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The Herbal Dispatch

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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.

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MSU MBP Director Traveled to Vietnam to Assist Farmers

When Winrock International, a USA nonprofit organization, asked Dr. Mario Morales to help implement a medicinal and aromatic plants (MAPs) project in Vietnam in January 2008, he couldn't refuse. "It offered the opportunity to help Vietnamese farmers increase their economic opportunities, sustain natural resources, and protect the environment," he said.

Morales, director of the Mountain State University Medicinal Botanicals Program and a MAPs expert, with the support of MSU and the USDA Agricultural Research Service, traveled to Vietnam to evaluate the forest in the Da Teh District, Lam Dong Province, and the plans of a flavors and fragrances company to contract Da Teh farmers to produce MAPs. He was also asked to identify and recommend marketable plant species that would perform well under the Da Teh District environmental conditions. The assignment was from January 19 to February 3.

"The problem is that people are clearing the forest to plant agricultural crops such as cashew, and this activity is seriously affecting the environment and plant and animal diversity in the area. Winrock International and Saroma—the flavors and fragrances company—are

interested in creating a buffer zone between the intensive agriculture lowland and the forest (mountains)," Morales explained.

"A central objective was to make commune members aware of the importance of preserving the forest as it reduces water runoffs, regulates temperatures, protects rivers and lakes, prevents soil erosion, and maintains animal and plant diversity. It was also important to explain that the forest can be a good source of income if shade-tolerant medicinal and aromatic crops are planted in the understory. The market for natural medicines and therapeutic oils is expanding and the implementation of this project would improve the economy of Da Teh District farmers", Morales said.

"The Saroma Company recently bought equipment for extraction and purification of natural products and is expanding its processing plant," he said. "The company seems to be financially healthy and capable of entering into long-term partnership with commune members for the production of MAPs."

After meeting with Winrock, Saroma, and Da Teh District leaders and exploring the area,



Dr. Morales recommended the following plant species: patchouli (*Pogostemon cablin* Benth., Lamiaceae), cardamom (*Elettaria cardamomum* Maton, Zingiberaceae), mang-tang [*Litsea cubeba* (Lour.) Pers., Lauraceae], and thien-nien-kien [*Homalomena occulta* (Lour.) Schott, Araceae].

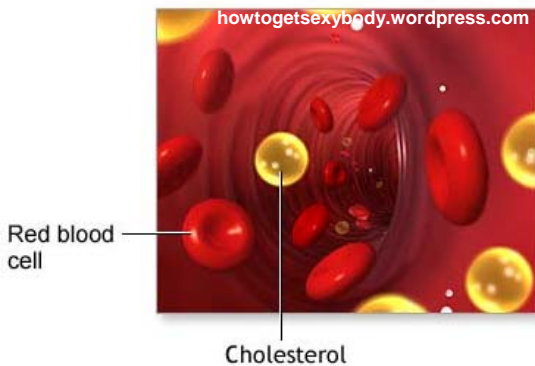
"Evaluation trials to measure the performance of these plants will be needed. Introduction of crops to a new area requires the selection of varieties with wide adaptability, high yields, and resistance to insects and diseases. Extension agents will need to train farmers about the culture, processing and marketing of these crops," he said.

"This project is a great opportunity for improving the economy of the Da Teh District while protecting the forest and its natural resources. The success of the project will depend on Saroma's commitment to signing long-term contracts that benefit the farmers, too," he concluded.

By Fred Pace, The Register-Herald, Beckley, WV, 2/25/08, modified.

Lowering Cholesterol ... How Low Should You Go?

Normal interior view of artery



artery disease, and stroke. And they have also discovered that reducing LDL cholesterol reduces risk. As studies have accumulated, the targets for LDL cholesterol levels have

Strict vegetarians don't get any cholesterol in their diets, but they still have plenty of cholesterol in their blood. So does everyone else. In fact, even folks in the burger and fries crowd can trace about two-thirds of their blood cholesterol to their metabolism, not their appetites.

Cholesterol is manufactured in the liver. Diet certainly influences how much your liver produces — when you eat more saturated or trans fat, your liver churns out more cholesterol — but even with a vegetarian diet, regular exercise, and a trim build, the liver produces an irreducible minimum amount of cholesterol. It's a good thing, too, since cholesterol makes vital contributions to health. For one thing, it is a major component of all human cell membranes. For another, it is the building block of steroid hormones, including cortisol, estrogen, and testosterone.

Scientists know that cholesterol is essential, but they also know that high levels of LDL ("bad") cholesterol dramatically increase the risk for heart attacks, angina, peripheral

steadily declined.

For healthy people, an LDL of 160 milligrams per deciliter (mg/dL) was once considered acceptable; now 130 mg/dL is okay, and 100 mg/dL, ideal. For people with stable coronary artery disease, diabetes, hypertension, or other major cardiovascular risk factors, the targets are more stringent still: 100 mg/dL is okay, 70 mg/dL or less, ideal. And for patients with unstable coronary heart disease, it's 70 mg/dL or bust.

Diet, weight control, and exercise are essential for everyone who needs to reduce his cholesterol. But most people need medication to approach an LDL of 100 mg/dL, and virtually everyone needs help to reach 70 or below. Many powerful drugs can provide that help. Most often, doctors turn to a statin drug, but if a statin won't do or if it doesn't do the job by itself, many other drugs are available.

Doctors can get your LDL cholesterol way down. But does it really help to get it very, very low? And is it safe?

The benefits and selection of statins

The first statin drug (*lovastatin*) was licensed for use in the United States in 1987. Five additional members of the group are now available. Although there are some differences among them, they all inhibit the activity of *3-hydroxy-3-methylglutaryl coenzyme A reductase*. It's the chief enzyme for cholesterol production; when it's blocked, the liver manufactures less cholesterol and blood cholesterol levels fall. And statins share another important benefit: As cholesterol production falls, the liver takes up more cholesterol from the blood, so levels drop even further.

Having pretty numbers is one thing, preventing disease another. But when the Cholesterol Treatment Trialists' Collaboration performed a meta-analysis of 14 randomized clinical trials of statins, they found impressive benefits. Collectively evaluating more than 90,000 patients for five years or longer, the studies showed that statin therapy reduces the risk of heart attack by 23%, the risk of stroke by 17%, and the overall mortality rate by 12%. Significant benefits were evident by the end of one year, but the gains increased steadily in subsequent years. People who were free of heart disease when they entered the trials enjoyed substantial protection, but people who had already been diagnosed with heart disease by the time they began therapy reaped even greater gains. In addition, the statins were safe, with very low rates of significant liver or muscle damage.

In round numbers, the Cholesterol Treatment Trialists' meta-analysis found that lowering LDL cholesterol by about 2 mg/dL reduces the risk of a major vascular event by about 1%. The greater the reduction, the greater the protection. But the report did not focus on extreme reductions of LDL cholesterol. Fortunately, other studies provide that information.

Low, low, low

Doctors in Michigan evaluated the benefits of extreme reductions in LDL cholesterol by studying 132 patients with heart disease who had LDL levels of 80 mg/dL or less *before* starting statin therapy; their average LDL was just 63 mg/dL. Despite their already low LDL levels, 63 of the patients were started on a statin while the other 69 were not. All the patients had similar risk factors, and they were similar in the extent and severity of their heart disease. Aside from the statins, they also received similar medical therapy. Over six months of observation, however, an important difference emerged: Major vascular events occurred in 29% of the patients who did not get statins but in only 9.5% of the individuals who had extremely aggressive LDL reductions with statins.

Because it involved many more patients and was a randomized clinical trial, a second study is even more convincing. In an earlier report, the Harvard scientists who directed the PROVE-IT trial demonstrated that intensive statin therapy that achieved average LDL levels of 62 mg/dL produced

Growing Virginia Snakeroot and Fairywand for Profit – Part II

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

Growing Virginia snakeroot from seed presents several daunting challenges.

1. Plants do not produce seeds consistently each year. For example, my 2007 seed crop quantity was only 56 % of the 2006 seed crop.
2. Special arrangements are required to collect the seeds from each pod as they ripen to prevent loss resulting from being carried off by ants or lost under leaves and debris.
3. Low seed production per plant is a reality. Pods average about 12 seeds each with but one or two pods per single stem plant.
4. Erratic and very low germination rate, and first year mortality in open, unprotected seed beds are also part of the challenge. Only 11 to 12 % germination can be expected, beginning in May and extending into July. Further low germination will occur the second year. Because of this natural low germination rate, several techniques are being researched to increase the germination percentage of these seeds.
5. Physical protection is absolutely necessary for successful seed bed growing.

During the long seed harvest season, August through October, seeds should be collected every two days and kept naturally moist in a sealed plastic bag in the

crisper of a refrigerator. When all seeds have been collected, they should be planted immediately in previously prepared beds that have been supplemented with well decayed hardwood leaf humus and raw bone meal. Beds should have board edges and tight screen covers to exclude predators such as pecking birds, mice, moles, rabbits, squirrels, and larvae of the pipe vine swallowtail butterfly (*Battus philenor*), which will completely defoliate Virginia snakeroot at any stage of growth. Seedling beds must be kept moist. The delicate little seedling plants have a very small, shallow root system and will not survive in dry soil. Apply a light top mulch of white pine needles before seedling emerge. Germinating seedlings have no difficulty emerging through pine needle mulch. The mulch will help conserve moisture and prevent splashing mud from rains which will knock down the little plants and “paste” them to bare ground. First year seedlings may have to be watered during dry summer months.

Experience growing these plants proves they will thrive and grow beyond all expectations under good growing conditions such as organic mulch, generous spacing, partial shade, well worked amended humus soil, adequate moisture, and protection from predation.

Established plants are tough, hardy, survivors. They will grow to 24 inches tall, and have ten or more above ground stems from one

rhizome, thus producing more seeds and an ounce or more green-root weight. Harvested roots lose about two thirds their green weight during the drying process, which is on par with ginseng and goldenseal in weight loss.

A planting must be protected from browsing deer and the pipe vine swallowtail butterfly larvae. Complete detailed growing instructions will be provided with planting stock when research is completed and planting stock is available. I am not aware of any diseases affecting this plant.

A well spaced seed bearing planting will allow nature to take its course to perpetually renew the growing area by self seeding. Little seedling plants will appear at random each year within a few inches to a few feet of the seed bearing mother plants, and may be allowed to grow to maturity and harvest. Crowded seedlings may be transplanted at the end of their second or third growing season. Your planting area may also be supplemented and/or expanded periodically with additional planting stock. I do not recommend a large first planting. Start on a smaller scale, learn from experience and expand your planting area in accordance with a planned progression.

A grower will be able to harvest his first crop sooner by establishing his planting with planting stock thus eliminating disappointments and delay associated with getting started by plantings seeds. However, if you are



Virginia Snakeroot Seeds

particularly interested in growing from seed, give it a try for the experience of it.

Wild plants, when found, may be single individuals or in colonies of thirty or more plants. They are rarely over six to eight inches tall and almost always have only a single stem. I suspect their small size in the wild is caused by annual deer browsing. They may be found growing in all soil types with a wide pH range.

Some historical uses of Virginia snakeroot are: nibbled small amounts or weak tea promotes sweating, increases appetite, expectorant, used for stomach aches, indigestion, suppressed menses, snakebites, gargled tea for sore throats, stimulant, tonic, diaphoretic properties, malaria, typhus fever, smallpox, pneumonia, poulticed on open wound and skin ulcers.

A word of caution: Two articles by Wendy Applequist have been published in the Herbal Dispatch, volume 3, issue 10 and volume 5, issue 5, warning of the toxic effects of Virginia snakeroot. Without Wendy's articles, I would not have been aware of the toxicity of this plant. Thanks Wendy!

Persons and Davis' recent book lists use of Virginia snakeroot to treat wounds and skin ulcers only.

Appalachian Plant Profile: Ground-Ivy

By Dean Myles, Coordinator
Medicinal Botanicals Program
Mountain State University

Glechoma hederacea L. is a perennial herb introduced from Europe commonly known as ground-ivy or gill-over-the-ground [1, 2]. This member of the mint family has a square stem, opposite leaf arrangement, and tends to creep along the ground. It is easily identified in lawns and gardens by its creeping habit and its reniform, kidney-shaped leaves [1]. The leaf margin is scalloped, and the leaf may have a purplish tint. The small bluish-purple flowers are in axillary clusters. Ground-ivy flowers from April thru July and can be found in lawns, fields, and road sides throughout West Virginia.

Traditionally, Ground-ivy leaf tea has been used to treat lung ailments, asthma, jaundice, kidney ailments and as a blood purifier [2]. It has been used

externally for backaches, bruises, and piles. It has been a folk remedy for cancer. Ursolic acid, a pentacyclic triterpenoid, contained in the leaves, is considered an effective anticancer agent by inhibiting TPA-induced initiation and promotion of tumor growth [3]. Ursolic acid has also been shown to have antibacterial, antifungal, anti-inflammatory, and antimicrobial activity. The Cherokee Indians used ground-ivy infusion for hives, measles and colds [4]. Although considered to be safe, ground ivy is reported to be toxic to horses and to cause swelling of the throat and labored breathing in humans [2].

Ground-ivy prefers loamy to clay soils with a pH range from 4 to 8 [5]. It can grow in semi-shade or full sun. It likes moist soils but can survive in drier but not arid soils. There are no seed germination protocols available but should be easy to

germinate. The best way to propagate is from root divisions. However, *G. hederacea* is considered to be a noxious weed. It spreads very quickly like most members of the mint family by rooting at the nodes and from adventitious roots. Remember to properly identify any wild plant that may be used for food or medicine. Contact your local native plant program or the National Plants Database at <http://plants.usda.gov/> for species harvesting and invasive status.

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[nfo/phytochemicals/ursolic-acid.php](http://www.phytochemicals.i)

4. Native American Ethnobotanical Database, *Prunella vulgaris*, University of Michigan, Dearborn. Accessed on 5/12/08 at <http://herb.umd.umich.edu/>
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Photograph courtesy of: Virginia Tech Weed Identification Guide at http://www.ppws.vt.edu/scott/weed_id/pruvu.htm

Ginseng helps cancer patients reduce fatigue, increase energy

American ginseng may reduce fatigue and increase overall psychological well-being in cancer patients, according to a study conducted by researchers at the Mayo Clinic in Rochester, N.Y., and presented at the annual meeting of the American Society of Clinical Oncology.

"We hope that Wisconsin ginseng may offer us a much-needed treatment to improve our patients' quality of life, and we look forward to further evaluation," said lead researcher Debra Barton of the North Central Cancer

Treatment Group.

Researchers treated 282 cancer patients with a daily dose of either a placebo or of 750, 1,000 or 2,000 milligrams of Wisconsin ginseng. They found that treatment with the placebo or the 750-mg dose caused very little improvement in measures of fatigue or physical or psychological well-being. Treatment with the higher doses, however, led to an improvement in overall energy and vitality levels, a decrease in fatigue and an improvement in overall emotional, mental, physical

and spiritual well-being.

Extreme fatigue is a common symptom among cancer patients, one that often cannot be remedied by increased rest or sleep.

Ginseng has a long history of use in Asian and indigenous American cultures. In modern times, it is most often used to increase energy levels and stamina and to reduce stress or fatigue. It also reportedly can aid in the treatment of cancer and diabetes and can reduce obesity risk.

All of these purported benefits

have led ginseng to become the second best-selling herbal supplement in the United States, at \$62 million annually. It has even been incorporated into mainstream energy drinks, albeit usually in subclinical doses.

Barton shied away from advising cancer patients to take ginseng supplements. The researchers hope to begin clinical trials by 2008 to find safe ways to incorporate ginseng into cancer treatment.

Source: Natural News.com, AZ, USA, 23 April 2008

Herbs for Women's Health: Evening Primrose

By Jennifer Gills
Laboratory Coordinator
Medicinal Botanicals Program

Common evening primrose, *Oenothera biennis* L., is native to North America where it is often considered a weed. It is an herbaceous biennial with alternate, toothed or shallowly lobed leaves that can reach a height of about seven meters. The stems are light green or red and are covered with small white hairs. The plant, sometimes called "sun drop", has a large yellow flower which blooms from early June until late September and open only in the evening [1]. The plant produces only a stalk with alternate leaves and a stubby rosette of flowers the first year, becoming taller and flowering in the second year. The flower produces many small seeds from which evening primrose oil, EPO, is derived.

The plant and its close relatives have many traditional uses in both Europe and North America. Native Americans used to rub the plant on the athletes to give them strength for performances [2]. Poultices of the plant were used to promote wound healing and ease bruises. It was also used for the treatment of premenstrual and menopausal conditions, skin conditions and gastro-intestinal disorders. The succulent roots, leaves and flowers were cooked and eaten, making

this common plant a food staple for many Native American tribes [3].

Evening primrose has many modern uses, including the treatment of premenstrual symptoms including cramping, irritability, mild depression, bloating and breast tenderness. Taken on a regular basis, it has been suggested to have the ability to regulate menstrual cycles. The oil is taken internally to treat asthma, cirrhosis and migraines and to prevent blood clots. It is considered to aid in insulin absorption and general mood regulation. It is prepared topically as a treatment for atopic eczema and the cosmetic improvement of reddened skin and acne. It is theorized that EPO can aid in the treatment of multiple sclerosis and other conditions, but at this time there is little scientific evidence to support this claim.

Studies conducted on EPO strongly suggest that it is effective for treatment of atopic dermatitis, and also indicate that it may be successful in treating many of the other conditions [4]. Evening primrose oil is generally well tolerated but should not be used by pregnant women or individuals with a history of seizure disorder or schizophrenia.

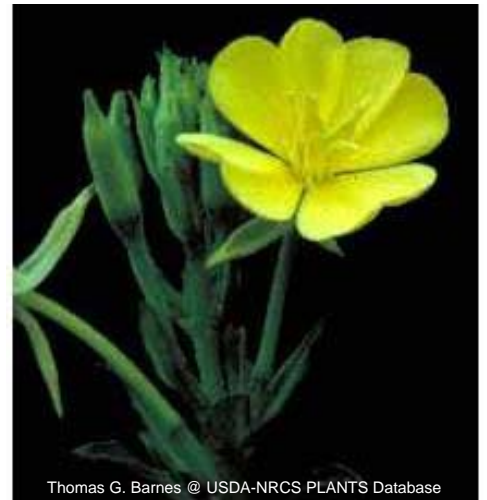
EPO is an excellent source

of gamma-linolenic acid (GLA), a long-chain fatty acid to which the majority of the plants therapeutic properties are attributed. GLA is necessary for the production of prostaglandins, which play an important role in many

biochemical reactions. GLA is not manufactured by the body but is an essential fatty acid, which is known to aid in prevention and treatment of heart disease, cirrhosis, rheumatoid arthritis, and menopause related symptoms [5, 6]. Research has demonstrated that common evening primrose plant extracts do improve prostaglandin production [7]. Evening primrose is one of few plants that can produce GLA. EPO is available as both a capsule and topical application, with the capsules containing approximately 9% GLA.

Common evening primrose can be easily cultivated. The plant prefers full sun, average moisture and sandy soil but will adapt easily to many growing conditions. Seeds can be easily obtained from the plant in the second year and remain viable for up to seventy years.

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Thomas G. Barnes @ USDA-NRCS PLANTS Database

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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 aim at the identification and development of native plants as specialty vegetable/forage crops. Educational offerings include symposia, workshops and farm visits.

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Contributions

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Please send contributions to the addresses indicated above.

Lowering Cholesterol ... How Low Should You Go? (Cont'd)

better protection than conventional statin treatment, which lowered the average LDL level to 95 mg/dL. In an analysis, the researchers divided 1,825 patients into four groups based on their LDL levels four months after an acute coronary event. Ten percent of the patients had LDL levels above 100 mg/dL and 14% had LDLs between 80 and 100 mg/dL, the traditional goal for people with heart disease or major risk factors. But 31% of the group achieved LDLs between 60 and 80 mg/dL, 34% were between 40 and 60 mg/dL, and 11% had staggeringly low LDLs of 40 mg/dL or less.

PROVE-IT proved that lower is better, at least for patients being treated for active, acute coronary artery disease. During a follow-up period that averaged two years, 26% of the patients with LDLs between 80 and 100 mg/dL experienced an additional major cardiovascular event such as a heart attack, stroke, hospitalization for unstable angina or an artery-opening procedure, or death. Compared to these patients, those with

lower LDLs enjoyed a reduction in major cardiac events. (See box, below.)

LDL level (mg/dL)	Reduction in events
60–80	20%
40–60	33%
40 or under	39%

Even if achieving radically low LDL cholesterol with statin therapy protects the heart, it wouldn't be worthwhile if it damaged other organs. But the PROVE-IT investigators found that extremely low LDL levels were safe, with no additional risk to the liver, muscle, eye, or brain.

A third study did not measure clinical events or evaluate varying cholesterol levels. Instead, it used a new technique called *intravascular ultrasound* to measure the size of the blockages in the coronary arteries of 349 patients. Before the first exam, the patients had an average LDL of 130 mg/dL. After two years of therapy, the average LDL was just 61 mg/dL — and follow-up intravascular ultrasounds showed a small but significant decrease in the size of the coronary artery plaques.

Radical or rational?

Before you ask your doctor to prescribe medication to bring your LDL to extremely low levels, remember that the demonstrated benefits apply to patients with active, acute coronary artery disease. Remember, too, that the reassuring safety figures published to date extend for

only two years of extremely low LDLs. It's enough to motivate aggressive LDL lowering for patients at the highest risk, but it does not yet lower the bar for people with a less urgent need for protection.

Medical guidelines for cholesterol are a work in progress. They have changed dramatically over the years, and more change is certain. Until now, each revision has lowered the LDL targets, and research suggests the trend will continue.

The average American man has an LDL of 126 mg/dL. Cutting that level in half seems radical indeed, but it may not be. According to a 2004 review in the *Journal of the American College of Cardiology*, our hunter-gatherer ancestors probably had LDLs between 50 and 70 mg/dL — and even today, babies come into the world with LDLs between 30 and 70 mg/dL.

Few American adults can achieve LDLs of 70 mg/dL without medication. It's not a good idea for healthy people who do not have major risk factors to take drugs to achieve very low LDLs, but it's a very important option for people at risk. And if a very low LDL is actually what our human heritage intends, we should all head in that direction by adopting the low-saturated-fat, high-fiber, physically active lifestyle that best fits our genetic endowment.

A very low LDL may not be so radical after all. With or without medication, it's back to basics.

HEALTHbeat, Harvard Medical School