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New Fossil Platyrrhine from Argentina

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Abstract

A new fossil primate was found in the Pinturas Formation, south-western Patagonia, at the type locality of the rare *Soriacebus ameghinorum*. It is a mandibular fragment with two molars that strongly resemble those of *S. ameghinorum* in their high and closed trigonid, distal expansion of the talonid, small hypoconulid, buccal expansion of the enamel and similar cusp development. But the type of *S. ameghinorum* differs by having mesiodistally longer trigonids, long premetacristids and more oblique distal trigonid walls, with the metaconid more lingually placed and the postmetacristid distolingually oriented and with the talonid being buccolingually smaller than the trigonid with a more restricted basin. M_2 is slightly smaller than in the new specimen, and the buccal enamel is less flared. Although it is difficult to determine if this new specimen represents an individual variation of *S. ameghinorum* or a new species of *Soriacebus*, its morphology appears to be less derived than that of the type mandible, and it is, therefore, of systematic significance.

Introduction

Since the 1980s, joint palaeontological expeditions to the late-early Miocene Pinturas Formation (Santacrucian Land Mammal Age), Argentine Patagonia, by the Museo Argentino de Ciencias Naturales (MACN, Buenos Aires) and the State University of New York (SUNY) at Stony Brook have recovered several new species of platyrrhine primates and other vertebrates. The named primate species are *Soriacebus ameghinorum, Soriacebus adrianae, Carlocebus carmenensis* and *Carloce-*

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bus intermedius [Fleagle et al., 1987; Fleagle, 1990]. One of the most controversial fossil platyrrhines has been the genus *Soriacebus*, represented by dental and mandibular specimens. Fleagle et al. [1987] pointed out that in its 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 in their narrowness and the structure of the molar trigonids. Kay [1990] suggested that *Soriacebus* is an early offshoot and sister taxon of the Platyrrhini, based on the unusual cheek teeth morphology. Rosenberger et al. [1990], Tejedor [2000] and Fleagle and Tejedor [2002] included *Soriacebus* in the tribe Pitheciini, together with the living *Pithecia, Chiropotes* and *Cacajao* and the extinct *Cebupithecia* and *Nuciruptor* from the middle Miocene of Colombia. More recently, *Proteropithecia* was also recognized as a pitheciin [Kay et al., 1998]. The tribe Pitheciini is generally characterized by major characters such as the morphology and size of the lower incisors and the robustness of the projecting canines, followed by a massive and tall P_2 and a posteriorly deep mandible. For this report, the pitheciin status of *Soriacebus* is accepted, as discussed elsewhere [Tejedor, 2000, 2002; Fleagle and Tejedor, 2002].

In December 2002, a new specimen of *Soriacebus*-like platyrrhine was found in Pinturas at the locality of Portezuelo Sumich Norte, in the property of Estancia Los Toldos [Bown and Larriestra, 1990], during a palaeontological expedition by members of the Laboratorio de Investigaciones en Evolución y Biodiversidad, Facultad de Ciencias Naturales, Sede Esquel (Universidad Nacional de la Patagonia 'San Juan Bosco'). Portezuelo Sumich Norte is the type locality of *S. ameghinorum* [Fleagle et al., 1987], and one of the two of the eight Pinturas primate localities where this species has been found. The new material was collected a few meters from where the type of *S. ameghinorum* was found, and it is a fragmentary right mandible with complete M_2 and talonid of M_1 (fig. 1a) showing a morphological pattern that differs from the similarly sized type specimen of *S. ameghinorum*.

Results and Discussion

Comparative measurements of the new specimen, MPM-PV 36, and other *S. ameghinorum* specimens are shown in table 1. The new material shows the following combination of characters. The talonid of M_1 has a restricted basin and large buccal face. A prominent hypoconid is present in M_1, along with a smaller entoconid and a very small hypoconulid separated from the entoconid by a small sulcus. M_2 has a mesiodistally short, closed trigonid with a shallow basin and short premetacristid. The trigonid is higher than the talonid, and the distal border is almost transverse. There is a prominent hypoconid on M_2, but the entoconid is small with no sulcus separating the apparently small hypoconulid. The postmetacristid is oriented distal to the metaconid. A considerable distal expansion of the talonid is present in both molars. The talonid basin is relatively wide, and the buccal face is large. The talonid is clearly wider than the trigonid.

MPM-PV 36 resembles *S. ameghinorum* in that it has a high and closed trigonid, distal expansion of the talonid, small hypoconulid, buccal expansion of the enamel and overall similar cusp development. But the holotype of *S. ameghinorum* (MACN-SC 2; fig. 1b) differs from MPM-PV 36 in having a mesiodistally longer

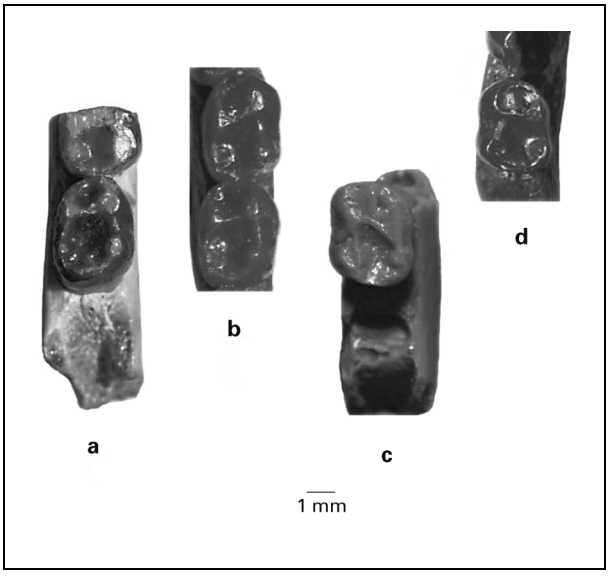

Fig. 1. a MPM-PV 36, the new specimen. **b** MACN-SC 2, holotype of *S. ameghinorum*. **c** MACN-SC 5, specimen tentatively attributed to *S. ameghinorum*, from Pinturas Formation. **d** MACN-CH 354, *Soriacebus*-like primate from Sacanana, Chubut Province.

Table 1. Measurements (mm) of the lower molars discussed in the text

	M_1	M_2		
	BL_{tal}	MD	BL_{tr}	BL_{tal}
MPM-PV 36	3.33	4.23	3.16	3.31
MACN-SC 2	3.04	4.15	3.15	2.90
MACN-SC 5	–	4.11	3.22	3.33
MACN-CH 354	3.32	–	–	–

BL_{tal} = Buccolingual – talonid; MD = mesodistal; BL_{tr} = buccolingual – trigonid.

trigonid, lingually inclined, with long premetacristid and a more oblique distal wall, with the metaconid more lingually placed and the postmetacristid distolingually oriented. The talonid is buccolingually smaller than the trigonid and has a more restricted basin; there is a clear sulcus behind the entoconid. M_2 is also slightly smaller than in the new specimen, and the buccal enamel flares less.

One of the most controversial characters of *S. ameghinorum* is the elongation of the lower molars and the large trigonids. If we assume that *Soriacebus* is a pitheciin – which is the most probable hypothesis [Rosenberger et al., 1990; Tejedor, 2000; Fleagle and Tejedor, 2002] – then the lower molars of the holotype appear to exhibit several autapomorphies compared with the living pitheciins [Tejedor, 2000,

2002]. The only detailed resemblance shared by the lower molars of living pitheciins and the holotype of *S. ameghinorum* is the distal expansion of the talonid. Even the Miocene pitheciins, *Cebupithecia, Nuciruptor* and *Proteropithecia*, show a short trigonid and relatively low crown relief.

MPM-PV 36 provides much new information, thus enlarging the morphological concept of *Soriacebus*, since the trigonid is shorter and the talonid is much broader than in the holotype. The distal crest of the trigonid is less oblique than in the type of *S. ameghinorum*, and it has a shorter premetacristid. If MPM-PV 36 is assigned to *S. ameghinorum*, then some previous considerations about the autapomorphic condition of the lower molars of *S. ameghinorum* [Tejedor, 2000] should be reinterpreted as individual variation present in the holotype only. Thus, the species could have had a more conservative morphological pattern preceding the more advanced pitheciin pattern (as in the extinct *Cebupithecia, Nuciruptor* and *Proteropithecia*), and this more primitive pattern might be better represented by MPM-PV 36. However, the morphological variations exhibited by the new material may, in fact, exceed the expected range of variation for the qualitative characters mentioned above. On the other hand, such variation in proportions and shape of the trigonid and talonid as observed in MPM-PV 36 and the type of *S. ameghinorum* is not seen in living platyrrhines, especially pitheciins. All pitheciins have similar trigonid/talonid proportions – the trigonid being considerably shorter – and show no elongation in the lower molars.

The remaining fossil record of lower molars tentatively assigned to *S. ameghinorum* or *Soriacebus*-like primates is very scarce. MACN-SC 5 (fig. 1c) is an isolated mandibular fragment with a worn M_1 collected by Fleagle and co-workers in the Pinturas Formation during the MACN-SUNY expeditions, but the precise locality is unknown. The specimen can be attributed to *S. ameghinorum*. The trigonid/talonid proportion of its M_2 is similar to that of MPM-PV 36, but the buccal enamel is even more inflated. However, the talonid basin of MACN-SC 5 is restricted as in the type specimen. This may support the hypothesis that these specimens are showing intraspecific variation in *S. ameghinorum*, because MACN-SC 5 combines the wider talonid (as in the new specimen) with the restricted talonid basin (as in the type). But, more importantly, the trigonid and talonid of MACN-SC 5 are similar in buccolingual width, also combining the characters of the type and MPM-PV 36. Also, a peculiar crest is seen in the extoflexid of MACN-SC 5 and MPM-PV 36, strongly developed in the former (fig. 1c).

Other materials from Patagonia have been tentatively attributed to *Soriacebus*. Fleagle and Bown [1983] have described a left mandibular fragment with complete M_1 in situ and a broken P_4 (MACN-CH 354; fig. 1d) from the Colhuehuapian locality of Sacanana, in Chubut Province. The specimen was originally assigned to *Tremacebus harringtoni*, since it was collected at the type locality where *Tremacebus* was found in the 1930s. However, Fleagle [1990] suggested that the mandible could be attributed to *S. ameghinorum* because of the large and mesially inclined trigonid on M_1 and the buccally expanded P_4. The Sacanana mandible shares with MPM-PV 36 similar trigonid/talonid proportions, postmetacristid distally oriented and an expanded buccal face. Also, the trigonid does not appear lingually inclined as it is in the type of *Soriacebus*. The cristid obliqua is longer and more lingually oriented than in MPM-PV 36, but this may indicate a typical morphology of M_1, which is broken in the new specimen. The cristid obliqua of M_1 in the new speci-

men cannot be evaluated at all because it is worn, but a slight lingual orientation is clear. It appears that the Sacanana molar also has a very tiny hypoconulid, although the entoconid is less prominent than in *Soriacebus*. These data may confirm that the Sacanana mandible is attributable to a *Soriacebus*-like primate.

In conclusion, the unusually elongate lower molars of the holotype of *S. ameghinorum* may be either an individual variation with respect to other *Soriacebus* specimens, especially MPM-PV 36, or a species-level character state. If MPM-PV 36 is a new species, it almost certainly belongs to the genus *Soriacebus*, but more material is needed to assess the diagnostic characters correctly. The information added by this new find, however, clearly contributes to understanding the primitive state of the molar morphology of *Soriacebus*, which is even more primitive than that of younger fossil pitheciins such as *Proteropithecia, Cebupithecia* and *Nuciruptor*. This hypothesis also reinforces the importance of the anterior dentition as a derived morphological link between *Soriacebus* and the living pitheciins.

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