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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 herbs, botanicals and vegetables

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

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WV Commissioner of Agriculture Speaks at 5th Symposium

The Mountain State University Medicinal Botanicals Program, the USDA-ARS Appalachian Farming Systems Research Center, the West Virginia Department of Agriculture, and the West Virginia Herb Association held the Fifth Appalachian Opportunities Symposium at the Tamarack Conference Center, Beckley, West Virginia, on Saturday March 10, 2007. The theme of the event was 'Plants and Plant Systems for Small Farm Product Diversification'.

The event gained relevance with the presence of the WV Commissioner of Agriculture, Gus Douglass, who delivered the keynote address "Agricultural Opportunities in West Virginia" during the lunch time. He mentioned that "Our heritage is largely agricultural, but WV's terrain dictates certain limitations, which should be taken as opportunities, not roadblocks". He went on to say that "We cannot produce 10,000 acres of corn per farm, but we can have prosperous small farms that fill lucrative niche markets". And that "Diversity and decentralization are important concepts for the future of American agriculture". He concluded by saying that "This conference and the number of people here today show that we are on the right track and that our efforts today will pay dividends in the future".



Mountain State University (MSU) was represented by the Dean of the School of Business and Technology, Professor Ann Nagye, who also spoke during lunch time about the importance of the collaborative efforts between MSU and the USDA-ARS Appalachian Farming Systems Research Center (AFSRC) to perform research that will eventually benefit the small-farm owner and the rural economy of WV.

She said "I am privileged to have been a part of this symposium for four years, three of those as a presenter. I am pleased to see this symposium grow into the wonderful conference it is now. MSU is proud to be associated with the USDA ARS. The collaborative efforts of our organizations have provided technical assistance to small farm growers, promoted the medicinal botanical industry in WV, and, most recently,

promoted research into natural products for animal health. It is our hope that this relationship will continue long into the future and that our collaborative efforts will truly have a positive, far-reaching impact on society."

Dr. David Belesky, Research Leader, USDA-ARS AFSRC, was the master of ceremonies of the lunch session. He also commented on the importance of the collaborative efforts between MSU and USDA-ARS AFSRC and the advances we have made.

The program covered one day of intensive educational activities with the sessions plants for small ruminant nutrition and health, utilization of plant resources, herbs and medicinal plants, business approaches and economics, and Appalachian food products. Speakers were selected from the research, education and business communities, all of them with several years of experience.

In evaluation forms, participants indicated that the information provided by the speakers was very beneficial and that they intend to use it to improve their business, which for the most part are related to goat production; herb production, processing and marketing; and medicinal plant preparation and utilization.

Fortified foods: Too much of a good thing? Your body may not need — or be able to absorb — the extra nutrients

By Allison Van Dusen, March 22, 2007

You're in the grocery store shopping for a carton of orange juice for tomorrow's breakfast and you're faced with a decision — plain old juice or, for no extra cost, one fortified with bone-building calcium.

You're not alone. Promising better bang for the buck, products like these, called functional foods, are increasingly filling grocery store aisles — and our fridges.

But do we really need them?

"There's a finite volume in the stomach and everybody is vying for that volume," says Fergus Clydesdale, distinguished professor and department head at the University of Massachusetts, Amherst. "One way to try to get a part of the share of that volume is to offer something that has some health benefit."

The term "functional food" has no legal definition. While it has long referred to fare beneficial to a person's health, such as broccoli, it's increasingly used to refer to designer foods or ones that have been modified to incorporate nutrients they wouldn't normally contain for a specific health purpose. A box of pasta with heart-healthy omega-3 fatty acids — normally found in fish — is a prime example.

And consumers, who are swimming in information about the relationships between foods or their ingredients and disease risks, are eating them up.

Three-quarters of consumers said they're trying to eat more fiber and whole grains, and half said they're trying to get more omega-3 fatty acids, according to an online International Food Information Council Foundation survey of 1,000 Americans 18 and older in late 2005. About 83

percent of respondents said they're interested in learning more about foods that offer health benefits beyond basic nutrition.

Women with children and the growing baby boomer population are most into these foods, says Wendy Reinhardt Kapsak, the foundation's director of health and nutrition, due to their focus on overall wellness and disease prevention.

People disenchanted with the medical system are also looking for more ways to control their destiny, says Clydesdale. They're using food to do it.

The trend is not entirely new. Manufacturers have been fortifying milk with vitamin D since the 1930s to prevent rickets, a disease caused by a vitamin D deficiency and characterized by defective bone growth in children. Since the vitamin isn't naturally found in a lot of foods, it can be difficult for people who are lactose intolerant, or simply don't like milk, to consume healthy amounts. Today, thanks to modern technology, you can drink a glass of orange juice packed with vitamin D for the same effect.

Worth it?

The question is: How much of these extra benefits do you need? You can get too much of a good thing without realizing it, says registered dietitian Cynthia Sass, a spokeswoman for the American Dietetic Association.

"The idea of a supplement or fortified foods is to fill a gap, to bring a person up to the recommended intake," she says. "If you're already at the recommended intake, it's not going to do anything for you. It may work against you."

For instance, exceeding the tolerable upper intake level for vitamin C, 2,000 milligrams a day

for adults, can cause diarrhea, an upset stomach and kidney stones. Likewise, while plant sterols and stanols added to your granola bar may help lower your cholesterol, you need only two grams of the substances a day. Exceeding that amount won't give you any extra benefit and the long-term effects of getting too much are unknown, according to medical research in the Harvard Heart Letter.

Then again, you may be buying a product promising benefits you're not getting.

Beverages containing herbs often don't state how much echinacea or ginseng, for instance, they actually contain. And universities and medical centers rarely take two groups of people, give one a certain food and withhold from the other to see the difference in outcomes, Sass says.

Iron might be added to your food, but in some forms it is insoluble and the body will flush it out without getting anything from it, Clydesdale says. You have to question whether the additive is able to be absorbed by your body.

That said, if a product makes a health claim, e.g., "calcium may reduce the risk of osteoporosis," there has to be science behind it to get the Food and Drug Administration's approval.

An eye on calories

But that may not make a trip to the grocery store any less confusing.

While Sass thinks it's great that consumers are getting the link between nutrition and health, she suggests people keep in mind the USDA's research-based dietary guidelines when considering changing the way they eat.

"I'm more for getting (nutrients) from the original source if you

can," she adds.

Of course, not everyone buying these foods and beverages is purposely seeking out a health benefit.

When 3 p.m. rolls around on any given weekday, people tend to feel tired and a little hungry. They may turn to coffee, tea or an energy drink for that boost, says Steve Haley, CEO and president of Celsius Holdings, which offers green tea-enhanced Celsius — "the earth's first calorie-burning soda." In 2006, the company saw more than \$1.5 million in revenue and expects to blow past the figure this year.

Haley notes that if we all ate balanced diets, exercised regularly, drank plenty of water and got enough sleep, we wouldn't need these kinds of products. But since nobody's perfect, maybe some extra fortification isn't a bad thing.

While a small clinical research study presented at the 2005 International Society of Sports Nutrition conference supports Celsius' claim that the soda raises the metabolism for up to three hours after consumption, the company doesn't make weight-loss claims or promote it as an alternative to exercise. Instead, it encourages people to drink the product as part of a healthier lifestyle, a point nutrition experts echo.

"What consumers need to be wary of with all of these healthy, functional foods out there is that they still need to keep an eye on calories, especially with the obesity and overweight problems we have," says Lori Hoolihan, registered dietitian and nutrition research specialist with the Dairy Council of California's Functional Food Task Force.

"Don't assume you can have as much as you want," she says, "because it's considered healthy."

Poison Ivy (*Rhus radicans*L.)

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

This native perennial, also known as poison oak, is a member of the cashew family (Anacardiaceae).

According to Reader's Digest's "North American Wildlife", cuttings from the same plant can produce individuals that look completely different when planted in different locations; that is, the species can grow in patches, ten to twelve inches high, when planted in some locations, and as a climbing vine, up to 100 feet long, when planted in others. As a vine, poison ivy attaches itself with fibrous roots to the bark of trees. The plant is extremely variable in both

growth habit and leaf form. Compound leaves have three leaflets, which can have smooth, lobed, or toothed edges; the center leaflet is on a longer stalk. Small greenish yellow-white flower clusters are produced at the lower leaf axils. The fruit is white and berrylike, providing forage for wildlife. Birds consume the fruits and deer browse the leaves.

Severe dermatitis results when most humans touch any plant part, clothing that has contacted plant parts, or smoke from burning plants. Some fortunate folks are apparently naturally immune. To prevent dermatitis, immediately, on exposure, wash thoroughly with soap and water, swab with isopropyl alcohol, or rub



University of Florida

exposed skin vigorously with crushed leaves and stems of jewelweed (*Impatiens capensis* or *Impatiens pallida*).

Yes, poison ivy is a medicinal plant. The active ingredient is urushiol. Micro doses are used homeopathically to treat the rash. CAUTION: Self-

administered internal consumption may cause severe medical complications.

American Botanicals, Eolia, Missouri, lists poison ivy at \$1.00 per pound for dry leaves from the collector.

Be observant and enjoy the great outdoors!

Inhibition of release of inflammatory mediators in primary and cultured cells by a Chinese herbal medicine formula for allergic rhinitis

G.B. Lenon, C.C.L. Xue, D. F. Story, F.C.K. Thien, S. McPhee, and C.G. Li. 2007. *Chinese Medicine* 2:2

Background

We demonstrated that a Chinese herbal formula, which we refer to as RCM-101, developed from a traditional Chinese medicine formula, reduced nasal and non-nasal symptoms of seasonal allergic rhinitis (SAR). The present study in primary and cultured cells was undertaken to investigate the effects of RCM-101 on the production/release of

inflammatory mediators known to be involved in SAR.

Methods

Compound 48/80-induced histamine release was studied in rat peritoneal mast cells. Production of leukotriene B4 induced by the calcium ionophore A23187 was studied in porcine neutrophils using an HPLC assay and lipopolysaccharide-stimulated prostaglandin E2 production was studied in murine macrophage (Raw 264.7) cells by immune-enzyme assay. Expression

of cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2) was determined in Raw 264.7 cells, using western blotting techniques.

Results

RCM-101 (1-100 microg/mL) produced concentration-dependent inhibition of compound 48/80-induced histamine release from rat peritoneal mast cells and of lipopolysaccharide-stimulated prostaglandin E2 release from Raw 264.7 cells. Over the range 1 - 10 microg/mL, it inhibited A23187-induced leukotriene

B4 production in porcine neutrophils. In addition, RCM-101 (100 microg/mL) inhibited the expression of COX-2 protein but did not affect that of COX-1.

Conclusion

The findings indicate that RCM-101 inhibits the release and/or synthesis of histamine, leukotriene B4 and prostaglandin E2 in cultured cells. These interactions of RCM-101 with multiple inflammatory mediators are likely to be related to its ability to reduce symptoms of allergic rhinitis.

Appalachian Plant Profile: Colt's Foot

By Dean Myles, Coordinator
Medicinal Botanicals Program
Mountain State University

Colt's foot *Tussilago farfara* L. is a perennial herb that was introduced to North America from Europe [1]. Colt's foot was once thought to be two different species of plants due to its unique flowering stage. Colt's foot is one of the first plants to flower in WV: on 3/14/07, I noticed it flowering around our greenhouse in Beckley. The plant produces flowers and sets seed before producing leaves several weeks later. The flowers are yellow and resemble those of dandelion, *Taraxacum officinale*, but have smaller rays and emerge from reddish scaly stems. The leaves are rounded, slightly lobed and resemble the hoof of a horse, whence the name [2]. The leaves are 4 to 8 inches in size and have a soft white underside and a heart-shaped base.

Traditionally, *Tussilago farfara* was considered to be an anti-tussive, astringent, bitter, demulcent, diaphoretic, emollient, and expectorant [3]. A leaf and flower tea was once used for sore throats, dry cough, asthma, bronchitis, and lung congestion [4]. An infusion of roots was used to make a

bitter, diaphoretic tonic [3]. A flower poultice was once used for eczema, skin ulcers, sores, insect bites and other skin inflammations. The dried leaves were smoked to relieve cough and asthma symptoms [4].

In modern times, smoking colt's foot leaves is approved in Germany for the treatment of coughs, and mouth, throat and respiratory tract inflammations. Research shows whole plant extracts may increase immune resistance to upper respiratory infections [3]. Colt's foot contains toxic alkaloids (pyrrolizidine) that may be toxic to the liver [3, 4]. It is suggested that decoction reduces the toxicity [4]. Although colt's foot is widely used in Europe, the flowers are used only under the supervision of medical professionals. It is also recommended not to use the leaves for more 4-6 weeks and nursing or pregnant women and children should not consumed them at all [3, 4].

Colts' foot is also considered an edible plant. It has been used for candy cough drops, teas, and salads, and the burnt leaves as a salt substitute [3, 5]. It



Please contact your state's Department of Forestry for laws and regulations concerning Colt's Foot harvest in your area.

has also been used as stuffing material, tinder, bank stabilizer, and compost.

Colt's foot grows in waste places and in any soil type and pH range [3]. It can grow in semi-shade and full sun. Cultivation is quite easy, simply sow the seeds or divide the rhizomes. Leaves are harvested in June or July. [3]. Colt's foot is considered a noxious weed throughout its range [1]. Naturalized populations can be harvested for personal use. 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 this and other species

status.

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Mother Nature still a rich source of new drugs

By Julie Steenhuisen, March 19, 2007

At least 70 percent of all new drugs introduced in the United States in the past 25 years come from nature despite the use of sophisticated techniques to design products in the lab, researchers reported on Monday.

Their study indicates that a back-to-nature approach might yield better possibilities for companies looking for the next blockbuster drug.

Drug discovery hit a 24-year low in 2004, with just 25 unique compounds known as new chemical entities introduced that year, said David Newman, who runs the U.S. National Cancer Institute's natural products branch.

"Chemists started making libraries of hundreds of thousands to millions of compounds. But they were simple compounds," he said in a telephone interview.

"Mother Nature doesn't make simple compounds. Mother Nature wants compounds that

fit into particular places."

Newman links a dearth of new drug development at U.S. drug companies with the shift away from nature as a main source of drug compounds.

"Wyeth and Merck are the only two U.S. manufacturers of that size that still use natural products as one of their sources to look for drugs," he said.

Newman's study found more than two-thirds of all drugs discovered in the last quarter-century have come from nature. He believes linking nature with advanced chemistry techniques that combine a vast array of molecules to speed drug development will likely yield much more fruitful results.

Newman and colleague Gordon Cragg reviewed the origins of new drugs developed in the past quarter-century and found that despite the introduction of a host of high-tech drug discovery tools, natural products continue to be the inspiration for most new drugs.



www.exelixis.com

NATURAL INSPIRATION

Aspirin, a staple in most medicine cabinets, was originally obtained from the willow tree. The widely used chemotherapy treatment Taxol was derived from Pacific yew tree.

"Even though it is made in a different way now, it is absolutely identical to the material that comes from the yew," Newman said.

Likewise, the colon cancer treatment irinotecan, a standard chemotherapy that interferes with the growth of cancer cells, and topotecan, a chemotherapy used for ovarian cancer and lung cancer, are both modifications of the tree *Camptotheca acuminata*, a native of China.

In fact, Newman and Cragg found that about half of all anti-cancer drugs introduced since the 1940s are either natural products or medicines derived directly from natural products.

Newman's study, to be published in the March 23, 2007 issue of the *Journal of*

Natural Products, is an expanded and updated version of reports published in 1997 and in 2003.

The researchers sought to trace how nature has inspired drugs currently on the market.

"A chemist would never conceive of making Taxol unless he or she had seen Taxol first," Newman said. "So what we looked back at was, what was the intellectual underpinning of the drugs that were currently on the market."

Newman said the advent of new drug discovery techniques such as combinatorial chemistry in the 1990s diverted many drug company resources away from a rich source of new drug compounds.

The technique allows for the rapid combination of many different but similar compounds -- basically industrializing the role of the chemist.

"Mother Nature's influence is alive and well," Newman said. "But you have to look for it in a subtle way. She doesn't come out and wave a broom in your face."

pubs.acs.org/.../8141/8141pharmaceuticals2.html



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About the Medicinal Botanical Program

This Program was created as a 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 through research, education, marketing and outreach. Educational offerings include science courses, a symposium and workshops. The Program also conducts research on the nutritional and medicinal qualities of native medicinal plants.

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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.

Researching complementary and alternative treatments - the gatekeepers are not at home

V Fonnebo et al., 2007. BMC Medical Research Methodology 7:7

Background. To explore the strengths and weaknesses of conventional biomedical research strategies and methods as applied to complementary and alternative medicine (CAM), and to suggest a new research framework for assessing these treatment modalities.

Discussion. There appears to be a gap between published studies showing little or no efficacy of CAM, and reports of substantial clinical benefit from patients and CAM practitioners. This gap might be partially due to the current focus on placebo-controlled randomized trials, which are appropriately

designed to answer questions about the efficacy and safety of pharmaceutical agents. In an attempt to fit this assessment strategy, complex CAM treatment approaches have been dissected into standardized and often simplified treatment methods, and outcomes have been limited. Unlike conventional medicine, CAM has no regulatory or financial gatekeeper controlling their therapeutic agents before they are marketed. Treatments may thus be in widespread use before researchers know of their existence. In addition, the treatments are often provided as an integrated whole system of care, without careful consideration of the safety issue. We propose a

five-phase strategy for assessing CAM built on the acknowledgement of the inherent, unique aspects of CAM treatments and their regulatory status in most Western countries. These phases comprise: 1. Context, paradigms, philosophical understanding and utilization; 2. Safety status; 3. Comparative effectiveness; 4. Component efficacy; and 5. Biological mechanisms.

Summary. Using the proposed strategy will generate evidence relevant to clinical practice, while acknowledging the absence of regulatory and financial gatekeepers for CAM. It will also emphasize the important but subtle differences between CAM and conventional medical practice.

Recipes: Ramp Soup

- 1 cup ramps (leaves and bulbs)
- 1 tablespoon butter
- 2 ½ cups of water, or 2 cups of milk and ½ cup of water
- 2 bouillon cubes (beef or chicken)

Clean and dice the ramps.

Add butter to a soup pan, add the ramps and sauté over a very low heat (remember to use a lid). Add the water or milk and the two bouillon cubes. Simmer for 15 minutes.

Now you have ramp soup. But what really makes it worthwhile is this little added effort. Toast one

piece of bread per bowl of soup. Float a piece of toast in each soup bowl, sprinkle with your favorite cheese, and then set the bowls in a hot oven until the cheese is melted. All I can say is this: any "skeptical" wild food enthusiast would love it.

Taken from: Wild Plant Cookbook, Bill Beatty, 1987, Naturegraph Publishers, Inc, Happy Camp, CA

MBP in Pictures



Mr. Gus Douglass, WV Commissioner of Agriculture; Dr. David Belesky, Research Leader, USDA-ARS AFSRC; Dr. Joyce G. Foster, Biochemist, USDA-ARS AFSRC; and Prof. Ann Nagye, Dean of the School of Business and Technology, MSU, during the 5th Appalachian opportunities symposium