



## PLENARY SPEAKERS



### **Tools to assess animal welfare in wild, captive, and domestic species Dr. Karen Machin**

Animal welfare is an assessment of the state of an individual in relation to its environment. Failure to cope with the environment and difficulty in coping are indicators of poor welfare but in animals this can be very difficult to determine and often assessment is subjective. Researchers are required to assess welfare in the capacity of animal care but assessing welfare can provide answers to bigger questions such as population changes. Poor welfare can be associated with animal suffering and distress but welfare can be poor without suffering. The indicators of poor welfare are varied including: reduced life expectancy, reduced growth and reproduction, immunosuppression and disease, release of stress hormones, pain, behavior anomalies, etc. The use of measures of stress hormones, metabolite profiles (metabolomics), behaviour and other measures of animal welfare will be discussed.



### **Recent advances in Cretaceous amber deposits from Myanmar and Canada Dr. Ryan McKellar**

Burmese amber has been mined from the Kachin State of Myanmar for more than two millennia, and over the last two decades, it has become one of the best sources for information on fossil insects in the mid-Cretaceous (99 million years ago). More recently, this deposit had become a new source for vertebrate fossils. Although these specimens are fragmentary in nature, they offer a valuable supplement to our understanding based on compression fossils found in sedimentary rocks. Amber preserves microscopic structures and labile tissues in a new level of detail, retaining chemical signals and three-dimensional arrangements that are seldom available from other types of fossils. This material allows us to explore new aspects of Late Cretaceous ecosystems, but it also presents its own limitations and biases (particularly related to the size of the inclusions preserved). As part of this talk, we will explore the recent discoveries of toothed birds (Enantiornithes) and dinosaur material (Coelurosauria) that have been reported from Burmese amber, and prospects for this line of research. We will also examine how the recent discoveries tie into research efforts and student projects here in Saskatchewan. New technologies, such as synchrotron-based CT scanning and chemical mapping, are reshaping the way that amber inclusions are studied, while standard biological techniques like stable isotope analyses are finally making their way into amber studies. It is an exciting time to be a student or researcher studying amber.

### **Some remarkable reproductive mechanisms in Cactaceae** **Dr. Hugo Cota-Sanchez**



The cactus family exhibits striking floral shapes, designed to attract a wide range of pollinators. These, together with the versatility in breeding systems and reproductive mechanisms have provided new avenues for diversification by promoting genetic variability often reinforced by outcrossing. To date, the reproductive biology of the Cactaceae has been investigated in less than 10% of taxa, which impedes a better understanding of reproductive strategies in the family. In this talk I discuss two unusual reproductive means in distantly related species of cacti. One example will include aspects of thigmonasty in the Prickly Pear *Opuntia polyacantha*, a nastic response of the stamen filament to touch, a movement seemingly involved in pollination and protection from pollen robber insects. The second example discusses vivipary, the germination of seeds while still on the parent plant, which has been interpreted as a reproductive advantage that, in addition to allowing propagules to root and grow almost immediately, favours quick establishment whenever seedlings land on suitable substrates.

### **On the Use of Feathers to Assess the Endocrine Status of Birds** **Dr. Tracy Marchant**



The adrenal cortex of birds and other vertebrates secrete glucocorticoid hormones which have an important role in the maintenance of blood glucose levels and act within the whole body system to regulate energy flow and partitioning. The primary circulating form of glucocorticoid in birds is corticosterone (CORT). Targets of this hormone include virtually every cell type in the body, which leads to a wide-ranging suite of physiological effects on protein, carbohydrate and lipid metabolism, the immune system, behavior and more. Given its central role in energy regulation, CORT is an obvious hormone to study as a physiological mediator of environmental or behavioural influences in avian ecology. To facilitate these ecophysiological studies, we pioneered a technique that would allow us to quantify the amount of CORT deposited into the keratinized matrix of growing feathers. Feather CORT measurement (CORT<sub>f</sub>) allows for the integrated and retrospective assessment of this important regulatory system and overall avian energy balance. In this lecture, I will provide a perspective on the unique information that can be provided when CORT<sub>f</sub> is used to assess the endocrine status of birds. Gaps in our knowledge, some common misconceptions, and future directions will be highlighted.



# UNIVERSITY OF SASKATCHEWAN

---

## **Your graduate school wardrobe: lab coats and field pants are SO hot right now.**

**Jeffrey Lane**



As part of your graduate program, you are likely receiving highly specialized training in your chosen discipline. This training is invaluable and will hopefully set you up for future success, be it within or outside of academia. However, if we focus too intently, we risk missing the forest for the trees. Many field biologists loath being cooped up in a lab, for example, while many lab biologists shudder at the lack of control in field situations. In this presentation, I will argue that we would all benefit from taking a more integrative approach to our research. First, I will try to address the challenges to integration. For instance, many things that seem completely ordinary to a field biologist may be terrifying to a lab biologist (e.g., rattlesnakes). On the flipside, perfectly mundane aspects of lab biology are apt to send field biologists running for the comfort of their field stations (e.g., titrations). Second, I will consider approaches to bridge this divide. While exposure therapy to rattlesnakes may be a tad extreme, other options should be more palatable (try inviting someone in a lab coat to your next field biology pub crawl!). Lastly, I will use both historical case studies, as well as examples from my own work, to highlight the insights that can be gained (or missed – imagine how much further evolutionary biology would be today if Darwin had read Mendel’s work!) from integration.

# **WORKSHOPS**

## **Self-Care and Mental Health during School**

A discussion on strategies for self care and the importance of mental health presented by the U of S Counselling Services

## **Career Avenues in Biology**

A panel of biology-graduates to discuss their careers, from a range of areas including government, industry, and academia

# **REGISTRATION**

The final date to register for the upcoming 51<sup>st</sup> Prairie University Biology Symposium (PUBS) is **February 11th, 2017!** After this date, the registration website will close and there will be no extension.

The conference runs from February 23-25<sup>th</sup>, 2017 and registration is open for undergraduate and graduate students, as well as post-docs. We are looking for student researchers to present their work in biology through a poster session or a platform presentation. Registration can be accessed through our website.

**email:** [pubs2017@gmail.com](mailto:pubs2017@gmail.com)

**website:** [pubs2017.wixsite.com/home](http://pubs2017.wixsite.com/home)

**facebook:** [facebook.com/PUBS2017SK](https://www.facebook.com/PUBS2017SK)

**twitter:** @PUBS2017sk