

T.rex 'followed its nose' while hunting

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Tyrannosaurus rex, a theropod from the Late Cretaceous of North America, pencil drawing. Image: Wikipedia.

Although we know quite a bit about the lifestyle of dinosaur; where they lived, what they ate, how they walked, not much was known about their sense of smell, until now.

Scientists at the University of Calgary and the Royal Tyrrell Museum are providing new insight into the sense of smell of carnivorous dinosaurs and primitive birds in a research paper published in the British journal *Proceedings of the Royal Society B*.

The study, by U of C paleontologist Darla Zelenitsky and Royal Tyrrell Museum curator of dinosaur palaeoecology François Therrien, is the first time that the sense of smell has been evaluated in prehistoric meat-eating dinosaurs. They found that Tyrannosaurus rex had the best nose of all meat-eating dinosaurs, and their results tone down the reputation of T. rex as a scavenger.

The researchers looked at the importance of the sense of smell among various meat-eating dinosaurs, also called theropods, based on the size of their olfactory bulbs, the part of the brain associated with the sense of smell. Although the brains of dinosaurs are not preserved, the impressions they left on skull bones or the space they occupied in the skull reveals the size and shape of the different parts of the brain. Zelenitsky and Therrien CT-scanned and measured the skulls of a wide variety of theropod dinosaurs, including raptors and ostrich-like dinosaurs, as well as the primitive bird Archaeopteryx.

"T. rex has previously been accused of being a scavenger due to its keen sniffer, although its nose may point to alternative lifestyles based on what we see in living animals" says Zelenitsky, the lead investigator on the study. "Large olfactory bulbs are found in living birds and mammals that rely heavily on smell to find meat, in animals that are active at night, and in those animals that patrol large areas. Although the king of carnivorous dinosaurs wouldn't have passed on scavenging a free dead meal, it may have used its sense of smell to strike at night or to navigate through large territories to find its next victim."

In addition to providing clues about the biology and behavior of the ancient predators, the study also reveals some surprising information about the sense of smell in the ancestors of modern birds.

Therrien and Zelenitsky found that the extinct bird Archaeopteryx, known to have evolved from small meat-eating dinosaurs, had an olfactory bulb size comparable to most theropod dinosaurs. Although sight is very good in most birds today, their sense of smell is usually poor, a pattern that does not hold true in the ancestry of living birds.

"Our results tell us that the sense of smell in early birds was not inferior to that of meat-eating dinosaurs," says Therrien. "Although it had been previously suggested that smell had become less important than eye sight

in the ancestors of birds, we have shown that this wasn't so. The primitive bird Archaeopteryx had a sense of smell comparable to meat-eating dinosaurs, while at the same time it had very good eye sight. The sense of smell must have become less important at some point during the evolution of those birds more advanced than Archaeopteryx."

Source: University of Calgary

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