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Ancient giant wasp species discovered by Royal BC Museum researcher

VICTORIA, BC – Some 53 million years ago, giant wasps, about seven centimetres in length, flew through the landscapes of British Columbia, burrowing into trees and growing their own fungal food sources.

Jumping ahead to 2015, Royal BC Museum studies of the fossilized remains of these ancient creatures have resulted in the discovery of three new species of herbivorous wasps. All three have been named in an article published online this week in The Canadian Entomologist, thanks largely in part to the work of Royal BC Museum research associate Dr. Bruce Archibald.

"The discovery of new species of BC flora and fauna, both modern and ancient, is a proud part of what we do here at the Royal BC Museum," said CEO Prof. Jack Lohman. "It is key to our role as a significant leader in scientific research and scholarship."

These insects were discovered by Archibald as fossils from the ancient forests of British Columbia and Washington, including at the McAbee Fossil Beds near Cache Creek. Archibald, also a research associate with Simon Fraser University and Harvard's Museum of Comparative Zoology, described the discoveries with Dr. Alexandr Rasnitsyn of the Russian Academy of Sciences in Moscow and the Natural History Museum, London.

These kinds of discoveries tell a story about BC's past and are an invaluable tool to understanding our natural world.

"By looking into the fossil record, we hope to better understand how ancient forests and the insects that lived in them were affected by differing climates," Archibald said. "Learning more from our deep past may help us as we experience climate change in our own times."

The horntail wood-wasp, which the researchers named *Ypresiosirex orthosemos*, resembles its modern relatives, and like them, was a strikingly large insect. Horntail wood-wasps are forest pests today: their young bore tunnels through wood to create gardens in which they grow the fungus that they eat. A secretion the wasp then produces weakens the tree's immune system, and the fungus emits plant poisons, eventually killing it.

The authors report that all of the elements that their modern relatives prefer today were in place in our region by the time of the *Ypresiosirex orthosemos*. Many of the trees and other plants that modern horntail wasp young burrow in have been found as fossils in the same locations as the ancient wasps, including fir, pine, spruce, hemlock, sequoia, cedar and possibly juniper, as well as a number of their preferred flowering plants such as maple, beech, hickory, ash, poplar, elm, and possibly oak.

The climate was right for these insects, too: although the ancient forest grew during a phase of Earth's history when much of the globe experienced tropical heat, because the southern interior of British Columbia was an upland of some significant elevation, the average temperature in the McAbee forest would have been much like that of modern Vancouver, temperatures that today's wasps find agreeable. The major difference is that the ancient winters were much milder, with few, if any, frost days across the region.

The other new species of fossil wasps described by Archibald and Rasnitsyn were found at the McAbee and other, similarly aged sites of this ancient temperate upland, from the central Cariboo south to Republic, Washington.

About the Royal BC Museum

The Royal BC Museum explores the province's human history and natural history, advances new knowledge and understanding of BC, and provides a dynamic forum for discussion and a place for reflection. The museum and archives celebrate culture and history, telling the stories of BC in ways that enlighten, stimulate and inspire. Looking to the future, the Royal BC Museum will be a refreshed, modern museum, extending its reach far beyond Victoria as a world-class cultural venue and repository of digital treasures.

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