

UNIVERSITY OF RHODE ISLAND
Department of Chemistry Ph.D. Seminar

2:00 PM, Friday, March 24, 2023
Beaupre Room 105

Kassie Picard
University of Rhode Island
Department of Chemistry

*Pesticides, polymers, and
pollution: Use of organic chemistry
to combat threats to honeybee
health*

HOST
Daniel Thomas
Department of Chemistry
401-874-5834

Pesticides, polymers, and pollution: Use of organic chemistry to combat threats to honeybee health

Pyrethroids are a class of synthetic pesticides with a wide range of agricultural, medical, and veterinary applications. These pesticides are particularly appealing due to the highly tunable molecular structure leading to selectivity towards pests and consistently low mammalian toxicity. The varroa mite, *varroa destructor*, is an ectoparasitic mite that infests honeybee colonies and transmits deadly viruses and bacteria. Traditional varroa mite management includes the use of an assortment of chemical treatments such as essential oils, natural organic acids, and small molecule pesticides. Three pesticides have been the workhorse for varroa management, however confirmed resistance to two of the compounds has led to widespread decline in honeybee colony health. This talk will discuss our efforts towards the development of new pesticides for varroa mite management in collaboration with a team of entomologists at URI East Farm.

In addition, we are interested in using honeybees to track terrestrial microplastic accumulation. Honeybees are designed to swab their environments and using microscopic hairs on their hind legs, gather pollen and other small fibers. Our aims are to analyze pollen pellets collected by honeybees and quantify the microplastic accumulation at various apiaries in Rhode Island. Making trends relating to geographical location and population density, we hope to develop a novel way to sample terrestrial microplastic accumulation.