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SUPPLEMENTARY ONLINE MATERIAL FOR

Osteology of the alvarezsauroid *Linhenykus monodactylus* from the Upper Cretaceous Wulansuhai Formation of Inner Mongolia, China, and comments on alvarezsauroid biogeography

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SOM 1. Optimized synapomorphies for the Alvarezsauroidea and more exclusive clades.

SOM 2. Data set 1 and 2.

SOM 1.

See Longrich and Currie (2009) for the character list.

Unambiguous synapomorphies for the Alvarezsauroidea: cervical epiphyses reduced or absent (character state 6.1), coracoid with elongate ventrolateral process (character state 25.1), humeral internal tuberosity hypertrophied and proximally projecting (character state 29.1), humeral ectepicondyle hypertrophied and distally positioned (character state 31.1), distal articular surface of ulna bulbous and trochlear (character state 33.1), olecranon process of ulna hypertrophied (character state 34.1), manual digit II subequal to humerus in diameter (character state 40.1), manual phalanx II-1 flattened and bearing a prominent ventral sulcus (character state 40.1), postacetabular process of ilium longer than preacetabular process (character state 50.1), and femoral lateral condyle conical and distally projecting (character state 61.1);

Unambiguous synapomorphies for Alvarezsauridae: cervical centra bearing deep lateral depressions (character state 8.1), posterior sacral vertebrae bearing a large ventral keel (character state 19.1), caudal vertebrae procoelous (character state 21.1), coracoidal biceps tubercle reduced or absent (character state 26.1), manual ungual II flexor tubercle reduced to a low keel (character state 44.1), proximal articular surface of manual ungual II at least as broad as tall (character state 46.1), pubic peduncle of ilium anteroposteriorly reduced (character state 48.1), medial shelf of brevis fossa reduced to a low ridge (character state 53.1), and pedal digit III more slender than either digit II or IV (character state 73.1);

Unambiguous synapomorphies for Parvicursorinae: dorsal vertebrae opisthocoelous (character state 10.1), dorsal vertebrae without hyosphene-hypantrum articulations (character state 12.1), parapophyses of dorsal vertebrae elevated to the level of the diapophyses (character state 13.1), dorsal infradiapophyseal fossa and infraprezygapophyseal fossa invisible in lateral view (character state 15.1), posterior sacral bearing a hypertrophied ventral keel (character state 19.2), anterior caudals with transverse processes anteriorly positioned on centrum (character state 22.1), metacarpal II with prominent tuberosity ('extensor process') on medial surface (character state 39.1), ventral surface of manual ungual II bearing axial groove (character state 43.1), manual ungual II without well-developed flexor tubercle (character state 44.2), ascending process of astragalus restricted and failing to cover medial surface of tibia (character state 66.1), shaft of metatarsal III triangular in section and proximally reduced (character state 68.1), and distal end of tibia with lateral malleolus anteroposteriorly expanded (character state 77.1).

SOM 2.

To replicate the Treefitter analyses, the reader should copy the text between quotation marks into a text only (.txt) document and then follow the instructions in the manual that accompanies Treefitter 2.0b (Ronquist 1998)

Data set 1

'Ptree alvarezsaur1

(Haplocheirus, ((Achillesaurus, Alvarezsaurus), (Patagonykus, (Linhenykus, ((Albertonykus, YPM1049), (Xixianykus, ((Mononykus, Shuvuuia), (Parvicursor, TugrikenShirehalvrezsaur))))))));

Range alvarezsaur1 *Haplocheirus:A, Achillesaurus:S, Alvarezsaurus:S, Patagonykus:S, Linhenykus:A, Albertonykus:N, YPM1049:N, Xixianykus:A, Mononykus:A, Shuvuuia:A, Parvicursor:A, TugrikenShirehalvrezsaur:A;*

Data set 2

'Ptree alvarezsaur2

(Haplocheirus, (Achillesaurus, (Alvarezsaurus, (Patagonykus, (Linhenykus, ((Albertonykus, YPM1049), (Xixianykus, ((Mononykus, Shuvuuia), (Parvicursor, TugrikenShirehalvrezsaur))))))));

Range alvarezsaur2 *Haplocheirus:A, Achillesaurus:S, Alvarezsaurus:S, Patagonykus:S, Linhenykus:A, Albertonykus:N, YPM1049:N, Xixianykus:A, Mononykus:A, Shuvuuia:A, Parvicursor:A, TugrikenShirehalvrezsaur:A;*