Cold is hot in evolution -- Researchers debunk belief species evolve faster in tropics

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University of British Columbia researchers have discovered that contrary to common belief, species do not evolve faster in warmer climates.

UBC Zoology PhD candidate Jason Weir and his mentor Prof. Dolph Schluter, director of the UBC Biodiversity Research Centre, charted the genetic family tree of 618 mammal and bird species in the Americas over the last several million years.

By analyzing the DNAs of species that are closely related to one another, the researchers found that speciation – the process in which one species splits into two – takes place faster in temperate zones than in the tropics. Their findings are published in today's edition of the journal *Science*.

"It's been long established that the tropics have more species, but it's not clear why," says Weir. "The common assumption is that species simply evolve faster in warmer climates."

"Our analysis shows that new species actually evolve faster as we move towards the poles. It would take one species in the tropics three to four million years to evolve into two distinct species, whereas at 60 degrees latitude, it could take as little as one million years."

The higher speciation rate in higher latitudes, however, is counteracted by a high extinction rate, both likely due to more intense climate fluctuations, says Weir.

"In comparison, even though there is a lower speciation rate in the tropics, the stable environment contributes to an equally low extinction rate. As a result, more species survive. This could help explain why there are more species in general in warmer climates," says Weir.

"In other words, there's a higher turnover of species in places like Canada, making it a hotbed of speciation, not the Amazon," says Schluter.

Source: University of British Columbia