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Contribution ID: **3316** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Using synchrotron radiation techniques as a tool in invertebrate paleontology

Wednesday, 8 June 2022 11:45 (15 minutes)

Over the past decade there has been a revolution in the methods that paleontologists use to analyze the remains of organisms that lived millions of years ago. Using the exceptional brightness of synchrotron light it is now possible to analyze bones and fossil insects in better detail than ever before, as well as provide new technical methods for research. While fossil vertebrates like dinosaurs can be studied famously from their skeletons, invertebrates and their preservation are an integral subset of paleontology. Insects are best preserved when they are trapped in sticky tree resin, which hardens and forms amber over millions of years. The insect is preserved in life-like 3-D position as the amber acts as a shield from outside environmental factors.

Fossilization is a rare process. Rarer still are organic signatures that preserve past a million years. Organic material has the potential to reveal more than mineralized inorganic remnants alone. Findings can help paleontologists peer into the past and make inferences on not only the evolution of organisms, but the evolution of planet Earth itself.

In this talk I will discuss some of the work I have done analyzing fossil insects included in amber. A focus will be on a leaf beetle from the Eocene epoch (˜44 Mya) that appears to have preservation of the organic substance chitin, one of the main components of insect exoskeletons. Synchrotron-based techniques used in the investigation include imaging and chemical analysis: Computed Tomography (μ-CT), Fourier Transform Infrared Spectroscopy (FTIR), and X-Ray Fluorescence micro-probe (μ-XRF) mapping. I will explain the physical principles of these various methods and how they are used to extract paleontological information from fossil insects.

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