Abstract

Speed estimations from trackways of Titanopodus mendozensis González Riga and Calvo provide information about the locomotion of titanosaurian sauropods that lived in South America during the Late Cretaceous. Titanopodus ichnites were found at Agua del Choique, a newly discovered track site in the Loncoche Formation, Late Campanian-Early Maastrichtian of Mendoza, Argentina. This speed study follows the hypothesis of dynamic similarity proposed by Alexander. As a refinement of this method, a complementary equation is presented here based on an articulated titanosaurian specimen collected in strata that are regarded as correlative to those that have yielded Titanopodus tracks (Allen Formation, Neuquén Basin). This analysis indicates that hip height can be estimated as 4.586 times the length of the pes track in derived titanosaurs. With an estimation of the hip height and the stride measurements, the speed is calculated. The study of two wide-gauge trackways indicates that Titanopodus ichnites were produced by mediumsized titanosaurids (hip height of 211-229 cm) that walked at 4.7-4.9 km/h towards the south and southwest, following, in part, a sinuous pathway. These speeds and some taphonomic features of tracks (prominent rims, distorted elongated shapes) indicate the capacity of derived titanosaurs for walking effectively over a very wet and slippery substrate. In the ichnological record, the walking speeds of Titanopodustrackmakers are somewhat faster than those previously inferred for most sauropods.

Keywords

Speed, Sauropoda, Titanopodus, Cretaceous, Argentina.