BIOL 498: Independent Research Project Template

**Title of Research Project (Maximum 65 characters including spaces.)**
Eugregarines and fighting success in Madagascar hissing cockroaches

**Calendar Description:**
In this course, students plan, conduct, and communicate the results of an independent research project in Biological Sciences under the direction of a faculty supervisor. Registration will be contingent on the student having made prior arrangements with a faculty member willing to supervise the research. Note: This course is intended for students in the final year of their degree. This course may be taken up to two times.

**Project Description (Maximum 200 words.)**
Competition between members of one sex over access to receptive members of the opposite sex often escalates to physical combat that can be both damaging and energetically demanding. Thus, an individual’s nutritional state can have a major impact on their relative fitness by affecting their success in contests over mates. Insects are models for the study of intersexual contest competition; many species are also infected by eugregarine intestinal parasites that compete for nutrients with their hosts. Recent research in dragonflies suggests that one of the effects of eugregarines is to reduce muscle mass in their insect hosts, thus reducing males’ ability to hold territories essential for mating and reproduction. Madagascar hissing cockroaches (*Gromphadorhina portentosa*) are also infected by eugregarines, but are a much better system in which to address the effects of these parasites due to the difficulty of rearing and housing dragonflies in a laboratory setting. Previous work on the cockroach-eugregarine system has shown that higher gut populations of eugregarines is associated with both increased food consumption and increased fat storage in juvenile males and increased searching behaviour in adult males. However, the effects on behaviours that are more closely associated with relative fitness, such as fighting success, have yet to be studied. The current project aims to investigate the relationship between eugregarine infestation and the outcome of contests between male hissing cockroaches.

**Potential Research Skills (The following is a tentative list of some of the research skills, procedures and applications that a student may be exposed to during this project.)**
The student will learn and/or develop the following skills: 1) care and handling of live insects, 2) experimental design to test specific scientific predictions, 3) systematic observation and recording of insect behaviour, 4) dissection and identification of insect anatomy, 5) identification and quantification of
eugregarine infestations, 6) collection and management of datasets using Microsoft Excel spreadsheets, 7) graphing and statistical analysis of data, and 8) oral and written presentation techniques.

Prerequisites
Minimum grade of B- in: Zoology 250; any 300 level course in biological sciences

Note to Student

If you are considering applying for this project you must consult with the faculty member listed to discuss your interest. The faculty member will provide you with an application form for you to complete. Please keep in mind that submission of an application does not guarantee acceptance to this, or any other BIOL 498 opportunity.

The project application deadline for Fall projects is April 5, 2019. Acceptance of students after this dates are at the discretion of the faculty member.