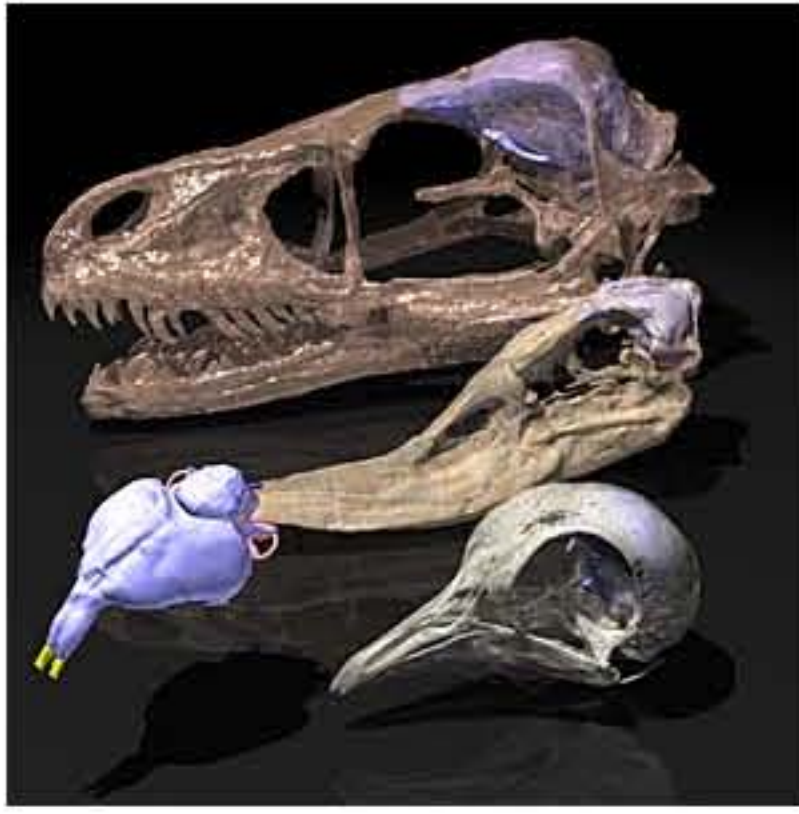


Birds' sense of smell improved from dinosaurs'

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Birds evolved a better sense of smell than their dinosaur ancestors, Canadian and U.S. researchers have found. That is contrary to what paleontologists had long believed.



This image shows the relative sizes of the olfactory bulbs (purple) in (top to bottom) Bambiraptor, a dinosaur that lived 75 million years ago, Presbyornis, an early bird from 50 million years ago, and a modern-day pigeon. (Witmer Lab/University of Ohio)

"The general perception has been that birds lost their sense of smell through evolution, so as they evolved from dinosaurs to modern birds their sense of smell got worse, because their vision and their co-ordination actually was improving for flight," said Darla Zelenitsky, an assistant paleontology professor at the University of Calgary.

"We actually found that sense of smell was not declining through bird evolution. It was actually improving and birds had a better sense of smell than their dinosaur ancestors."

Upcoming interview

Darla Zelenitsky talks to Quirks & Quarks on Saturday, April 16 at noon on CBC Radio One

Zelenitsky is the lead author of a paper on the findings, published Tuesday by scientists from the University of Calgary, Ohio University and the Royal Tyrrell dinosaur museum in Drumheller, Alta., in the Royal Society's flagship biological research journal, *Proceedings of the Royal Society B*.

The research team used CT scan technology to examine the skulls of 157 different species of dinosaurs and birds. They wanted to determine the size of a part of the brain involved in the sense of smell. Among modern-day birds and mammals, the larger the olfactory bulbs, the better the sense for scents.



The general perception has been that birds lost their sense of smell through evolution, said University of Calgary researcher Darla Zelenitsky. Her research found that in fact, early birds improved their sense of smell. (University of Calgary)

The study found that olfactory bulbs increased in size during the period right after birds evolved from dinosaurs.

The combination of a keen smell, good vision and co-ordination in early modern-day birds may have proved advantageous to orient themselves when flying and to look for food, mates or suitable habitats, Zelenitsky suggested.

"Birds must have been using their sense of smell for something and we know in modern birds, some use their sense of smell for looking for food or actually for navigating and homing," said Zelenitsky.

"So it's quite possible that early birds were also using their sense of smell for these activities."

Ducks, flamingoes are good sniffers

Co-author François Therrien, a curator at the Royal Tyrrell Museum, said more primitive birds such as ducks, flamingoes and the albatross still have highly developed olfactory skills.

"We found that even the early birds had a sense of smell that is equivalent to modern pigeons," Therrien said, "and modern pigeons use the sense of smell for homing to find their way back where they started."



More primitive birds such as flamingoes still have highly developed olfactory skills. (Associated Press)

The research showed that birds today with the smallest olfactory bulbs — perching birds such as crows and finches — are the ones most often seen at feeders. It may be no coincidence that these are also the cleverest birds, suggesting that enhanced smarts may decrease the need for a powerful sniffer.

Fossils have also revealed interesting details about the evolution of smell among early birds, Therrien said.

"The oldest known bird, Archaeopteryx, inherited its sense of smell from small meat-eating dinosaurs about 150 million years ago," he added. "Later, around 95 million years ago, the ancestor of all modern birds evolved even better olfactory capabilities.

"These guys went one step further and improved. It likely gave them a competitive edge when looking for food and navigating over long areas."



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