

## ‘From pipsqueaks to titans’: The complicated evolution of dinosaurs

For tens of millions of years, even as other dinosaur species grew to huge sizes, 40-foot carnivores weren’t around. How, then, did the meat-eaters rise to the top of the food web in the Age of Dinosaurs?

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The critical transition between big and giant seemed to happen sometime in the Middle Jurassic, a little-understood time when dinosaurs flourished. The critical time is between 201 and 174 million years ago, in the Early and Middle parts of the Jurassic. As luck would have it, once such carnivore was recently unearthed.

Late last year, Ludwig-Maximilian University of Munich paleontologist Oliver Rauhut and colleague Diego Pol named an exceptional skeleton of a Middle Jurassic carnivore they called *Asfaltovenator*. This was a large animal, more than 25 feet long.

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[I]mportantly, Rauhut and Pol say, *Asfaltovenator* appears to display traits of more than one theropod lineage. The bones carry echoes of a more ancient time before the major theropod groups; *Asfaltovenator* most closely resembles *Allosaurus*, but the dinosaur also has some traits seen in a group called megalosaurs, a family of large-headed carnivores such as *Torvosaurus* and *Megalosaurus*. This could be an indication that these two families split from each other a few million years prior, occupying different niches as such dinosaurs grew ever larger.

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