Abstract Submitted
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Allometry in dinosaurs and mammals SCOTT LEE, University of Toledo — The proportions of the leg bones change as the size of an animal becomes larger since the mass of the animal increases at a faster rate than the cross-sectional area of its leg bones. For the case of elastic similarity (in which the longitudinal stress in the legs remains constant in animals of all sizes), the diameter d and length L of the femur should be related as $d = A\ L^{3/2}$. For geometric similarity (in which all dimensions are scaled by the same factor), $d = A\ L$. For animals with femora longer than 20 cm, we find the power law relationship to be $d = A\ L^b$ with $b = 1.13 \pm 0.06$ for extant mammals (the largest mammal being *Loxodonta africana* with a 1.00-m-long femur) and $b = 1.18 \pm 0.02$ for dinosaurs (the largest dinosaur being *Brachiosaurus brancai* with a 2.03-m-long femur). These data show that extinct dinosaurs and extant animals scale in the same basic manner. The large sauropods (with femora twice as long as found in elephants) scale in a manner consistent with extrapolation of the scaling shown by extant mammals. These results argue that extinct dinosaurs moved in a manner very similar to extant mammals.

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