

Supporting Information

Goswami et al. 10.1073/pnas.1108723108

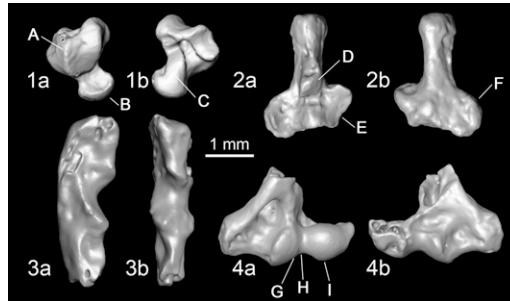


Fig. S1. Postcranial elements of *Deccanolestes hislopi*. 1. Astragalus (VPL/JU/NKIM/52) in dorsal (1a) and ventral (1b) views. 2. Calcaneus (VPL/JU/NKIM/50) in dorsal (2a) and ventral (2b) views. 3. Ulna (VPL/JU/NKIM/81) in medial (3a) and anterior (3b) views. 4. Humerus (VPL/JU/NKIM/79) in anterior (4a) and posterior (4b) views. Selected characters of note for phylogenetic and functional interpretations are: A, disto-medially curved lateral trochlear crest; B, rounded and extended navicular facet; C, confluence sustentacular and navicular facets; D, elongate and curved ectal facet; E, extended sustentacular facet; F, prominent peroneal tubercle; G, lateral keel of the trochlea; H, narrow zona conoidea; I, spherical capitulum (1–6).

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- Prasad GVR, et al. (2010) First mammal evidence for the Late Cretaceous of India for biotic dispersal between India and Africa at the K/T transition. *C R Palevol* 9:63–71.
- Hooker JJ (2001) Tarsals of the extinct insectivoran family Nyctitheriidae (Mammalia): Evidence for archontan relationships. *Zool J Linn Soc* 132:501–529.
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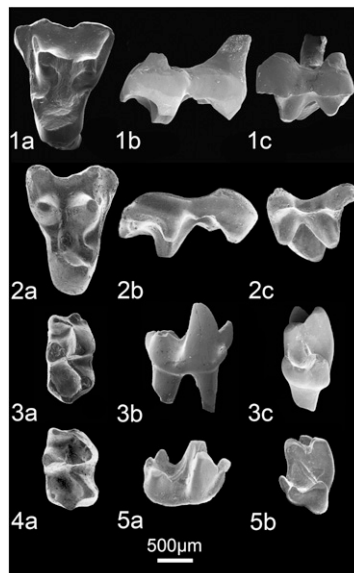


Fig. S2. Comparison of *Deccanolestes* and *Afrodon* dentition. 1. Left M1 of *D. hislopi* (VPL/JU/IM/17) in occlusal (1a), posterior (1b), and labial (1c) views. 2. Right M2 of *Afrodon germanicus* (CR-19-Bn) in occlusal (2a), posterior (2b), and labial (2c) views. 3. Right m1 or m2 of *D. narmadensis* (VPL/JU/IM/8, holotype) in occlusal (3a), labial (3b), and posterior (3c) views. 4a. Right m2 of *A. germanicus* (CR-1-Bn) in occlusal view. 5. Right m1 of *A. germanicus* (Wa/16118B) in labial (5a) and posterior (5b) views. Modified from Prasad et al. (1).

- Prasad GVR, et al. (2010) First mammal evidence for the Late Cretaceous of India for biotic dispersal between India and Africa at the K/T transition. *C R Palevol* 9:63–71.

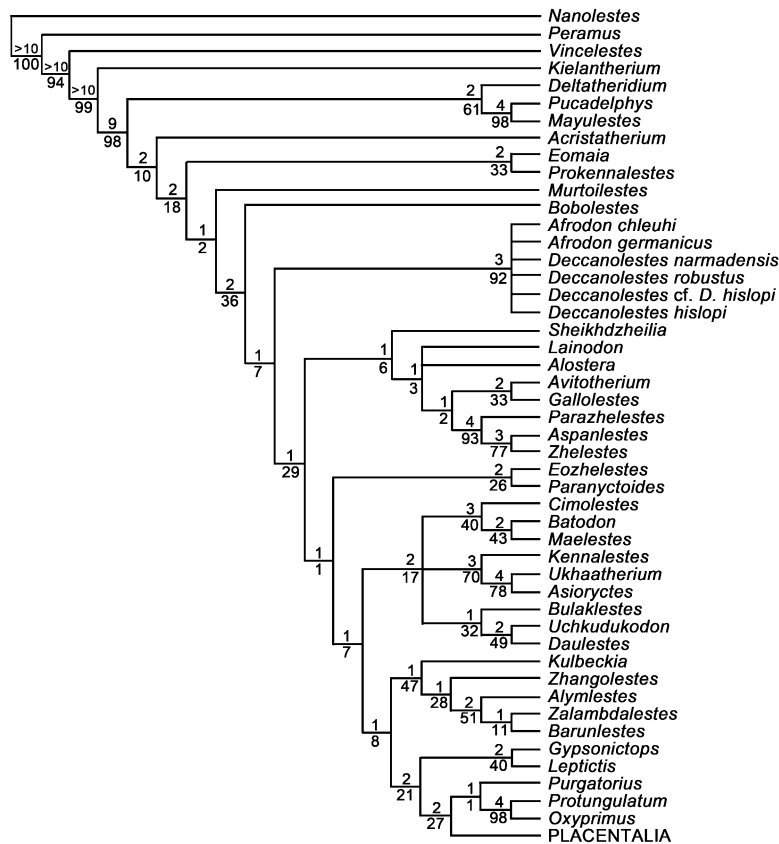


Fig. S4. Bootstrap and Bremer branch support indices. Support indices are displayed for Crown Constraint 1 (Exafroplacentalia topology, Fig. 1). Bremer support indices are located above branches; bootstrap supports are located below branches. Bootstrap analysis was conducted using TNT (5,000 replicates for each analysis). Bremer branch supports were generated from 50,000 suboptimal trees up to 10 steps longer than the most parsimonious tree.

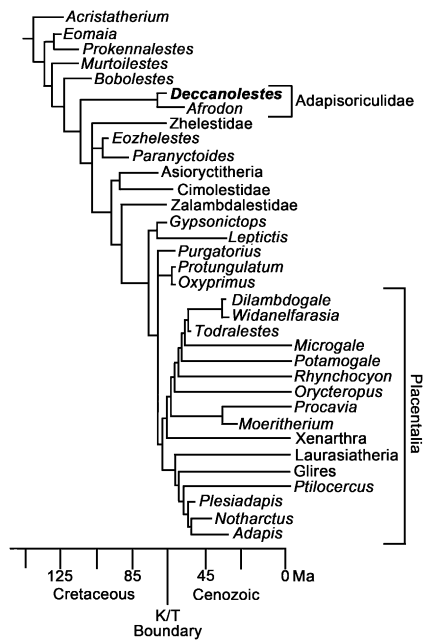


Fig. S5. Relationships of *Deccanolestes* to other eutherians using Crown Constraint 2 (Atlantogenata). Simplified reduced strict consensus tree with the crown group constrained to an Atlantogenata + Boreoeutheria topology. Positions of terminal branches indicate the age of last known occurrence of the respective taxon.

Table S1. List of specimens used to code characters for species of *Deccanolestes*, *Kharmarungulatum*, and *Afrodon*

Species	Specimens
<i>Deccanolestes hislopi</i>	Dental/Mandibular: VPL/JU/NKIM10, VPL/JU/NKIM11, VPL/JU/NKIM15, VPL/JU/NKIM16, VPL/JU/NKIM12, VPL/JU/NKIM17, VPL/JU/NKIM18, VPL/JU/NKIM54, VPL/JU/NKIM57 Postcranial: VPL/JU/NKIM50, VPL/JU/NKIM52, VPL/JU/NKIM53, VPL/JU/NKIM79, VPL/JU/NKIM81, VPL/JU/NKIM82, VPL/JU/IM40
<i>Deccanolestes cf hislopi</i>	VPL/JU/IM4, VPL/JU/IM5, VPL/JU/IM11, VPL/JU/IM14, VPL/JU/IM15, VPL/JU/IM16, VPL/JU/IM17
<i>Deccanolestes robustus</i>	VPL/JU/NKIM13, VPL/JU/NKIM14, VPL/JU/NKIM55
<i>Deccanolestes narmadensis</i>	VPL/JU/IM6, VPL/JU/IM7, VPL/JU/IM8
<i>Kharmarungulatum vanvaleni</i>	VPL/JU/IM31
<i>Afrodon germanicus</i>	UMLH-Wa/383, MNHM.F.CR19-Bn, MNHN.F.CR181-Ph
<i>Afrodon chleuhi</i>	UM2 THR161 (holotype), UM2 THR51, UM2 THR149, UM2 THR168, UM2 THR176, UM2 THR 197, UM2 THR214, UM2 THR219

Institutional abbreviations: VPL/JU/IM, Vertebrate Paleontology Laboratory, University of Jammu, intertrappean mammal catalog numbers; VPL/JU/NKIM, Vertebrate Paleontology Laboratory, University of Jammu, Naskal intertrappean mammal catalog number; UM2 THR, Adrar Mgorn1 collections of the Université des sciences et techniques du Languedoc, Montpellier II catalog numbers; MNHN.F, Muséum national d'Histoire naturelle, Paris; CR, Cernay collection in MNHN; Bn, Braillon collection in MNHN; Ph, Phélizon collection in the MNHN; UMLH-Wa, Walbeck collection of the Geologisch-Paläontologisches Institut, Halle, Germany.

Table S2. List of synapomorphies supporting key nodes A to D, shown in Fig. 2

Character (and state)	Character description	Character state description
Node A: Characters uniting <i>Deccanolestes</i> and <i>Afrodon</i>		
76 (0)	Deep ectoflexus	Present only on penultimate molar
86 (0)	Postprotocrista	Extends to midlingual surface of metacone
87 (0)	Development of postvallum shear	Present but only by the first rank: postmetacrista
111 (0)	Trigonid configuration	Open, with paraconid anteromedial, paracristid-protocristid angle more than 50°
118 (1)	Anteroposterior shortening at base of trigonid relative to talonid	Some shortening (50–75% of tooth length)
121 (2)	Hypoconulid of ultimate molar	Posteriorly procumbent
123 (1)	Postcristid (between entoconid and hypoconulid) taller than hypoconulid and nearly transverse	Present
401 (1)	Calcaneal sustentacular facet expanded onto body	Present
403 (1)	Calcaneal plantar tubercle	Present, at distal margin
408 (1)	Deep groove for tendon of flexor fibularis on calcaneum	Present
409 (1)	Lateral keel of humerus	Present
410 (1)	Humerus, zona conoidea	Present, narrow
415 (1)	Plantar pit on calcaneal cuboid facet	Present
Node B: Characters that unite Adapisoriculidae with the clade including crown placentals (as well as most other Late Cretaceous eutherians), to the exclusion of <i>Acristatherium</i> , <i>Eomaia</i> , <i>Prokennalestes</i> , <i>Murtoilestes</i> , and <i>Bobolestes</i>		
57 (1)	Ultimate lower premolar talonid	As wide as anterior portion of crown
79 (1)	Metacone and paracone bases	Separated
117 (1)	Trigonid height relative to talonid height	Less than twice
398 (2)	Ectal (or posterior calcaneoastagalal facet) longest dimension	Posteromedial to anterolateral
404 (1)	Tuber calcis ventral curvature	Absent (1)
406 (1)	Orientation of ML axis of cuboid facet on calcaneum relative to long axis of calcaneum	~70–80°
Node C: Characters that exclude <i>Deccanolestes</i> + <i>Afrodon</i> from the clade including crown placentals (as well as most other Late Cretaceous eutherians). Note that this list pertains to only the node immediately following the divergence of the adapisoriculid branch. Many other characters at other nodes may thus also exclude this clade from a more crownward position		
41 (0)	Ultimate upper premolar metacone	Absent
65 (1)	Size (labiolingual width) of upper molar labial styler shelf at maximum	Less than 50% but more than 25%
70 (0)	Styler cusp A	Subequal to larger than B
80 (0)	Preparacrista	Strong, from side of paracone to stylocone
415 (1)	Plantar pit on calcaneal cuboid facet	Present
Node D: Characters supporting the hypothesized relationship of Adapisoriculidae with Euarchonta (Node D) in the constrained analysis		
62 (1)	Size of molar series	Posterior increase (although <i>Ptilocercus</i> has state 0)
88 (2)	Paraconule	Prominent, midway or closer to paracone (although <i>Ptilocercus</i> has retained state 0)
113 (0)	Protocristid orientation	Oblique
375 (0)	Size of lesser trochanter of femur	Large
389 (1)	Sustentacular and navicular facets of astragalus contact	Present
395 (0)	Astragal canal	Present (although <i>Ptilocercus</i> displays state 2)
401 (1)	Calcaneal sustentacular facet expanded onto body	Present
407 (0)	Proportions of cuboid facet on calcaneum	Facet much deeper (dorsoventral) than wide (mediolateral) (although Primates have state 2)
408 (1)	Deep groove for tendon of flexor fibularis on calcaneum	Present (although <i>Ptilocercus</i> displays state 0)
409 (1)	Lateral keel of humerus	Present
410 (1)	Humerus, zona conoidea	Present, narrow
411 (1)	Humerus, capitulum shape	Spherical (1)
415 (1)	Plantar pit on calcaneal cuboid facet	Present

Unless otherwise noted, all dental traits refer to the penultimate molar.

Other Supporting Information Files

[SI Appendix \(DOC\)](#)