Behind The Scenes: Seeram Discovers the Taste of Success in Maple Syrup

by Dr. Amy Keller

ASP member Dr. Navindra Seeram has received considerable publicity this year on several fronts. His work on medicinally beneficial compounds from maple syrup has been featured in a number of popular press articles, such as ScienceDaily (**http://www.sciencedaily.com/releases/2010/03/100321182924.htm**). *A commercial for the University of Rhode Island that features Dr. Seeram, "What's Your Big Idea?," was used in television spots in the Northeast. The* Newsletter *interviewed Dr. Seeram about his new publication in the* Journal of Functional Foods *entitled "Quebecol, a novel phenolic compound isolated from Canadian maple syrup." Please read the full article in the Journal of Functional Foods, 2011, 3(2), 125-128, and visit Dr. Seeram's website* (**www.uri.edu/pharmacy/departments/bps/faculty/seeram.shtml**).

MR. J. PETER MORGAN

The maple tree (Acer spp.) from which syrup is derived.

URI Bioactive Botanical Research Laboratory members. Back row (L to R): Professor Geneive Henry (Visiting Professor), Dr. Liya Li (Postdoc), Professor Navindra Seeram (Principal Investigator), Dr. Tao Yuan (Postdoc), Dr. Antonio Gonzalez-Sarrias (Postdoc). The graduate students are: middle row (L to R) Hang Ma, Chunpeng Wan, and Raed Omar, bottom row (L to R) Pragati Nahar, and Dinorah Jean-Gilles.

How did you become interested in maple syrup and theie bioactive phytochemicals?

Maple syrup, a natural sweetener, is the largest consumed plant natural product that is obtained entirely from the sap of trees. During the intensive heating process required to transform tree sap into syrup, a complex 'cocktail' of native phytochemicals (originally present in the xylem sap) and derived compounds (formed through chemical reactions during processing) ultimately ends up in maple syrup. Given our laboratory's interest in identifying bioactive phytochemicals in medicinal foods, we collaborated with the Federation of Maple Syrup Producers from Quebec, Canada, leaders of the world's commercial production of maple syrup, to isolate and identify its chemical constituents.

Who in your laboratory carried out the research?

Although assisted by students, the majority of the maple syrup research was conducted by postdoctoral fellow, Dr. Liya Li, who obtained her PhD in Pharmacognosy from Peking University, Beijing, China in 2006. She joined my lab, the URI Bioactive Botanical Research Laboratory (BBRL), in the summer of 2008. Dr. Li is an energetic and fantastic natural products chemist who in her capacity as the BBRL Lab Manager also serves as a great training resource for junior postdocs as well as graduate and undergraduate students.

Could you provide a brief explanation of the work and results in your own words? In what way are the data in your paper new?

Our extraction and isolation scheme started with 20 L of maple syrup obtained from Quebec, Canada, and it should be

continued on page 9

continued from page 8

appreciated that this volume of maple syrup was obtained from a large amount of sap (40 L of sap is needed to form 1 L of syrup). Along with 53 natural plant compounds, including four new compounds, we obtained a small quantity of a process-derived compound, 2,3,3-tri-(3-methoxy-4-hydroxyphenyl)-1-propanol, which was assigned the common name of quebecol in honor of the province of Quebec in Canada. Quebecol has a new chemical structure and while the mechanisms of its formation remains elusive, we believe that it was formed during the processing and/or extraction of the maple syrup. We speculate that quebecol may have interesting biological properties given that it bears structural similarities to tamoxifen, the breast cancer chemotherapeutic drug. We also suspect that there are other, yet to be identified, process-derived compounds in maple syrup. Thus, the finding of quebecol opens up the possibility of the presence of other bioactive compounds in maple syrup.

What impact does this research have on natural product science?

This research underscores the exciting opportunity for the identification of new chemical entities and potential drug molecules not only native to plants, but also from their derived products such as compounds formed in situ during processing and extraction of plant foods. This work highlights the importance of botanical research and has attracted significant public interest given that consumers now have heightened interest in their selection of 'functional' foods with health benefits that extend beyond basic nutrition.

What is a favorite nonscientific activity of your lab?

We enjoy getting together outside of the lab for our summer barbeque and pool party and our annual Christmas festivities.

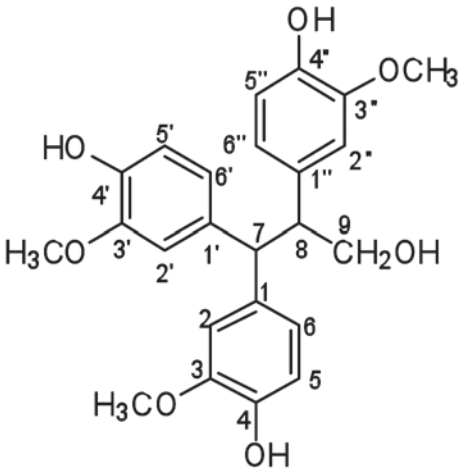
What is your lab's motto?

"Plants Rule!"

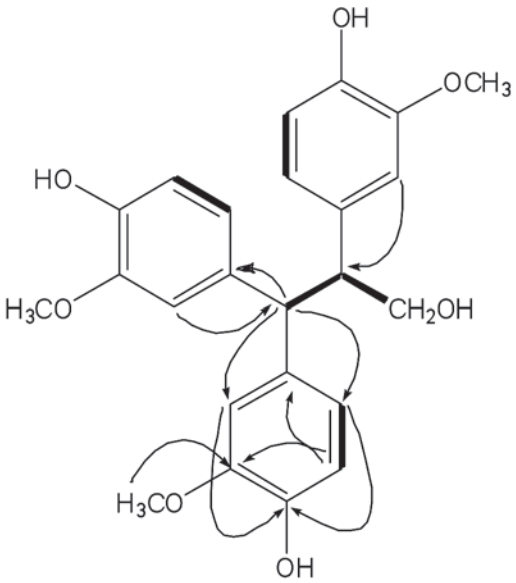
What is your greatest extravagance in the lab?

We spare no costs to provide lab members with whatever resources, instruments, and supplies that they need.

Structure of quebecol (1A) and its key COSY (thick lines) and selected key HMBC (arrows) correlations (1B).



1A



1B