American Chemical Society
Office of Communications
1155 16th St. NW
Washington, DC 20036

NEWS
from the world's largest scientfic society

Contact: Michael Bernstein
202-872-6042
m_bernstein@acs.org

FOR IMMEDIATE RELEASE

O Christmas tree: Your bark may fight arthritis

A fake Christmas tree may be more popular, but here's a new reason to appreciate the real thing: Researchers have identified a group of anti-inflammatory compounds in the bark of the Scotch pine — widely used for Christmas trees — that they say could be developed into food supplements or drugs for treating arthritis and pain. The compounds, which show promise in preliminary cell studies, are likely to be found in other pine species as well, the scientists say.

Anti-inflammatory compounds have been found in a wide variety of plant species, but this is believed to be the first time that they've been identified in a species that is used commonly for Christmas trees, the researchers say. The compounds identified were phenolics, a class of highly-active plant chemicals that have been increasingly tied to beneficial health effects. The study appeared in the *Journal of Agricultural and Food Chemistry*, a peer-reviewed publication of the American Chemical Society, the world's largest scientific society.

"The preliminary study showed that highly purified preparations of pine bark extract have potent anti-inflammatory effects. In the future, this may mean that people with arthritis may ease their pain by eating food supplements made from Christmas trees," says study leader Kalevi Pihlaja, Ph.D., a chemistry professor at the University of Turku in Finland. He cautions that the extract used in this study has not yet been tested in animals or humans. Until those studies are done, he adds, no one knows how much might be needed to obtain health benefits or whether there are any side-effects.

Pine bark extract has been used worldwide for many years as folk medicine, both orally and topically, to treat a variety of health conditions ranging from wounds to coughs. Recent research by others, including some human studies, shows that the extract has the potential to relieve high blood pressure, asthma, heart disease and skin cancer. The new study may help provide an explanation for some of its alleged health benefits, Pihlaja says.

– more –

As part of a larger search for healthy compounds in plants that might be used to develop functional food products or nutraceuticals, the researchers studied several different preparations of pine bark extract taken from the Scotch pine (*Pinus sylvestris*) and identified up to 28 compounds, some of which showed high biological activity.

The researchers then tested the various extracts against mouse inflammatory cells (macrophages) for their ability to produce nitric oxide and prostaglandin E_2 (PGE_2), chemicals which are known to help trigger inflammation when they are produced in excess amounts, as during disease or injury. The results were then compared to the chemical responses of inflammatory cells that were not exposed to pine bark extracts.

The researchers found that the most highly purified extract tested had the most potent anti-inflammatory activity. The extract (at 50 μg/mL concentration level) inhibited nitric oxide production, an excess of which has been linked to arthritis and circulatory problems, by up to 63 percent, they say. Likewise, they found that the same extract concentration inhibited prostaglandin production, an excess of which has been linked to arthritis and pain, by up to 77 percent.

The extract inhibited prostaglandin E_2 production probably by blocking COX-2 enzyme activity, which is normally enhanced during inflammatory responses, according to the scientists. Blocking this enzyme is the basis for some widely used arthritis medications.

It is not known how the compounds in the extract compare to anti-inflammatory agents that are already on the market. Some of the phenolic compounds identified in the extract are already familiar to scientists as potent disease-fighting antioxidants, but there are other compounds present in the extract that have not yet been characterized, the researchers say.

The extract did not appear to show any signs of cell toxicity in the current study. But don't try to brew your own pine bark remedy at home, Pihlaja and his associates warn, as further studies are needed to ensure the safety of its components.

The National Technology Agency of Finland provided funding for this study.

— Mark T. Sampson

# # #

The online version of the research paper cited above was initially published Nov. 10 on the journal's Web site. Journalists can arrange access to this site by sending an e-mail to newsroom@acs.org or calling the contact person for this release.

DOWNLOAD PDF:
http://pubs.acs.org/cgi-bin/article.cgi/jafcau/2004/52/i25/pdf/jf048948q.pdf
DOWNLOAD HTML:
http://pubs.acs.org/cgi-bin/article.cgi/jafcau/2004/52/i25/html/jf048948q.html

CONTACT:
Kalevi Pihlaja, Ph.D.
Environmental Chemistry
University of Turku
Turku, Finland
Phone: 358-2-3336750
Fax: same as phone
e-mail: kpihlaja@utu.fi

OUTSIDE EXPERT:
Ronald R. Watson, Ph.D.
Professor
Department of Health Promotion Sciences
University of Arizona Medical School
Tucson, Arizona
Phone: 520-626-2850
Cell phone: 520-591-8152
e-mail: rwatson@u.arizona.edu

(Dr. Watson has done research on the beneficial health effects of pine bark extracts and is willing to talk with reporters about this area).