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NOTA PALEONTOLÓGICA

New specimens of *Soriacebus adrianae* Fleagle, 1990, with comments on pitheciin primates from the Miocene of Patagonia

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Introduction

Since the early 1980s, joint paleontological expeditions to the Pinturas Formation (Santacrucian, late-early Miocene), in northwestern Santa Cruz Province, Argentine Patagonia, by the Museo Argentino de Ciencias Naturales (Buenos Aires) and the State University of New York at Stony Brook, have recovered several new species of platyrrhine primates and other vertebrates. The named primate species are *Soriacebus ameghinorum* Fleagle *et al.*, 1987, *Soriacebus adrianae* Fleagle, 1990, *Carlocebus carmenensis* Fleagle, 1990 and *Carlocebus intermedius* Fleagle, 1990. The most controversial Pinturas primate has been the genus *Soriacebus*, represented by several dental and mandibular specimens that provide rather complete information regarding its dentition. There is no consensus about the phylogenetic affinities of *Soriacebus* and different approaches were discussed by some authors after the original description. Fleagle *et al.* (1987) pointed out that in the anterior dentition and mandibular shape *Soriacebus* is close to the living pitheciins (*Pithecia*, *Chiropotes*, *Cacajao*), while the lower premolars and molars resemble those of extant callitrichines for their narrowness and morphology of the molar trigonids. However, Fleagle *et al.* (1987) drew attention to the unique condition of *Soriacebus* among platyrrhines by having three-rooted upper premolars, although the presence of small hypocones in P^4 is shared with the living *Callicebus*. Rosenberger *et al.* (1990) and Tejedor (2000) included *Soriacebus* in the tribe Pitheciini, together with the living *Pithecia*, *Chiropotes* and *Cacajao*, and the extinct *Cebupithecia*, from the Laventan of Colombia, for several traits characterizing its dentition and mandible. *Proteropithecia* is a more recently described pitheciin from Neuquen Province (Kay *et al.*, 1998). Among the major shared features are the morphology and size of the lower incisors and the robustness of the projecting canine, followed by a massive and tall P$_2$. Also, the posterior mandibular depth is a shared similarity with the extant pitheciins and *Callicebus*. Kay (1990) suggested that *Soriacebus* is an early offshoot of platyrrhines, especially because of the cheek teeth which he considers distinct and more primitive than in most living platyrrhines. In several dental characteristics, the author compared *Soriacebus* with *Apidium* and *Aegyptopithecus*, from the Egyptian Oligocene, concluding that *Soriacebus* was a sister taxon of the Platyrrhini.

In March, 2000, two new specimens of *Soriacebus adrianae* were found in Pinturas at the locality of Portezuelo Sumich Sur (see Bown and Larriestra, 1990), in a joint expedition by members of the State University of New York at Stony Brook, University of Utah, Centro Nacional Patagónico (CENPAT), and Facultad de Ciencias Naturales, Sede Esquel (Universidad Nacional de la Patagonia "San Juan Bosco"). These are important discoveries since *S. adrianae* is still poorly represented in the record and new information about the anatomy of the species is provided here. One specimen is a fragmentary mandible (figures 1.A-B), including the symphysis, right canine, right P$_2$, left P$_4$, roots of right I$_{1-2}$ and left P$_{2-3}$, and alveoli of left I$_{1-2}$, left canine and right P$_3$. Unfortunately, the teeth are not well preserved but the crown of the right canine, although broken at the apex, shows a clear lingual crest or entocristid running upward from the base of the crown. Taking into account the controversies around the phylogenetic position of *Soriacebus*, this character is of major interest in assessing the affinities of the genus. The other specimen is an isolated right upper canine (figure 1.C).

Results and discussion

The new fragmentary mandible, MPM-PV1605 (Museo Padre Molina, Río Gallegos), is identical and

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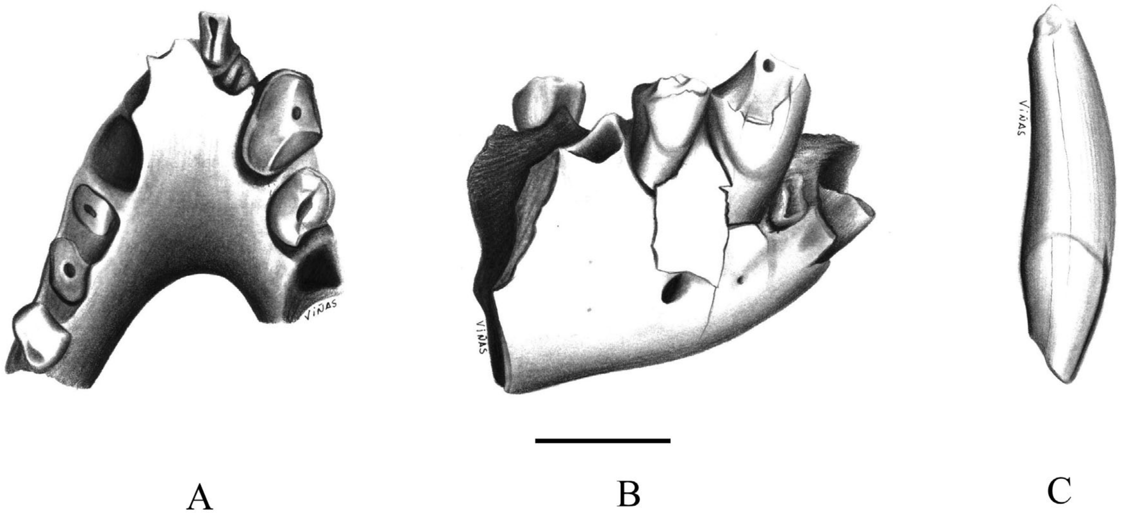

Figure 1. MPM-CV1605: partial mandible of ***Soriacebus adrianae*** Fleagle, 1990 in occlusal **(A)**, and buccal views **(B)**. Measurements of the right canine are: MD=2.80 mm; BL=3.82 mm. **(C)** MPM-PV1606 isolated right upper canine attributed to ***Soriacebus adrianae*** in buccal view**:** MD= 3.39 mm; BL= 2.89 mm. Scale bar= 0.5 cm. MD: mesiodistal; BL: buccolingual / *MACN-SC 4107: mandíbula parcial de* Soriacebus adrianae *Fleagle, 1990, en vista oclusal* **(A)** *y bucal* **(B)**. *Medidas del canino derecho: MD=2,80 mm; BL=3,82 mm.* **(C)** *MPM-PV1606: canino superior derecho aislado atribuido a* Soriacebus adrianae, *en vista bucal. MD= 3,39 mm; BL= 2,89 mm. Escala= 0,5 cm. MD: mesodistal; BL: bucolingual.*

more complete than the type of *Soriacebus adrianae*, MACN-SC 59, a right part of a symplysis preserving the canine root and P_{3-4} (see Fleagle, 1990). The canine is high-crowned, projecting well above the occlusal plane and shows a typical pitheciin structure, being buccolingually compressed with an entocristid along the lingual side. The entocristid makes the cross-section of the canine nearly triangular, as shown by more advanced pitheciins and the extremely derived living *Pithecia*, *Chiropotes* and *Cacajao*. This character is universally present in pitheciins. The holotypes of *Soriacebus ameghinorum* and *Soriacebus adrianae* (mandibles MACN-SC 2 and MACN-SC 59; see Fleagle *et al.*, 1987; Fleagle, 1990) have the canine crowns broken, but they are large at the base and were certainly high-crowned. There is a smooth root-crown transition characterizing the living pitheciins, so that the crown is not expanded at the base, as is noted in the *Soriacebus* specimens.

The isolated upper canine, MPM-PV1606, also demonstrate affinities with pitheciins, having a long and projecting crown, reduced lingual cingulum, no distolingual heel, a relatively deep mesial groove and the base of the crown is not wide relative to the height. This is certainly a pitheciin pattern characterizing *Soriacebus* (see Tejedor, 2002). Although smaller, the morphology of this upper canine is the same as those attributed to *Soriacebus ameghinorum*, as discussed elsewhere (Tejedor, 2002). Unquestionably, this upper canine is morphologically indistinguishable from that of the maxillary fragment of *Soriacebus ameghinorum*, MACN-SC 4 (see Fleagle *et al.*, 1987), excepting for its smaller size that fits well with *Soriacebus adrianae*. Among the living platyrrhines with projecting canines, upper canines of pitheciins are distinct from *Saimiri* and *Cebus* because the latter have a deeper mesial groove and the distolingual side of the canine is thinner, blade-like, in contrast with the robustness showed by pitheciins. *Alouatta* also shows a blade-like pattern in upper canines, but even more projecting, with a more robust root.

The above mentioned characters certainly describe a pitheciin primate. However, *Soriacebus* has an unusual lower premolar and molar morphology. The lower molars are elongate with large trigonids, in contrast to the trend towards reduced trigonids in all other pitheciins. In the type specimen of *Soriacebus ameghinorum*, the talonid is usually narrower than the trigonid, more in M1, but it shows a distal expansion with a small hypoconulid on M_{1-2}. These are the major controversial characters since such morphology is not shared with any other platyrrhine. On the other hand, trigonid and talonid proportions of P_{3-4} are similar in *Cebupithecia* and *Soriacebus*, with a long preprotocristid in P_3 and the trigonid lingually inclined. It is noted that the pitheciin status of *Cebupithecia* is unquestionable. This similarity is certainly homologous and the premolars of *Soriacebus* probably evolved their elongate shape secondarily. As mentioned above, Fleagle *et al.* (1987) compared the lower molar morphology of *Soriacebus* to callitrichines, where the trigonid is also large in the lower molars. But callitrichines are quite different from *Soriacebus* by having reduced talonid and talonid cusps. Thus, there is no homologous similarities between callitrichines and *Soriacebus*, emphasizing the possible autopomorphic condition of the lower molar morphology in the latter. An alternative view suggests an individual variation in the lower molars of the type, based on a new finding of *S. ameghinorum* (Tejedor, 2003; Tejedor, in prep.). But the major synapomorphies of *Soriacebus* and pitheciins are the anterior dentition with compressed and procumbent incisors and projecting canines, as well as a strong symphysis and a mandibular corpus that deepens posteriorly, being very deep below the molars.

Other fossil pitheciins were also recovered in Patagonia. *Proteropithecia neuquenensis* is a poorly represented species from Colloncuran sediments (Middle Miocene) at Cañadón del Tordillo, Neuquén Province (Kay *et al.*, 1998). *Soriacebus*-like primates were reported from Colhuehuapian deposits in Chubut Province (Kay *et al.*, 1999) but remains undescribed. A left upper canine was recovered at Gran Barranca, in south central Chubut, which shows pitheciin affinities and proportions (Tejedor, 2002) resembling *Soriacebus* in having a projecting crown with no basal enlargement and a deep mesial groove. Hershkovitz (1981) attributed a mandibular fragment from Gran Barranca with the right P_4 *in situ* to *Homunculus* sp., but Fleagle (1990) held the view that it could be allocated to *Soriacebus* cf. *ameghinorum*, based especially on the buccal expansion of P_4, long trigonid and reduced occlusal surface. Additionally, this mandible is deep and thin buccolingually with a robust symphysis, and may have been rather V-shaped.

These additional specimens, along with those collected in the Pinturas Formation, support the view of a broader geographic and temporal radiation of pitheciin primates, having its earliest representatives in Patagonia.

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References

Bown, T.M. and Larriestra, C.N. 1990. Sedimentary paleoenvironments of fossil platyrrhine localities, Miocene Pinturas Formation, Santa Cruz Province, Argentina. *Journal of Human Evolution* 19: 87-119.

Fleagle, J.G. 1990. New fossil platyrrhines from the Pinturas Formation, Southern Argentina. *Journal of Human Evolution* 19: 61-85.

Fleagle, J.G., Powers, D.W., Conroy, G.C. and Watters, J.P. 1987. New fossil platyrrhines from Santa Cruz Province, Argentina. *Folia Primatologica* 48: 65-77.

Hershkovitz, P. 1981. Comparative anatomy of platyrrhine mandibular cheek teeth dpm4, pm4, m1, with particular reference to those of *Homunculus* (Cebidae), and comments on platyrrhine origins. *Folia Primatologica* 35: 179-217.

Kay, R.F. 1990. The phyletic relationships of extant and fossil Pitheciinae (Platyrrhini, Anthropidea). *Journal of Human Evolution* 19: 175-208.

Kay, R.F., Johnson, D. and Meldrum, D.J. 1998. A new pitheciine primate from the Middle Miocene of Argentina. *American Journal of Primatology* 45: 317-336.

Kay, R.F., Madden, R.H., Vucetich, M.G., Cenlini, A.A., Mazzoni, M.M., Re, G., Heizler, M. and Sandeman, H. 1999. Revised geochronology of the Casamayo-ran South American Land Mammal Age: climatic and biotic implications. *Proceedings of the National Academy of Sciences* 95: 13235-13240.

Rosenberger, A.L., Setoguchi, T. and Shigehara, N. 1990. The fossil record of callitrichine primates. *Journal of Human Evolution* 19: 209-236.

Tejedor, M.F. 2000. [*Los Platyrrhini fósiles de la Patagonia (Primates, Anthropoidea). Sistemática, filogenia e inferencias paleoambientales*. Tesis Doctoral. Facultad de Ciencias Naturales y Museo. Universidad Nacional de La Plata. 251 pp. Inédita.]

Tejedor, M.F. 2002. Primate canines from the early Miocene Pinturas Formation, southern Argentina. *Journal of Human Evolution* 43: 127-141.

Tejedor, M.F. 2003. Variaciones en la morfología dentaria de *Soriacebus ameghinorum* (Primates, Platyrrhini), del Mioceno temprano de la Patagonia. *Resúmenes 19º Jornadas Argentinas de Paleontología de Vertebrados*, p. 30.

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