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MEDIA RELEASE

Giant fossil ants linked to global warming

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Contact:
Bruce Archibald, Vancouver resident, 778.782.4458, sba48@sfu.ca
Rolf Mathewes, Maple Ridge resident, 778.782.4472, mathewes@sfu.ca
Carol Thorbes, PAMR, 778.782.3035, cthorbes@sfu.ca

Four paleontologists, including two at Simon Fraser University, have discovered the fossil of a gigantic ant whose globetrotting sheds light on how global warming events affected the distribution of life some 50 million years ago.

The *Proceedings of the Royal Society B*, a British scientific journal, has published online today (May 4) their study *Intercontinental dispersal of giant thermophilic ants across the Arctic during early Eocene hyperthermals*.

The authors are Bruce Archibald and Rolf Mathewes from SFU (British Columbia, Canada), David Greenwood from Brandon University (Manitoba, Canada) and Kirk Johnson from the Denver Museum of Nature & Science (Colorado, USA).

They describe a new fossil species of giant ant, which they've named *Titanomyrma lubei*. This winged queen ant lived in the Eocene Epoch about 50 million years ago. It had a body just over five centimetres long — comparable to a hummingbird — a size only rivaled today by the monstrously large queens of an ant species in tropical Africa.

Archibald found the ant in a drawer when visiting Johnson at the Denver Museum. He says: "What is surprising is that this ant scurried about an ancient forest in what is now Wyoming when the climate there was hot like the modern tropics. In fact, all of the closely related fossil giant ants have been found in Europe and North America at sites that had hot climates."

The researchers also looked at the habitats of the largest modern ants, and found that almost all live in the tropics, indicating that there might be something about being big that requires ants to live in hot temperatures.

During the Eocene Epoch, many plants and animal species migrated between Europe and North America via continuous land across the Arctic, bridging the two continents. But the mystery is how did these ancient giant ants pass through a temperate Arctic climate — too cool for them?

The researchers suspect that the key is in the brief, but intense episodes of global warming that happened around this time. They appear to have created periodic opportunities for hot climate life to pass between continents through the Arctic. Archibald calls them brief openings of a physiological gate to cross the physical land bridge.

He notes that these findings will help scientists gain a better grasp of the impacts of global warming on life. He says: "As the Earth's climate changes, we are seeing tropical pest species extend their ranges into mid-latitudes and dragonflies appear in the Arctic. Understanding the details of how life forms adapted to global warming in the past will be of increasing importance in the future."

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