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## Study Challenges Theories on Species

By RANDOLPH E. SCHMID  
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WASHINGTON -- More species develop in warm, tropical climates or cooler, temperate areas? It turns out the longtime answer \_ the tropics \_ may be wrong. True, more different types of animals exist there than in places farther from the equator. New research suggests that is because tropical species do not die out as readily. Cooler regions have a higher turnover rate, with more species developing but also more becoming extinct.

"It's a surprising result," Jason T. Weir of the zoology department at the University of British Columbia said in a telephone interview.

The findings by Weir and Dolph Schluter are published in Friday's issue of the journal Science.

They compared sister species from the Americas. Sister species are the most closely related species that share a common ancestor.

By analyzing the DNA of 618 mammal and bird species that lived in the past several million years, they were able to determine that new species develop more readily farther away from the tropics.

"It would take one species in the tropics 3 to 4 million years to evolve into two distinct species, whereas at 60 degrees latitude (two-thirds of the way toward either pole), it could take as little as 1 million years," Weir said.

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

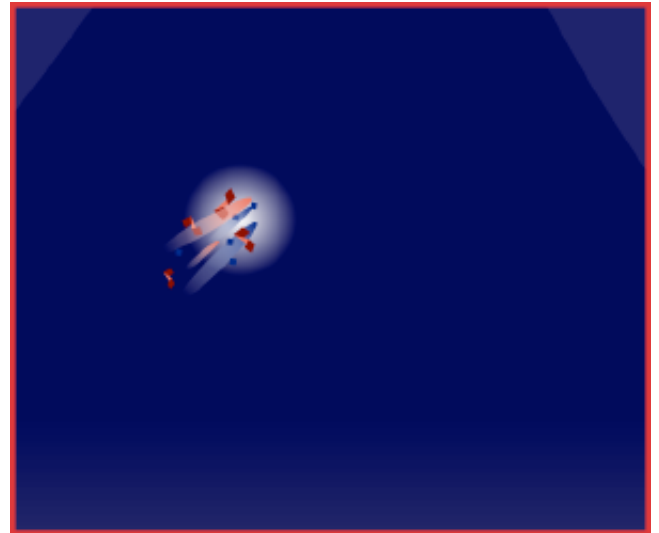
That, however, is balanced by a higher extinction rate in colder climates, so the tropics still have more diversity.

It also raises the question of whether a more variable climate causes more rapid evolution.

"That's our belief, but we can't prove it yet," Weir said.

The next step, he said, is to look at changes in behavior and body form, comparing tropical and temperate areas.

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Kenneth E. Filchak of the department of biological sciences at the University of Notre Dame, said "scientists and naturalists have been wondering about patterns of diversity for well over a century."

"We have come along way in our knowledge of evolution in the last 150 years," Filchak said, "but these questions still hold a central place in science."

He said the new report was "interesting and significant," for its look at the process of evolution and patterns of diversity.

But Filchak, who was not part of the research team, added: "One is left with the question of why?"

Weir said they got interested in the topic while studying the effects of ice sheets on evolution. They found that new species developed more rapidly in areas that had been covered with ice sheets than in regions that did not have ice cover.

That, he said, caused them to widen the research to cover a larger area.

The research by Weir and Schluter was supported by the Natural Sciences and Engineering Research Council of Canada, Canadian Foundation for Innovation and a Smithsonian Short-Term Fellowship.

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