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## Blueberry Leaves May Heal Hepatitis C

Natural News  
August 15, 2009

Hepatitis C is a contagious liver disease resulting from infection with the hepatitis C virus (HCV). Although the infection can be mild and not even produce noticeable symptoms, once established in the body chronic hepatitis C infection can progress to fibrosis (when the liver is scarred), cirrhosis, liver failure and even liver cancer. According to the Centers for Disease Control (CDC), the virus becomes persistent and chronically infects the liver in about 85 percent of those who contract HCV. Persistent infection is treated by western medicine with medications like peginterferon and ribavirin. And while it's true these drugs can wipe out the infection, they are only effective about half the time and they can produce very severe, debilitating side effects. So people who aren't cured by the drugs and who go on to develop cirrhosis or liver cancer may face death from the infection or require a liver transplant.

But now there's another avenue of hope for the 270 to 300 million people who are infected with hepatitis C worldwide. Research just published in the American

Society of Biochemistry and Molecular Biology's *Journal of Biochemistry (JVC)* concludes **a chemical found in blueberry leaves actually blocks the replication of the hepatitis C virus, shutting it down.** This finding could open up a new and natural avenue for treating chronic HCV infections, according to scientist Hiroaki Kataoka and colleagues at the University of Miyazaki in Japan.

Because HCV is localized in the liver and can take two decades or more to develop into significant disease, Kataoka and colleagues reasoned a dietary supplement might help slow or stop disease progression over the years. They decided to screen around 300 different agricultural products for potential compounds that might be effective at suppressing HCV replication. The results? They uncovered a strong candidate for a natural HCV fighter -- the leaves of the rabbit-eye blueberry, a plant native to the southeastern US.

They purified the specific compound in the leaves that is active against HCV and an analysis showed it is a *proanthocyanidin* (a polyphenol much like the beneficial natural chemicals found in grapes and



wine). While large doses of *proanthocyanidin* can be toxic, Kataoka and his research team found the plant's effective concentration against HCV was 100 times less than the toxic threshold. What's more, similar chemicals are found in many edible plants, so the scientists believe it should be safe as a dietary supplement. The researchers are now planning to study exactly how this chemical blocks replication of the hepatitis C virus.

### Reference:

"Proanthocyanidin from Blueberry Leaves Suppresses Expression of Subgenomic Hepatitis C Virus RNA" by Masahiko Takeshita, Yo-ichi Ishida, Ena Akamatsu, Yusuke Ohmori, Masayuki Sudoh, Hirofumi Uto, Hirohito Tsubouchi, and Hiroaki Kataoka.

### 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

## The Soil Biology Primer-Part VIII

By Elaine R. Ingham  
Oregon State University

### Chapter 4: SOIL FUNGI

#### THE LIVING SOIL: FUNGI

Fungi are microscopic cells that usually grow as long threads or strands called hyphae, which push their way between soil particles, roots, and rocks. Hyphae are usually only several thousandths of an inch (a few micrometers) in diameter. A single hyphae can span in length from a few cells to many yards. A few fungi, such as yeast, are single cells.

Hyphae sometimes group into masses called mycelium or thick, cord-like “rhizomorphs” that look like roots. Fungal fruiting structures (mushrooms) are made of hyphal strands, spores, and some special structures like gills on which spores form. (See figure) A single individual fungus can include many fruiting bodies scattered across an area as large as a baseball diamond.

Fungi perform important services related to water dynamics, nutrient cycling, and disease suppression. Along with bacteria, fungi are important as decomposers in the soil food web. They convert hard-to-digest organic material into forms that other organisms can use. Fungal hyphae physically bind soil particles together, creating stable aggregates that help increase water infiltration and soil water holding capacity.

Soil fungi can be grouped into

three general functional groups based on how they get their energy. *Decomposers* – saprophytic fungi – convert dead organic material into fungal biomass, carbon dioxide (CO<sub>2</sub>), and small molecules, such as organic acids. These fungi generally use complex substrates, such as the cellulose and lignin, in wood, and are essential in decomposing the carbon ring structures in some pollutants. A few fungi are called “sugar fungi” because they use the same simple substrates as do many bacteria. Like bacteria, fungi are important for immobilizing, or retaining, nutrients in the soil. In addition, many of the secondary metabolites of fungi are organic acids, so they help increase the accumulation of humic-acid rich organic matter that is resistant to degradation and may stay in the soil for hundreds of years.

*Mutualists* – the mycorrhizal fungi – colonize plant roots. In exchange for carbon from the plant, mycorrhizal fungi help solubilize phosphorus and bring soil nutrients (phosphorus, nitrogen, micronutrients, and perhaps water) to the plant. One major group of mycorrhizae, the *ectomycorrhizae* (Figure 3), grow on the surface layers of the roots and are commonly associated with trees. The second major group of mycorrhizae are the *endomycorrhizae* that grow within the root cells and are commonly associated with

grasses, row crops, vegetables, and shrubs. Arbuscular mycorrhizal (AM) fungi (Figure 4) are a type of endomycorrhizal fungi. Ericoid mycorrhizal fungi can be either ecto- or endomycorrhizal.

The third group of fungi, *pathogens* or *parasites*, cause reduced production or death when they colonize roots and other organisms. Root-pathogenic fungi, such as *Verticillium*, *Pythium*, and *Rhizoctonia*, cause major economic losses in agriculture each year. Many fungi help control diseases. For example, nematode-trapping fungi that parasitize disease-causing nematodes, and fungi that feed on insects may be useful as biocontrol agents.



**Figure 1:** Many plants depend on fungi to help extract nutrients from the soil. Tree roots (brown) are connected to the symbiotic mycorrhizal structure (bright white) and fungal hyphae (thin white strands) radiating into the soil.

**Credit:** Randy Molina, Oregon State University, Corvallis



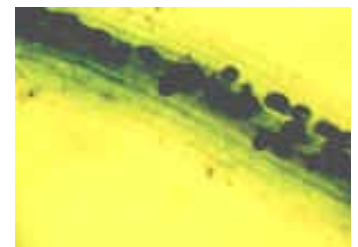
**Figure 2:** Fungus beginning to decompose leaf veins in grass clippings.

**Credit:** No. 48 from Soil Microbiology and Biochemistry Slide Set. 1976. J.P. Martin, et al., eds. SSSA, Madison WI.



**Figure 3:** Ectomycorrhizae are important for nutrient absorption by tree and grape roots. The fungus does not actually invade root cells but forms a sheath that penetrates between plant cells. The sheath in this photo is white, but they may be black, orange, pink, or yellow.

**Credit:** USDA, Forest Service, PNW Research Station, Corvallis, Oregon



**Figure 4:** The dark, round masses inside the cells of this clover root are vesicles for the arbuscular mycorrhizal fungus (AM).

**Credit:** Elaine R. Ingham, Oregon State University, Corvallis

## Hoodia (*Hoodia gordonii*L.)

Hoodia is a flowering, cactus-like plant native to the Kalahari Desert in southern Africa. Its harvest is protected by conservation laws.

### What It Is Used For

- Kalahari Bushmen have traditionally eaten hoodia stems to reduce their hunger and thirst during long hunts.
- Today, hoodia is marketed as an appetite suppressant for weight loss.

### How It Is Used

- Dried extracts of hoodia stems and roots are used to make capsules, powders, and chewable tablets. Hoodia can also be used in liquid extracts and teas.
- Hoodia products often contain other herbs or minerals, such as green tea or chromium picolinate.

### What the Science Says

There is no reliable scientific evidence to support hoodia's

use. No studies of the herb in people have been published.

### Side Effects and Cautions

- Hoodia's safety is unknown. Its potential risks, side effects, and interactions with medicines and other supplements have not been studied.
- The quality of hoodia products varies widely. News reports suggest that some products sold as hoodia do not contain any

hoodia.

NCCAM



## Acupuncture-Like Treatments Improve Outcomes Compared to Usual Care for Low Back Pain

NCCAM Press Office  
May 11, 2009

People suffering from chronic low back pain who received acupuncture or simulated acupuncture treatments fared better than those receiving only conventional care according to a recent study published in the *Archives of Internal Medicine*.<sup>1</sup> The study highlights central questions about the mechanisms of benefit seen in acupuncture studies.

This trial, led by Daniel Cherkin, Ph.D., of Group Health Center for Health Studies in Seattle, was funded by the National Center for Complementary and Alternative Medicine (NCCAM), a component of the National Institutes of Health.

"Because of the lack of highly effective medical treatments for chronic low back pain, we were pleased to find that acupuncture-like treatments were helpful for persons suffering from chronic back pain," said Dr. Cherkin. "However, the finding that real

acupuncture produced no greater benefit than simulated acupuncture raises important questions about acupuncture's mechanisms of action."

This trial enrolled 638 adults with chronic low back pain who had never had acupuncture and who had rated the "bothersomeness" of their pain as at least a 3 on a 0-to-10 scale. The participants were randomly assigned to one of four groups: individualized acupuncture, involving a customized prescription for acupuncture points from a diagnostician; standardized acupuncture, using a single prescription for acupuncture points that experts consider generally effective for chronic low back pain; simulated acupuncture, which mimics needle acupuncture but does not involve actual penetration of the skin; or usual care, which is standard medical care.

The patients assigned to any of the three acupuncture groups (individualized, standardized, or simulated)

were treated twice weekly for three weeks, and then weekly for four weeks. At 8, 26, and 52 weeks, researchers measured back-related dysfunction and how much symptoms bothered participants.

The researchers found that at eight weeks the individualized, standardized, and simulated acupuncture groups all improved their dysfunction scores significantly more than the group receiving usual care. These benefits persisted for one year, though diminished over time. However, there was no significant difference between the groups receiving the needle and simulated forms of acupuncture. Thus, while acupuncture was found effective in treating low back pain, neither tailoring acupuncture needle sites to an individual patient nor penetrating the skin appears to be important for receiving therapeutic benefit.

"The findings of this research show that acupuncture-like treatments, including

simulated acupuncture, can elicit positive responses," said Josephine P. Briggs, M.D., director of NCCAM. "This adds to the growing body of evidence that there is something meaningful taking place during acupuncture treatments outside of actual needling. Future research is needed to delve deeper into what is evoking these responses."

The researchers believe that further research is needed to determine the roles of patient expectancy, practitioner reassurance and the physiological effects of non-invasive stimulation and other effects that may contribute to acupuncture-like benefits.

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## Appalachian Plant Profile: Dandelion

By Dean Myles, Coordinator  
Medicinal Botanicals Program  
Mountain State University

*Taraxacum officinale* Weber is the common perennial lawn weed Dandelion. Dandelion is easily identified by its leaves and flowers. The leaves occur in basal rosettes. The leaves are deeply incised with the segments directed backwards [1]. The leaves can be 2 to 15 inches in length and ½ to 3 inches wide. The large yellow flower occurs at the end of an erect hollow scape (naked stem arising from the ground). Dandelion flowers in early spring but can be found most of the year. The fruit is a brown achene, 3-5 mm long. The achene forms a white seed head that resembles a puff-ball. The thick taproot is whitish in color with milky latex. Common dandelion is of Eurasian origin but has become naturalized throughout the United States [2]. Dandelion occurs in all 50 states, almost all Canadian provinces, and Mexico.

Dandelion has had a long history of use including food, medicine, and wildlife forage. Dandelion leaves are high in vitamins A, B complex, C, and D; minerals such as iron, potassium, and zinc; and can

be eaten as spring greens [2, 3]. Traditionally the root can be roasted and used as coffee. Medicinally a leaf tea was used as a laxative. The roots are used for liver, gallbladder, kidney, and bladder ailments. The American Indians had varying uses for dandelion including: analgesic for stomachaches and back pain, emetic, laxative, menstrual cramps, sedative, sore throats, to purify the blood, toothache, to produce postpartum milk flow, spring tonic, smashed or swollen testicles, as well as food, and for making wine [4]. The Iroquois tribe used a decoction of roots as a wash for an anti-witch medicine, and as a love medicine. The Mohegan tribe used a strong infusion of dried leaves taken as a physic.

In modern times, dandelion leaf is approved in Germany for loss of appetite, indigestion, and flatulence [3]. The root is approved for bile flow disturbances, appetite stimulate, gastric ailments and urinary tract infections [3, 5]. Due to the Inulin content (2-40%), dandelion should be well tolerated by diabetics, may assist in weight loss by stimulating bile secretions.

Common dandelion is an

aggressive seed producer and reproduces mainly from seed [2]. Seeds travel a considerable distance because of the parachuting effect produced by the spreading pappus. Common dandelion tolerates a wide range of site and soil conditions. Soil texture ranges from clays, loams to sandy loams. The soil pH range is from 6.8 to 7.2. Cultivation can be in full sun, to light shade. Propagation is easily accomplished by planting seeds in loose rich soil. Germination should take about two weeks. Remember when planting dandelion that it is highly invasive and due to its deep tap root and mode of seed dispersal is difficult to control. Please contact your state's agency concerning harvesting of wild plants or contact your local native plant program or the National Plants Database at <http://plants.usda.gov/> for species status.

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Photo courtesy of Alden Weatherbie at [http://www.wildflower.org/gallery/result.php?id\\_image=18460](http://www.wildflower.org/gallery/result.php?id_image=18460)

## Turmeric Fights Body Fat

Natural News  
Aug 14, 2009

A diet high in turmeric may help reduce weight gain by suppressing the growth of new fat tissue, according to a study conducted by researchers from Tufts University and published in the *Journal of Nutrition*.

The study was funded by the U.S. Department of Agriculture and a grant from the Higher Education Commission of Pakistan.

"Weight gain is the result of the growth and expansion of fat tissue, which cannot happen unless new blood vessels form, a process

known as angiogenesis," senior author Mohsen Meydani said. "Based on our data, curcumin appears to suppress angiogenic activity in the fat tissue of mice fed high fat diets."

Curcumin is an antioxidant chemical in the polyphenol family that naturally occurs in

turmeric. In contrast to some phytochemicals, it is easily absorbed by the body.

Researchers fed two groups of mice identical high-fat diets, supplementing the diets of the half the mice with 500 milligrams of curcumin per kilogram of body weight per day. They found that mice in

## Americans Spent \$33.9 Billion Out-of-Pocket on Complementary and Alternative Medicine

NCCAM Press Office  
July 30, 2009

Americans spent \$33.9 billion out-of-pocket on complementary and alternative medicine (CAM) over the previous 12 months, according to a 2007 government survey<sup>1</sup>. CAM is a group of diverse medical and health care systems, practices, and products such as herbal supplements, meditation, chiropractic, and acupuncture that are not generally considered to be part of conventional medicine. CAM accounts for approximately 1.5 percent of total health care expenditures (\$2.2 trillion<sup>2</sup>) and 11.2 percent of total out-of-pocket expenditures (conventional out-of-pocket: \$286.6 billion<sup>2</sup> and CAM out-of-pocket: \$33.9 billion<sup>1</sup>) on health care in the United States.

Approximately 38 percent of adults use some form of CAM for health and wellness or to treat a variety of diseases and conditions, according to data from the 2007 National Health Interview Survey (NHIS)<sup>3</sup>. The CAM component of the NHIS was developed by the National Institutes of Health's

(NIH) National Center for Complementary and Alternative Medicine (NCCAM) and the National Center for Health Statistics (NCHS) part of the Centers for Disease Control and Prevention. The data provide estimates of the cost of CAM use, the frequency of visits made to CAM practitioners, and frequency of purchases of self-care CAM therapies.

"With so many Americans using and spending money on CAM therapies, it is extremely important to know whether the products and practices they use are safe and effective," said Josephine P. Briggs, M.D., director of NCCAM. "This underscores the importance of conducting rigorous research and providing evidence-based information on CAM so that health care providers and the public can make well-informed decisions."

Of the \$33.9 billion spent on CAM out-of-pocket, an estimated \$22.0 billion was spent on self-care costs—CAM products, classes, and materials—with the majority going to the purchase of nonvitamin, nonmineral,

natural products (\$14.8 billion) such as fish oil, glucosamine and Echinacea. U.S. adults also spent approximately \$11.9 billion on an estimated 354.2 million visits to CAM practitioners such as acupuncturists, chiropractors, massage therapists, etc.

To put these figures in context, the \$14.8 billion spent on nonvitamin, nonmineral, natural products is equivalent to approximately one-third of total out-of-pocket spending on prescription drugs, and the \$11.9 billion spent on CAM practitioner visits is equivalent to approximately one-quarter of total out-of-pocket spending on physician visits.

"These data indicate that the U.S. public makes millions of visits to CAM providers each year and spends billions of dollars for these services, as well as for self-care forms of CAM," said Richard L. Nahin, Ph.D., MPH, acting director of NCCAM's Division of Extramural Research and lead author of the cost of complementary and alternative medicine analysis. "While these expenditures represent just a small fraction of total health care spending

in the United States, they constitute a substantial part of out-of-pocket health care costs."

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- <sup>1</sup> Nahin, RL, Barnes PM, Stussman BJ, and Bloom B. [Costs of Complementary and Alternative Medicine \(CAM\) and Frequency of Visits to CAM Practitioners: United States, 2007](#). *National health statistics reports; no 18*. Hyattsville, MD: National Center for Health Statistics. 2009.
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## Turmeric Fights Body Fat (Cont'd)

the curcumin group had significantly lower blood cholesterol and significantly less microvessel density in fat tissue than the mice in the control group, implying less blood vessel growth and thus less overall growth of fat tissue. The livers of mice in the curcumin group also contained significantly less fat

than those of the mice in the control group.

"In general, angiogenesis and an accumulation of lipids in fat cells contribute to fat tissue growth," Meydani said.

The researcher also noted that "curcumin appeared to be responsible for total lower body fat in the group that

received supplementation."

In a similar study conducted on cells rather than animals, the researchers also found curcumin to suppress angiogenesis. The chemical also appeared to suppress the expression of two genes linked to angiogenesis in both the mouse and cell experiments.



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

## Purple Carrots in High Demand as Natural Food Coloring

Natural News  
 Aug 15, 2009

Producers of purple carrots are anticipating a massive surge in demand as consumers and governments become increasingly wary of artificial food colorings.

For decades, food producers have used petroleum-based dyes to give their products bright colors, sometimes reminiscent of the flavors the food is supposed to carry.

"We eat with our eyes, and the first thing you evaluate is color," said Stephen Lauro of natural colors manufacturer ColorMaker.

After researchers linked artificial colors to hyperactivity in children, however, the United Kingdom began making plans to ban a number of the additives. The European Union responded to growing concern among scientists, consumers and health professionals by passing a law requiring all food containing artificial colors to carry a warning label reading, "May have an adverse effect on activity and attention in

children."

This law, which goes into force on January 1, has fueled an already growing demand for natural food coloring.

"There's a mad dash in Europe to get synthetic dyes out and put natural ones in, and it's coming across the Atlantic," Lauro said. "It was dumb luck and we stepped into it."

Now being explored as a source of such dyes is the purple carrot, ancient ancestor to the modern, orange version. Originally used as a clothing dye by Afghan royalty, the purple carrot is now being investigated as a potential source of food colorings. Researchers are at work to stabilize the purple pigment in the vegetables, which can turn brown when heated, red in acidic foods and blue in alkaline ones.

The carrots are given their purple color by anthocyanin, a powerful antioxidant that also gives blueberries and red grapes their color.

"Mom always said vegetables are good for you but didn't

know why," said Paul Verderber of Grimmway Farms, which grows organic purple carrots. "The colors are causing the goodness."



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### 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.

### MBP in Pictures



**Bee balm (*Monarda didyma* L.) growing at the MBP Medicinal Plants Garden**

Bee balm is commonly used as an antiseptic, diuretic, stimulant, diaphoretic, and carminative or flatulence reliever. As an antiseptic, the plant, or more commonly its fragrant oil, can be used externally to treat skin eruptions and infection. Used internally, bee balm can treat or relieve colds, headaches, sore throat, fever, nausea, menstrual pain, insomnia, and gastric disorders, including flatulence.

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