

## Osteoderm histology of Late Pleistocene cingulates from the intertropical region of Brazil

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During the Late Pleistocene, several possibly endemic cingulate species, known mostly from isolated osteoderms, carapace fragments, and caudal tubes, coexisted in the Brazilian Intertropical Region. Here, we describe the osteoderm microstructure of *Pachyarmatherium brasiliense*, as well as the glyptodonts *Panochthus greslebini*, *Panochthus jaguaribensis* and *Glyptotherium* sp., in order to provide additional species-diagnostic characters and shed light on their evolutionary relationships. *Pachyarmatherium brasiliense* lacks several derived features shared by glyptodonts and pampatheres, such as extensive bone remodeling, fibers arranged in large bundles, and relatively poorly developed layers of compact bone, thus supporting its exclusion from glyptodonts as suggested by a recent cladistic study. The osteoderm histology of *P. greslebini* resembles that of other species of *Panochthus* (e.g., *Panochthus frenzelianus*). By contrast, the presence of relatively thick layers of compact bone, the configuration and size of resorption areas, the absence of randomly oriented lateral fiber bundles, and the absence of an intermediary region between the compact and trabecular bone potentially support the exclusion of *Panochthus jaguaribensis* from the genus. Finally, osteoderms of the Brazilian specimens of Glyptodontinae share histological features with *Glyptotherium floridanus*, rather than *Glyptodon*, thus reinforcing their assignment to *Glyptotherium*. These results highlight the relevance of histological osteoderm characters in cingulate systematics, and call for further and more comprehensive studies.

**Key words:** Mammalia, Cingulata, Glyptodontidae, Pachyarmatherium, osteoderms, paleohistology, Pleistocene, Brazilian Intertropical Region.

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