

Researcher finds new bee in downtown Toronto

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A York University doctoral student who discovered a new species of bee on his way to the lab one morning has completed a study that examines 84 species of sweat bees in Canada. Nineteen of these species - including the one Jason Gibbs found in downtown Toronto – are new to science because they have never been identified or described before.

Gibbs' expansive study will help scientists track bee diversity, understand pollination biology and study the evolution of social behaviour in insects. It is also much anticipated by bee taxonomists who, like Gibbs, painstakingly examine the anatomy (morphology) of [bees](#) to distinguish one type of bee from another.

Bees are responsible for pollinating many wildflowers and a large proportion of agricultural crops. As much as one of every three bites of food that humans eat, including some meat products, depends on the pollination services of bees. Sweat bees are common visitors to a wide range of plants, including fruit and vegetable flowers in Toronto gardens.

Sweat bees – named for their attraction to perspiration – can be smaller than 4 mm in length, often have metallic markings, and make up one-third to one-half of bees collected in biodiversity surveys in North America. Complete species descriptions of 84 metallic sweat bees in Canada are included in Gibbs' monumental study, "Revision of the metallic species of *Lasioglossum (Dialictus)* in Canada." It was published today by the peer-reviewed journal *Zootaxa* as a single issue.

Despite their numbers and their importance as pollinators, sweat bees remain among the most challenging bees to identify to species, perhaps because they evolved so rapidly when they first appeared about 20 million years ago. Gibbs' research significantly improves upon all other available tools for the identification of these bees.

"These bees are morphologically monotonous. They are a nightmare to identify to species because their physical characteristics - their morphologies - are so similar among species. No one has been able to identify these bees until now even though they make up so many of the bees we collect," says Gibbs. "It's important to identify these species, because if we don't know what bees we have, we can't know what bees we're losing."

Gibbs examined tens of thousands of individual bees over about four years, from his own and others' collections as well as historical collections housed in museums. To identify bees to species, he first sorted them using morphological study, then tested his assessments using DNA sequences generated at the Canadian Centre for DNA Barcoding at the University of Guelph, which assigns "barcodes" to species based on their DNA. Finally, he carefully re-examined the bees' physical characteristics to draw even finer distinctions between the bees and identify them to species.

Among the 19 new species of sweat bee identified by Gibbs is one that he collected on his commute from downtown Toronto to York University. When he arrived at his York lab and examined it, he knew he had found a new species, never before identified by science but, as it turns out, quite common in [Toronto](#) and throughout eastern Canada and the USA. He also identified and described 18 other species from Canada that are new to science including a cuckoo bee: like a cuckoo bird, it doesn't build a nest or collect food but it has big mandibles for fighting. This cuckoo sweat bee is believed to invade the nest of another sweat

bee species to lay its eggs on the pollen and nectar collected by its host.

Provided by New York University

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