy of Herbal Medicine contact Janice Sumpter at 304-252-1600.

Schedule–MSU/WVHA 2009 Spring Conference*

MSU/WVHA Spring Conference: Medicinal Plant Applications
2 May 2009
O'Dell Hall, Mountain State University, Beckley, WV

07:30–09:30	Registration; Vendor Set-up, Room 103	
A.M.	Room 101	Room 102
08:00–08:55	Aromatherapy <i>Terri Johnson, Herb Grower</i>	The Art of Timing: Planting, Harvesting, and Processing by the Phases of the Moon <i>Eva Ristl, Herb Grower</i>
09:00–09:55	Energy Medicine, Part I <i>Dr. Linda Geronilla, Marshall University</i>	New Pharmacological Use for an Ancient Herb (<i>Artemisia annua</i>) <i>Dr. Jorge Ferreira, USDA-ARS AFSRC</i>
10:00–10:30	Break; Vendor Session, Room 103	
10:30–11:25	Energy Medicine, Part II <i>Dr. Linda Geronilla, Marshall University</i>	Nature's Answer to Pain and Inflammation-Part I <i>David Hawkins, Master Herbalist</i>
11:30–12:25	Flower Essences <i>Dr. Bonnie Buchman, RN, ND, PhD</i>	Nature's Answer to Pain and Inflammation-Part II <i>David Hawkins, Master Herbalist</i>
P.M.		
12:30–01:30	Lunch Break, Room 103	
01:30–02:25	Aphrodisiacs: Everything You Wanted to Know but Were Afraid to Ask <i>Dr. Hassan Amjad</i>	Purslane: Much More than a Weed <i>Dr. Mario R. Morales, MBP Director, MSU</i>
02:30–03:25	Herbalism: What a Herbalist Can Do for Diabetes Mellitus, Menopause, Cancer, and Obesity <i>Dr. Hassan Amjad</i>	Diabetes and Diet <i>Arnie Vaughn, Dietician-Nutritionist, Certified Diabetes Educator</i>
03:30–04:00	Break; Vendor Session, Room 103	
04:00–04:55	Natural Cosmetics—Learn How to Make and Use Them <i>Dr. Hassan Amjad</i>	Kitchen Herbs 101: Vinegars, Oils, and Easy to Grow Herbs <i>Melissa Dennison, Herb Grower</i>
05:00–05:55**	Cooking with Herbs <i>Chef Sawsan Galal, MSU School of Culinary Arts</i>	Herbal Preparations: Healing Teas and Tinctures <i>Janice Sumpter, Herbalist</i>
06:00–06:30	Discussion and Conference Closing	

* Schedule subject to change

** Weather permitting participants may also tour the MSU Medicinal Plants Garden

Mountain State University

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 Beckley, WV 25801

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Program's Fax: (304) 929-1640

Webpage:
www.mountainstate.edu/usda

About the Medicinal Botanical Program

This Program was created as result of a Specific Cooperative Agreement between Mountain State University and the USDA/ARS-Appalachian Farming Systems Research Center in Beaver, WV. The establishment of this agreement came through the efforts of Senator Robert C. Byrd and a Congressional Appropriation.

The mission of the Program is to promote the medicinal plant industry in WV through research, education and outreach. The Program conducts research aimed at the identification and development of native plants as specialty vegetable/forage crops. Educational offerings include symposia, workshops and farm visits.

Subscriptions

Would you like to receive this newsletter? Subscriptions are free and subscribing is easy. Just send us your name, address and e-mail (if available). We provide electronic and printed versions of the newsletter; indicate which one you would prefer by sending an electronic message to: mmorales@mountainstate.edu

Or a letter request to:

Mountain State University
 Medicinal Botanicals Program
 P.O. Box 9003
 Beckley, WV 25801-9003

Contributions

Dear reader:

Would you like to share your knowledge, skills and experience with us? Do you know how to produce, process, market and/or use herbs and medicinal plants?

Would you like to share this knowledge with our readers? It is quite simple. Just write your ideas on a piece of paper and mail it to us. We will type it and make sure that it gets published in our newsletter.

Please send contributions to the addresses indicated above.

The Soil Biology Primer-Part IV (Cont'd)

Measuring activity levels.

Activity is determined by measuring the amount of by-products, such as CO₂, generated in the soil, or the disappearance of substances, such as plant residue or methane used by a large portion of the community or by specific groups of organisms.

These measurements reflect the total "work" the community can do. Total biological activity is the sum of activities of all organisms, though only a portion are active at a particular time.

Respiration – measuring CO₂ production. This method does not distinguish which organisms (plants, pathogens, or other soil organisms) are generating the CO₂.

Nitrification rates – measuring the activity of those species involved in the conversion of ammonium to nitrate.

Decomposition rates – measuring the speed of disappearance of organic residue or standardized cotton strips.

Measuring cellular constituents. The total biomass of all soil organisms or

specific characteristics of the community can be inferred by measuring components of soil organisms such as the following.

Biomass carbon, nitrogen, or phosphorus – measure the amount of nutrients in living cells, which can then be used to estimate the total biomass of organisms. Chloroform fumigation is a common method used to estimate the amount of carbon or nitrogen in all soil organisms.

Enzymes – measure enzymes in living cells or attached to soil. Assays can be used to estimate potential activity or to characterize the biological community.

Phospholipids and other lipids – provide a "fingerprint" of the community, and quantify the biomass of groups such as fungi or actinomycetes.

DNA and RNA – provide a "fingerprint" of the community, and can detect the presence of specific species or groups.

Forms–MSU/WVHA 2009 Spring Conference

PARTICIPANT REGISTRATION FORM

Name: _____

Company: _____

Address: _____

City: _____

State: _____ **Zip code:** _____

Telephone: _____

Email: _____

Registration Fee: \$50

Box lunch (optional): \$ 10 (sandwich, chips, dessert, drink)

_____ Ham _____ Turkey _____ Vegetarian

VENDOR REGISTRATION FORM Before April 15: \$10/table; after April 15: \$15/table

Name: _____

Affiliation: _____

Address: _____

City: _____

State: _____ **Zip code:** _____

Telephone: _____

Email: _____

Number of 4 x 8 tables: _____

Special requirements (power, cold storage, etc.): _____