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A Reevaluation of Some Fossils Identified as Vultures (Aves: Vulturidae) from Quaternary Cave Deposits of Cuba

WILLIAM SUÁREZ *Museo Nacional de Historia Natural, Obispo 61, Plaza de Armas, La Habana, CP 10100, Cuba.*
geopal@mnhnc.inf.cu

Arredondo (1984) provisionally recorded the extant genus *Sarcoramphus* Duméril in Cuba (previously cited by Acevedo-González and Arredondo (1982) without mention of specimen or locality) based on the distal portion of a left ulna collected by Arredondo in 1972 in Cueva del Indio, Calabazar, Ciudad de La Habana (Fig. 1- specimen deposited in the Oscar Arredondo collection, OA 2973). Suárez (2000) tentatively cited this specimen as *Sarcoramphus?* sp., although it did not show a clear relationship with the Vulturidae (= Cathartidae). Examination of skeletons of the King Vulture (*Sarcoramphus papa*) in the National Museum of Natural History, Smithsonian Institution, Washington, DC, confirmed that the Cuban specimen is not referable to that family. Further comparisons revealed that the fossil ulna belongs to the extinct large hawk *Titanohierax borraasi* (Accipitridae; Arredondo, 1970; see also Arredondo, 1976; Olson and Hilgartner, 1982), being inseparable from that taxon in qualitative and quantitative characters (Table 1).

The ulna fragment (41.2 mm as preserved) is about the size and proportions of the corresponding element in *Cathartes aura*, but is slightly more robust. It differs from *C. aura* and from the Vulturidae in general by the absence of these osteological characters: carpal tuberosity large and distally projected, well-flared distal end (internal view); deep, pneumatic distal radial depression and foramen in palmar surface (see Emslie, 1988). In addition, the specimen is separable from *Sar-*

coramphus by the external condylar surface not passing medially onto the shaft (the external condylar surface passes medially onto the shaft in *Sarcoramphus* [Campbell, 1979]). This specimen agrees with the subfamily Buteoninae, specifically with *T. borraasi*, and with species of the extant genus *Buteogallus* Lesson, in the following qualitative characters (Fig. 1): thin, acute and distally projected external condyle, which is large in its proximo-distal extension; intercondylar sulcus deep and well defined throughout its length; small projection of carpal tuberosity; straight, only slightly flared shaft in its junction with distal end (internal view); and inferior-internal margin of shaft forming an acute border (less rounded than in Vulturidae) in cross section.

Suárez (2000) established that the most common vulturid in Quaternary deposits of Cuba is the Cuban Condor, *Gymnogyps varonai*, and commented that all specimens identified as *Cathartes aura* (summarized by Arredondo, 1984:8-9) were bones of modern individuals and not fossils. Inspection of these specimens revealed that they retain the mineral-organic combination that produces flexibility and hardness in bones. An exception is a right ulna from a cave near Cueva Lamas, La Habana, previously preserved as two pieces, both with catalog number OA 2974 (see Arredondo 1984:9). The proximal piece (only part available today) is mineralized as other bones of extinct mammals and reptiles from Cueva Lamas, being similar in color and degree of mineralization (Arredondo, op. cit.). However, it is not a vulture but a misidentified wing element of the Cuban Giant Owl, *Ornimegalonyx oteroi*.

In addition to *G. varonai*, at least two other extinct taxa referable to Vulturidae have been found in Cuba (Suárez, pers. obs.), neither of which was reported by Arredondo (1984). At least one of these taxa is probably referable to *Cathartes*, but differs from *C. aura* (Suárez, 2000). The other taxon is larger than *C. aura* but its relationships within the Vulturidae require further study. The presence of another extinct "large vulture" in Cuba from a cave deposit in La Habana was suggested by Arredondo (1976:172), but he has since concluded (pers. comm.) that the specimens are not vulturids.

In summary, the specimen referred to *Sarcoramphus* should be listed as *Titanohierax borraasi*, thereby providing another locality for this interesting and poorly known accipitrid. *Cathartes aura* is unknown in the fossil record of Cuba, where the family Vulturidae is known only by the condor *G. varonai* and two poorly known, probably undescribed, smaller species.

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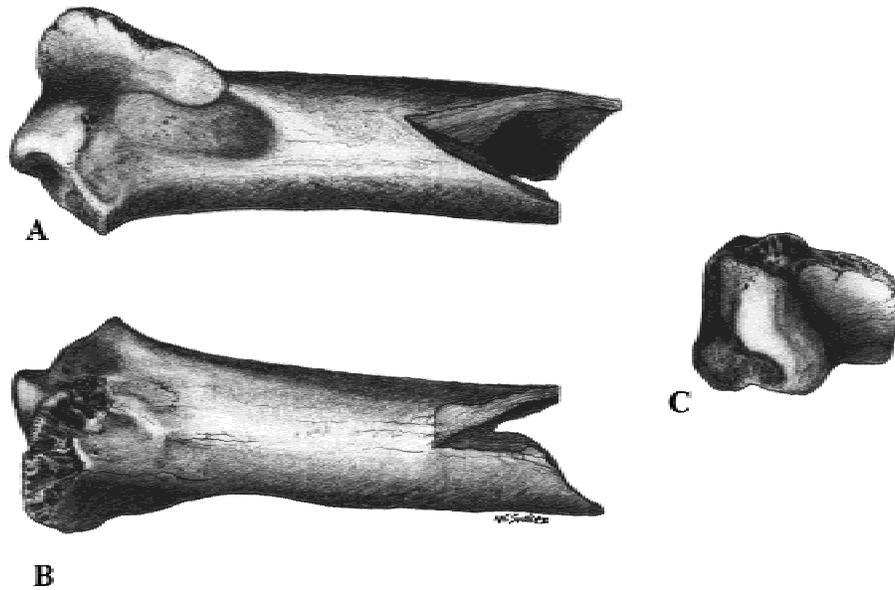


FIG. 1. Distal end of left ulna (OA 2973) of *Titanohierax borraasi*, previously identified as *Sarcoramphus*, in internal (A), external (B), and distal (C) views. Osteological characters discussed in the text separate it from the Vulturidae. Scale bar = 1cm.

TABLE 1. Measurements (mm) of the distal ulna in Vulturidae and Accipitridae taxa discussed in the text compared with specimen OA 2973. Sequence is: range (mean) n.

Taxa	Distal width	Distal depth	Depth of shaft at level of the proximal end of the external condyle
<i>Cathartes aura</i>	13.8-14.9 (14.3) 5	12.9-13.6 (13.3) 5	10.0-10.2 (10.1) 5
<i>Gymnogyps varonai</i>	25.4	23.1	16.4
<i>Titanohierax borraasi</i>	12.5	14.9	10.9
OA 2973	12.1 ¹	15.0	10.8

¹Fracture

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