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Closely Spaced Growth Rings in Teeth Point to Cold-Blooded Dinosaurs, Says UD Geologist

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NEWS RELEASE

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DAYTON, Ohio — Teeth from meat-eating dinosaurs that lived 100 million years ago show the same conspicuous closely spaced growth rings as teeth taken from reptiles from the same period and exhibited today in living crocodiles — a finding that supports the idea that dinosaurs were cold-blooded animals.

Michael R. Sandy, professor of geology at the University of Dayton, worked with then-undergraduate geology major Monica Stefanoff to section and examine teeth from three species of dinosaurs and three species of reptiles from the Cretaceous era. An additional specimen from an alligator from a later time period, the Pliocene of 5 million years ago, was also included in the study.

Sandy will display the findings Monday, Nov. 13, during the 112th annual meeting of the Geological Society of America to be held Nov. 9-18 at the Reno/Sparks Convention Center in Reno, Nev.

"We know the reptiles from that period were cold-blooded, as they are today, and the patterns from the dinosaur teeth are similar to the patterns from the reptiles," Sandy said. "We think this pattern could be indicative of a cold-blooded metabolism.

"This is one piece of evidence that no one has looked at before," he said.

Dinosaur teeth used in the study were from a Spinosaurus, a two- to three-ton dinosaur with an elaborate sail on its back; an Albertosaurus, similar to a small Tyrannosaurus with short front limbs and powerful hind legs; and a Dromosaurus, a lizard-like dinosaur. Also examined

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from the Cretaceous period were teeth from a crocodile; a Mosasaurus, an aquatic lizard with a snake-like body, large skull and long snout; and a Pteranodon, a flying reptile with a wingspan of up to 23 feet. The final sample was the tooth from the Pliocene alligator.

Similar to the way rings in a tree record growth patterns, teeth rings record periods of growth. Of the samples examined, all reflect patterns of continuous growth, a common characteristic of the species studied. "Sharks do this, and alligators and crocodiles replace teeth all of their lives," Sandy said.

The teeth rings also show no major breaks in growth, indicating there was not a winter period of slow growth. The lack of seasonality coincides with the probable climate of the time, Sandy said. "The Cretaceous climate is thought to be much more equitable than the current climate. There are not thought to have been ice caps, and these animals were all from a fairly low latitude so you would not expect a winter season."

He said the next area of inquiry will be to examine further the cause of the close spaces between the growth rings — "whether that's a characteristic of continuous growth or cold-blooded metabolism. Since these teeth are growing rapidly, that may be the cause of the closely spaced growth rings," he said. He may also expand the study to include herbivores and more varieties of meat-eating dinosaurs.

Establishing the metabolism of dinosaurs can help scientists paint a clearer picture of dinosaur life and eventual extinction. "Metabolism has an effect on all kinds of things when you take into account how dinosaurs lived, how fast they could move and what conditions they could tolerate," Sandy said. "It can help us understand what's happened in the past, which has led us directly to the position we're in today.

"Dinosaurs dominated the world for 140 million years. We've only been here 250,000 years. We've got a ways to go."

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For media interviews, contact **Michael Sandy** at (937) 229-3436, via cell phone at (937) 361-8468 or via e-mail at Michael.Sandy@notes.udayton.edu. From Nov. 9 to 18, he can be reached at the Reno Hilton in Reno, Nev., at (775) 789-2129. He will be conducting field studies in the area from Nov. 10 to 12.