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The use of Micro Computer Tomography in the establishment of a new basal sauropodomorph taxon

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Understanding the palaeobiodiversity of the Early Jurassic of South Africa relies on researchers' ability to correctly identify the various fossil taxa from that time. Complicating factors such as ontogeny, sexual dimorphism, and taphonomic deformation often hinder these taxonomic identifications. Micro Computed Tomography (CT) allows for an unprecedented level of detail when studying fossils and therefore more insight into the factors explaining observed morphological disparities. Here, a basal sauropodomorph specimen (BP/1/4779) previously referred to Massospondylus carinatus was CT-scanned and compared to a small ontogenetic series of M. carinatus specimens in order to rule out developmental effects as a reason for the morphological differences observed. Using digital retrodeformation of the reconstructed scans, we assessed if the shapes of the overall skull of BP/1/4779 and of the individual cranial bones can be deformed to resemble that of M. carinatus, therefore excluding taphonomic deformation as an explanation. On the basis of this CT-based investigation, we can confidently reassign BP/1/4779 to a new genus.

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