

Still believe an asteroid killed the dinosaurs? Think again—new theory suggests

April 4 2018



Psychology professor Gordon Gallup (left) and his former student Michael Frederick (right) claim that due to a psychological deficit, the dinosaurs were dying off long before the notorious asteroid hit. Credit: University at Albany

Some experts have long believed that a massive asteroid was a primary cause of dinosaurs' extinction some 65 million years ago, but new analysis from a University at Albany psychology professor suggests that the dinosaurs were in trouble long before the asteroid hit.

Professor and evolutionary psychologist Gordon Gallup and his former student Michael J. Frederick, now of the University of Baltimore, assert that the emergence of toxic <u>plants</u> combined with dinosaurs' inability to associate the <u>taste</u> of certain foods with danger had them already drastically decreasing in population when the asteroid hit.



"Learned taste aversion" is an evolutional defense seen in many species, in which the animal learns to associate the consumption of a plant or other food with negative consequences, such as feeling ill. To explain the defense mechanism, Gallup offers the example of rats.

"A reason why most attempts to eliminate rats have not been successful is because they, like many other species, have evolved to cope with plant toxicity," said Gallup. "When rats encounter a new food, they typically sample only a small amount; and if they get sick, they show a remarkable ability to avoid that food again because they associate the taste and smell of it with the negative reaction."

The first flowering plants, called angiosperms, appear in the fossil record well before the asteroid impact and right before the dinosaurs began to gradually disappear. Gallup and Frederick claim that as plants were evolving and developing toxic defenses, dinosaurs continued eating them despite gastrointestinal distress. Although there is uncertainty about exactly when flowering plants developed toxicity and exactly how long it took them to proliferate, Gallup and Frederick note that their appearance coincides with the gradual disappearance of dinosaurs.

In addition to studying the proliferation of <u>toxic plants</u> while dinosaurs were alive, Gallup and Frederick examined whether or not birds (considered to be a descendant of dinosaurs) and crocodilians (also considered to be descended from dinosaurs) could develop taste aversions. They found that the birds, rather than forming aversions to taste, developed aversions to the visual features of whatever made them sick. Still, they knew what they shouldn't eat in order to survive. In a previous study in which 10 crocodilians were fed different types of meat, some slightly toxic, Gallup discovered that like dinosaurs, crocodilians did not develop learned taste aversions.

"Though the asteroid certainly played a factor, the psychological deficit



which rendered dinosaurs incapable of learning to refrain from eating certain plants had already placed severe strain on the species," said Gallup. "The prevailing view of dinosaur extinction based on the asteroid impact implies that the disappearance of <u>dinosaurs</u> should have been sudden and the effects should have been widespread, but the evidence clearly shows just the opposite: Dinosaurs began to disappear long before the <u>asteroid impact</u> and continued to gradually disappear for millions of years afterward."

The full paper is published in the peer-reviewed *Ideas in Ecology and Evolution*.

More information: The demise of dinosaurs and learned taste aversions: The biotic revenge hypothesis: <u>ojs.library.queensu.ca/index.p</u> ... <u>EE/article/view/6802</u>

Provided by University at Albany

Citation: Still believe an asteroid killed the dinosaurs? Think again—new theory suggests (2018, April 4) retrieved 1 May 2024 from <u>https://phys.org/news/2018-04-asteroid-dinosaurs-againnew-theory.html</u>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.