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Hypsodonty and enamel microstructure in the Paleocene gondwanatherian mammal *Sudamerica ameghinoi*

Wighart v. Koenigswald, Francisco Goin, and Rosendo Pascuali
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Gondwanatherians were the earliest mammals to develop hypsodont cheek-teeth with thick cementum, already by the Late Cretaceous. Hypsodonty occurred independently in Gondwanatheria and Theria; however, very similar biomechanical strategies are observed. The hypsodont molariform cheek-teeth of the early Paleocene *Sudamerica ameghinoi*, the youngest member of the Gondwanatheria, are described. *Sudamerica* had in the lower jaw a continuously growing incisor and, separated by a large diastema, four cheek-teeth which cannot be homologized with premolars or molars, therefore they are regarded as molariforms. The analysis of one fragmentary mandible and 30 isolated molariforms led to the recognition of 8 different morphological categories among them, corresponding to four upper and four lower molariforms. The height of the teeth indicates a relatively high shape of the skull. The molariforms are characterized by transverse lophs; when only slightly worn, they show central enamel islets in the anterior/posterior caps and in the transverse valleys. When the first quarter of the tooth is worn down, these islets disappear and the synclines expand leaving only a narrow central longitudinal ridge. The enamel of the molariforms of *Sudamerica* is one-layered and formed by radial enamel; it resembles the enamel of *Gondwanatherium*. Compared to the enamel of the Gondwanatheria from Madagascar and India, the South American gondwanatherians are distinctly less derived. In turn, the incisor enamel is less derived in *Sudamerica*, although younger, than in *Gondwanatherium*; both show a combination of radial and tangential enamel. The evolution of hypsodonty in gondwanatherians during the Late Cretaceous and early Paleocene cannot be correlated with a grass diet, since grasses were not present during that time. Various lines of evidence including the dental morphology and the inferred habitat for *Sudamerica ameghinoi*, suggest semiaquatic and perhaps a burrowing way of life, similar to that of living beavers.

Key words: Hypsodonty, enamel microstructure, enamel islets, Gondwanatheria, *Sudamerica*, Multituberculata.

Wighart v. Koenigswald [koenigswald@uni-bonn.de], Institut für Paläontologie, Universität Bonn, Nussallee 8, D-53115 Bonn, Germany; Francisco Goin [palvert@museo.fcnym.unlp.edu.ar] and Rosendo Pascual [palvert@museo.fcnym.unlp.edu.ar], Departamento Paleontología Vertebrados, Museo

de La Plata, Paseo del Bosque s/n, 1900 La Plata, Argentina.


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