

### Encadrement :

Nom Prenom : Sandy M Smith, Dean and Professor

Laboratoire /Entreprise : Forest Insect Ecology & Management, Faculty of Forestry, University of Toronto

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Courriel : Nature du financement de la gratification :  
 acquis  prévu

### Titre du stage :

**Urban Biodiversity on Native and Non-native Trees**

### Mots clés :

Urban Forestry, Biodiversity, Forest Health, Biological Invasion, Ecosystem Resilience

### Résumé :

Non-native trees now comprise >50% of most urban forests, yet the ecological impacts of this change are largely unknown. Ecological theory predicts that the effects could be either positive (e.g. Biotic Resistance Hypothesis: native biodiversity will be able to utilize non-native trees), or negative (e.g. Enemy Release Hypothesis: native biodiversity will not be able to utilize non-native trees). Although there has been an abundance of research conducted on these competing hypotheses, much of it has lacked an ecologically meaningful phylogenetic study design, and moreover very little work has been conducted in urban areas.

In an effort to clarify the response of urban biodiversity to the increasing proportion of non-native plant species, my research lab in biological invasions at University of Toronto, Faculty of Forestry, has designed, and has been conducting a large-scale phylogenetically-controlled study on the response of insects to non-native species in the centre of Toronto, a highly urbanized area.

The objectives of the internship will be to evaluate these competing hypotheses for a select variety of cogenetic pairs of native and non-native tree species in terms of the complete insect community structure (to Family level). Furthermore, in addition to a community-wide analysis, the intern will also evaluate the response of different insect guilds (e.g. syrphid fly pollinators, parasitic hymenopteran bio-control agents) to determine how general the response of insects may be to host plant nativity. Most work will involve identifying insects to Family level and running analyses on the data. Depending on the seasonal timing of the intership, there will also be opportunities to conduct field work, although the focus will be on assessing specimens collected in previous years to help identify important families for further analysis.

Successful completion of the project will result in recommendations for improved urban forest plantings based on sound ecological principles. By furthering our biological understanding of urban systems and the ecological services that they can provide, we will be able to design optimal strategies for emulating natural systems in highly urbanized settings. This, in turn, will lead to more effective programs in sustainable urbanism that will be of benefit to all.

### Deux références bibliographiques:

- 1) Native Fauna on Exotic Trees: Phylogenetic Conservatism and Geographic Contingency in Two Lineages of Phytophages on Two Lineages of Trees Martin M. Goßner, Anne Chao, Richard I. Bailey and Andreas Prinzing Page [599] of 599-614  
<http://www.jstor.org/stable/20491548>

2) The Economic Value of Ecological Services Provided by Insects John E. Losey and Mace Vaughan.  
<http://www.bioone.org/doi/abs/10.1641/0006-3568%282006%2956%5B311:TEVOES%5D2.0.CO%3B2>

**Techniques mises en œuvre:**

Insect identification & taxonomy ; lab & field sampling techniques ; data tabulation & analysis ; report writing

Compétences particulières exigées:

Focus, microscopes, interest in insects & ecology, ability to work with others, computing & quantitative skills

Liste complète des sujets de stage de M2 sur le site de la filière bop : <http://www.u-bourgogne.fr/BOPdijon/>