

Taxonomic status of *Apterodytes ictus* AMEGHINO, 1901 (Aves; Sphenisciformes) from the Early Miocene of Patagonia, Argentina

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With 2 figures

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Abstract: A proximal end of a humerus collected by C. AMEGHINO was designated as the holotype of *Apterodytes ictus* AMEGHINO, 1901 in the monotypic genus *Apterodytes* AMEGHINO, 1901. Later, AMEGHINO (1905) transferred this species to the new genus *Palaeoapterodytes* AMEGHINO, 1905. The validity and affinity of this species has been discussed controversial, not only on account of the poor preservation of the material, but also because of the characters used in its diagnosis and description. A systematic revision of *Apterodytes ictus* (AMEGHINO, 1901) is presented. This is a proximal end of a right humerus strongly weathered that was interpreted as a complete humerus with an unique morphology. The characters included in the original diagnosis and the description are inadequate to compare with those of other species as they are based mainly on the assumption of the atrophy of a humerus that is in fact fractured and incomplete. Its morphology allows its confident assignment to the family Spheniscidae, although it is not well enough preserved to assign it to any known genus. Therefore, this fossil is not appropriate to found a species on and *Palaeoapterodytes ictus* (AMEGHINO, 1901) must be considered as a *nomen dubium*.

Key words: Taxonomy, Spheniscidae, *Palaeoapterodytes ictus*, Miocene, Argentina, South America.

1. Introduction

Following the discovery of extensive fossils in Miocene sediments from Patagonia, Argentina, many fossil penguin species were described between the years 1891 and 1905. These included a few from Chenque Formation (Early Miocene) (Fig. 1), including a proximal end of a humerus collected by CARLOS AMEGHINO and designated as the holotype of *Apterodytes ictus* AMEGHINO, 1901 and the identified material of *Apterodytes* AMEGHINO, 1901. Its taxonomic history and systematic status have been a matter of discussion for over a century. Due to the existence of the genus *Apterodyta* SOP, 1786,

AMEGHINO (1905: 120) modified the generic name *Apterodytes* to *Palaeoapterodytes*, and consequently listed the species as *Palaeoapterodytes ictus* (AMEGHINO, 1901). Certainly, this appears to be an unjustified emendation in terms of the Rules of Nomenclature, as *Apterodytes* is not the same as *Apterodyta*. However, the name *Apterodytes* HERMANN, 1783 pro *Apterodytes* MILLER, 1778 (Emperor Penguin and King Penguin), does exist, and predates *Apterodyta* SOP, 1786 whatever this taxon's status, and so *Palaeoapterodytes* AMEGHINO, 1905 is a necessary *nomen novum* for *Apterodytes* AMEGHINO, 1901, preoccupied by the junior homonym of *Apterodytes* HERMANN, 1783.

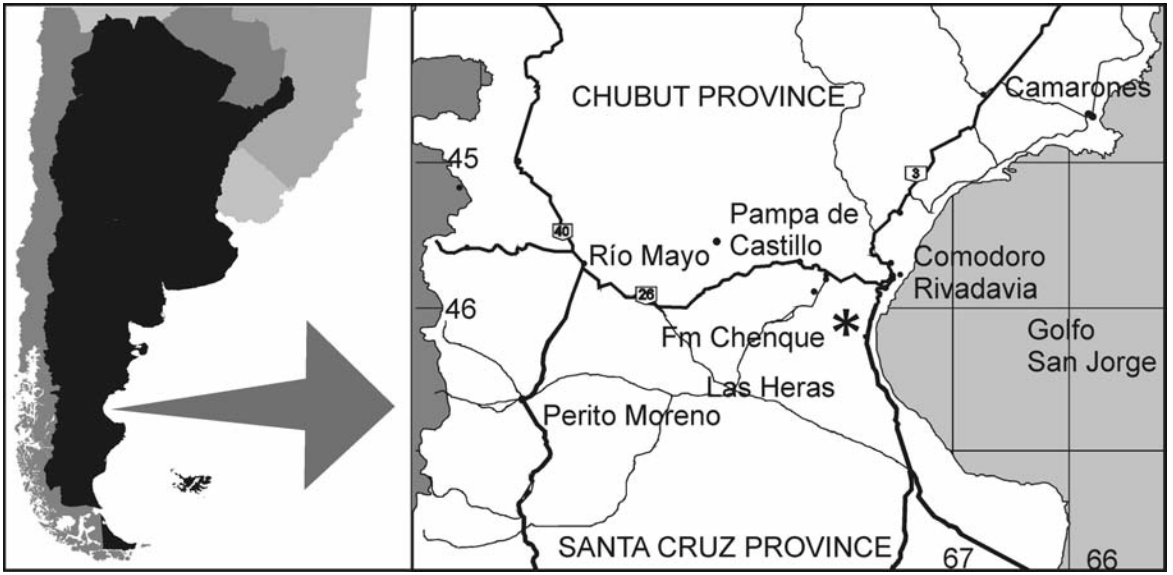


Fig. 1. Location map, showing the Chenque Formation, where the holotype of *Palaeoapterodytes ictus* MACN 11040 was collected.

However, when AMEGHINO proposed this change, he also introduced a small error in stating that *Apterodytes* and *Apterodytes ictus* had been founded in 1891, when they were actually nominated in 1901. A less minor detail that should be considered is that AMEGHINO (1898) mentions that *Aptenodytes patagonicus* MILLER, 1778 is the only penguin species from the “Patagonian Formation”. It is possible that this reference alludes to the same humerus later assigned to *Aptenodytes ictus* AMEGHINO, 1901.

SIMPSON (1946) listed this taxon as *Apterodytes* AMEGHINO, 1901, and considered that the species *A. ictus* AMEGHINO, 1901 was a *nomen vanum* (= *nomen dubium* in present practice). In his famous systematic catalogue BRODKORB (1964) interpreted *Apterodytes ictus* AMEGHINO, 1901 as a junior synonym of *Palaeospheniscus gracilis* AMEGHINO, 1899. Despite this synonymy, and changing the opinion regarding his previous work (see SIMPSON 1946), SIMPSON (1972) listed *Palaeoapterodytes ictus* (AMEGHINO, 1901) as a valid species of Spheniscidae, with dubious affinities.

TONNI (1980) proposed that *Palaeoapterodytes ictus* (AMEGHINO, 1901) was a junior synonym of *Palaeospheniscus bergi* MORENO & MERCERAT, 1891.

Subsequent systematic lists, such as the well-known catalogue of South American fossil vertebrates by MONES (1986), and the catalogue of Aves from

the collections of the Museo de La Plata (ACOSTA HOSPITALECHE et al. 2001) have followed SIMPSON (1972) in considering that *Palaeoapterodytes ictus* (AMEGHINO, 1901) is a valid penguin species. However, a rigorous revision made in the phylogenetic context nowadays available (ACOSTA HOSPITALECHE et al. 2007; BERTELLI & GIANINNI 2005), allows re-opening of this discussion and re-examination of its taxonomic status.

In this paper, a systematic revision of *Palaeoapterodytes ictus* (AMEGHINO, 1901) is presented. Its holotype (MACN 11040) is housed at the Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” of the Ciudad Autónoma de Buenos Aires, Argentina, and also a cast (M-599) is deposited at the Museo de La Plata, Argentina.

2. Discussion and conclusions

Despite the many considerations made by different authors on *Palaeoapterodytes ictus*, AMEGHINO (1901, 1905) was the only one who thoroughly analyzed the morphoanatomy of its humerus. The controversy around this species is not only due to the poor preservation of the material, but to the characters used in the diagnosis and the subsequent description. This is a proximal end of a right humerus (Fig. 2) that

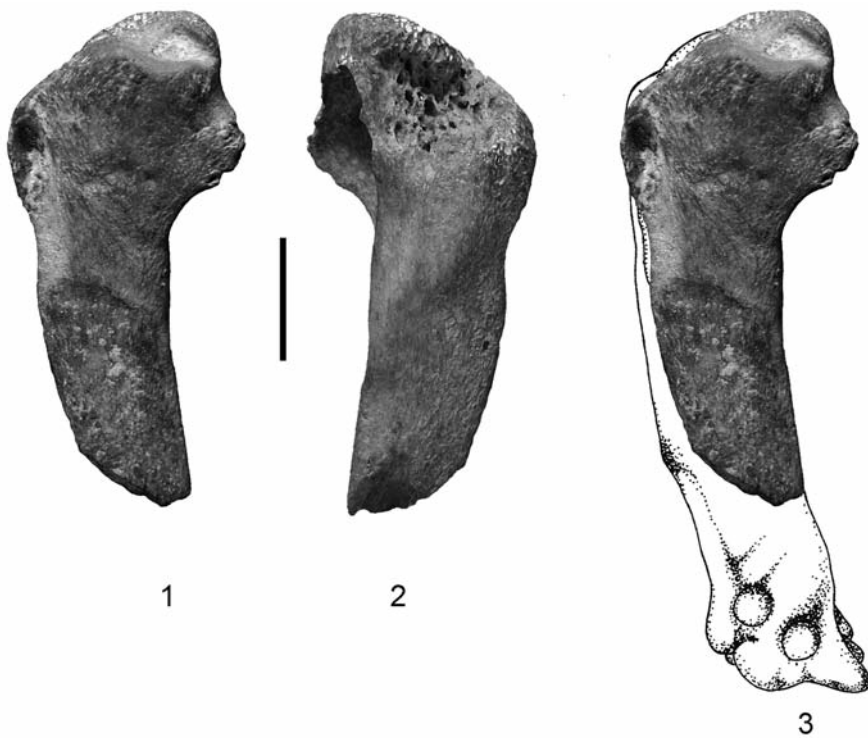


Fig. 2. Holotype of *Palaeoapterodytes ictus* MACN 11040, proximal end of right humerus; **1** – anterior view; **2** – posterior view; **3** – reconstruction of the humerus in anterior view. Scale bar equals 10 mm.

was interpreted as a complete humerus with a unique morphology. AMEGHINO (1901: 81) revealed this clearly when he founded the genus and species, stating “in this genre, the wing was completely atrophied, and the humerus was only represented by the proximal tip of 21 millimeters of diameter, with an styloid extension of 4 centimeters long”. AMEGHINO (1905: 120) when referring to *Palaeoapterodytes*, reaffirmed that it “is characterized by the atrophy of the humerus, which has been reduced to its proximal end” and added a detailed description of the material and some illustrations (AMEGHINO 1905: pl. 3, figs. 16a, 16c, 16e, 16U). These show only a small portion of the humerus has been preserved and no signs of bone atrophy compared with other penguin species, but rather, a strong weathering. In his descriptions referring to *Palaeoapterodytes ictus*, AMEGHINO (1905: 120) indicated that the humerus “has a little more than 43 mm length and with his perfect articular head, its total length should be about 45 mm”. He did not consider that this material not only lacks of a small portion of the proximal epiphyses, but also of a part of its diaphysis and the complete distal epiphyses. He

also explains (AMEGHINO 1905: 120) that “his articular head is partially destroyed, but it would be sure very little because its largest diameter not exceeded 15 mm”. But, in relative terms, the preserved portions reveals that it would be a medium-sized penguin, comparable to the current species *Spheniscus magellanicus* (FORSTER, 1781), or the extinct *Palaeospheniscus patagonicus* MORENO & MERCERAT, 1891.

AMEGHINO (1905) stated “the big subtrochanteric fossa has its walls partially destroyed, but it is known that had the form and normal development of Penguins” (AMEGHINO 1905: 120). Despite being unable to establish with certainty what part of the humerus AMEGHINO was referring to, it is likely the *fossa tricipitalis*. While the walls are indeed very badly preserved, it is possible to recognize a bipartite fossa typical of most Miocene penguins, with a crus dorsale fossae weakly developed, such as in *Madrynornis mirandus* ACOSTA HOSPITALECHE, TAMBUSI, DONATO & COZZUOL, 2007 and *Palaeospheniscus biloculata* (SIMPSON, 1970) ACOSTA HOSPITALECHE, 2007. AMEGHINO additionally declared that “The pectoral crest is very poorly deve-

loped, with an atrophied palmer inversion, and as a result, the fossa for the insertion of the large pectoral muscle is reduced to minimal proportions, in correlation with the atrophy of the wing” (AMEGHINO 1905: 120). However, the *crista deltopectoralis*, which would be the insertion surface of the cranial portion of the *musculus pectoralis*, is heavily eroded, not allowing determining the size of the *impressio coracobrachialis*, where the *coracobrachialis cranialis* muscle would have been attached. Moreover, speculations about the wing muscular development of this species have little support.

The diaphysis of the humerus was also characterized by AMEGHINO (1905: 120) as follows “Below the widened portion of the proximal end, the bone is extended like a plate of 2.5 centimeters length which gradually slims until ending in a sharp edge (in both ends and both sides)”. “This plate, about 10 cm wide and only 1 mm thick in the bottom half, it bowed inward, thus presenting the palmar surface slightly concave in a longitudinal direction, and the anconal surface slightly convex in the same direction” (AMEGHINO 1905: 120). Although meticulously detailed and actually precise, this description has no anatomical or systematic significance, as it describes a fragment of the diaphysis (Fig. 2).

The characters included its diagnosis and description turns out inadequate to make comparisons with those of other species since they are based mainly on the assumption of the atrophy of a humerus that is in fact fractured and incomplete. Its morphology allows its assignment to the family Spheniscidae without any doubt, but its preservation does not allow an allocation to any known penguin genera. Therefore, this fossil is not appropriate to found a species, and *Apterodytes ictus* AMEGHINO, 1901 must be considered as a *nomen dubium* (or as a *nomen vanum* sensu MONES 1989).

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