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## Royal BC Museum palaeontologist and team find *T. rex* sported lizard-like lips

VICTORIA, BC — A paper co-authored by Derek Larson, a member of the Royal BC Museum’s palaeontology department, working with an international team of palaeontologists, proposes that *Tyrannosaurus rex* may not have been the teeth-baring, ferocious looking creature that we’ve come to know.

Results from the researchers’ work suggests theropods like *Tyrannosaurus rex* and *Velociraptor* may not have had exposed teeth when their mouths were closed, but may have instead had a fleshy covering something similar to lips, not unlike those of modern-day lizards.

“For a long time, researchers have suggested that theropod dinosaurs had exposed teeth, like we see with crocodiles, and this has become the pervasive depiction of predatory dinosaurs in films and documentaries,” says Derek Larson, collections manager and researcher, Palaeontology, at the Royal BC Museum. “Our study overturns that idea and seriously brings into question how we reconstruct what certain dinosaurs look like.”

Alongside the paper’s other co-authors, Larson looked to modern examples of lip and tooth structure. From looking at the composition of animal teeth like the Komodo dragon, the researchers were able to determine that the exposed teeth of crocodiles are unique to that group and that covered teeth are more typical, and therefore, more probable in extinct animals.

“Our study shows that predatory dinosaur teeth were not atypically large,” said Auburn University’s Dr. Thomas Cullen, the lead author of the study. “Even the giant teeth of tyrannosaurs are proportionately similar in size to those of living predatory lizards, rejecting the idea that their teeth were too big to cover with lips.”

Larson, Cullen and their fellow researchers are also quick to acknowledge what the paper does not indicate, mainly that the fleshy tooth coverings they presume dinosaurs had would not be akin to the muscular, mobile lips humans have. They also acknowledge that some extinct animals, like various tusked mammals and flying or marine reptiles, almost certainly had exposed teeth—just not *T. rex* and other predatory dinosaurs.

These findings directly impact the way palaeontologists reconstruct the soft tissue and appearance of dinosaurs and other extinct species.

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“Accurately reconstructing an extinct animal has huge implications for inferring the behaviour, diet, and evolution of these organisms,” says Larson.

Given that dinosaurs’ closest modern genetic relatives, crocodiles and birds, are also lipless, Larson says it’s not surprising these depictions have become so prevalent.

“Palaeontologists often like to compare extinct animals to their closest living relatives, but in the case of dinosaurs, their closest relatives have been evolutionarily distinct for hundreds of millions of years and today are incredibly specialized. Many of the similarities that they once shared with dinosaurs are long gone,” he says.

One specimen examined for this study was the Field Museum of Natural History *T. rex*, nicknamed SUE. Visitors to the Royal BC Museum will be able to see SUE’s jaws and teeth in person with the opening of *SUE: The T. rex Experience* exhibition, opening June 16, 2023.

This study was published in the scientific publication *Science*. Alongside Larson and Cullen, the paper’s research team includes Mark P. Witton, Diane Scott, Tea Maho, Kirstin S. Brink, David C. Evans, Robert Reisz, and collaboration with museum collections around the world. This study primarily represents a collaboration of former and current students of the two senior authors of the study.

— 30 —

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