

Dinosaur whodunit: Solving a 77-million-year-old mystery

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It has all the hallmarks of a Cretaceous melodrama. A dinosaur sits on her nest of a dozen eggs on a sandy river beach. Water levels rise, and the mother is faced with a dilemma: Stay or abandon her unhatched offspring to the flood and scramble to safety?

Seventy-seven million years later, scientific detective work conducted by University of Calgary and Royal Tyrrell Museum researchers used this unique fossil nest and eggs to learn more about how nest building, brooding and eggs evolved. But there is a big unresolved question: Who was the egg-layer?

"Working out who the culprit was in this egg abandonment tragedy is a difficult problem to crack," says Darla Zelenitsky, U of C paleontologist and the lead author of a paper published today in the journal *Palaeontology*. "After further investigation, we discovered that this find is rarer than we first thought. It is a one of a kind fossil. In fact, it is the first nest of its kind in the world."

Zelenitsky says she first saw the nest in a private collection which had been collected in Montana in the 1990s. The nest was labeled as belonging to a hadrosaur (duck-billed) dinosaur, but she soon discovered it was mistakenly identified. In putting all the data together, she realized they had a small theropod (meat-eating) dinosaur nest. "Nests of small theropods are rare in North America and only those of the dinosaur *Troodon* have been identified previously," says Zelenitsky. "Based on characteristics of the eggs and nest, we know that the nest belonged to

either a caenagnathid or a small raptor, both small meat-eating dinosaurs closely related to birds. Either way, it is the first nest known for these small dinosaurs."

The nest tells scientists more about the behaviour of the animal as well as some valuable information relating to the characteristics of modern birds. "Our research tells us a lot about the dinosaur that laid the eggs and how it built its nest," says Francois Therrien, a co-investigator in the study and curator of dinosaur palaeoecology at the Royal Tyrrell Museum in Drumheller, Alta.

The fossil nest is a mound of sand about half a metre across and weighing as much as a small person. The eggs were laid two at a time, on the sloping sides of the mound, and form a ring around its flat top, where the nesting dinosaur would have sat and brooded its clutch.

"Based on features of the nest, we know that the mother dug in freshly deposited sand, possibly the shore of a river, to build a mound against which she laid her eggs and on which she sat to brood the eggs," says Therrien. "Some characteristics of the nest are shared with birds, and our analysis can tell us how far back in time these features, such as brooding, nest building, and eggs with a pointed end, evolved – partial answers to the old question of which came first, the chicken or the egg."

Source: University of Calgary

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