

The fossil family Ameghinornithidae (Mourer-Chauviré 1981): a short synopsis

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Abstract A short synopsis of the taxa included in Ameghinornithidae is presented. The rather poor fossil record suggests that these birds were (nearly?) flightless, similar to small phorusrhacids.

Keywords Ameghinornithidae · *Aenigmavis* · *Ameghinornis* · *Strigogyps* · Palaeogene

Introduction

Ameghinornithinae Mourer-Chauviré 1981 were established as a subfamily of the Phorusrhacidae Ameghino 1889 comprising the single species *Ameghinornis minor* (Gaillard 1939). Recently, Mayr (2005) presented arguments that *Strigogyps* Gaillard 1908, *Ameghinornis* Mourer-Chauviré 1981 and *Aenigmavis* Peters 1987 might belong to this taxon now ranking as a family Ameghinornithidae, different from the Phorusrhacidae. The latter are confined to the Americas, as shown by Alvarenga and Höfling (2003). Mayr (2005) considered *Strigogyps*, *Ameghinornis* and *Aenigmavis* to be synonymous. However, concerning the fragmentary record at hand it seems more appropriate to keep these genera taxonomically separate.

Systematics

Aves Linnaeus 1758
Gruiformes (Bonaparte 1854)
Cariamae Fürbringer 1888
Ameghinornithidae (Mourer-Chauviré 1981).

Tentative diagnosis: medium-sized (flightless?) birds approaching the size of some Psilopterinae, the smallest phorusrhacids. Wings relatively small and reduced; processus flexorius humeri shorter than in the Phorusrhacidae; ulna stout and shorter than humerus, with condylus dorsalis very pronounced (Fig. 1), apart from that similar to the ulna of the Cariamidae. Legs strong, with powerful raptor-like talons; ossified pons supratendineus tibiotarsi lacking, condylus lateralis tibiotarsi laterally with a circular or nearly circular outline (similar to *Rhynchoetos*), epicondylus medialis strongly protruding, sulcus intercondylaris asymmetrical (medially deeper) (Figs. 2, 3); tarsometatarsus shorter than femur (about 85%) and much shorter than tibiotarsus (about 55%), hypotarsus formed by two parallel crests (very similar to *Rhynchoetos*), trochlea metatarsi II and IV with plantarly projecting flange. Skull probably much weaker than that of the Phorusrhacidae.

Aenigmavis Peters 1987.

Aenigmavis sapea Peters.

1987 *Aenigmavis sapea* Peters, Docum. Lab. Géol. Lyon, no. 99:71–87, Figs. 1–12.

2005 *Strigogyps sapea*—Mayr, PaleoBios, 25(1):11–16, Figs. 1–3, 5, 6.

Fossil record: an incomplete associated skeleton (the holotype), a right foot and distal tibiotarsus and a left tarsometatarsus.

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Fig. 1 *Aenigmavis sapea*, holotype. Distal part of the right wing; ulna and radius, ventral aspect; carpometacarpus crushed and twisted by ca. 180° around its longitudinal axis; arrow condylus dorsalis ulnae. Scale bar 1 cm. Photo: S. Tränkner

Type locality: Grube Messel (Hessen, Germany).

Type horizon: Geiseltalium, Middle Eocene.

Differential diagnosis: *Aenigmavis sapea* differs from

- *Ameghinornis minor* in: humerus much shorter (87: 120 mm) and stouter, the proximal end only slightly bent caudally.
- Unnamed species, SMF-ME 11094 in: wing bones larger (humerus 87: 71.8 mm) and with different proportions: (based on bone dimensions given by Mayr 2005) *Ae. s.* humerus 100%, ulna 86.2%, carpometacarpus 43.7%; SMF-ME 11094 humerus 100%, ulna 78.8% carpometacarpus 52.2%.
- *Strigogyps dubius* in: distal end of tibiotarsus much smaller (condylus lateralis craniocaudally 14: 19 mm), outline of condylus lateralis perfectly circular, its cranial rim more strongly inflated, whereas caudal rim not swollen at all, thus caudal half of the lateral surface even, not concave (Figs. 2, 3), on the condylus medialis the pit cranial to the epicondylus medialis relatively deeper and steeper.

Remarks: the holotype of *Aenigmavis sapea* is the only known specimen of the Ameghinornithidae with associated fore and hind limbs. The skeleton of the preserved right wing (not the left one as stated by Mayr 2005) is complete. However, the bones are badly crushed and cannot be measured exactly. Therefore, the proportions given above should be considered cautiously all the more as the wing SMF-ME 11094 is also crushed, although to a lesser degree.

Alvarenga and Höfling (2003) emphasized that the proportion of the leg in *Ae. s.* is also observed “in birds



Fig. 2 *Aenigmavis sapea*, holotype. Distal end of right tibiotarsus, lateral aspect; proximal end of right tarsometatarsus with hypotarsus, plantar aspect. Scale bar 1 cm. Photo: S. Tränkner

with arboreal habits ... thus excluding running habits for *Aenigmavis*”. Similar proportions, however, can be seen in Brontornithinae, gigantic phorusrhacids far from any arboreal adaptation.

Ameghinornis Mourer-Chauviré 1981.

Ameghinornis minor (Gaillard).

1939 *Strigogyps minor* Gaillard, Arch. Mus. Hist. Natur. Lyon, 15(2):10–11, Fig. 4.

1981 *Ameghinornis minor*—Mourer-Chauviré, Geobios, 14(5):637–647, Figs. 1–10.

1983 *Ameghinornis minor*—Mourer-Chauviré, Palaeovertebrata, 13(4):83–143, Pl. 5, Figs. 11–14.

2005 *Strigogyps dubius*—Mayr, PaleoBios, 25(1):11–16, Fig. 4.

Fossil record: left humerus (holotype), proximal fragment of right coracoid and nearly complete left coracoid, right and left carpometacarpus.

Type locality: Phosphorites du Quercy, precise place unknown.

Type horizon: Upper Eocene–Upper Oligocene.

Differential diagnosis: *Ameghinornis minor* differs from:

- *Aenigmavis sapea* in: humerus longer (120: 87 mm) and relatively slimmer, the proximal end more strongly bent caudally.
- Unnamed species SMF-ME 11094 in: humerus much longer (120: 71.8 mm) and relatively slimmer,

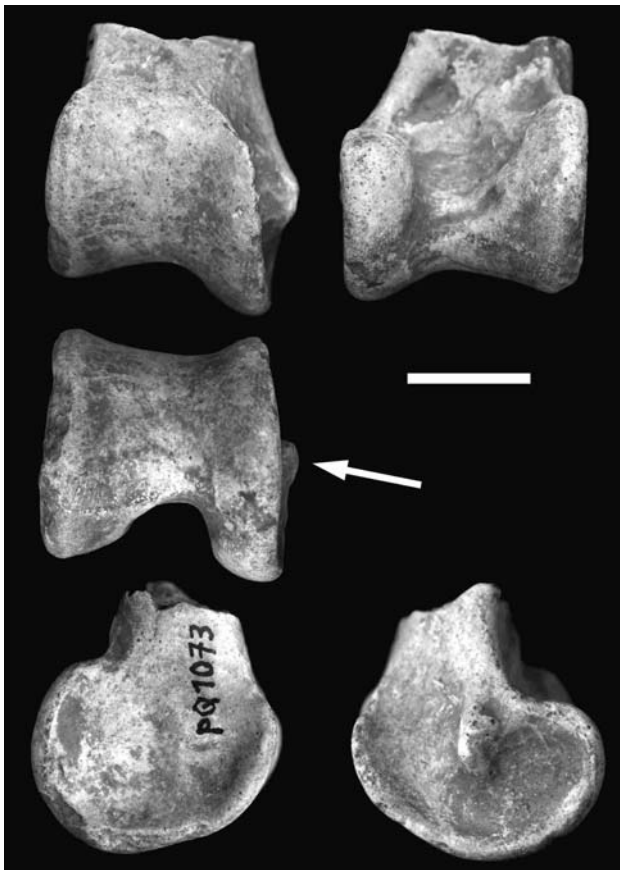


Fig. 3 *Strigogyps dubius*, cast of holotype. Distal end of left tibiotarsus; *top left* caudal aspect; *top right* cranial aspect; *centre* basal aspect; *bottom left* lateral aspect; *bottom right* medial aspect; *arrow* epicondylus medialis. Scale bar 1 cm. Photo: S. Tränkner

the proximal end more strongly bent caudally; coracoid much more elongated and slender; metacarpale minus more strongly bowed.

- *Strigogyps dubius*: fragments not comparable.

Remarks: Mourer-Chauviré (1983) assigned an additional juvenile coracoid to *Ameghinornis minor*. Mayr (2005) is right in that the isolated coracoids differ markedly from the coracoid associated with the wing of SMF-ME 11094; they may thus belong to a species different from the Ameghinornithidae.

Unnamed species represented by SMF-ME 11094.

2005 *Strigogyps* sp. Mayr, *PaleoBios*, 25(1): 13–14, Fig. 3A.

Fossil record: Left coracoid and wing, complete but crushed.

Type locality: Grube Messel (Hessen, Germany).

Type horizon: Geiseltalium, Middle Eocene.

Differential diagnosis: SMF-ME 11094 differs from:

- *Aenigmavis sapea* in: wing smaller (humerus 71.8: 87 mm) and with different proportions (see above).
- *Ameghinornis minor* in: humerus smaller (71.8: 120 mm), and stouter, its proximal end only slightly bent caudally; coracoid relatively stouter.
- *Strigogyps dubius*: fragments not comparable.

Strigogyps dubius Gaillard

1908 *Strigogyps dubius* Gaillard, *Ann. Univer. Lyon, Nouv. Série, Fasc. 23*:39–40, Fig. 5.

1987 *Strigogyps dubius*—Mourer-Chauviré, *Docum. Lab. Géol. Lyon*, no. 99:120.

2005 *Strigogyps dubius*—Mayr, *PaleoBios*, 25(1):11–16, Fig. 4.

Fossil record: distal end of left tibiotarsus (holotype).

Type locality: Phosphorites du Quercy, precise place unknown.

Type horizon: Upper Eocene–Upper Oligocene.

Differential diagnosis: comparison possible only with *A. sapea*; distal end of tibiotarsus larger (condylus lateralis craniocaudally 19: 14 mm), the outline of the condylus lateralis distally deviating from a perfect circular form (Fig. 3), its rim throughout moderately inflated, thus the whole lateral surface concave, the pit cranial to the epicondylus medialis flatter.

Remarks: the holotype was lost when the museum in Munich was bombed in WW II. Fortunately, casts persisted in the Musée Guimet d’Histoire Naturelle in Lyon.

Gaillard (1908, 1939) classified *Strigogyps* “pour le moment” with the family Strigidae. This classification was revised and rejected by Mourer-Chauviré (1981, 1987).

Discussion

As Olson (1985) rightly maintained “it is impossible to diagnose Palaeogene birds on isolated fragments of limb bones”. Keeping this in mind, the family Ameghinornithidae seems not to be well founded. Indeed, the definition of the family depends on the holotype of *A. sapea* as a standard for comparison and interpretation.

The shape of the distal end of the tibiotarsus and the lack of the pons supratendineus in *Strigogyps* and *Aenigmavis* may be interpreted as synapomorphic; all the other members of the Gruiformes have an ossified

pons supratendineus (exception? *Salmila*; Mayr 2000) and in most of them the outline of the condylus lateralis tibiotarsi is distally flattened and not circular or nearly circular. The wing-bones at hand seem to be quite similar to each other; the reliability of the comparison, however, is hampered by the poor preservation in *Aenigmavis* and SMF-ME 11094. Nevertheless, there is little doubt that these bones are reduced towards the condition of flightlessness similar to the condition in Phorusrhacidae. However, the similarity not only between Phorusrhacidae and Ameghinornithidae (Olson 1985) but also the similarity between *Ameghinornis*, *Aenigmavis* and SMF-ME 11094 may be the result of parallel evolution and not of common descent. The shared taxonomical identity of the isolated wing-bones of *Ameghinornis* and SMF-ME 11094 and the isolated holotype of *Strigogyps dubius* is inferred from the findings in the only associated skeleton of *A. sapea*.

Strigogyps and *Ameghinornis* are younger and larger than *Aenigmavis* and the unnamed fossil. Whether they belong to a single species *S. dubius* is highly speculative and cannot be decided without a broader fossil record. Different size and proportions seem to preclude conspecificity of *Aenigmavis* and SMF-ME 11094.

Thus, Ameghinornithidae is a family based on isolated fragmentary fossils. Provided that the interpretation of these fragments is correct, Ameghinornithidae probably were an Old World pendant of the Phorusrhacidae of the New World.

A broader fossil record is needed to confirm the generic and specific status of the included taxa.

Zusammenfassung

Eine kurze Übersicht der fossilen Familie Ameghinornithidae (Mourer-Chauviré 1981)

Ursprünglich für eine Unterfamilie der Phorusrhacidae gehalten, scheinen die Ameghinornithidae sich im

Paläogen der Alten Welt parallel zu diesen entwickelt zu haben (Reduktion des Flugvermögens), erreichten aber nie deren Riesenwuchs. Die dürftigen fossilen Belege lassen die Unterscheidung der Gattungen *Strigogyps* Gaillard 1908, *Ameghinornis* Mourer-Chauviré 1981 und *Aenigmavis* Peters 1987 zu. Ein weiterer Rest (Flügel mit Coracoid) aus der Grube Messel ist noch nicht benannt. Weitere Funde müssen zeigen, ob diese Einteilung Bestand haben kann.

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References

- Alvarenga HMF, Höfling E (2003) Systematic revision of the Phorusrhacidae (Aves: Ralliformes). Pap Avulsos Zool (São Paulo) 43(4):55–91
- Gaillard C (1908) Les Oiseaux des Phosphorites du Quercy. Ann Univ Lyon n s 23:1–178
- Gaillard C (1939) Contribution à l'étude des oiseaux fossils. Arch Mus Nat Lyon 15(2):1–100
- Mayr G (2000) A remarkable new gruiform bird from the Middle Eocene of Messel (Hessen, Germany). Paläont Z 74(1/2):187–194
- Mayr G (2005) “Old World phorusrhacids” (Aves, Phorusrhacidae); a new look at *Strigogyps* (“*Aenigmavis*”) *sapea* (Peters 1987). PaleoBios 25(1):11–16
- Mourer-Chauviré C (1981) Première indication de la présence de Phorusrhacidés, Famille d'oiseaux géants d'Amérique du Sud, dans le Tertiaire Européen: *Ameghinornis* nov. gen. (Aves, Ralliformes) des Phosphorites du Quercy, France. Géobios 14:637–647
- Mourer-Chauviré C (1983) Les Gruiformes (Aves) des Phosphorites du Quercy (France). I. Sous-Ordre Cariamae (Cariamidae et Phorusrhacidae). Palaeovertebrata 13(4):83–143
- Mourer-Chauviré C (1987) Les Strigiformes (Aves) des Phosphorites du Quercy (France): systematique, biostratigraphie et paleobiogeographie. Docum Lab Géol Lyon 99:89–127
- Olson SL (1985) The fossil record of birds. In: Farner DS, King JR, Parkes KC (eds) Avian biology. Academic, Orlando, San Diego, New York, London, Toronto, Montreal, Sydney, Tokyo, vol 8, pp 79–256
- Peters DS (1987) Ein “Phorusrhacide” aus dem Mittel-Eozän von Messel (Aves: Gruiformes: Cariamae). Docum Lab Géol Lyon 99:71–87