

A SMALL ASIAN BRACHIOSAURID SAUROPOD DINOSAUR FROM THE LATE MIDDLE JURASSIC OF CHINA

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Here we describe the first brachiosaurid from Asia based on a cervical vertebra from the lower part of the Shishugou Formation at Wucuiwan in the Junggar basin of Xinjiang, western China. The horizon that yielded the specimen is below a tuff radiometrically dated at 161.2 ± 0.4 ma, correlated approximately with the Middle-Upper Jurassic boundary, making this the oldest known brachiosaurid. The Shishugou has yielded several sauropod taxa, including *Mamenchisaurus sinocanadorum* from the early Late Jurassic upper part and the enigmatic *Klamelisaurus* and *Bellusaurus* from the late Middle Jurassic lower part. The new specimen differs from cervical vertebrae of mamenchisaurids in having an anteroposteriorly short neuropophysis, and pneumatic excavations in the lateral arch and spine. It differs from *Klamelisaurus* which has a convex ventral face on its cervicals and from *Bellusaurus* which lacks the pneumatic fossae of the new taxon. Both possess short forelimbs uncharacteristic of brachiosaurids. The specimen resembles the anterior cervicals of known brachiosaurids in having a high neural arch, low neural spine, and sharp-lipped pneumatic cavities in the centrum, arch, and spine. The specimen differs from known brachiosaurids in having prominent epiphyses that strongly overhang the postzygapophyses. Together with the proportions of the vertebra and its biogeographic and stratigraphic location, they suggest that the specimen represents a new taxon. Based on the closure of the neurocentral suture this specimen is thought to be close to adult size, yet is about half the size of the comparable bone in *Brachiosaurus*, suggesting that this was the smallest brachiosaurid known so far with an estimated total length of 11 m. The new taxon is important as brachiosaurids are otherwise known from the Late Jurassic and Early Cretaceous of the Americas, Europe and Africa, and this significantly extends both the geographic and stratigraphic ranges of this clade. Brachiosaurids and titanosauriforms as a whole must have originated before the Callovian, and given the isolation of Asia from other continents in the Middle Jurassic this suggests an even older divergence for these clades.
