

Abstract Submitted
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Mesothermy in the Mesozoic: Mass gain curves in dinosaurs

SCOTT LEE, University of Toledo — Thermal regulation is an important property of animals. Most extant (i.e., living today) animals use either endothermy (in which the body temperature is kept very close to a certain value) or ectothermy (in which the body temperature varies greatly and can be as low as ambient temperature). In order to maintain their high body temperature, extant endotherms have a much higher metabolic rate than extant ectotherms. This permits endotherms to grow much faster than ectotherms. A small number of extant animals (echidna, leatherback turtles, and certain tuna and sharks) use mesothermy in which their body temperature varies by as large as 10 °C or is kept warmer than ambient by a certain amount). A model based on conservation of energy is used to determine the growth of extant animals and dinosaurs. Of particular interest is the maximum growth rate of the animal which is correlated with metabolism. Extant animals show that the maximum growth rate is about an order of magnitude higher in endotherms than it is in ectotherms. Maximum growth rates of twenty different dinosaur species are found to be intermediate between extant endotherms and ectotherms. This argues that dinosaurs used mesothermy to regulate their body temperature.

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