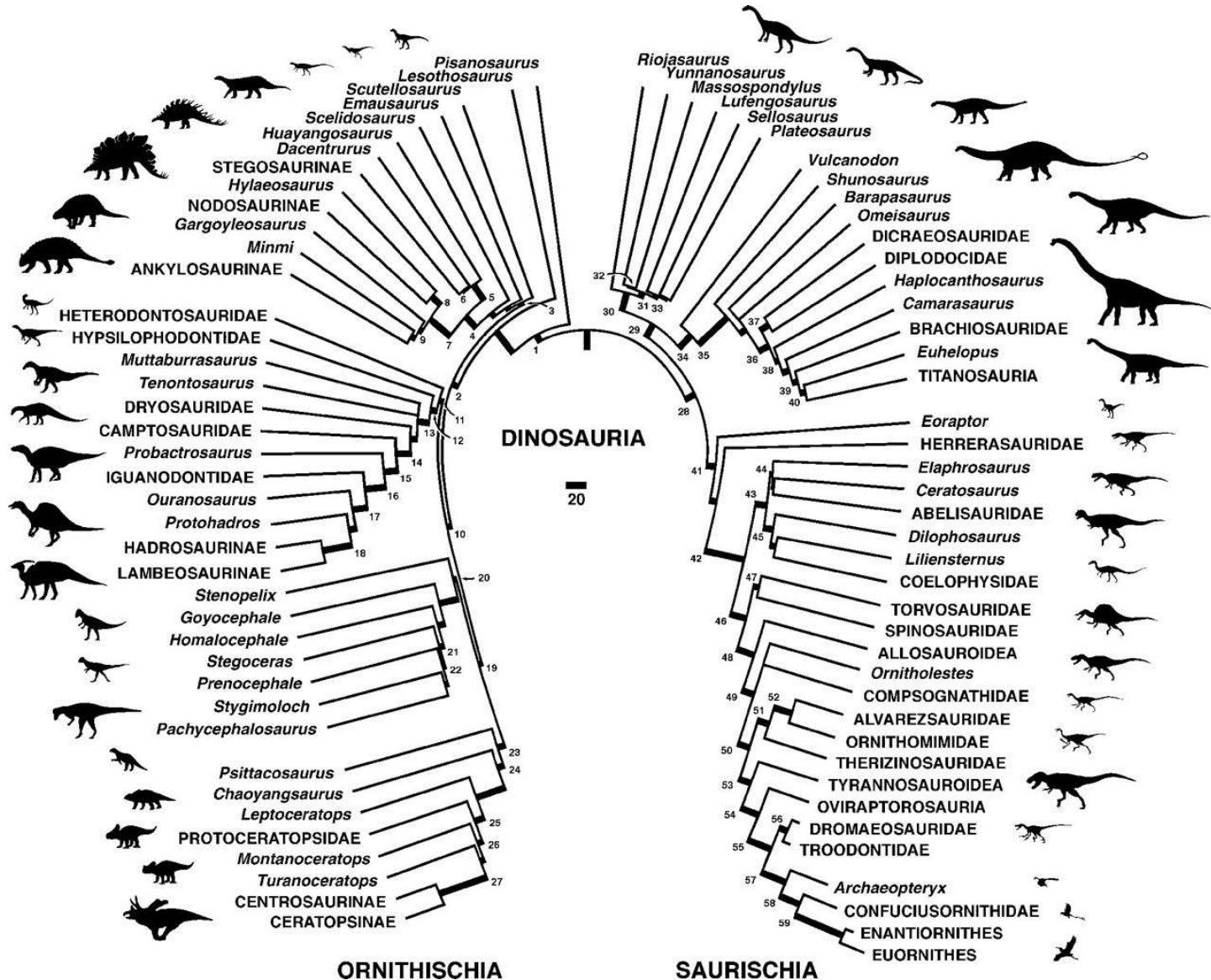




Saurischia - Sauropodomorpha

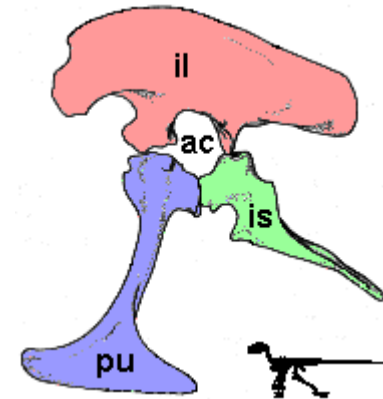
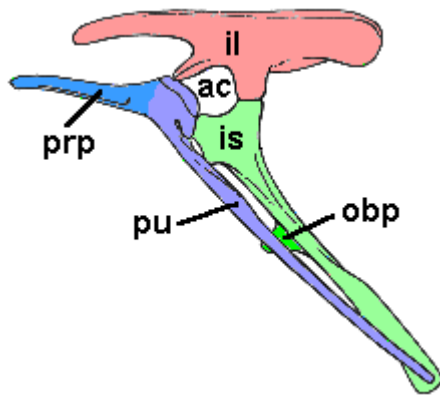


Saurisquia

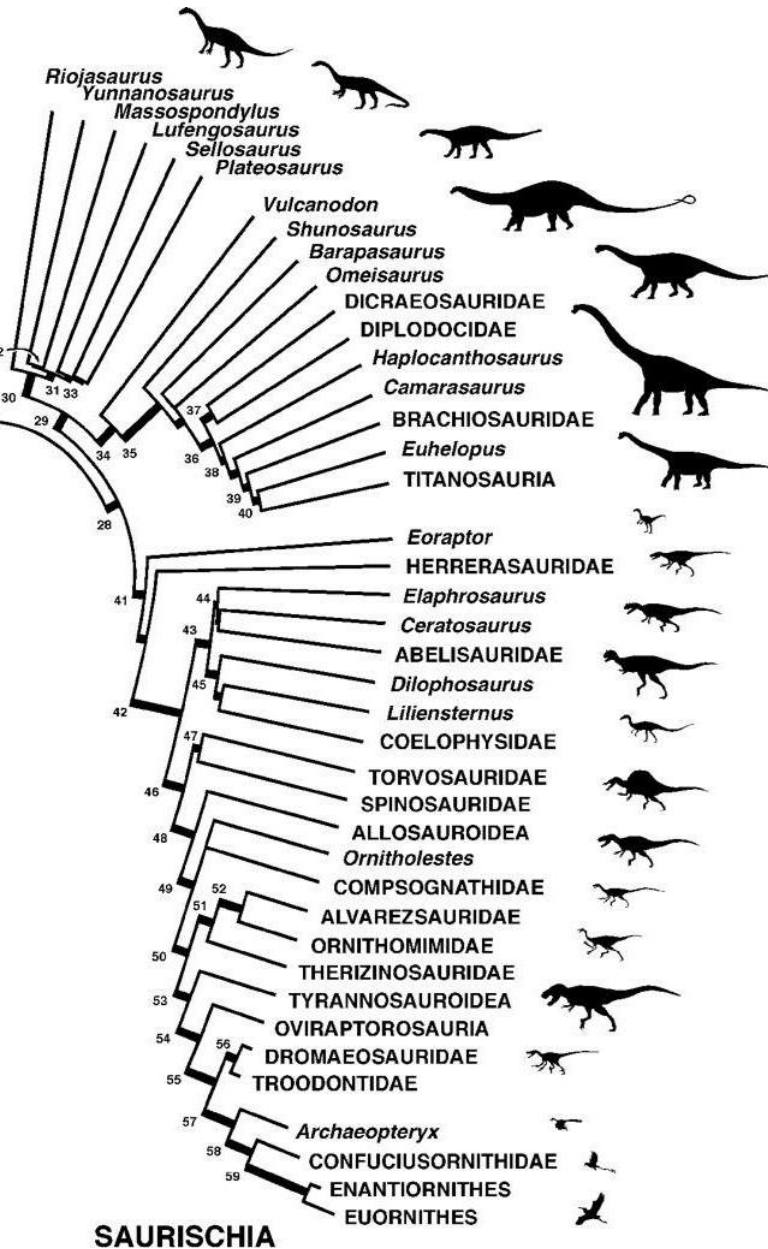


Saurischia

Saurischia: Todos los taxa que comparten un ancestro común más reciente con las aves que con Triceratops.



Saurischia



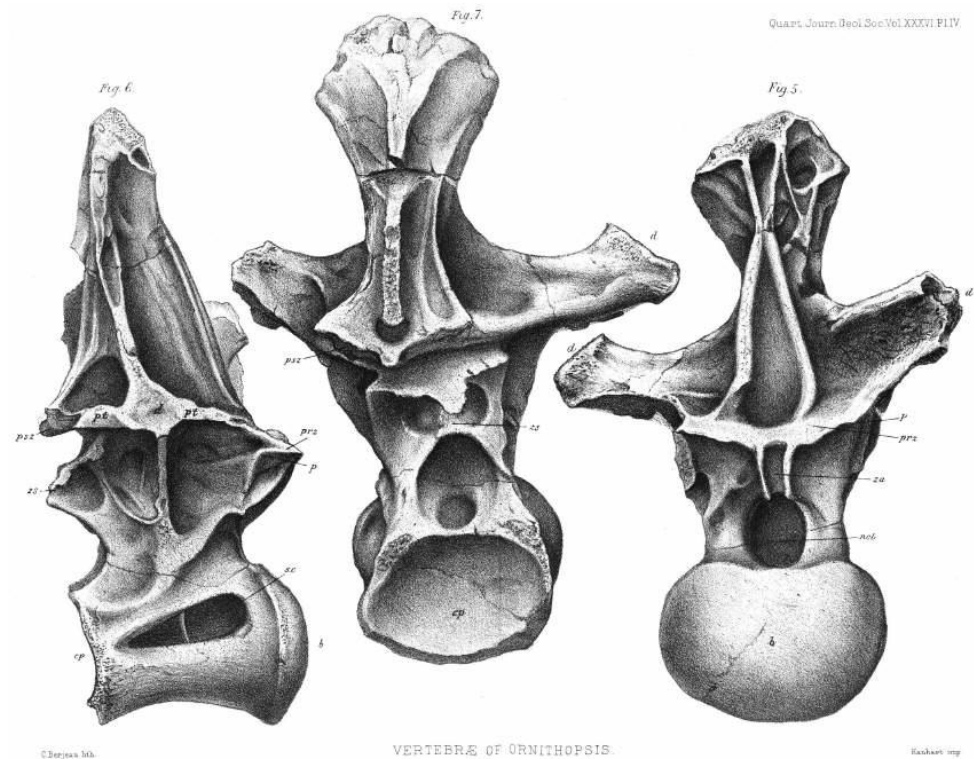
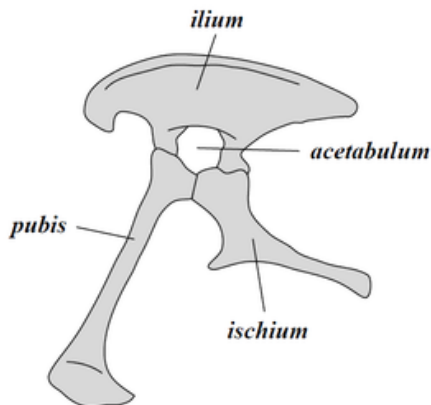
Sauropodomorpha: Todos los taxa más cercanos a Apatosaurus que a las aves.



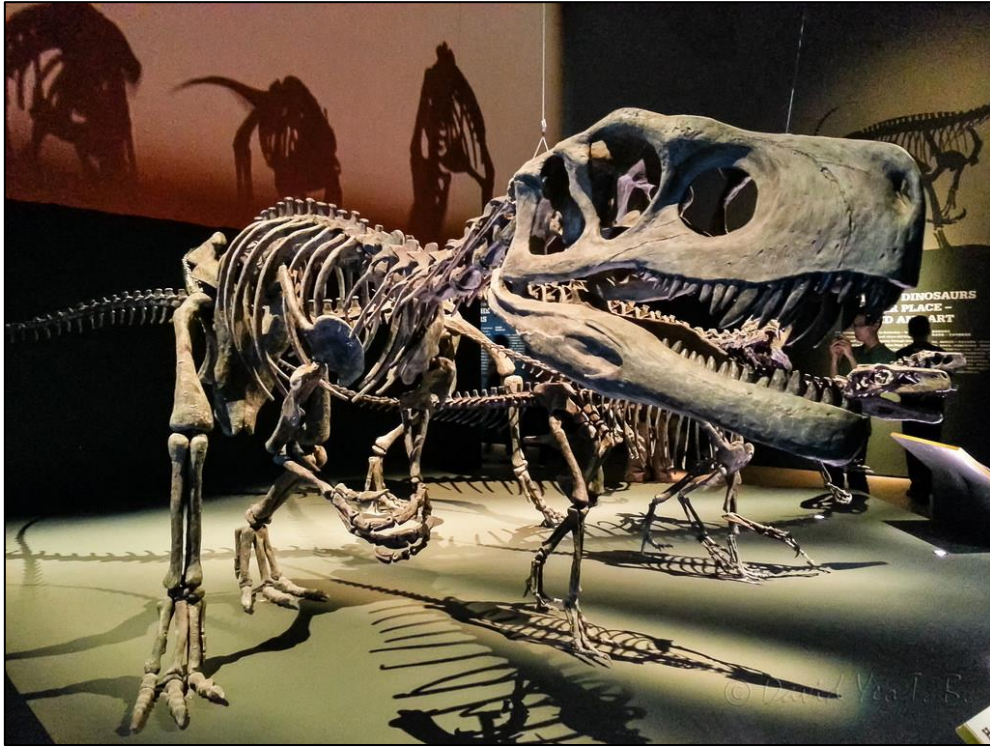
Theropoda: Todos los taxa más cercanos a las aves que a Apatosaurus.



- Isquion y pubis alargados y proyectados en dirección opuesta
- Vertebrae cervicales posteriores alargadas
- Dedos IV y V de la mano reducidos
- Articulación accesoria (hypantro-hyposfeno) en las vertebrae
- Metacarpo I corto
- Garra del dedo I alargada
- Sacos aéreos



Herrerasauridae



Herrerasaurus

Staurikosaurus



Herrerasauridae

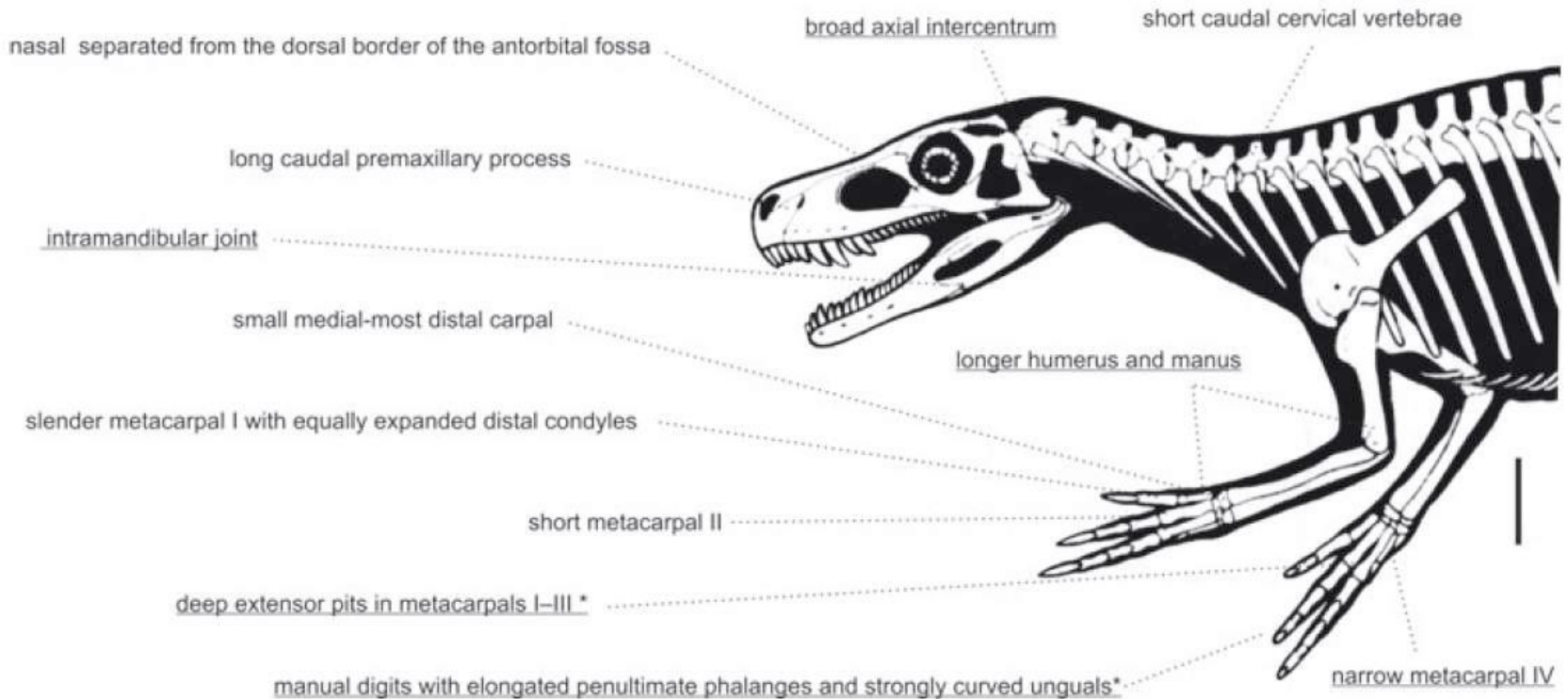
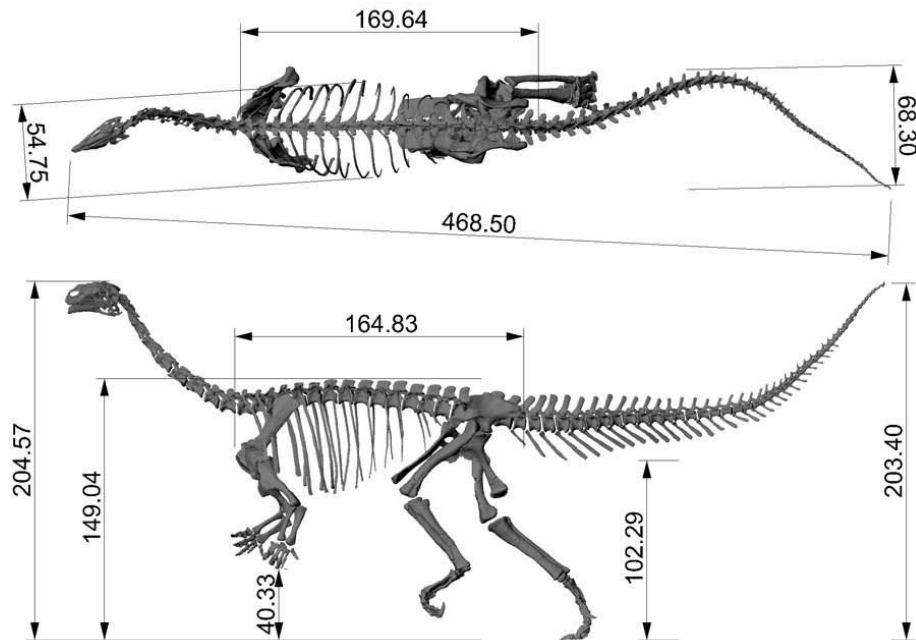
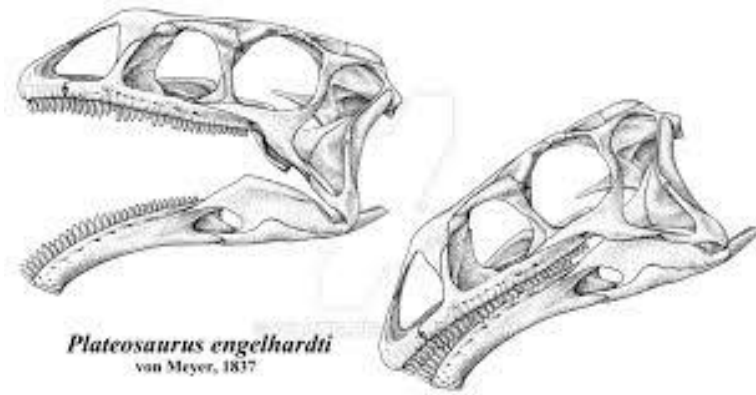


Fig. 10. Selected anatomical features of *Herrerasaurus ischigualastensis*, depicting a combination of apomorphic traits shared with Neotheropoda (underlined) and plesiomorphic states relative to the Eusaurischia condition (non underlined). Asterisks indicate traits also seen in basal ornithischians according to Butler *et al.* (2007). Skeletal reconstruction based on Sereno (1993). Scale bar = 10 cm.

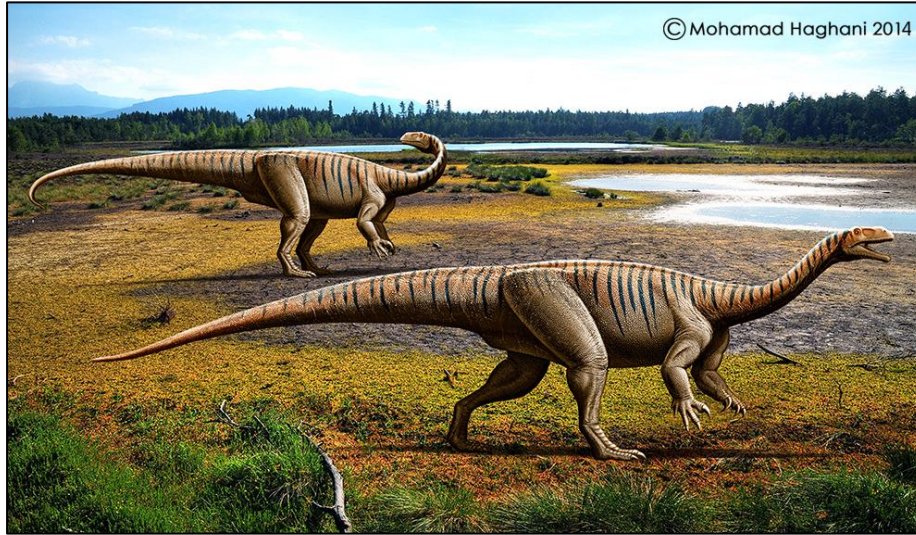
Sauropodomorpha

Sinapomorfías:

- Cráneo pequeño (aprox 5% de la longitud total)
- Dentario curvado hacia abajo
- Fémur más largo que la tibia
- Dientes altos en forma de hoja
- Al menos 10 vertebras cervicales



Sauropodomorpha



'Prosauropoda'

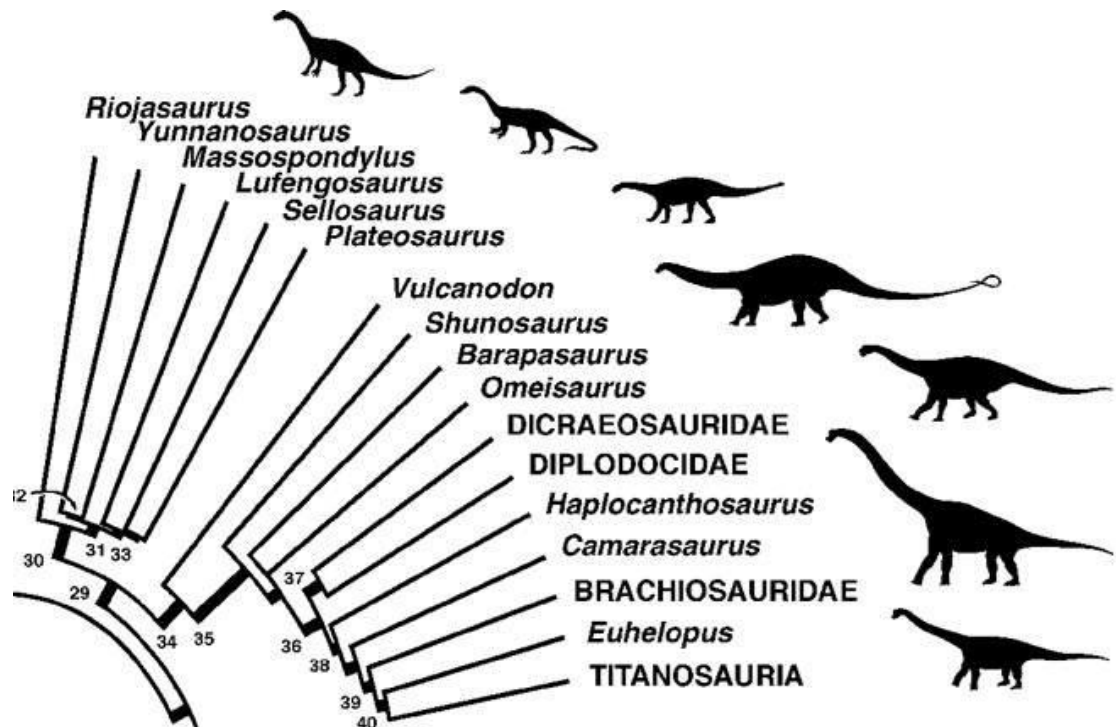


Sauropoda

Sauropodomorpha

‘Sinapomorfías prosauropodas’:

- Metatarso V reducido
- Posición digitígrada del pie
- Bipedalismo facultativo

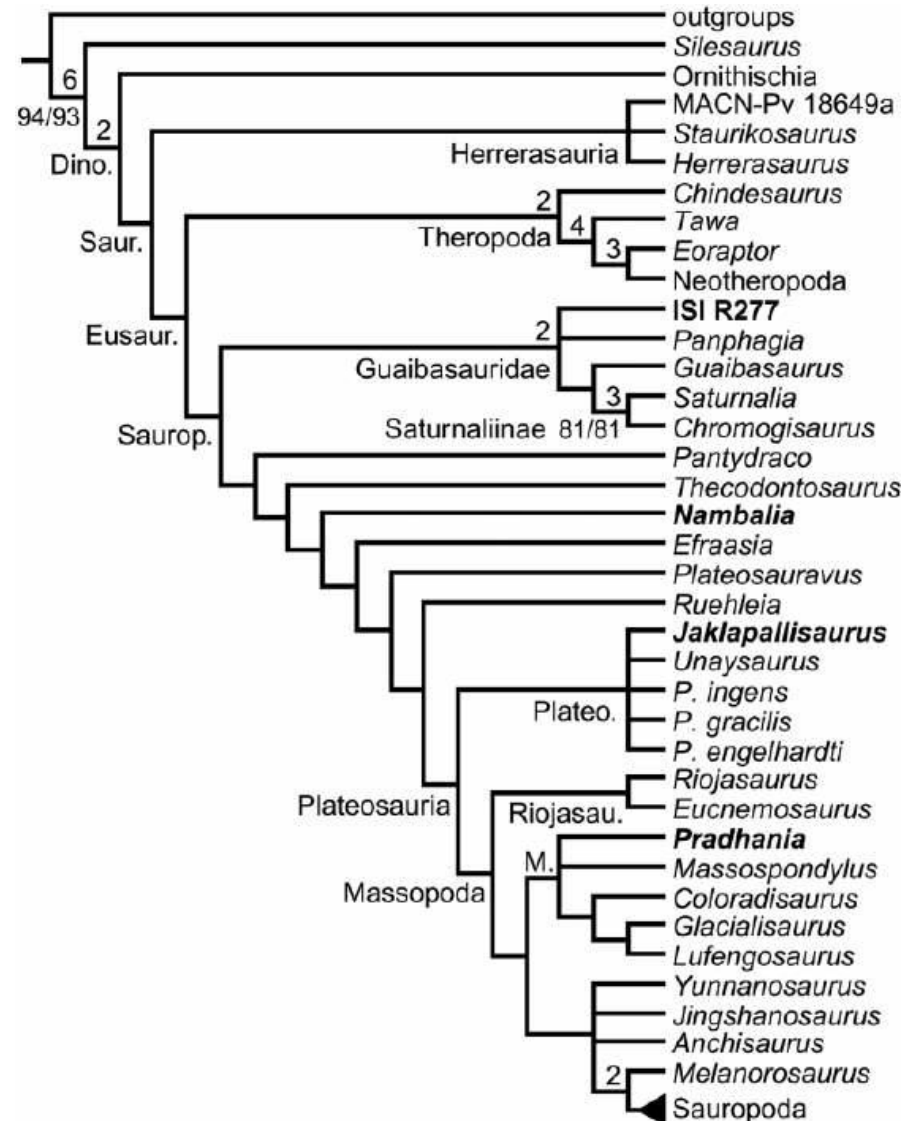


Sauropodomorpha

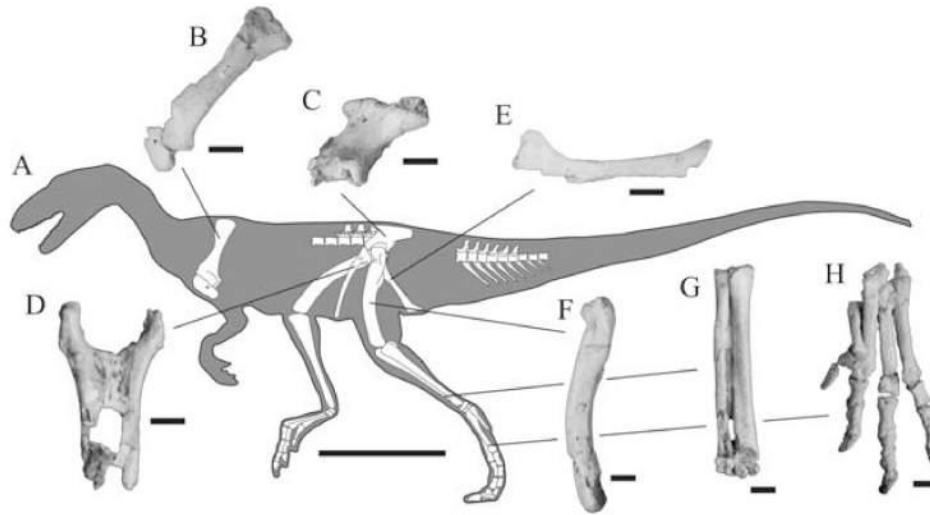
‘Sinapomorfías prosauropodas’:

- Metatarso V reducido
- Posición digitígrada del pie
- Bipedalismo facultativo

Son características plesiomorficas.

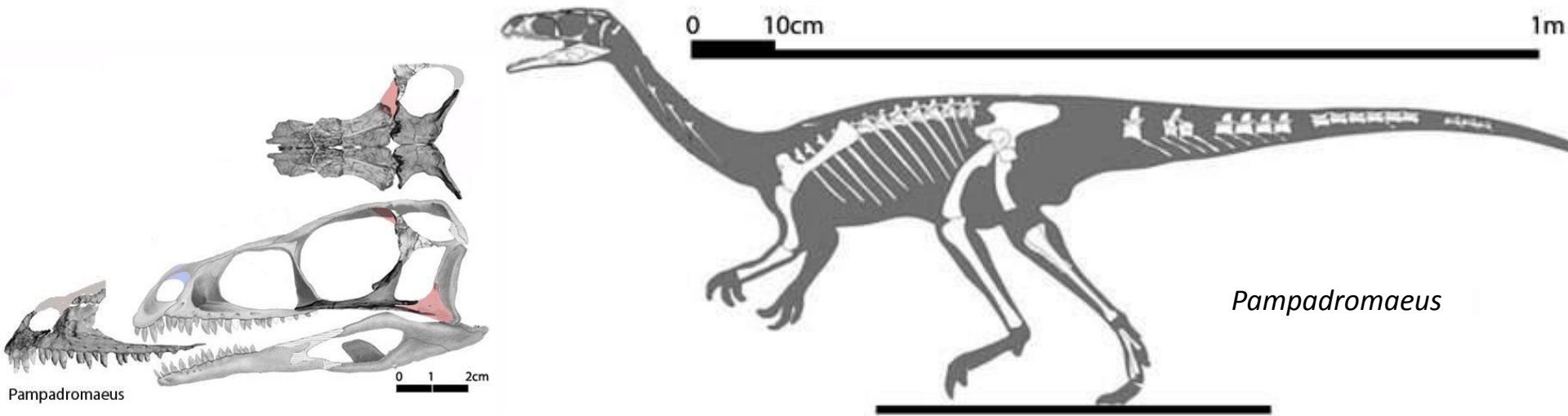


Sauropodomorpha



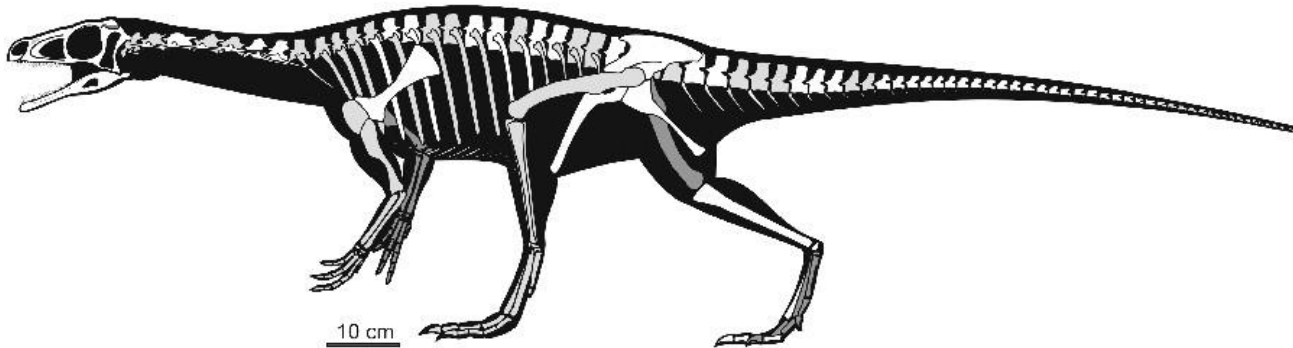
Guaibasaurus

Figure 2 Skeletal reconstruction of *Guaibasaurus candelariensis*. **A**, preserved bones on shaded outline in lateral aspect; **B**, left scapulocoracoid in lateral aspect; **C**, right ilium (reversed) in lateral aspect; **D**, pubic pair in cranial aspect; **E**, left ischium in lateral aspect; **F**, right femur (reversed) in lateral aspect; **G**, right tibia and fibula in cranial aspect; **H**, left pes in cranial aspect. **B–G** based on MCN-PV 2355 and **H** based on MCN-PV 2356. Scale bars: **A** = 250 mm; **B–H** = 25 mm.



Pampadromaeus

Sauropodomorpha



Panphagia

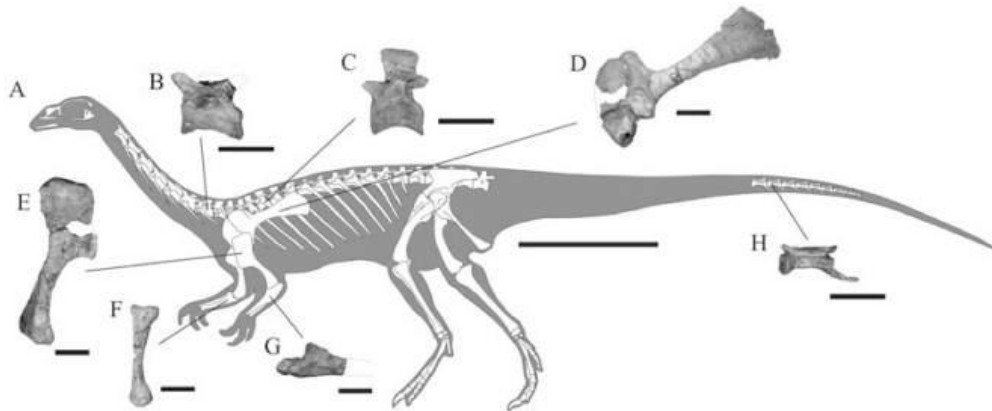
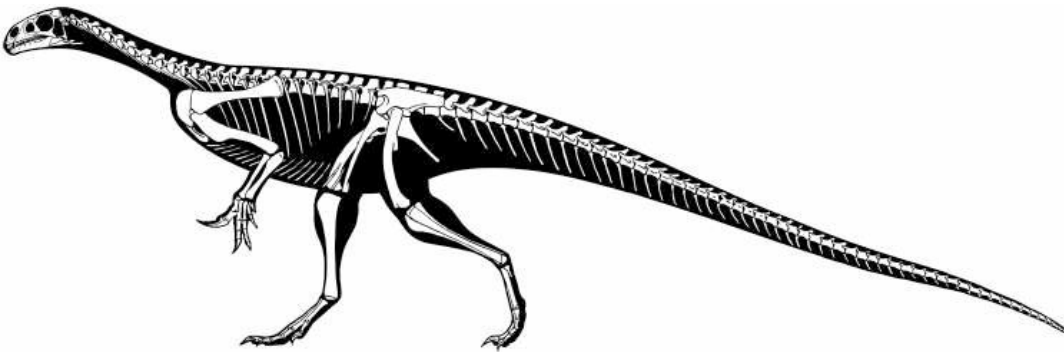
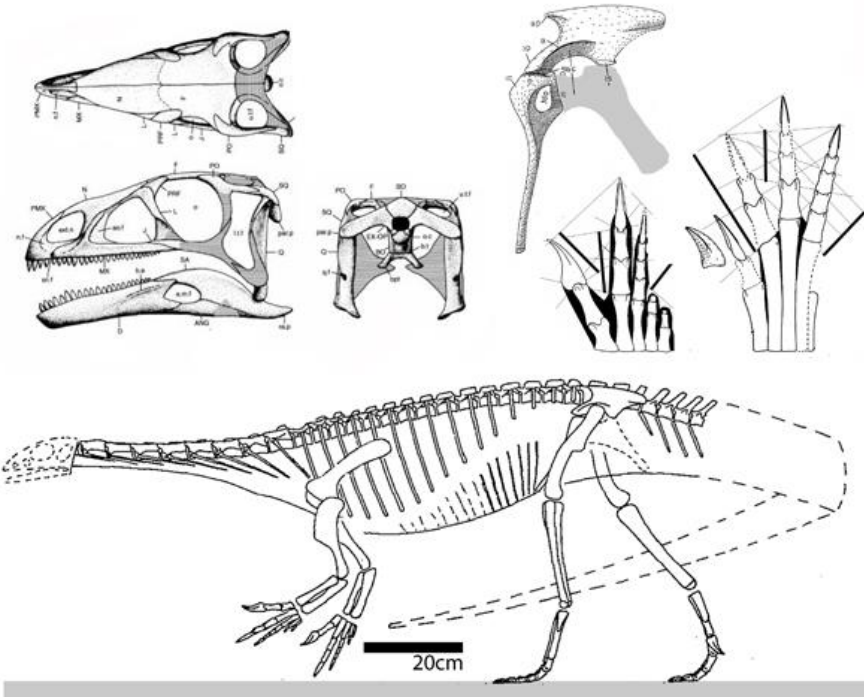


Figure 3 Skeletal reconstruction of *Saturnalia tupiniquim*. **A**, preserved bones on shaded outline; **B**, 8th cervical vertebra in lateral aspect; **C**, 4th trunk vertebra in lateral aspect; **D**, right scapulocoracoid (reversed) in lateral aspect; **E**, right humerus in lateral aspect; **F**, right radius in medial aspect; **G**, right ulna in lateral aspect; **H**, distal caudal vertebra in lateral aspect. **B–D, H** based on MCP 3845-PV and **E–G** based on MCP 3846-PV. Scale bars: **A** = 250 mm; **B–H** = 20 mm.

Saturnalia

Sauropodomorpha

Efraasia



Thecodontosaurus



Sauropodomorpha

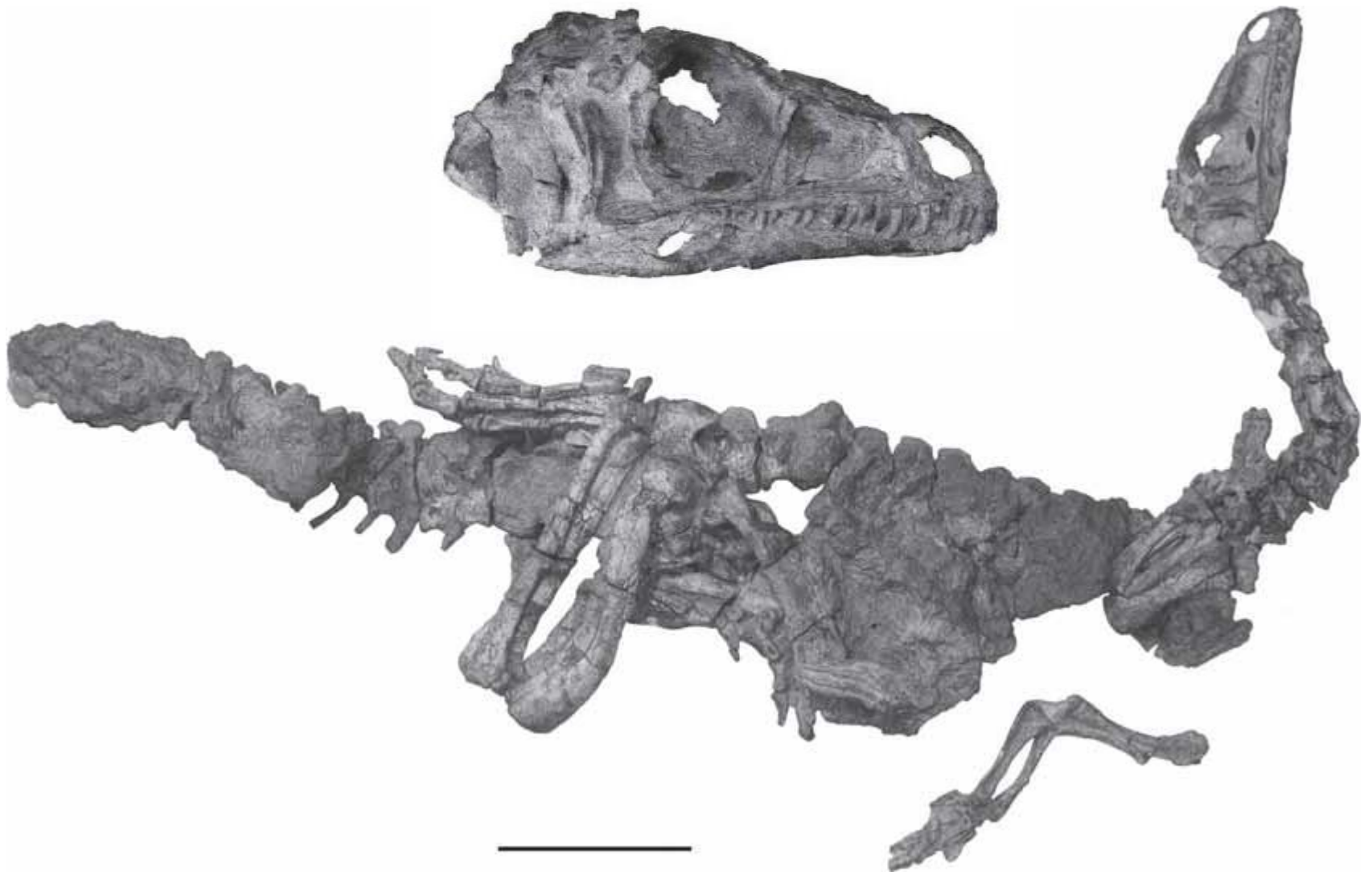
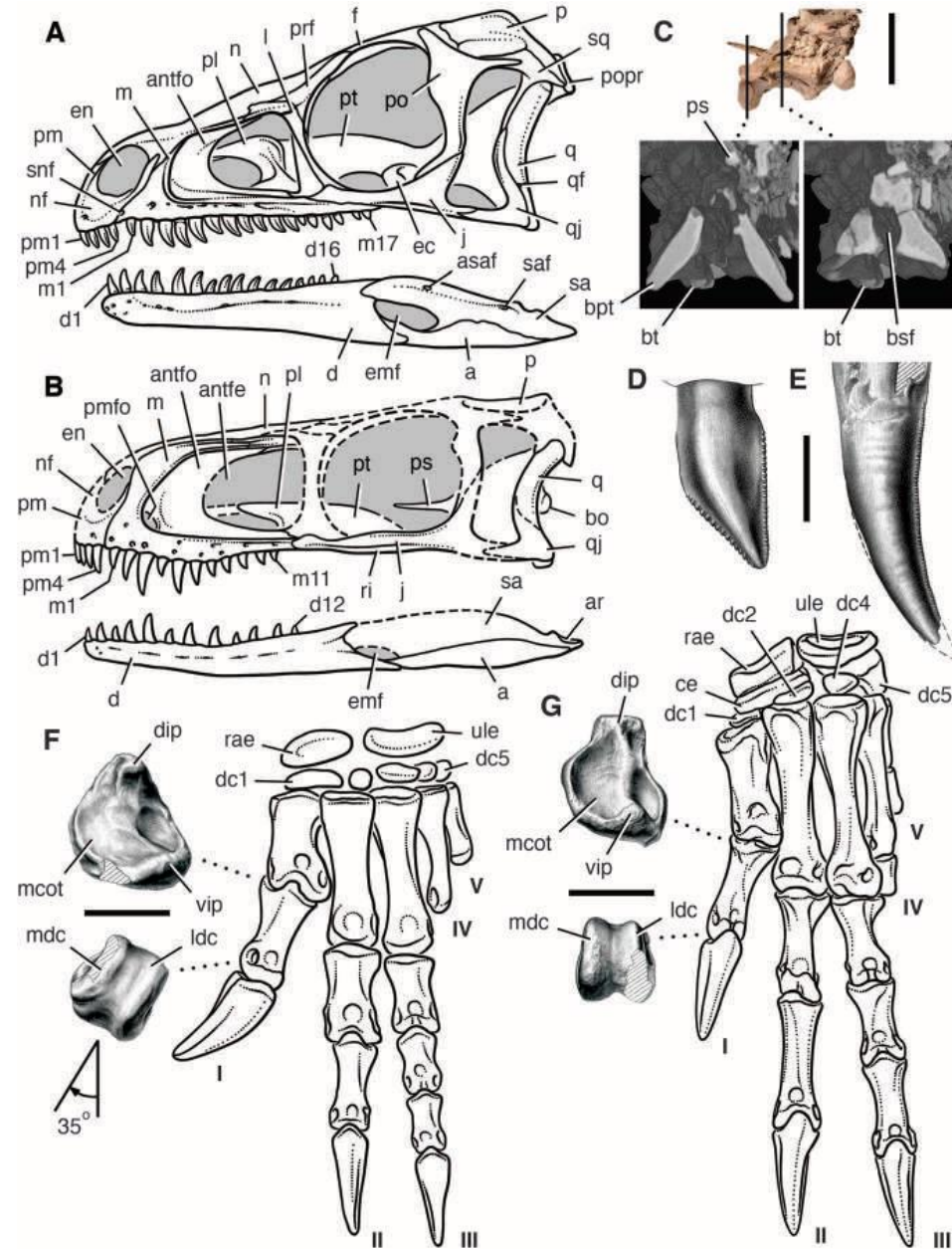


FIGURE 7. Photograph of the skeleton of *Eoraptor lunensis* (PVSJ 512) in right lateral view. Small ventral block with several partial gastralia is not included. Scale bar equals 10 cm.

Fig. 1. Skull, carpus, and manus of the basal dinosaurs *Eoraptor lunensis* and *Eodromaeus murphi*. Skull reconstruction in lateral view of (A) *E. lunensis* (based on PVSJ 512) and (B) *E. murphi* (based on PVSJ 560 to 562). (C) Braincase of *E. murphi* (PVSJ 562) in ventrolateral view (reversed) and in two computed-tomographic (CT) cross sections (at vertical lines). Anterior left maxillary teeth are shown at the same scale in (D) *E. lunensis* [PVSJ 512, drawing of right maxillary tooth 2 in lateral view (reversed)] and (E) *E. murphi* [PVSJ 561, cast of left maxillary tooth 3 in medial view (reversed)]. Reconstruction of the left carpus and manus in dorsal view with enlarged views of the proximal and distal ends of phalanx 1 of digit I in (F) *E. lunensis* (based on PVSJ 512) and (G) *E. murphi* (based on PVSJ 560 and 562). The distal condyles in *E. lunensis* show 35° clockwise rotation with the proximal dorsal extensor process positioned dorsally. Abbreviations: I to V, manual digits I to V; a, angular; antfe, antorbital fenestra; antfo, antorbital fossa; ar, articular; asaf, anterior surangular foramen; bo, basioccipital; bpt, basipterygoid process; bsf, basisphenoid fossa; bt, basal tubera; ce, centrale; d, dentary; d1, d12, and d16, dentary teeth 1, 12, and 16; dc1 to dc5, distal carpals 1 to 5; dip, dorsal intercondylar process; ec, ectopterygoid; emf, external mandibular fenestra; en, external naris; f, frontal; j, jugal; l, lacrimal; ldc, lateral distal condyle; m, maxilla; m1, m11, and m17, maxillary teeth 1, 11, and 17; mcot, medial cotylus; mdc, medial distal condyle; n, nasal; nf, narial fossa; p, parietal; pl, palatine; pm, premaxilla; pm1 and pm4, premaxillary teeth 1 and 4; pmfo, promaxillary fossa; po, postorbital; popr, paroccipital process; prf, prefrontal; ps, parasphenoid; pt, pterygoid; q, quadrate; qf, quadrate foramen; qj, quadratojugal; rae, radiale; ri, ridge; sa, surangular; saf, surangular foramen; snf, subnarial foramen; sq, squamosal; ule, ulnare; vip, ventral intercondylar process. Dashed lines indicate a missing margin; hatching indicates a broken surface. Scale bars, 2 cm in (C) (for braincase); 3 mm in (D) and (E); 5 mm in (F) and (G) (enlarged views).



Plateosauria

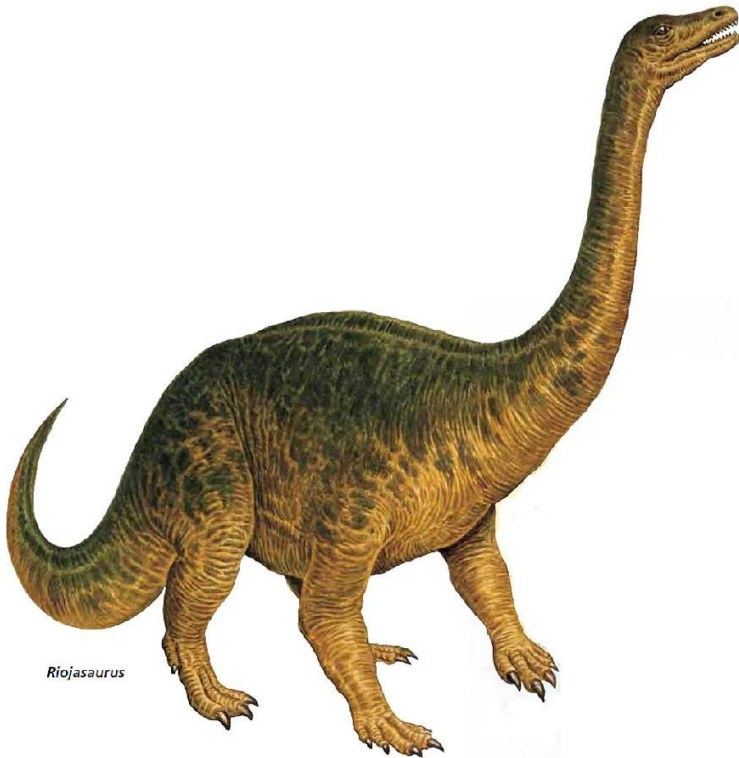
- Mayor tamaño corporal
- Cuellos más largos
- Acortamiento de la Tibia-Fibula
- Dedo I es el dedo más largo del carpo



Plateosaurus

Massopoda

- Riojasauridae: primariamente cuadrúpedos



Riojasaurus



Riojasaurus

Massopoda

- Massospondylidae



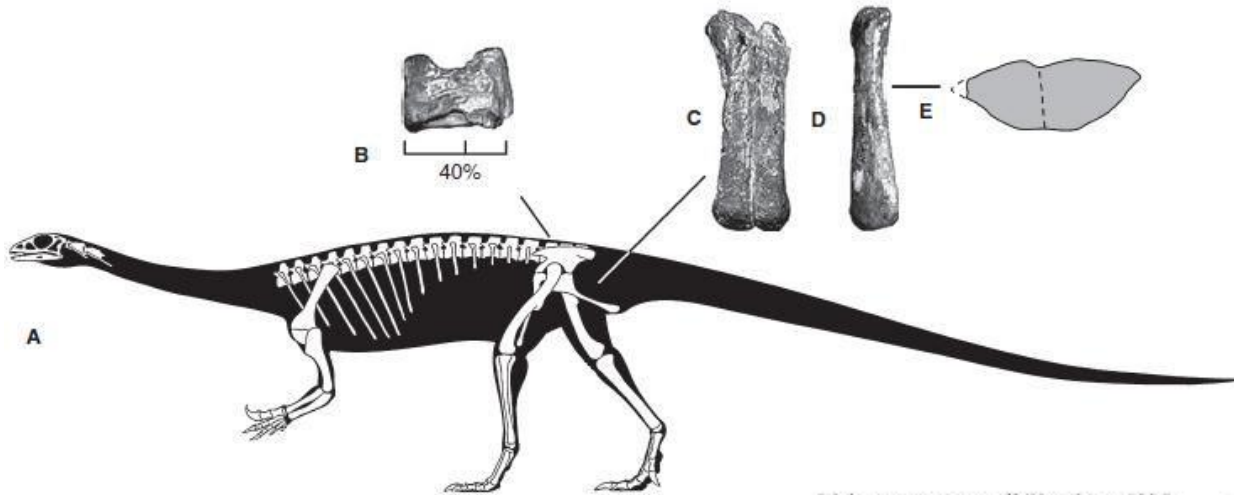
Massospondylus

Massopoda

- Massospondylidae: juveniles cuadrúpedos



Anchisauria



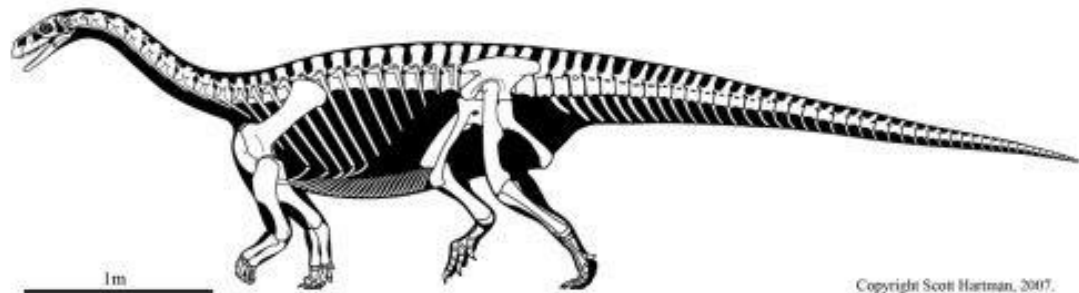
Anchisaurus

Melanorosaurus readi (Haughton, 1924)

Reconstruction of sub-adult specimen NM QR3314. Rigorous skeletal reconstruction shows what is known of NM QR3314 (gray portions of scapulae apparently present but buried in matrix). Missing elements are restored predominantly after NM 1551.



Melanorosaurus

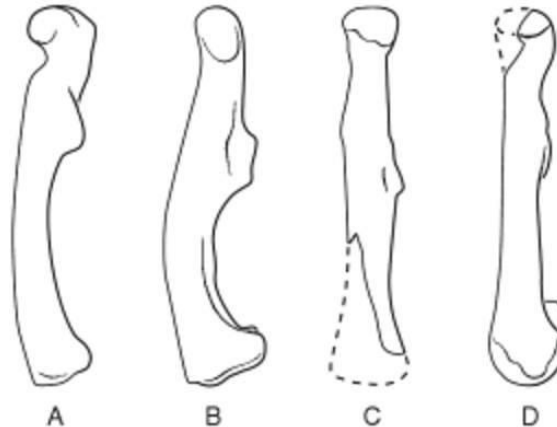


Sauropoda

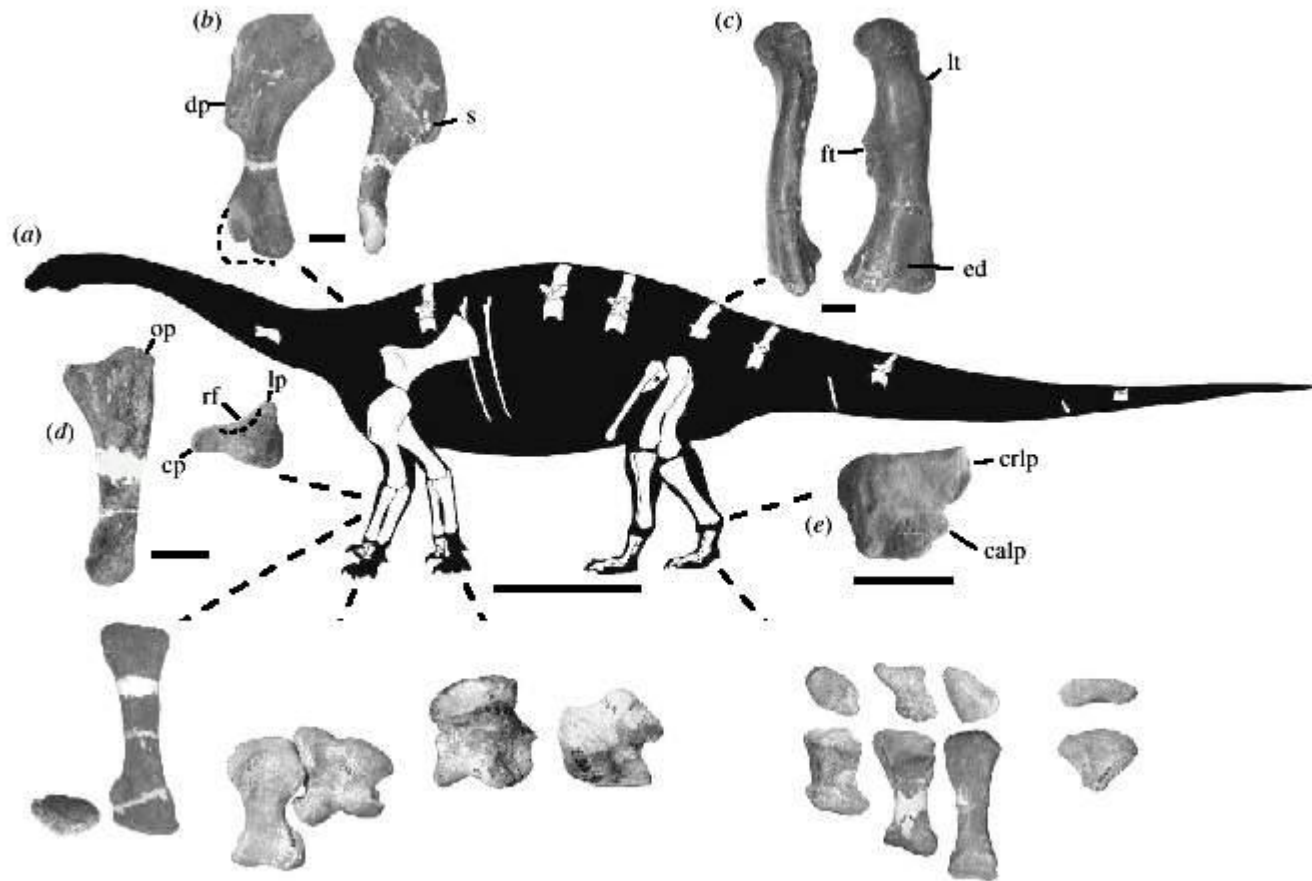
Sinapomorfías:

- Cuadrúpedos obligados, piernas en forma de columna
- Extremidades anteriores alargadas
- Metatarsal V elongado
- Elementos de las extremidades rectos
- Reducción del olécranon
- Superficies articulares de las extremidades no osificadas
- Distales carpales no osificados
- Distales tarsales III y IV no osificados

FIGURE 1.8. Femoral curvature in the saurischian dinosaurs *Herrerasaurus* (A), *Massospondylus* (B), *Vulcanodon* (C), and *Isanosaurus* (D). Femora are figured in right medial view and have been scaled to the same length to facilitate comparison. The left femur of *Isanosaurus* has been reversed. Based on Novas (1993), Cooper (1981), Cooper (1984), and Buffetaut et al. (2000), respectively.



Sauropoda



Antetonitrus

Sauropoda

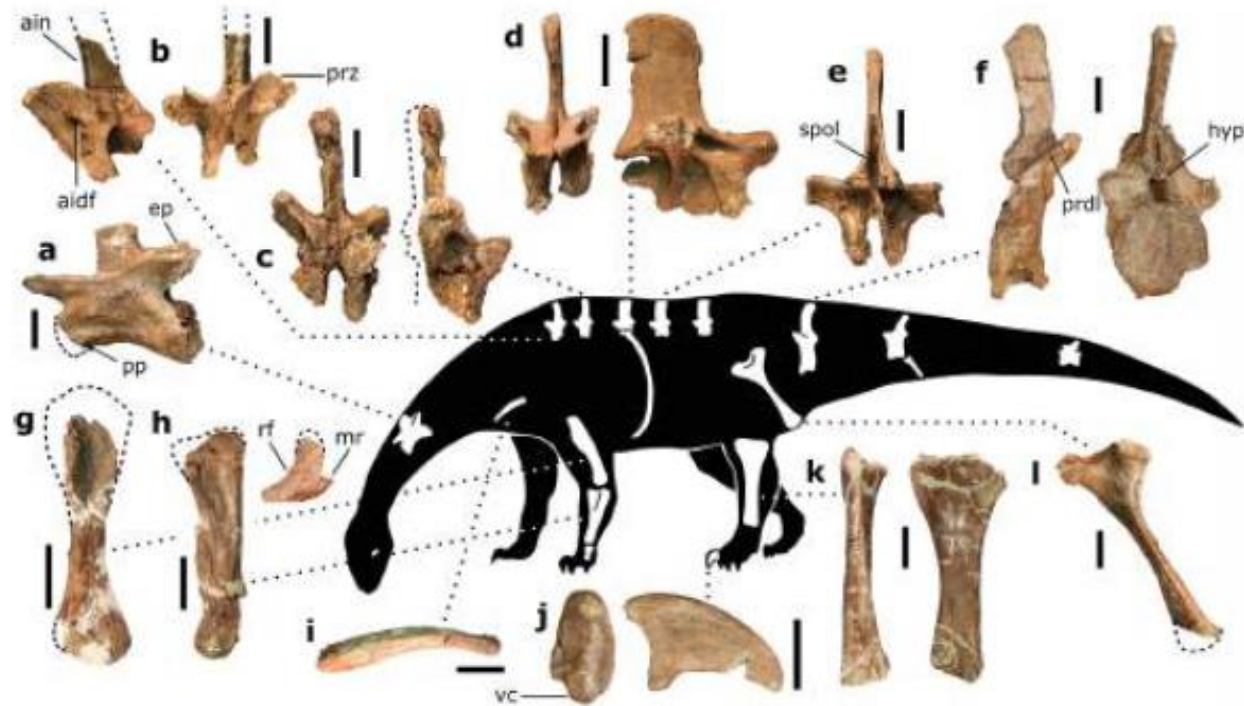


Figure 3. Representative bones of *Pulanesaura eocollum*. (a) anterior-to-middle cervical vertebrae (BP/1/6199) in left lateral view; (b) holotypic anterior-most dorsal neural arch (BP/1/6882) in left lateral and anterior views; (c) anterior dorsal neural arch (BP/1/6984) in anterior and right lateral views; (d) anterior mid-dorsal neural arch (BP/1/6183) in anterior and right lateral views; (e) middle dorsal neural arch (BP/1/6770) in posterior view; (f) anterior caudal vertebra (BP/1/6646) in right lateral and posterior views; (g) right humerus (BP/1/6193) in anterior view; (h) left ulna (BP/1/6210) in lateral and proximal views; (i) ?left clavicle (BP/1/6752) in dorsal view; (j) left pedal ungual I (BP/1/6186) in proximal and medial views; (k) left tibia (BP/1/6200) in anterior and lateral views; (l) right ischium (reversed) (BP/1/7366) in lateral view. Abbreviations: aidf, anterior infradiapophyseal fossa; ain, anterior incline of the neural spine; ep, epipophysis; hyp, hyposphene; mr, medial ridge; pp, parapophysis; prdl, prezygodiapophyseal lamina; prz, prezygapophyses; rf, radial fossa; spol, spinopostzygapophyseal lamina; vc, ventral convexity. Scale bars equal 5 cm in a-f and i, j; 10 cm in g, h, k, l. Silhouette drawn by BWM Photographs by BWM.

Eusauropoda

Sinapomorfías:

- Hocico corto y redondeado
- Oclusión precisa
- Aumento del número de vertebrales cervicales
- Reducción en el número de falanges. Mayor reducción en la mano
- Metatarsos en posición hacia afuera
- Unguales del pie en posición lateral

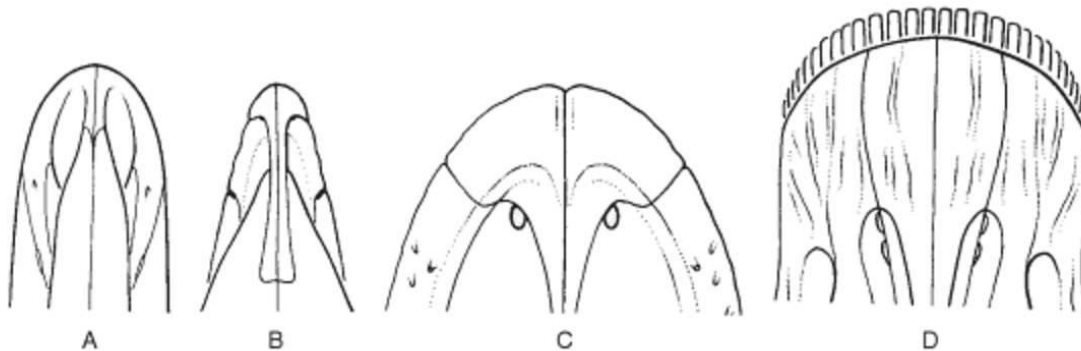


FIGURE 1.10. Snouts of the theropod *Herrerasaurus* (A), the prosauropod *Plateosaurus* (B), and the sauropods *Brachiosaurus* (C) and *Diplodocus* (D) in dorsal view. Based on reconstructions from Sereno (1993) and Wilson and Sereno (1998)

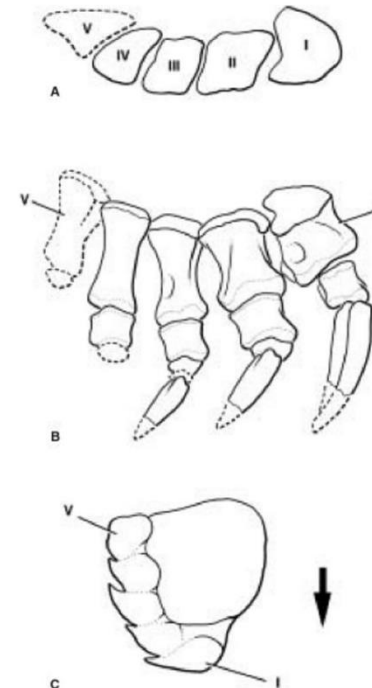
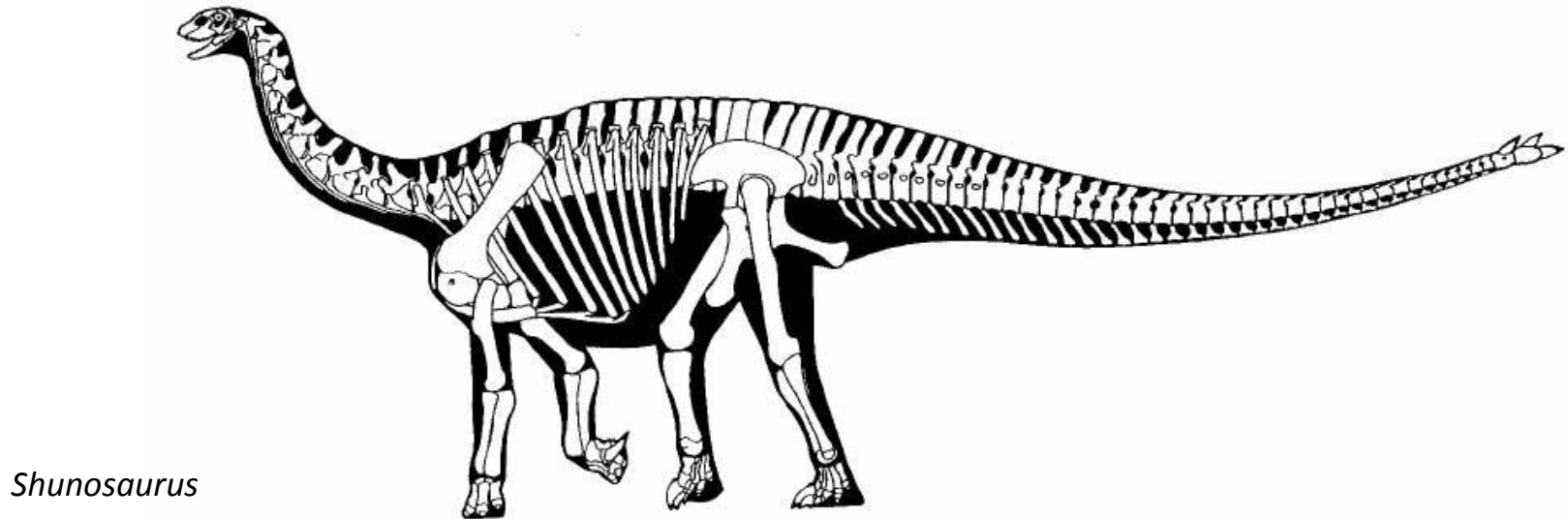


FIGURE 1.11. Right pes of *Apatosaurus* in proximal (A) and dorsal (B) views; C, right pes print of *Apatosaurus* oriented relative to the trackway midline (arrow). *Apatosaurus* modified from Gilmore (1936:figs. 25, 27, 28); *Brontopodus* modified from Thulborn (1990:fig. 6.16f). Abbreviations: I-V, digits I-V.

Eusauropoda



Shunosaurus

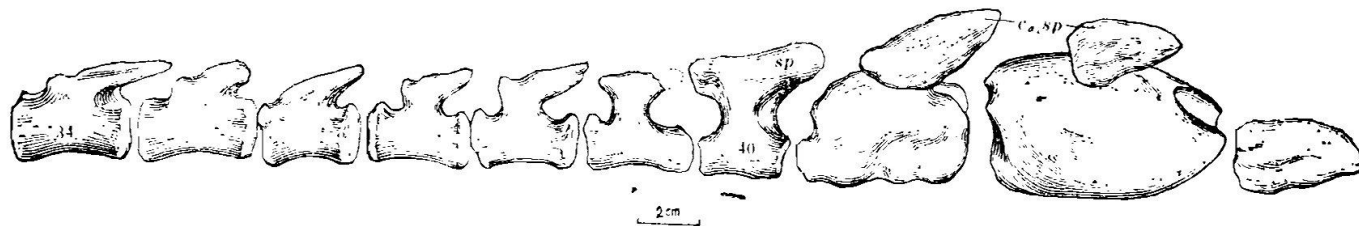


图39 李氏蜀龙的后部尾椎与“尾刺”左视。NO.T5401. 原大 $\times 1/4$

Fig.39 *Shunosaurus lii*, Left side views of posterior caudals with dermal tail spines, No. T5401. $1/4$ nat. size.

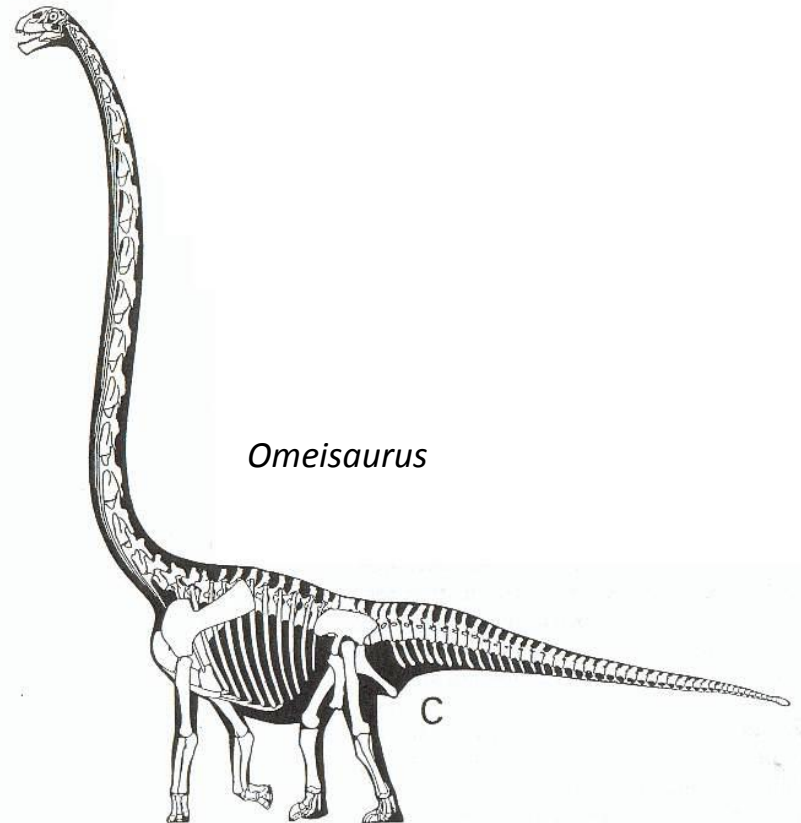
Eusauropoda

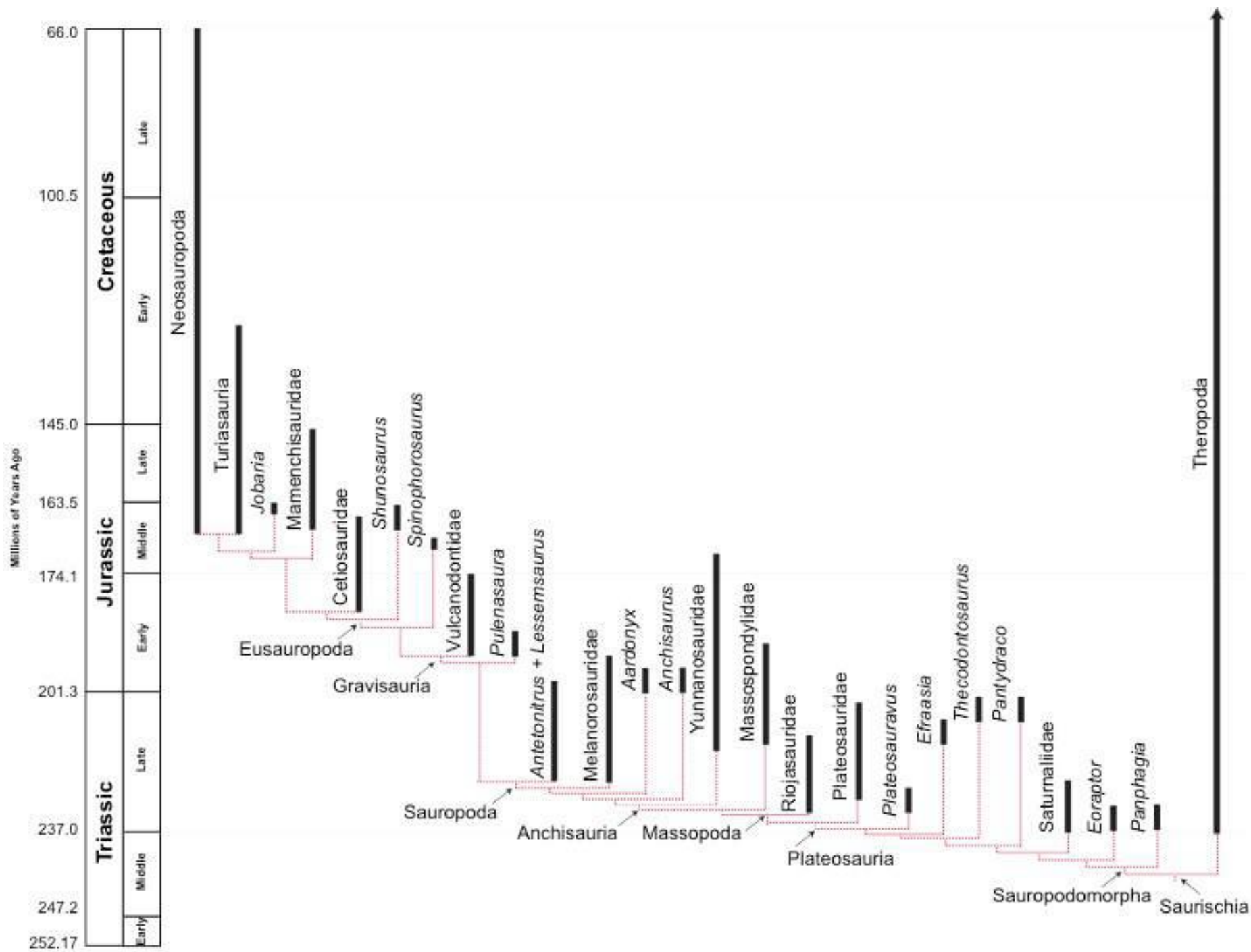
Mamenchisauridae: Cuellos increíblemente largos. Incorporación de una 5ª vertebra sacral.

Mamenchisaurus

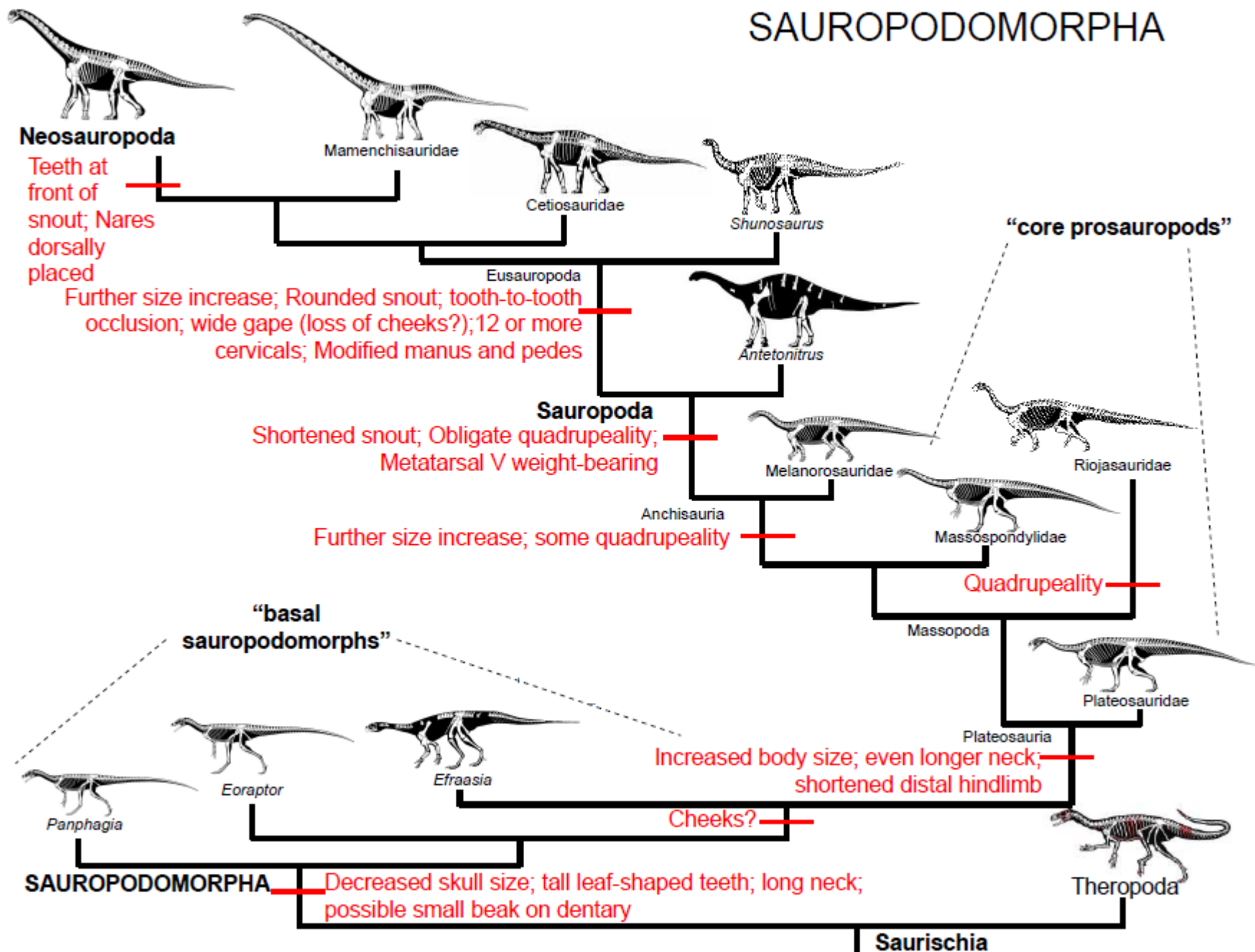


Omeisaurus





SAUROPODOMORPHA



Neosauropoda

Sinapomorfías:

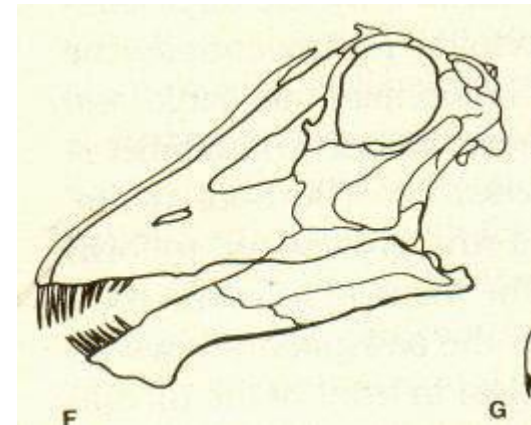
- Narinas ubicadas dorsalmente
- Metacarpos orientados verticalmente, con forma de arco semiunar
- Mayor reducción de falanges carpales
- Reducción de huesos carpales de la muñeca
- Reducción del astrágalo



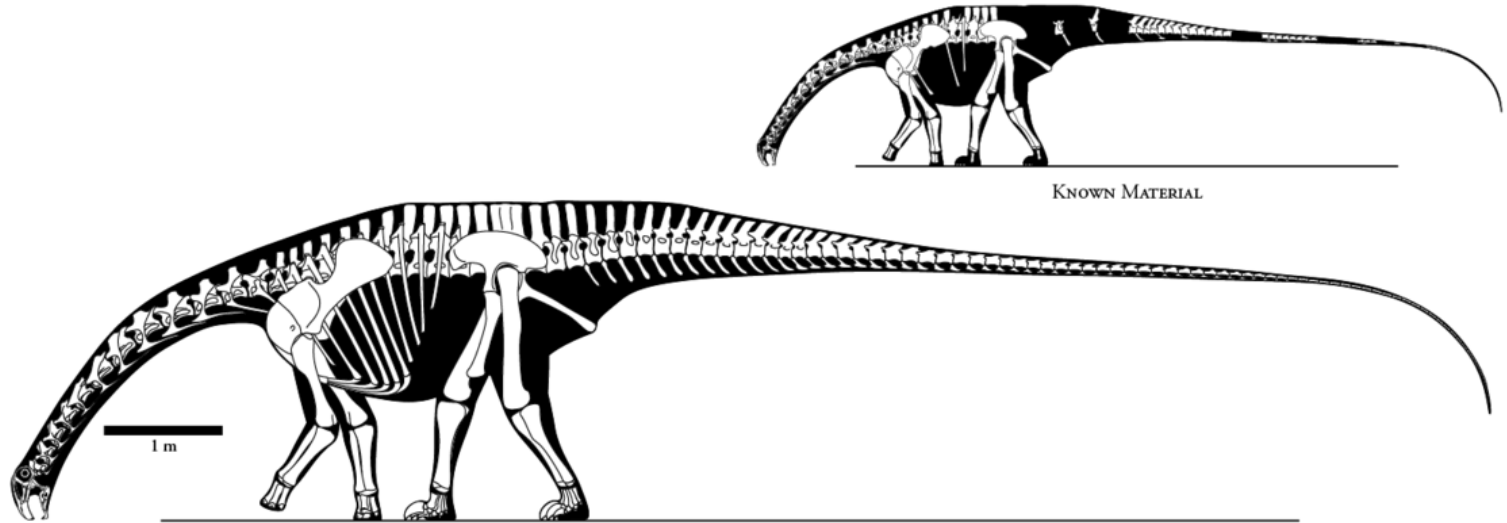
Diplodocoidea

Sinapomorfías:

- Dientes restringidos a la zona anterior de la mandíbula
- Mandíbula de forma cuadrada
- Articulación de la mandíbula desplazada hacia adelante
- Dientes de forma cilíndrica
- Centros vertebrales caudales elongados y biconvexos
- Chevrones dirigidos hacia atrás, con forma de trineo.
- Más de 30 centros caudales sin arcos



Rebbachisauridae



Nigersaurus taqueti Sereno, Beck, Duthiel, Larsson, Lyon, Moussa, Sadleir, Sidor, Varricchio, G. P. Wilson, & J. A. Wilson, 1999

Nigersaurus



Flagelicaudata

Sinapomorfías:

- Narinas fusionadas en la zona dorsal, por sobre la órbita
- Cráneos largos
- Extremidades cortas
- Cola terminada en látigo
- Espinas neurales bifurcadas



Flagellicaudata

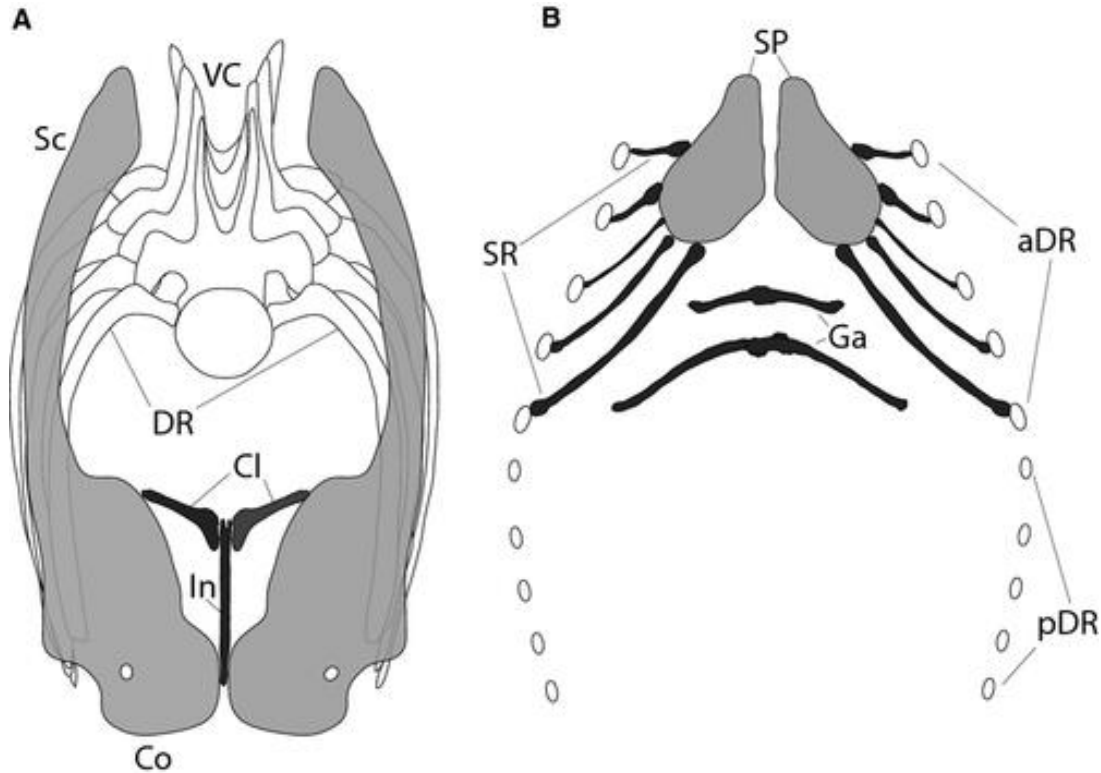
Diplodocidae: Cuellos y colas extremadamente elongados



Diplodocus

Flagellicaudata

Diplodocidae: Cuellos y colas extremadamente elongados

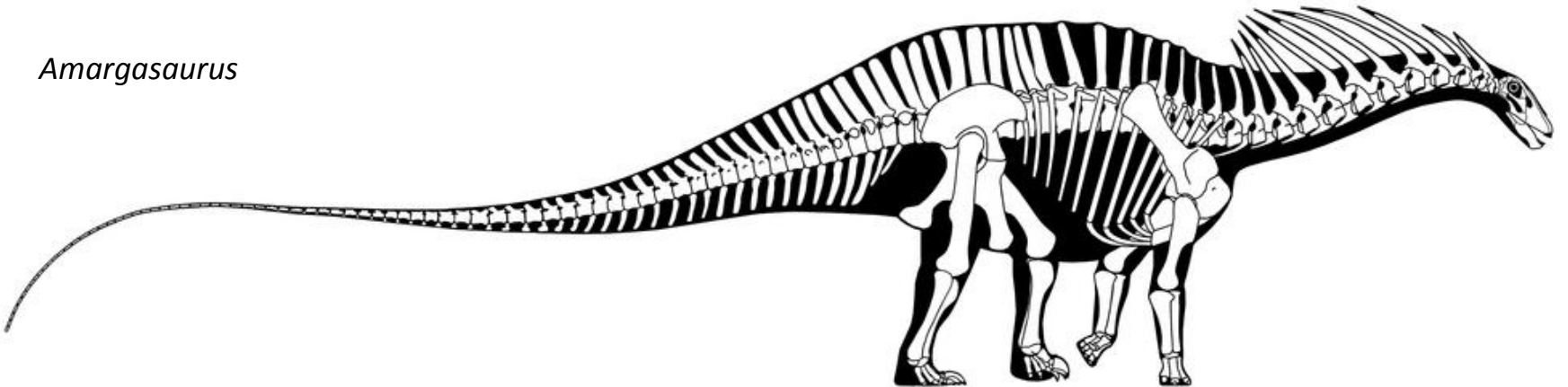


Flagellicaudata

Dicraeosauridae: Espinas neurales largas, cuellos cortos.

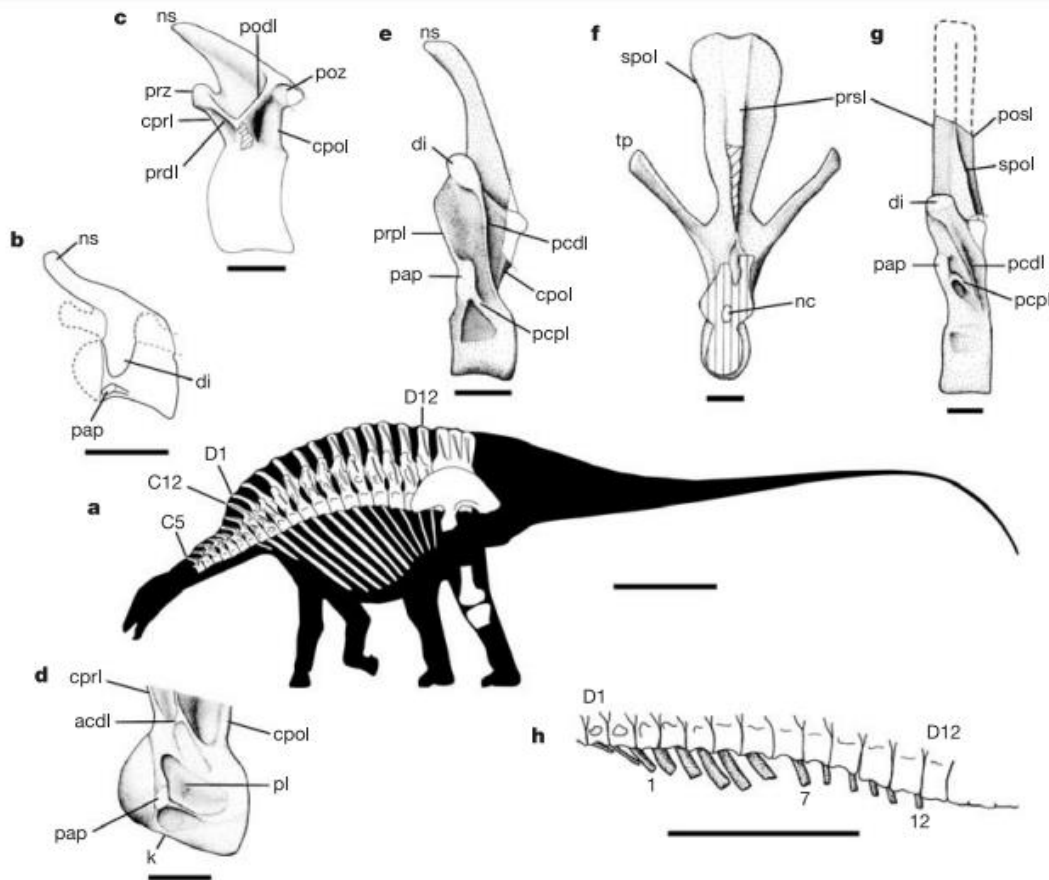


Amargasaurus



Flagellicaudata

Dicraeosauridae: Espinas neurales largas, cuellos cortos.



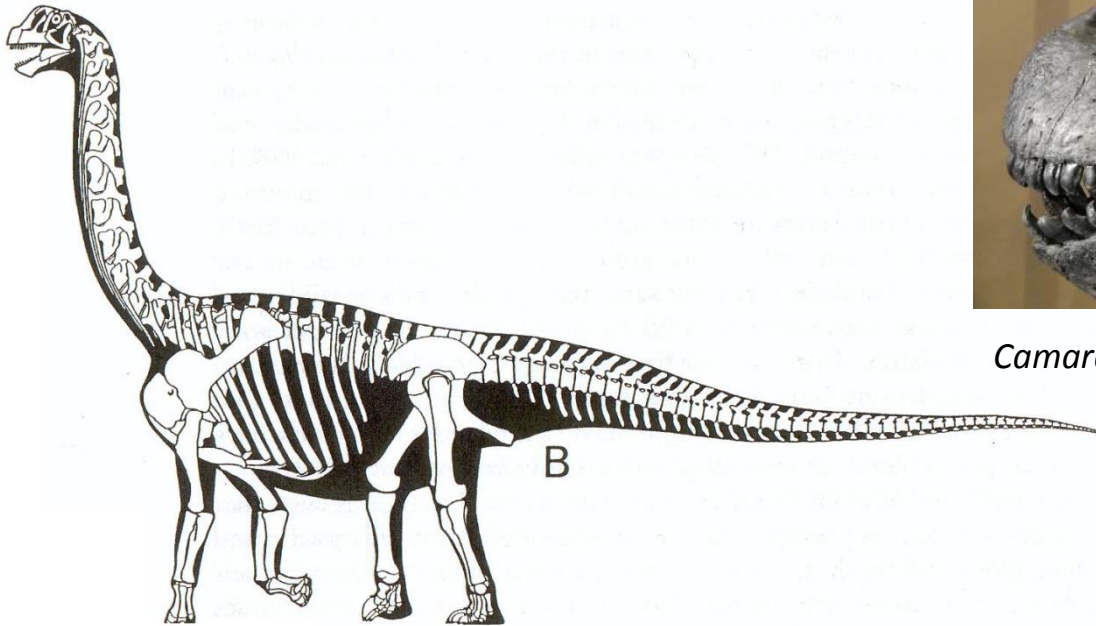
Brachytrachelopan



Macronaria

Sinapomorfías:

- Narinas tan grandes como las órbitas
- Metacarpos elongados



Camarasaurus

Brachiosauridae

Sinapomorfías:

- Brazos más largos que las piernas
- Cola corta

Brachiosaurus



Giraffatitan

Brachiosauridae

Sinapomorfías:

- Brazos más largos que las piernas
- Cola corta
- Narinas muy altas

Europasaurus

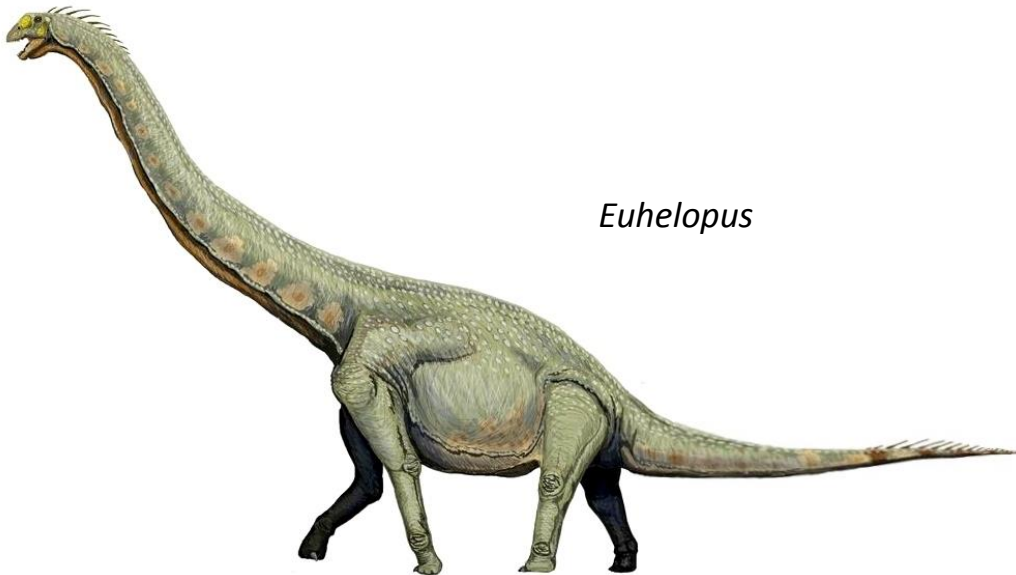


Somphospondyli

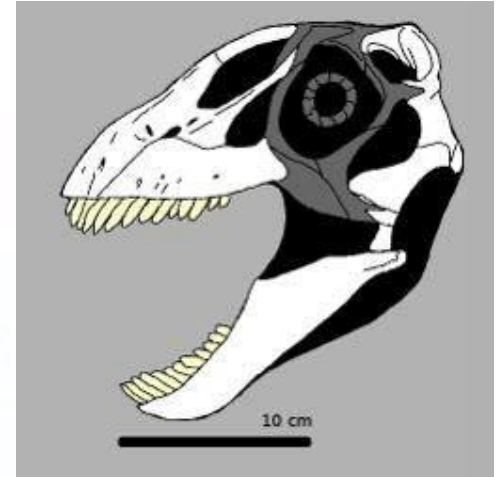
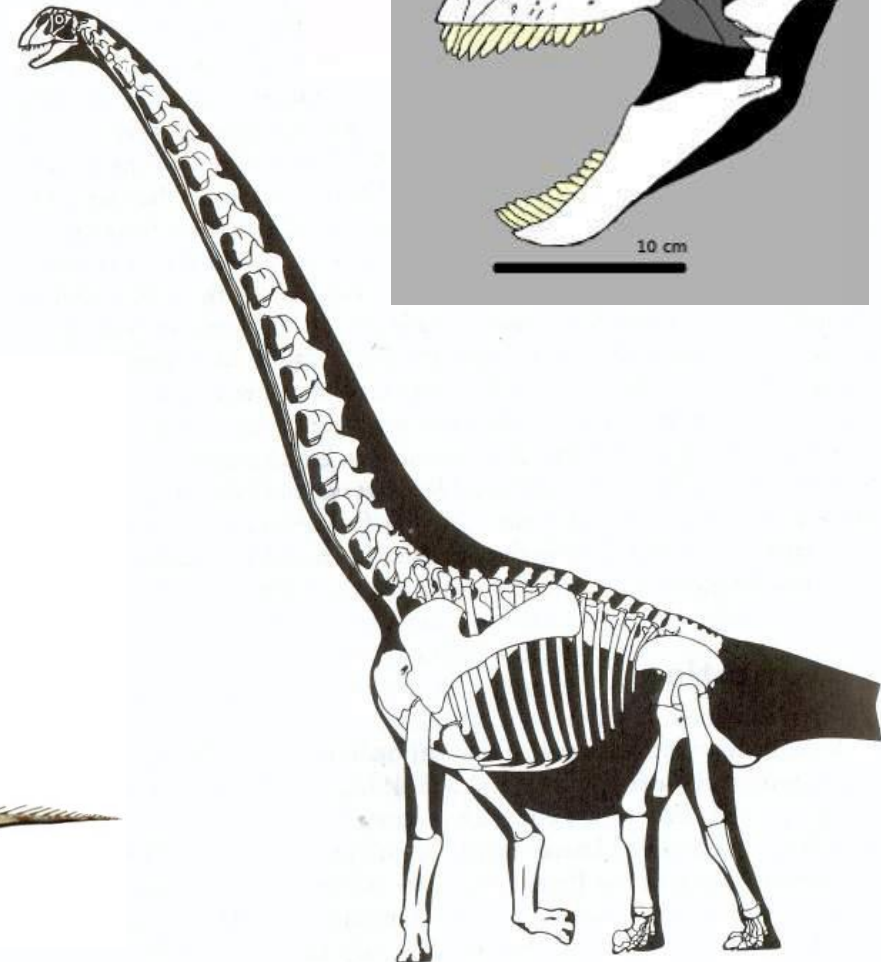
Euhelopidae

Sinapomorfías:

- Pata esbeltas
- Vertebras cervicales alargadas



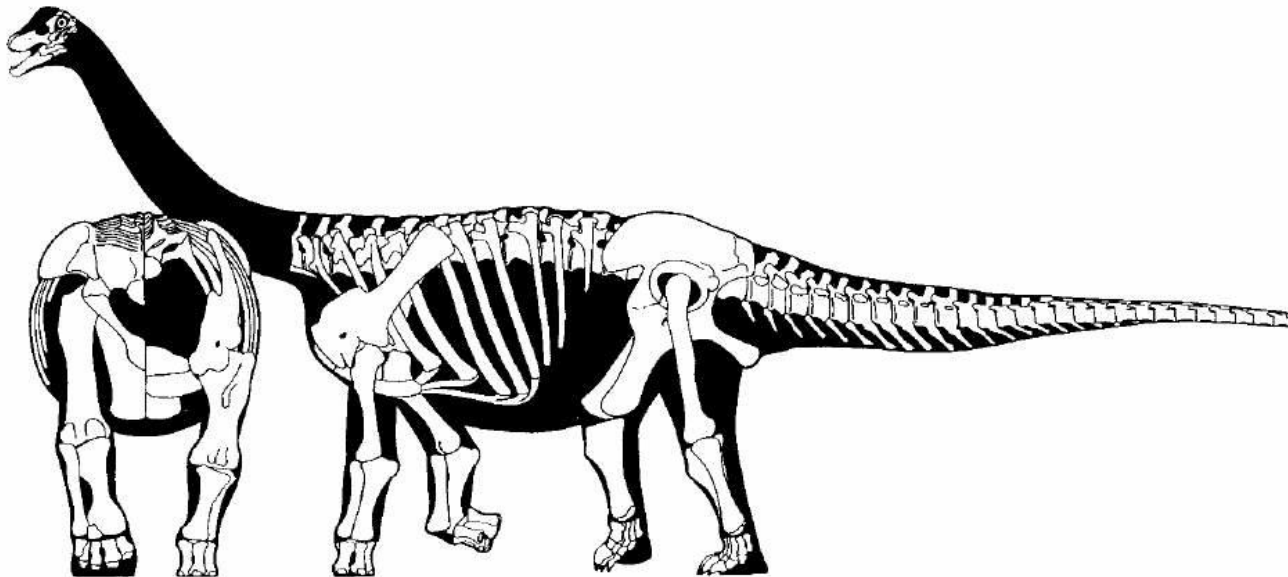
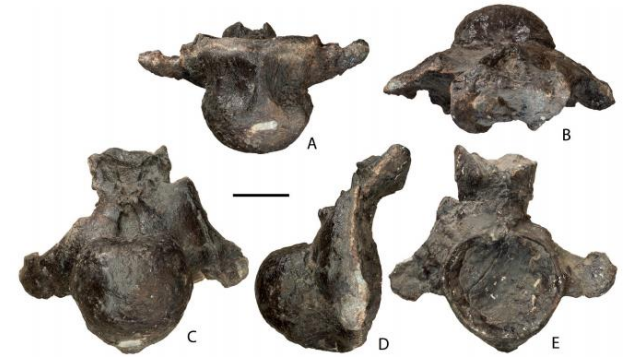
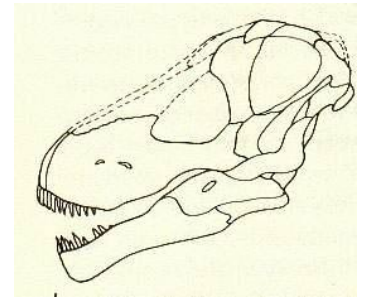
Euhelopus



Titanosauria

Sinapomorfías:

- Pelvis amplia
- Radio y ulna robustos
- Pecho amplio
- Espalda plana
- Cola con centro vertebrales procélicos
- Cráneos convergentes con los de diplodócidos



Malawisaurus

Titanosauria

Lognkosauria: Costillas cervicales prominentes, cajas torácicas amplias, espinas neurales prominentes.



Argentinosaurus

Titanosauria

Saltasauridae: Presencia de osteodermos, perdida de las falanges de la mano, coracoides cuadrangular, carpo no osificado, radio y tibia expandido.

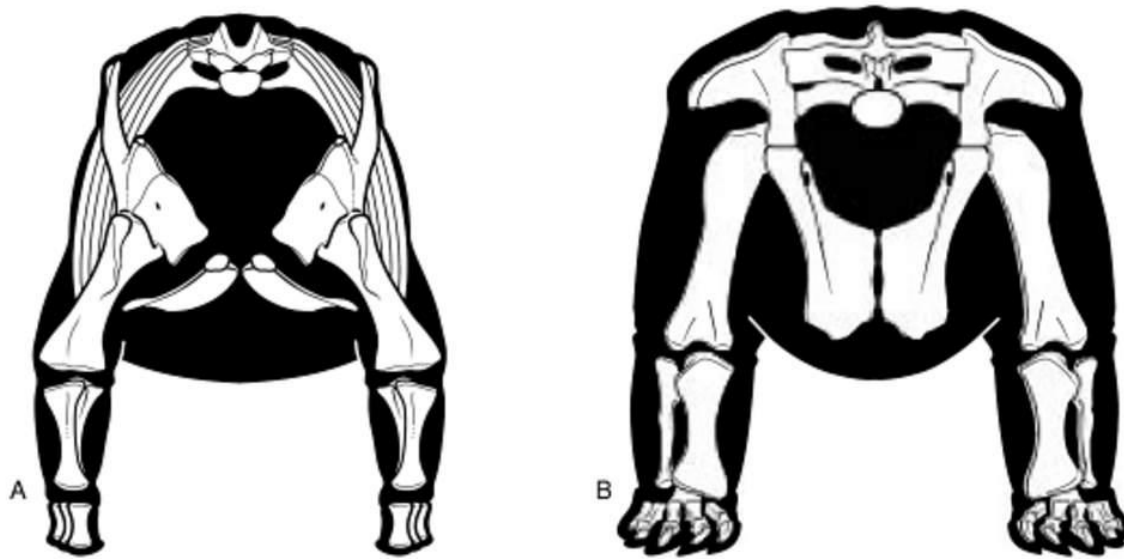


FIGURE 1.14. Limb skeleton of the wide-gauge saltasaurid *Opisthocoelicaudia*. Pectoral girdle and forelimb (A) and pelvic girdle and hindlimb (B) in anterior view. Forelimb reconstruction based on illustrations and photographs in Borsuk-Bialynicka (1977:fig. 9B, pl. 7–9, 11); hindlimb reconstruction modified from Wilson and Carrano (1999).

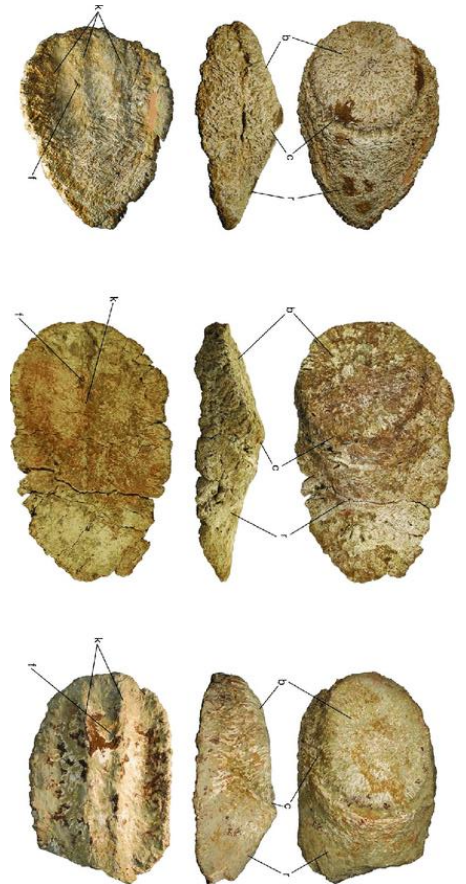


TABLE 1.4
Manual and Pedal Phalangeal Counts in Select Saurischian Genera

	MANUS	PES
Theropoda		
<i>Eoraptor</i>	2*-3*-4*-1-0	2*-3*-4*-5*-1
<i>Herrerasaurus</i>	2*-3*-4*-1-0	2*-3*-4*-.?-1
Prosauropoda		
<i>Jingshanosaurus</i>	2*-3*-4*-3*-1	2*-3*-4*-5*-1
<i>Lufengosaurus</i>	2*-3*-4*-3-1	2*-3*-4*-5*-1
<i>Plateosaurus</i>	2*-3*-4*-3-2	2*-3*-4*-5*-2
?Sauropoda		
<i>Blikanasaurus</i>	—	2*-3*-4*-.?5*-.?
<i>Antenonitrus</i>	—	—
Sauropoda		
<i>Vulcanodon</i>	—	—
<i>Gongxianosaurus</i>	—	2*-3*-4*-5*-.?
<i>Shunosaurus</i>	2*-2-2-2-2	2*-3*-3*-3*-2
<i>Omeisaurus</i>	2*-2-?-?-1	2*-3*-3*-3*-2
<i>Diplodocus</i>	—	2*-3*-3?-2-0
<i>Camarasaurus</i>	2*-1-1-1-1	2*-3*-4*-2*-.?
<i>Brachiosaurus</i>	2*-1-1-1-1	—
<i>Opisthocoelicaudia</i>	0-0-0-0-0	2*-2*-2*-1?-?

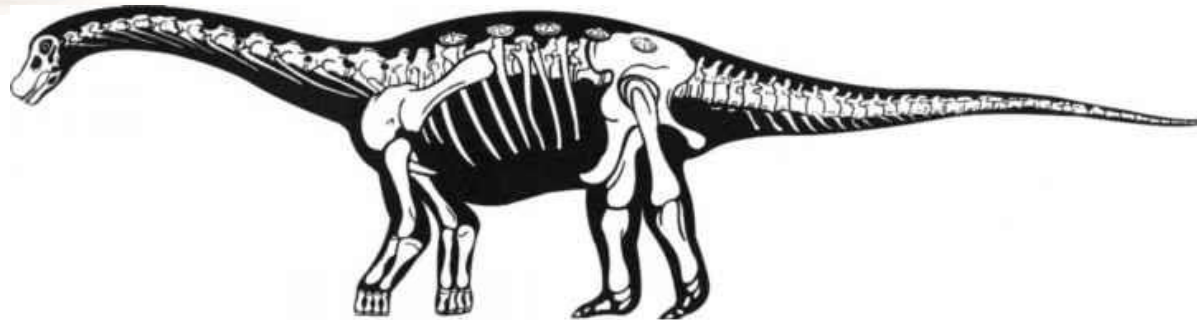
NOTE: Asterisk (*) indicates a clawed digit. References as in Table 1.2; *Diplodocus* data from Hatcher (1901).

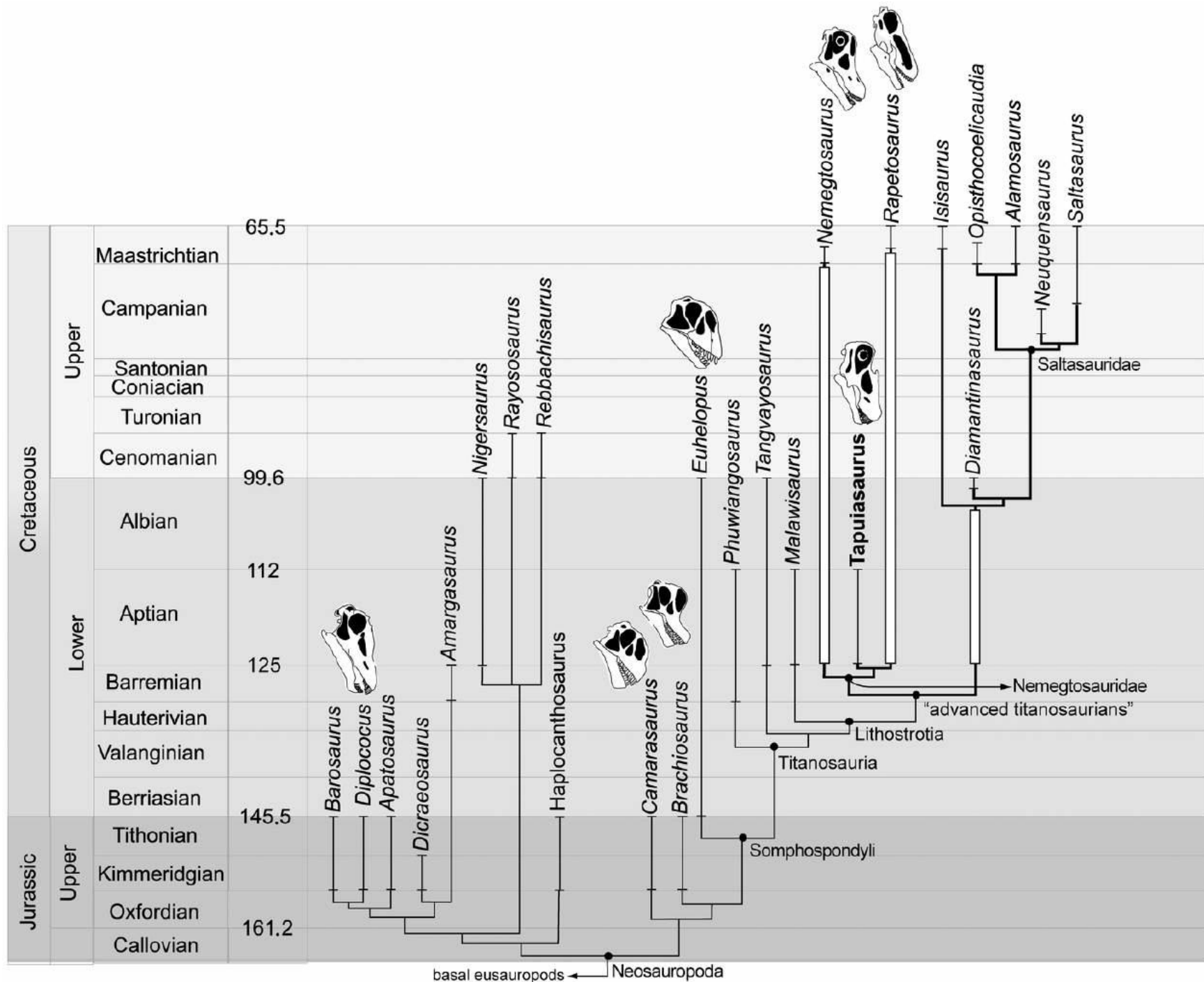
Titanosauria

Saltosauridae: Presencia de osteodermos, perdida de las falanges de la mano, coracoides cuadrangular, carpo no osificado, radio y tibia expandido.



Saltasaurus





NEOSAUROPODA

