

**AGRI 5710/5705: Graduate Module Course
Plant Secondary Metabolites**

Instructor: Dr. Vasantha Rupasinghe
(Cox 219-3; 893-6623; vrupasinghe@nsac.ca)

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Course Objectives:

To give an introduction to plant secondary metabolites, including: (i.) an overview of plant secondary metabolism; (ii.) classes, functions, and biosynthesis of isoprenoids, phenolics and alkaloid; and (iii.) introduction to biologically active major plant secondary metabolites.

Course Description:

This graduate module provides a basic knowledge about the perspectives of plant secondary metabolites with emphasis on the current scientific knowledge and awareness of their ecological functions, biosynthesis and metabolic control, biological activity, and economic significance.

Lecture and Laboratory Outline:

The graduate module consists of combination of lectures, discussions, reading/writing assignments, student-led literature review and a presentation. Lectures, class discussions, and assignments will cover introduction to plant secondary metabolism, biosynthesis, classes and functions of isoprenoids, phenolics and alkaloids, and introduction to biologically active major plant secondary metabolites.

The writing of a mini-review will provide an opportunity to explore and expand knowledge on a specific topic within plant secondary metabolites. Students will share the information of the literature review with the class and designated researcher(s)/advisor(s) in an oral presentation toward the end of the course.

Evaluation Methods:

Participation in class activities	10%
Assignments (paper discussion)	10%
Writing a mini-review	60%
Oral presentation	20% (class average)

Assignments: Research paper discussion / TBA

Mini-review (TBA):

The mini-review will consist of a 15-20 (double-spaced) page essay written about a specific plant secondary product of your choice. You are encouraged to select a topic that is not directly associated with your thesis research.

For example, you might write your article on one of the following topics:

- The current knowledge of a plant biosynthetic pathway;
- Elucidation of the mechanism of a specific enzyme associated with plant secondary metabolism;
- Regulation or engineering of specific secondary metabolic pathway to either enhance or suppress the biosynthesis of a target secondary metabolite;
- Distribution of a specific compound (or class of compound) among agricultural crops of your interest;
- Methods of extraction, isolation, identification, and/or quantification of selected plant secondary metabolite(s);
- Bioconversion or bio-processing associated with plant secondary metabolites;
- Interactions with other living organisms, bioavailability, biological activity, and/or health benefits of a selected plant secondary metabolite;
- Ecological and/or economic significance of selected plant secondary metabolite(s).
- Impact of food processing on the bioactive secondary metabolite(s).

You may also decide to combine two or more options from the above. However, keep in mind that the focus/emphasis of writing should be on plant secondary product(s).

You are encouraged to discuss your topic and content with the instructor before you begin on writing.

Presentation (TBA):

You will present a 20-min talk to the class on the topic you have written your mini-review. Students are encouraged to deliver a PowerPoint presentation and the required A&V facilities will be provided. A CD consists of your presentation or an e-copy is due a day before the scheduled time for your presentation. Please e-mail the presentation to vrupasinghe@nsac.ca.