

New data from Cerdas, Bolivia, a low latitude site that chronicles the end of the Middle Miocene Climatic Optimum (MMCO)

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Many South American mammal groups apparently underwent northward range contractions following the MMCO including primates, porcupines (Erethizontidae), palaeothentid marsupials (Paucituberculata), and astrapotheres (a native ungulate group). Determining the precise timing of these shifts has been hampered by a scarcity of: (1) early middle Miocene (Langhian) sites from tropical latitudes; and (2) late middle Miocene (Serravallian) sites from the Southern Cone. Cerdas, Bolivia (ca. 21° S) dates to the Langhian age (ca. 16.5-15.3 Ma based on ⁴⁰Ar/³⁹Ar dating and paleomagnetic correlation) and is one of only three sites that documents Neotropical mammal species of the MMCO. Our team's recent fieldwork at Cerdas recovered specimens from low in section that represent three previously undocumented groups: a meat-eating metatherian (Sparassodonta), a proboscis-bearing ungulate (Astrapotheria), and a megatheriid sloth. Paleosols of the lower Cerdas Beds are weakly to moderately developed, have compound and composite profiles, and preserve several types of ichnofossils including lined and unlined burrows, rhizohaloes, and rhizotubules. The sparassodont remains include the basicranium and most of the mandible of a species comparable in size to the hathliacynid *Cladosictis patagonica* from the late early Miocene of Santa Cruz, Argentina. However, several features suggest borhyaenoid rather than hathliacynid affinities including a jugular fossa, a non-pneumatized squamosal, and the lack of a hypoconulid on m4. The astrapothere remains consist of many tooth fragments with an unusual combination of features not typical of late early Miocene *Astrapotherium magnum* nor late middle Miocene members of the Uruguaytheriinae; these include relatively smooth premolar ectolophs and very large upper molar cingulae. A partial megatheriid sloth dentary preserving the last molariform likely pertains to a Megatheriinae, suggesting that this subfamily could have originated in lower latitudes and later spread into Patagonia. A newly discovered specimen of a horned armadillo (Peltephilidae) from Cerdas includes a partial articulated carapace that supports its identification as a new species. The osteoderms of this specimen are characterized by a surface texture of small tubercles and pits, a central longitudinal elevation (acute in cross section) surrounded by a deep, wide groove extending over most of the osteoderm, and depressions along the border arranged in a unique, radial pattern. The large proportion of regionally endemic species at Cerdas provides evidence that the MMCO was a key factor in the differentiation of Miocene mammal assemblages. Ongoing studies at Cerdas aim to clarify the evolutionary relationships of these species and to place them in a refined paleoenvironmental context.