

## **A new approach to evaluate the cursorial ability of the giant theropod *Giganotosaurus carolinii***

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The cursorial capability of the South American giant theropod *Giganotosaurus carolinii* should have been quite limited taking into account the strength indicator of its femur (approximately 7 GPa-1) as well as the risk of experiencing grave or even lethal injuries involved in the falling of this multitonne animal on a run. However, even at low speeds a fall would have caused serious injuries. Thus, in accordance to the approach developed in this study, the maximum speed of *Giganotosaurus* should be not that which will implicate corporal lesions with minimum probability of lethality. Instead, its maximum speed should be that which would permit the recovery of body equilibrium as each step is taken. Taking into consideration this approach, an indicator of stability is defined for bipedal, cursorial animals. This indicator is determined by the relationship between the time available for the movement of hip joint during the retraction of a hindlimb and the time needed to move the opposite hindlimb by an angle (in function of the speed) of sufficient magnitude as to facilitate the recovery of body equilibrium. This indicator was used to estimate the maximum speed of locomotion of *Giganotosaurus* (about 14 m s<sup>-1</sup>) at which, from a kinematic point of view, the danger of falling does not exist.

**Key words:** Dinosauria, Theropoda, *Giganotosaurus*, cursorial gait, Cretaceous, South America.

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