# Catalogue of Cuban fossil and subfossil birds

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# Catalogue of Cuban fossil and subfossil birds

*by William Suárez*

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Summary.—All information relating to the Cuban palaeo-avifauna since the first published list in 1928 to the present, is summarised and presented as a catalogue with commentary. I update data on the composition, systematics and distribution of fossil and subfossil birds from Quaternary (Late Pleistocene-Holocene interval) deposits in Cuba, with a necessary critical review. Thirty-six taxa (30 extinct, two poorly represented and apparently also extinct, and four extirpated) are listed as valid records in Section I, under 14 families, with Teratornithidae the only extinct family grouping. Birds of prey and scavengers constitute 72.2% of these taxa, with Accipitridae (22.2%) and Falconidae (16.6%) the best represented, followed by nocturnal raptors. Sections II and III comment on and discuss material referred to 29 taxa, of which one is of dubious identity and the others misidentified and / or synonymised at class, family, genus or species level. Cuban neospecies currently known in paleontological localities throughout the archipelago are listed in Section IV; 49 are identified (14 considered today as endemic species, including six endemic genera) in 26 families.

*In memoriam: Storrs L. Olson (1944–2021), mentor, friend and partner in the study of fossil birds*

During 1911 and 1918, Carlos de la Torre, his assistant Víctor Rodríguez (both from Universidad de La Habana), Barnum Brown (American Museum of Natural History, New York), and allied personnel, conducted extensive field work at Quaternary fossil localities in central Cuba, especially in spring deposits at Baños de Ciego Montero, Cienfuegos province (Goldberg *et al*. 2017). The first mention of Cuban fossil birds—for the living avifauna of Cuba see Kirkconnell *et al*. (2020)—was published by Brown (1913: 228) with news of bones secured there along with remains of other vertebrates, including a remarkable mammalian assemblage (see Matthew 1931, Aguayo 1950, Williams 1950, Álvarez Conde 1951). Also in 1913, the Links collected fossil material, including of birds, from the western part of the archipelago (Peterson 1917; see Holland 1917: 356, Anthony 1919: 625) in a Quaternary cave deposit at Sierra de Caballos, Isla de Pinos (now Isla de La Juventud). Being more explicit than Brown on the avian specimens, Peterson (1917: 359) described the material as in 'semi-petrified condition' where 'few limb-bones of snipes and small herons are represented'. At the end of excavations in Ciego Montero, a small collection (11 specimens) of bird elements emerged. Eight taxa were identified (Wetmore 1928), with two extinct, one extirpated and one intrusive.

The geologist Roy E. Dickerson discovered fossils (see Chawner 1932), including those of birds in a 'tar pit near Hato Nuevo [now Martí]', a locality currently known as 'Las Breas de San Felipe', Matanzas province, western Cuba, and the only fossil deposit of its kind in the Greater Antilles (Iturralde-Vinent 1998, Iturralde-Vinent *et al*. 1999, 2000). Some specimens were collected there in early 1933 (see Berry 1934: 237, Richards 1935: 255–256, Williams 1950: 7) by Dickerson, Pedro J. Bermúdez (both from the Atlantic Refining Company) and Horace G. Richards (New Jersey State Museum, Trenton), and



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sent to Carlos de la Torre, but never studied (Iturralde-Vinent *et al*. 2000: 300). The next notable event was in 1947, when Abelardo Moreno (Museo Felipe Poey, La Habana) sent to Alexander Wetmore (Smithsonian Institution, Washington DC), two fossils of a large extinct raptor (genus *Ornimegalonyx* Arredondo, see Suárez 2020b), from the former Oriente (now Santiago de Cuba) province, eastern Cuba (Arredondo & Olson 1994) that was identified and considered to be a giant barn owl (genus *Tyto* Billberg) for some time (Wetmore 1959: 15, Brodkorb 1959: 357, Olson's footnote in Arredondo 1976: 172, Olson 1978: 105).

In the second half of the 20th century, studies of fossil vertebrates in Cuba were greatly enhanced by the dedication of Prof. Oscar Arredondo (1918–2001). Arredondo's explorations, discoveries and publications on fossil birds during his lifetime added significant advances to Cuban avian paleontology (Arredondo Antúnez 2007, see also Álvarez Conde 1957: 247–248, Olson 1978: 101). Wetmore (1956, 1959) and Brodkorb (1963, 1964, 1971, 1978) listed Cuban fossil birds, including those recorded by Wetmore (1928) and described by Arredondo (1958, 1970a) and Brodkorb (1969). These were treated in more detail by Arredondo (1984) in *Sinopsis de las aves halladas en depósitos fosilíferos pleisto-holocénicos de Cuba* ['Synopsis of the birds found in Pleisto-Holocene fossil deposits of Cuba'], with the addition of most of the birds named and identified by Fischer (1968, 1970, 1977), Fischer & Stephan (1971a,b), Arredondo (1972a,b,c, 1982), Olson (1974) and Acevedo-González & Arredondo (1982), plus all others recovered, or then known, from Quaternary deposits throughout the archipelago. The 'synopsis' has been, for almost four decades, the main source of information for palaeontologists and archaeologists dealing with Cuban avian remains.

The catalogue of Cuban fossil and subfossil birds has been changing since 1984 (see Section I) by deletions, records of additional extinct and/or extirpated taxa, and descriptions of new genera and species for science (Olson 1985, Arredondo & Olson 1994, Suárez & Arredondo 1997, Suárez 2000a, 2001a,b, 2004a,b, 2020a,b, Suárez & Olson 2001a,b, 2003a,b,c, 2009a, 2015, 2020a,b, 2021, Arredondo & Arredondo 2002a,b, Olson & Suárez 2008a, Steadman & Takano 2016), with consequent modifications in composition, systematics and distribution of the palaeo-avifauna. Thirty-six taxa (including extinct and extirpated) are currently known in the palaeontological record of Cuba (see summary in Table 1). The present catalogue updates and critically summarises all data concerning Cuban palaeornithology since Wetmore's pioneering list published on 29 February 1928.

## Material and Methods

The catalogue is divided into four sections: Section I: Extinct (†) & Extirpated (×) Taxa; Section II: Species of Dubious Identity; Section III: Misidentified & Synonymised Taxa; and Section IV: Cuban Neospecies in Fossil Deposits.

Only paleontological records are presented, with archaeological (pre- or post-Columbian) and recent (Late Holocene) material, usually derived from barn owl (= *Tyto*) pellets, excluded, or only mentioned for particular taxa or as incidental comments. In section I, under 'History', are summaries of relevant dates when known, in the history of some extinct birds, e.g., related to discovery, type material, taxonomy, etc. 'Other material' includes all specimens (mostly paratypes) mentioned in the original description of each taxon, other than the holotype. Distribution of taxa by their respective localities (= Late Pleistocene-Holocene deposits), are ordered from west to east, using an identification key (Appendix, Fig. 1). Each taxon is indicated following the publication in which it has been recorded and cited as appears in the original source, if the nomenclature is different from that used herein. For species with wider distribution (continental and/or insular), information provided under 'Referred material' and 'Distribution' is restricted


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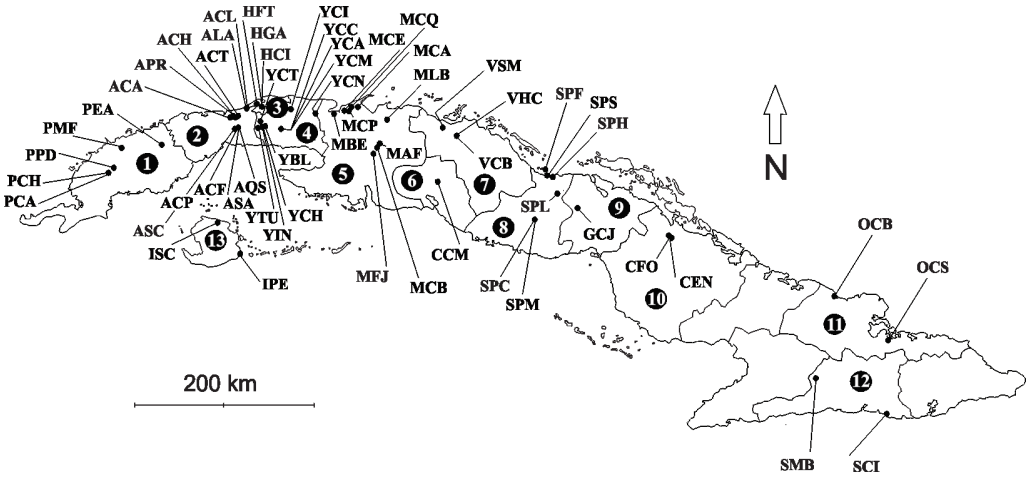


Figure 1. Distribution of Quaternary deposits in Cuban territory.

to Quaternary fossil localities in Cuba. Figures and/or drawings (*) from the literature are cited (when they exist) for each specimen, with their respective views indicated in brackets. Information concerning types and specimens that constitute first records to Cuba, with their localities and related bibliography, is summarised in Table 1. Acronyms, ordered alphabetically by collections and/or institutions from the USA, Cuba and France as follows: AMNH (American Museum of Natural History, New York), Av. (acronym as in Fischer & Stephan 1971a,b; Universidad de La Habana, La Habana; specimens currently in other Cuban collections are indicated in each case), CAZGA (Colección Arqueozoológica del Gabinete de Arqueología, Oficina del Historiador de La Habana, La Habana), CLV (Lazaro W. Viñola, Matanzas), CZACC (Colecciones del Instituto de Zoología, Academia de Ciencias de Cuba, now at Instituto de Ecología y Sistemática, La Habana), DPUH (Departamento de Paleontología de la Universidad de La Habana, La Habana), GEC (Grupo de Exploraciones Científicas, Cuba), GEPAB (Grupo Espeleológico Pedro A. Borrás, La Habana), IGP/ACC (Instituto de Geología y Paleontología, Academia de Ciencias de Cuba, La Habana), LACM (Natural History Museum of Los Angeles County, California), LMR (Luis M. Rodríguez, Holguín), MCZ (Museum of Comparative Zoology, Harvard University, Cambridge, MA), MNHN (Muséum national d'Histoire naturelle, Paris), MNHNCu (Museo Nacional de Historia Natural de Cuba, La Habana), OA (Oscar Arredondo, La Habana), OJ (Osvaldo Jiménez, La Habana), PB (Pierce Brodkorb, University of Florida, Gainesville), SEC (Sociedad Espeleológica de Cuba), UCMP (University of California Museum of Paleontology, Berkeley), UF (University of Florida, Gainesville), USNM (National Museum of Natural History, Smithsonian Institution, Washington DC; collections at the Department of Paleobiology with the acronym PAL, cited sporadically in recent literature) and WS (William Suárez, La Habana). Systematic arrangement follows the last edition of the American Ornithologists' Union (AOU 1998) and its supplements, except the extant White-winged Barn Owl *Tyto furcata* (Temminck, 1827), considered a full, insular species from Cuba, Jamaica and Cayman Islands (Suárez & Olson 2015, 2020a). Authors' names and titles of papers appear in 'References' without modifications from their original sources, with corrections indicated when necessary and in those cases, authors cited in the text as corrected. Osteological terminology is from Howard (1929).


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TABLE 1
Extinct (†) and extirpated (×) fossil and subfossil birds with holotypes and specimens that constitute first records in Quaternary deposits in Cuba.

| Taxon | Specimen(s) | Locality | Bibliography |
|---|---|---|---|
| **1**. †*Siphonorhis daiquiri* Olson, 1985 | *Distal half of right tarsometatarsus (USNM 336506). | *Cueva de los Indios (**SCI**), Santiago de Cuba, Santiago de Cuba. | Olson 1985, *Proc. Biol. Soc. Wash*. 98: 528. |
| **2**. †*Nesotrochis picapicensis* (Fischer & Stephan, 1971) | *Left humerus (Av. 832/67 [as '*Fulica picapicensis*']). | *Caverna de Pío Domingo (**PPD**), Minas de Matahambre, Pinar del Río. | Fischer & Stephan 1971b, *Wiss. Zeitsch. Humboldt-Univ. Berlin, Math.-Nat. R*. 20: 595. |
| **3**. †*Antigone cubensis* (Fischer & Stephan, 1971) | *Skull with its respective mandible and left quadrate (Av. 1/67 [as '*Grus cubensis*']). | *Caverna de Pío Domingo (**PPD**), Minas de Matahambre, Pinar del Río. | Fischer & Stephan 1971a, *Wiss. Zeitsch. Humboldt-Univ. Berlin, Math.-Nat. R*. 20: 565. |
| **4**. ×*Burhinus bistriatus* (Wagler, 1829) | Distal ends of left (OA 2958) and right (OA 2959) humeri (as '*Burhinus* sp.'). | Cueva de Paredones (**ACP**), Caimito, Artemisa. | Arredondo 1984, *Rep. Invest. Inst. Zool*. 17: 16 (see Suárez 2020a). |
| **5**. †*Gallinago kakuki* Steadman & Takano, 2016 | Right humerus (MNHNCu 75.4709 [as '*Capella* sp.']). | Cueva El Abrón (**PEA**), Los Palacios, Pinar del Río. | Suárez 2004b, *Carib. J. Sci*. 40: 155 (see Steadman & Takano 2016). |
| **6**. †*Ciconia maltha* L. Miller, 1910 | Distal left tibiotarsus (AMNH unnumbered) and proximal right (AMNH unnumbered) tarsometatarsus (as '*Jabiru mycteria*'). | Baños de Ciego Montero (**CCM**), Palmira, Cienfuegos. | Wetmore 1928, *Amer. Mus. Novit*. 301: 2 (see Howard 1942). |
| **7**. *Ciconia* sp. | Distal end of right tibiotarsus (MNHNCu 75.4599). | Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez & Olson 2003a, *Condor* 105: 151. |
| **8**. †*Mycteria wetmorei* Howard, 1935 | Proximal end of right carpometacarpus (MNHNCu 75.4602), distal end of right tibiotarsus (MNHNCu 75.4603), proximal end of left tarsometatarsus (juvenile, MNHNCu 75.4604), distal end of right tarsometatarsus (MNHNCu 75.4605). | Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez & Olson 2003a, *Condor* 105: 151. |
| **9**. ×*Tigrisoma mexicanum* Swainson, 1834 | Left tarsometatarsus (AC-33). | Casimba en los Buentes (**VCB**), Mal Páez, Villa Clara. | Olson & Suárez 2008a, *Waterbirds* 31: 285. |
| **10**. †*Oscaravis olsoni* Arredondo & Arredondo, 2002 | *Right femur (IGP/ACC 400–649 [as '*Teratornis* sp.']). | *Cueva de Paredones (**ACP**), Caimito, Artemisa. | Suárez & Arredondo 1997, *El Pitirre* 10: 101 (see Arredondo & Arredondo 2002b, Suárez & Olson 2009a). |
| **11**. †*Gymnogyps varonai* (Arredondo, 1972) | *Proximal fragmentary left tarsometatarsus (DPUH 1254 [as '*Antillovultur varonai*']). | *Cueva de Paredones (**ACP**), Caimito, Artemisa. | Arredondo 1972c, *Mem. Soc. Cienc. Nat. La Salle* 31: 310 (see Suárez & Emslie 2003). |
| **12**. †*Coragyps seductus* Suárez, 2020 | *Left tarsometatarsus (MNHNCu 75.4719). | *Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez 2020a, *Zootaxa* 4780: 12. |
| **13**. †*Cathartes emsliei* Suárez & Olson, 2020 | *Proximal half of left tarsometatarsus (MNHNCu 75.4752). | *Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez & Olson 2020b, *Bull. Brit. Orn. Cl*. 140: 335. |
| **14**. †*Gigantohierax suarezi* Arredondo & Arredondo, 2002 | *Left femur (MNHNCu 75.574). | *Cueva de Sandoval (**ASA**), Caimito, Artemisa. | Arredondo & Arredondo 2002a, *Poeyana* 470–475: 10. |



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| Taxon | Specimen(s) | Locality | Bibliography |
|---|---|---|---|
| **15**. †*Gigantohierax itchei* Suárez, 2020 | *Distal third of right tarsometatarsus lacking trochlea IV (MNHNCu 75.4869). | *Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez 2020a, *Zootaxa* 4780: 25. |
| **16**. *Buteogallus* cf. †*B. fragilis* (L. Miller, 1911) | Distal end of right tibiotarsus (MNHNCu 75.4735), distal shaft of left tarsometatarsus (MNHNCu 75.4736). | Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez 2020a, *Zootaxa* 4780: 17. |
| **17**. †*Buteogallus borrasi* (Arredondo, 1970)[1] | *Left tarsometatarsus lacking distal end (DPUH 1250 [as '*Aquila borrasi*']). | *Cueva del Túnel (**YTU**), Quivicán, Mayabeque. | Arredondo 1970a, *Cienc. Biol. Univ. Habana* 4(8): 3 (see Suárez & Olson 2008). |
| **18**. †*Buteogallus royi* Suárez, 2020 | *Left tarsometatarsus (MNHNCu 75.4909). | *Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez 2020a, *Zootaxa* 4780: 20. |
| **19**. †*Buteogallus irpus* Suárez & Olson, 2021 | ***Partial skeleton (WS 365 [as '*Amplibuteo* sp.]). | Cueva de Sandoval (**ASA**), Caimito, Artemisa. | Suárez & Arredondo 1997, *El Pitirre* 10: 101 (see Suárez & Olson 2021). |
| **20**. ×*Buteo lineatus* (J. F. Gmelin, 1788) | Proximal end of right femur (MNHNCu 75.4614), distal halves of right (MNHNCu75.4615) and left (MNHNCu 75.4616) tibiotarsi, distal end of left tibiotarsus (MNHNCu 75.4617), distal halves of right (MNHNCu 75.4618) and left (MNHNCu 75.4619) tarsometatarsi. | Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez & Olson 2003b, *J. Raptor Res*. 37: 71. |
| **21**. †*Buteo sanfelipensis* Suárez, 2020 | *Left tarsometatarsus lacking trochlea IV (MNHNCu 75.4910). | *Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez 2020a, *Zootaxa* 4780: 28. |
| **22**. †*Tyto pollens* Wetmore, 1937 | Distal left tarsometatarsus (DPUH 1252 [holotype of '*Tyto riveroi*']). | Cueva de Bellamar (**MBE**), Matanzas, Matanzas. | Arredondo 1972b, *Bol. Soc. Venez. Cienc. Nat*. 30 (124/125): 131 (see Suárez & Olson 2015). |
| **23**. †*Tyto noeli* Arredondo, 1972 | *Right tarsometatarsus (DPUH 1251). | *Cueva del Túnel (**YTU**), Quivicán, Mayabeque. | Arredondo 1972a, *Bol. Soc. Venez. Cienc. Nat*. 29 (122/123): 416. |
| **24**. †*Tyto cravesae* Suárez & Olson, 2015 | *Associated postcranial elements of one individual (MNHNCu 75.590 [= proximal half of left humerus, proximal end of right ulna, right carpometacarpus and right femur]). | *Cueva de Paredones (**ACP**), Caimito, Artemisa. | Suárez & Olson 2015, *Zootaxa* 4020: 545. |
| **25**. †*Tyto maniola* Suárez & Olson, 2020 | *Proximal half of left tarsometatarsus (MNHNCu 75.4651). | *Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez & Olson 2020a, *Zootaxa* 4830: 552. |
| **26**. †*Pulsatrix arredondoi* Brodkorb, 1969 | *Left tarsometatarsus (PB 8420). | *Cueva de Paredones (**ACP**), Caimito, Artemisa. | Brodkorb 1969, *Quart. J. Fla. Acad. Sci*. 31: 112. |
| **27**. †*Bubo osvaldoi* Arredondo & Olson, 1994 | *Right tarsometatarsus lacking proximal end (MNHNCu 75.27). | *Cueva del Mono Fósil (**PMF**), Viñales, Pinar del Río. | Arredondo & Olson 1994, *Proc. Biol. Soc. Wash*. 107: 438. |
| **28**. †*Ornimegalonyx oteroi* Arredondo, 1958 | **Left tarsometatarsus lacking distal end (SEC P-383.E [at MCZ]). | *Caverna de Pío Domingo (**PPD**), Minas de Matahambre, Pinar del Río. | Arredondo 1958, *El Cartero Cubano* 17(7): 11 (see Brodkorb 1961). |



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| Taxon | Specimen(s) | Locality | Bibliography |
|---|---|---|---|
| **29**. †*Ornimegalonyx ewingi* Suárez, 2020 | *Right femur (USNM 447022). | *'Mine' in vicinity of Baire (**SMB**), Contramaestre, Santiago de Cuba. | Suárez 2020b, *Bull. Brit. Orn. Cl.* 140: 391. |
| **30**. †*Caracara creightoni* Brodkorb, 1959 | Incomplete skull (OA 3928). | Cueva Calero (**MCA**), Cantel, Matanzas. | Suárez & Arredondo 1997, *El Pitirre* 10: 101. |
| **31**. †*Milvago carbo* Suárez & Olson, 2003 | *Near-complete right tarsometatarsus (MNHNCu 75.4569). | *Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez & Olson 2003c, *Proc. Biol. Soc. Wash.* 116: 302. |
| **32**. †*Milvago diazfrancoi* Suárez, 2020 | *Left tarsometatarsus lacking trochleae II and IV (MNHNCu 75.4610). | *Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez 2020a, *Zootaxa* 4780: 36. |
| **33**. *Milvago* sp. | Proximal left tarsometatarsus (WS 977). | Cueva de Paredones (**ACP**), Caimito, Artemisa. | Suárez & Arredondo 1997, *El Pitirre* 10: 101. |
| **34**. ×*Falco femoralis* Temminck, 1822 | Incomplete right carpometacarpi (MNHNCu 75.4606, MNHNCu 75.4607), distal end of left tibiotarsus (MNHNCu 75.4608), proximal end of left tarsometatarsus (MNHNCu 75.4609). | Las Breas de San Felipe (**MLB**), Martí, Matanzas. | Suárez & Olson 2003b, *J. Raptor Res.* 37: 73. |
| **35**. †*Falco kurochkini* Suárez & Olson, 2001 | *Left tarsometatarsus (MNHNCu 75.3229). | *Cueva de Sandoval (**ASA**), Caimito, Artemisa. | Suárez & Olson 2001a, *Proc. Biol. Soc. Wash.* 114: 35. |
| **36**. †*Ara tricolor* Bechstein, 1811 | Proximal half of right carpometacarpus (AMNH unnumbered) | Baños de Ciego Montero (**CC**M), Palmira, Cienfuegos. | Wetmore 1928, *Amer. Mus. Novit.* 301: 4. |

[1] For *Geranoaetus melanoleucus* see section II.

* Holotype and type locality. ** Lectotype. *** Paratype.

# I—EXTINCT & EXTIRPATED TAXA

## Systematic palaeontology

## Order CAPRIMULGIFORMES Ridgway
## Family CAPRIMULGIDAE Vigors
## Genus *Siphonorhis* P. L. Sclater, 1861

*Siphonorhis* P. L. Sclater, 1861, *Proc. Zool. Soc. London*, pl. 1, p. 77. Type, by original designation, *Caprimulgus americanus* Linnaeus (not '*Siphonorhis jamaicensis*' *sensu* Garrido 2003: 62).

*Microsiphonorhis* Chapman, 1917, *Bull. Amer. Mus. Nat. Hist.* 37: 329. Type, by original designation, *M. brewsteri* Chapman.

### 1. †*Siphonorhis daiquiri* Olson, 1985
Cuban Pauraque (Torico Cubano)

*Siphonorhis daiquiri* Olson, 1985, *Proc. Biol. Soc. Wash.* 98: 528.

*Siphonorhis* sp.: Acevedo-González & Arredondo 1982: table 1.

*Siphonornis daiquiri*: Zelenkov & González 2020: 416 (*lapsus calami*).

***History***.—*February 1917*: Harold E. Anthony collects first material at type locality (see Anthony 1917, 1919). *October 1980*: field work by S. L. Olson *et al*. provides the holotype and some paratypes (Olson 1985: 528–530). *1982*: two additional specimens identified (April) by Olson, previously collected by E. N. Kurochkin in Camagüey province (Olson 1985: 529, see Olson & Kurochkin 1987: 354). First mentioned as '*Siphonorhis* sp.' by Acevedo-González &



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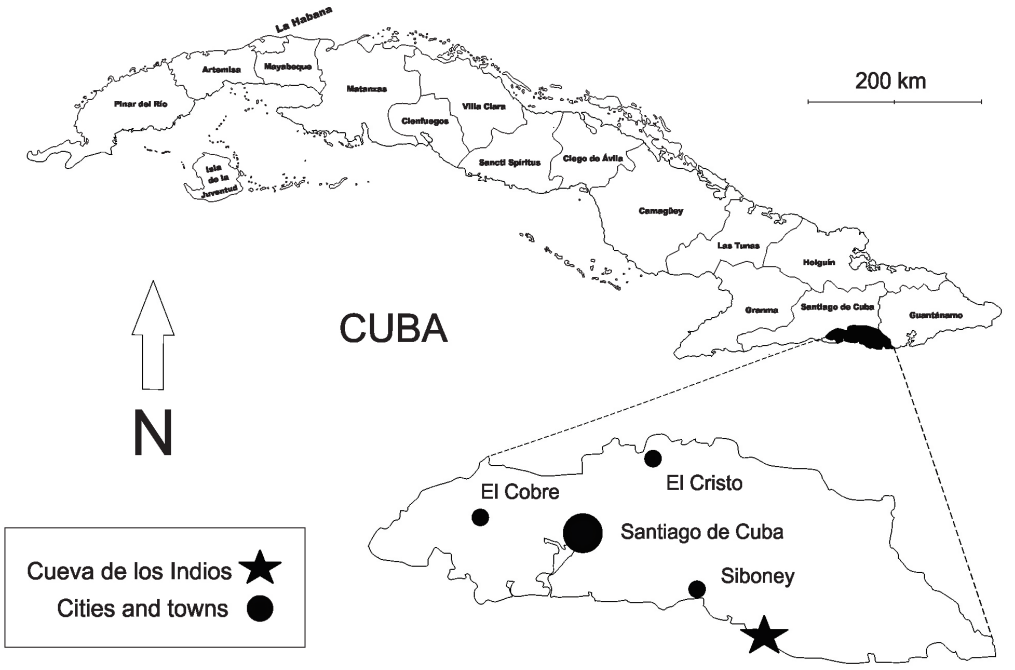


Figure 2. Cueva de los Indios (**SCI**), Santiago de Cuba, eastern Cuba. Type locality of †*Siphonorhis daiquiri* Olson.

Arredondo (1982: table 1). *16 May 1985*: original description of *S. daiquiri* published (Olson 1985). *Autumn 2000*: first record from western Cuba, in El Sumidero, Cueva de Sandoval, Artemisa (formerly La Habana) province, an apparently older deposit than the type locality (Suárez 2000b: 67). *April 2004*: reported from Cueva El Abrón, its westernmost known fossil locality (Suárez 2004b: 156), in the mountains of Pinar del Río province (see Suárez & Díaz-Franco 2003).

***Holotype***.—Distal half of right tarsometatarsus, USNM 336506—not 'Right proximal humerus (USNM 336506)' as stated by Orihuela (2019: 64)—(Olson 1985: 528, fig. 1: A [anterior], B [posterior], fig. 2: B [posterior]). Collected 31 October 1980 by S. L. Olson *et al*. [= Jim Lynch, Nicasio Viña and Fernando González (S. L. Olson *in litt*. 2015)] (Olson 1985: 528).

***Other material***.—**Coracoid**: left, USNM 336507. **Humerus**: right, AMNH 21905 (Olson 1985: 529, fig. 3: B [anconal]), AMNH 21906; right lacking distal end, AMNH 21907; proximal ends of right, AMNH 21908, USNM 336508; proximal end of left, USNM 336509; left lacking proximal end, AMNH 21909. **Carpometacarpus**: right lacking minor metacarpal, AMNH 21904; proximal end of left, USNM 336510. AMNH material collected by H. E. Anthony in 1917 (Olson 1985: 529, see 'History').

***Type locality***.—Cueva de los Indios (**SCI**), near Daiquirí, *c*.22 km east-southeast of Santiago de Cuba, Santiago de Cuba province, Cuba (Olson 1985: 528; see Anthony 1917, 1919). Fig. 2.

***Distribution***.—Cave deposits across the main island of Cuba (see Appendix). *Pinar del Río*. Los Palacios: **PEA** (Suárez 2004b: 156). *Artemisa*. Caimito: **ASA** (Suárez 2000b: 66, fig. 3 = tarsometatarsus: A [anterior], B [posterior], fig. 4 = idem: A [anterior]). *Mayabeque*. Quivicán: **YBL** (Jiménez Vázquez *et al*. 2005: 97–98). *Camagüey*. Sierra de Cubitas: **CFO**


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(Olson 1985: 529). *Santiago de Cuba*. Santiago de Cuba: **SCI** = type locality (Olson 1985: 528–529 ['*Siphonorhis daiquiri*, new species'], Arredondo 1996: 1).

***Direct $^{14}$C dating***.—None. For dating of associated fauna from PEA (17,406 ± 161 $^{14}$C yr BP) and YBL (7,864 ± 96 $^{14}$C yr BP), see Suárez & Díaz-Franco (2003: 373) and Jiménez Vázquez *et al*. (2005: 90), respectively.

***Notes***.—Not rare in cave deposits containing relatively ancient barn owl pellets (*cf. Tyto furcata* and *T. noeli*). Genus *Siphonorhis* is endemic to the Greater Antilles and a primitive caprimulgid stock, being one of the most ancient members of the West Indies avifauna (Olson 1978, 1985). The extinct (but see Olson 1985: 531, Suárez 2000b: 68) Cuban Pauraque was first mentioned by Acevedo-González & Arredondo (1982: table 1) as '*Siphonorhis* sp.', without reference to specimens or locality, based on information supplied by S. L. Olson (O. Arredondo pers. comm.). Subsequently, it was deleted without comment in Arredondo (1984: 30). Three species are known in *Siphonorhis* (not '*S. noctitherus*† in Puerto Rico' as appears in Kirkconnell *et al*. 2020: 65), distributed on Hispaniola including Gonâve Island (Least Pauraque *S. brewsteri* [Chapman, 1917]; see Garrido 2003, Keith *et al*. 2003, Latta *et al*. 2006), Jamaica (Jamaican Pauraque †*S. americana* [Linnaeus, 1758], see Olson & Steadman 1977, Downer & Sutton 1990, AOU 1998) and Cuba (Cuban Pauraque †*S. daiquiri*). The latter is intermediate in size compared to the two other species (Olson 1985: 530, see Olson & Steadman 1977: 456).

## Order GRUIFORMES Bonaparte
## Family INCERTAE SEDIS
## Genus †*Nesotrochis* Wetmore, 1918

*Nesotrochis* Wetmore, 1918, *Proc. US Natl. Mus*. 54: 516. Type, by original designation, *Nesotrochis debooyi* Wetmore.

### 2. †*Nesotrochis picapicensis* (Fischer & Stephan, 1971)
Pica-Pica's Rail (Gallinuela de Pica-Pica)

*Fulica picapicensis* Fischer & Stephan, 1971b (part), *Wiss. Zeitsch. Humboldt-Univ. Berlin, Math.-Nat. R*. 20: 595.
*Fulica picapicensis*: Fischer & Stephan 1971b: 595 (part).
*Nesotrochis picapicensis*: Olson 1974: 441.
*Nesotrochis picapicebsis*: Jiménez Vázquez & Arrazcaeta Delgado 2015: 142 (*lapsus calami*).
*Nesotrochis picipicensis*: Oswald *et al*. 2021: 2 (*lapsus calami*).
*Fulica picipicensis*: Oswald *et al*. 2021: 2 (*lapsus calami*).

***History***.—*Summer 1967*: members of the Cuban-German Expedition (Universidad de La Habana & Institut für Paläontologie und Museum der Humboldt-Universität zu Berlin) collect the type material in western Cuba (Castellanos 1968: 4, Fischer 1968: 270, 1970). *1971*: original description of *Fulica picapicensis* published (Fischer & Stephan 1971b: 595–597). *31 December 1974*: Antillean extinct genus *Nesotrochis* identified from Cuba, leading to the new combination *N. picapicensis* (Olson 1974: 441, see 'Notes'). *September 1995*: first record outside the type locality, in Cueva del Indio, Mayabeque (formerly La Habana) province (Jiménez Vázquez & Valdés Ruiz 1995: 62). *27 August 2019*: morphology of the hypotarsus in *Nesotrochis* indicates it is not a Rallidae (Mayr 2019), but shares osteological characters with flufftails, Sarothruridae (Africa and New Guinea) and related taxa (Heliornithidae). *17 March 2021*: mitochondrial genome analysis of *N. steganinos* Olson, 1974 (Hispaniola) corroborates that the genus is not a rallid (Oswald *et al*. 2021), but a sister taxon to Sarothruridae and the extinct flightless Aptornithidae (New Zealand).

***Holotype***.—Left humerus, Av. 832/67, at CZACC (Fischer & Stephan 1971b: 595, fig. 9: a [anconal], b [palmar], Olson 1977: 352, fig. 1b: bottom [anconal]). Collected summer 1967 by members of the Cuban-German Expedition [= Wolfgang Reichel, Hans-Hartmat Krueger,


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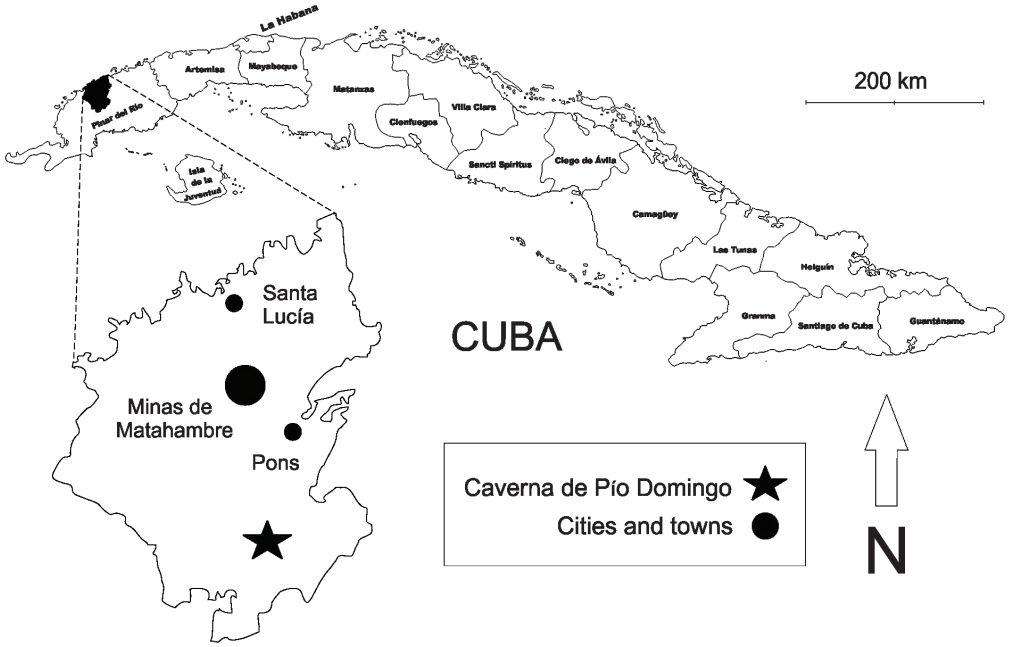


Figure 3. Caverna de Pío Domingo (**PPD**), Minas de Matahambre, western Cuba. Type locality of †*Nesotrochis picapicensis* (Fischer & Stephan), †*Antigone cubensis* (Fischer & Stephan) and †*Ornimegalonyx oteroi* Arredondo.

Karlheinz Fischer, Gustavo Furrazola Bermúdez, Manuel Acevedo González, Néstor Mayo and Manuel Iturralde Vinent (Castellanos 1968: 4)] in El Abismo [= Furnia del Aguacero, or del Abismo] at the type locality (see Fischer & Stephan 1971a: 541, b: 593).

***Other material***.—**Skull**: incomplete, Av. 833/67 (fig. 8: a [dorsal]). **Vertebra**: cervical, Av. 834–838/67; thoracic, Av. 839/67. **Humerus**: right, Av. 840–841/67[+]; left, Av. 842/67[+]. **Ulna**: see 'Notes'. **Pelvis**: incomplete, Av. 844 (Figs. 11a [dorsal], 12a [lateral]) to 849/67[+]. **Femur**: right, Av. 850 (fig. 13a [posterior]) to 851/67; proximal right, Av. 852/67[+]; left, Av. 853/67[+]. **Tibiotarsus**: right, Av. 854/67; proximal right, Av. 855–857/67; left, Av. 858 (fig. 14: a [anterior], b [posterior]) to 860/67[+]; proximal left, Av. 861–862/67[+]; distal left, Av. 863–864/67[+]. **Tarsometatarsus**: right, Av. 865 (fig. 15a [anterior]; Olson 1977: 352, fig. 1B: top [anterior]), 866/67[+], and Av. 867/67 (the last is immature); proximal right, Av. 868/67; distal right, Av. 869–870/67; left, Av. 871/67[+] (immature); proximal left, Av. 872/67[+]; distal left, Av. 873–874/67[+]. Cited figures from pl. 2–6 of Fischer & Stephan (1971b), other than when indicated. The annotation ([+]) indicates specimens (= paratypes) at CZACC (see comments in Arredondo 1984: 14 and Livezey 2003: 55).

***Type locality***.—Caverna de Pío Domingo (**PPD**), Sierra de Sumidero, municipality of Minas de Matahambre, Pinar del Río province, Cuba (Fischer & Stephan 1971b: 595). Fig. 3.

***Distribution***.—Cave deposits in west Cuba (see Appendix). *Pinar del Río*. Viñales: **PMF** (Arredondo & Rivero 1997: 111 ['*Nesotrochis* sp.'], Jiménez Vázquez 1997b: 97, Arredondo & Arredondo 2000: Anexo 1 ['*Nesotrochis* sp.']), Minas de Matahambre: **PPD** = type locality (Fischer & Stephan 1971b: 595 ['*Fulica picapicensis*, n. sp.']). *Artemisa*. Caimito: **ACP** (Jiménez Vázquez 1997b: 97), **ASA** (*cf*. Suárez & Arredondo 1997: 101, Suárez 2000b: table 1, Arredondo & Arredondo 2002a: table 1 ['*Nesotrochis* sp.']). *Mayabeque*. Quivicán: **YBL** (Jiménez Vázquez 1997b: 97), San José de las Lajas: **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62, Jiménez Vázquez 1997b: 97, Rojas Consuegra *et al*. 2012: 6, 10), Madruga: **YCN** (Orihuela 2012: 306–308, tables 1 ['*Nesotrochis* sp.'] and 3 ['Rallidae cf. *Nesotrochis* sp.'], fig.


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8A = femur ['*Nesotrochis* sp. (cf.) *N. picapicensis*']: left [medial], right [anterior], Orihuela 2019: 61, fig. 3 = idem: A [medial], B [anterior]). *Matanzas*. Jagüey Grande: **MFJ** (*cf.* CLV).

***Direct $^{14}$C dating***.—None. For indirect dating from relevant Cuban archaeological sites, see Córdova Medina *et al*. (1997), Jiménez Vázquez (2005), Orihuela (2019), Orihuela *et al*. (2020b).

***Notes***.—Bones of this cave rail are common in palaeontological deposits of western Cuba and are abundant in cultural (*contra* Steadman *et al*. 2013: 1355) sites (see Jiménez Vázquez 1997b, 2001, Jiménez Vázquez & Arrazcaeta Delgado 2008, 2015). Formerly described as a coot, genus *Fulica* Linnaeus. One of the paratypes, the incomplete right ulna, Av. 843/67 (Fischer & Stephan 1971b: 595, fig. 10a [medial]), 'is not from a rail and is possibly columbid' (Olson 1974: 441, footnote). The extinct genus *Nesotrochis* is endemic to the Greater Antilles but has Old World origins (Oswald *et al*. 2021). Three large flightless species (Olson 1977: 352–353, Olson 1978: 107, Cuello 1988: 15; see Livezey 1998) have been described, from the Virgin Islands (*N. debooyi* Wetmore, 1918), but also present in Puerto Rico (Wetmore 1922, Olson 1974), Hispaniola (*N. steganinos* [= *M. sterganinos* Arredondo 1984: 15, *lapsus calami*]) and Cuba (*N. picapicensis*), and seem to have survived on these islands until recently (Olson 1974, Jiménez Vázquez & Arrazcaeta Delgado 2008, 2015, Carlson & Steadman 2009). The Cuban species was for some time considered the same bird named 'Biaya' or 'Bambiaya' by native peoples (*cf*. Jiménez Vázquez 1997b, 2005), but this is incorrect (Jiménez Vázquez & Arrazcaeta Delgado 2015: 144). Figueredo (2011: 13) commented that the distribution of *Nesotrochis* could be extended to the Bahamas, citing Steadman *et al*. (2007). This appears to be a misinterpretation, as the only flightless rail mentioned in the latter paper (see also Steadman *et al*. 2013) is '*Rallus* undescribed sp.'. For a summary of extinct birds in Quaternary deposits of the Bahamas, see Steadman & Franklin (2020).

## Family GRUIDAE Vigors
## Genus *Antigone* Reichenbach, 1852

*Antigone* Reichenbach, 1852, *Av. Syst. Nat*., p. xxiii. Type, by original designation and tautonymy, *Grus torquata* Vieillot = *Ardea antigone* Linnaeus.

### 3. †*Antigone cubensis* (Fischer & Stephan, 1971)
Cuban Flightless Crane (Grulla Cubana)

*Grus cubensis* Fischer & Stephan, 1971a, *Wiss. Zeitsch. Humboldt-Univ. Berlin, Math.-Nat. R*. 20: 565.
*Ciconia*: Castellanos 1968: 4.
*Grus cubensis*: Fischer & Stephan 1971a: 565.
*G*[*rus*]. *cubanensis*: Kilmer & Steadman 2016: table 3 (*lapsus calami*).
*Antigone cubensis*: Suárez 2020a: 6.

***History***.—*April 1968*: first notice of material collected by the Cuban-German Expedition, being tentatively identified as '*Ciconia*' (Castellanos 1968). The name *Baeopteryx cubensis* (*nomen nudum*) appears (Fischer 1968: 271) with the comment 'wie der pleistozäne Cuba-Kranich später heißen soll' ['as the Pleistocene Cuban crane will later be called']), without indication of type material or catalogue numbers, along with comments on the proportions of some elements. Referred to as a flightless crane for the first time: 'Flugunfähiger Kranich aus dem Pleistozän Cubas' ['Flightless crane from the Pleistocene of Cuba'] (Fischer 1968). *1971*: original description of *Grus cubensis* published (Fischer & Stephan 1971a). *September 1995*: first record outside the type locality, in Cueva del Indio, Mayabeque (formerly La Habana) province, west Cuba (Jiménez Vázquez & Valdés Ruiz 1995: 62, not Suárez 2000b: table 1). *December 2000*: reported from asphalt deposits at Las Breas de San Felipe, Matanzas province (Iturralde-Vinent *et al*. 2000: table 2). *22 May 2020*: direct $^{14}$C dating of material


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from tar seeps and treated under new combination *Antigone cubensis* (Suárez 2020a: 6, table 2).

***Holotype***.—Skull with its respective mandible and left quadrate [but not 'atlas', see 'Notes'], Av. 1/67, at CZACC (Fischer 1968: 271, fig. unnumbered* [lateral], Fischer 1970: 234, Plate 1*, skull: a [lateral], e [dorsal], f [ventral], g [posterior]; quadrate: c [lateral]; mandible: b [lateral], d [dorsal]; Arredondo 1971: 96, fig. centre left unnumbered*: top [lateral], Fischer & Stephan, 1971a: 565, Figs. 26*: skull and quadrate [lateral], 27*: mandible [lateral], 28*: skull [ventral], 29*: skull [posterior]; pl. 1, skull: 1 [lateral], 4 [dorsal], 5 [ventral], mandible: 2 [lateral], 3 [dorsal]). Collected summer 1967 by the Cuban-German Expedition [= Wolfgang Reichel, Hans-Hartmat Krueger, Karlheinz Fischer, Gustavo Furrazola Bermúdez, Manuel Acevedo González, Néstor Mayo and Manuel Iturralde Vinent (Castellanos 1968: 4)] in El Abismo [= Furnia del Aguacero, or del Abismo] at the type locality (Fischer & Stephan 1971a: 565, see also Fischer 1968: 270, 1970: 233–235).

***Other material***.—**Skull**: calvaria, Av. 2/67, Av. 5–11/67, Av. 15–16/67; crania, Av. 3–4/67. **Mandible**: 'upper and lower', Av. 12/67; 'lowers', Av. 13–14/67. **Vertebra**: atlases, Av. 17 (fig. 7*: a [anterior], b [posterior]) to 18/76; axes, Av. 19 (fig. 8* [lateral]) to 20/67; cervical 3, Av. 21–24/67; cervical 4, Av. 25–28/67; cervical 5, Av. 29–35/67; cervical 6, Av. 36–42/67; cervical 7, Av. 43/67; cervical 8–2, Av. 44–51/67, Av. 52 (fig. 9*: a [dorsal], b [ventral], c [lateral], d [anterior], e [posterior]) to 63/67; cervical 13 to 14, Av. 102–110/67; cervical 15, Av. 111–118/67; cervical 16, Av. 119–126/67; cervical 17, Av. 127–143/67; cervical indet., Av. 144–149/67; thoracic 1, Av. 150–159/67; thoracic 2, Av. 160–161/67; thoracic 3–5, Av. 162–163/67; thoracic 5–8, Av. 164 (fig. 10*: a [lateral], b [anterior]) to 192/67; thoracic indet., Av. 193–194/67. **Rib**: right, Av. 195–198/67; left, Av. 199–205/67. **Sternum**: incomplete, Av. 206/67 (fig. 31* [lateral]). **Coracoid**: right, Av. 207 (fig. 32*: a [ventral], b [dorsal]) to 210/67; left, Av. 211/67. **Scapula**: right, Av. 212 (fig. 33*: a [dorsal], b [ventral]) to 218/67, Av. 227/67; left, Av. 219–226/67, Av. 228/67. **Furcula**: right, Av. 229–231/67; left, Av. 232 (fig. 14*: a [internal], b [external]) to 235/67. **Humerus**: right, Av. 236/67, 237 (fig. 34*: a [anconal], b [palmar]) to 239/67; right without distal end, Av. 240/67; proximal half of right, Av. 241/67; proximal half of left, Av. 242/67; distal ends of left, Av 243/67, Av 247/67; left without distal end, Av 244/67; proximal end of left, Av 245/67; shaft piece of left, Av 246/67. **Radius**: right, Av 248/67 (fig. 35*: a [dorsal], b [ventral]); proximal ends of right, Av 249–257/67, Av 274/67; distal ends of right, Av 258–265/67, Av. 275/67; proximal ends of left, Av. 266–269/67; distal ends of left, Av. 270–273/67. **Ulna**: distal ends of right, Av. 276–277/67; distal ends of left, Av. 278 (fig. 36*: a [dorsal], b [ventral]) to 280/67. **Carpometacarpus**: right, Av. 281/67; fragmentary right, Av. 282–284/67; left, Av. 285/67 (fig. 37*: a [medial], b [lateral]), Av. 287/67; left without proximal end, Av. 286/67; left without distal end, Av. 288/67. **Pelvis**: incomplete, Av. 289 (fig. 30*: a [dorsal], b [ventral]) to 292/67; synsacral vertebrae 1–2, Av. 293/67. **Femur**: right, Av. 294/67 (fig. 38*: a [anterior], b [posterior]); shaft of right, Av. 295/67; left without proximal end, Av. 296/67; fragmentary proximal half of left, Av. 297/67; distal end of left, Av. 298/67; shaft of left, Av. 299/67; distal articular region, Av. 300/67. **Tibiotarsus**: right, Av. 301 (fig. 39*: a [anterior], b [posterior]) to 304/67; right without proximal ends, Av. 313–317/67; distal ends of right, Av. 322–327/67; shafts of right, Av. 334–335/67; left, Av. 305–312/67; left without proximal ends, Av. 318–321/67; distal ends of left, Av. 328–333/67; shaft of left, Av. 336/67. **Fibula**: right, Av. 337 (fig. 40*: a [medial], b [lateral]) to 340/67; left, Av. 341–342/67. **Tarsometatarsus**: right, Av. 343 (fig. 41*: a [anterior], b [posterior]) to 352/67; proximal ends of right, Av. 361–364/67; right without proximal end, Av. 372/67; distal ends of right, Av. 373–375/67; left, Av. 353–360/67; proximal ends of left, Av. 365–371/67; distal ends of left, Av. 376–381/67. **Phalanges**: right digit II, phalanx 1, Av. 382–390/67; right digit II, phalanx 2, Av. 391–393/67; right digit III, phalanx 1, Av. 407–412/67; right digit IV, phalanx 1, Av.


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433–438/67; left digit II, phalanx 1, Av. 394–403/67; left digit II, phalanx 2, Av. 404–406/67; left digit III, phalanx 1, Av. 413–422/67; left digit IV, phalanx 1, Av. 439–443/67; digit III, phalanx 2, Av. 423–429/67; digit III, phalanx 3, Av. 430–432/67; digit IV, phalanx 2, Av. 444–447/67; digit IV, phalanx 3, Av. 448–450/67; digit I?, phalanx 1, Av. 451/67; ungual phalanges, Av. 452–456/67. Cited material and figures are from Fischer & Stephan (1971a), in which catalogue numbers on figure legends are preceded by '67/', contrary to the holotype, or the same paratypes listed in their table 1.

***Type locality***.—Caverna de Pío Domingo (**PPD**), Sierra de Sumidero, municipality of Minas de Matahambre, Pinar del Río province, Cuba (Fischer & Stephan 1971a: 565). Fig. 3.

***Distribution***.—Cave and asphalt deposits in west Cuba (see Appendix). *Pinar del Río*. Minas de Matahambre: **PPD** = type locality (Castellanos 1968: 4 ['*Ciconia*'], Fischer 1968: 271 ['*Baeopteryx cubensis*'], Fischer 1970: 234 ['*Baeopteryx*'], Arredondo 1971: 95 ['*Baeopteryx cubensis*'], Acevedo González 1971: 36 ['*Baeopteryx cubensis*'], Fischer & Stephan 1971a: 565 ['*Grus cubensis*, nov. spec.'], Arredondo 1984: 13 ['*Grus cubensis*' see 'Notes']). *Artemisa*. Caimito: **ACP** (*cf*. Suárez & Arredondo 1997: 101 ['*Grus cubensis*'], Arredondo & Arredondo 2002a: table 1 ['*Grus cubensis*'], 2002b: table 1 ['*Grus cubensis*']), **ASA** (Suárez 2000b: table 1 ['*Grus cubensis*']). *Mayabeque*. San José de las Lajas: **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 ['*Grus cubensis*'], Rojas Consuegra *et al*. 2012: 6, 10 ['*Grus cubensis*']). *Matanzas*. Martí: **MLB** (Iturralde-Vinent *et al*. 2000: table 2 ['*Grus cubensis*'], fig. 6 = tarsometatarsus: A [anterior], Suárez 2020a: 6–7, fig. 3A–D = tibiotarsus: A [anterior], B [distal], C [medial], D [posterior], 3E–F = tarsometatarsus: E [anterior], F [proximal], 3G–J = tarsometatarsus: G [posterior], H [medial], I [anterior], J [distal]).

***Direct $^{14}C$ dating***.—Late Pleistocene (MLB): 22,900 ± 2,700 $^{14}C$ yr BP (Suárez 2020a: table 2, tibiotarsus).

***Notes***.—Remains of this large crane are known to be common in just three Cuban Quaternary deposits (see Fischer & Stephan 1971a, Rojas Consuegra *et al*. 2012, Suárez 2020a). In the original description, Fischer & Stephan (1971a: 565) mentioned: 'Cranium mit Atlas (Abb. 7–12), Universität Habana, Av. 1/67' ['Cranium with atlas (fig. 7–12), University of Havana, Av. 1/67']. The indication of 'atlas' seems to be a mistake for mandible, as no atlas with the catalogue number of the holotype is mentioned in the text or figures of this work. The only two atlases mentioned are paratypes (Fischer & Stephan 1971a, fig. 7, table 1, see 'Other material' above). Otherwise, in figures the mandible and a left quadrate accompanying the skull has the same number, Av. 1/67, as the holotype. Fischer (1968) tentatively identified this species as a member of *Baeopteryx* Wetmore, a genus described as a fossil from Bermuda (Wetmore 1960), but considered subsequently to be a junior synonym of *Grus* Brisson (Fischer & Stephan 1971a: 574; see Olson & Wingate 2000: 356). Use of '*Grus cubensis* (Fischer, 1968)' by Arredondo (1975: 146, 1984: 13) and Arredondo Antúnez (1997: 5) is incorrect, being based on '*Baeopteryx cubensis*', which name is not available (see 'History' and ICZN 1999, Art. 15.1). Apart from its large size and other osteological characters related to flightlessness, the Cuban species is most similar to *Antigone antigone* (Linnaeus, 1758) and *A. canadensis* (Linnaeus, 1758) in features of the skull, rather than to *Grus americana* (Linnaeus, 1758). Recently, Mayr *et al*. (2020) considered species of the genus *Antigone* under *Grus* Brisson.

## Order CHARADRIIFORMES Huxley
## Family BURHINIDAE Mathews
## Genus *Burhinus* Illiger, 1811

*Burhinus* Illiger, 1811, *Prodromus Syst. Mamm. Av*., p. 250. Type, by monotypy, *Charadrius magnirostris* Latham (not '*Charadrius magnirrostris* Latham' *sensu* Arredondo 1984: 16).



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### 4. ×*Burhinus bistriatus* (Wagler, 1829)
Double-striped Thick-knee (Búcaro)

*Charadrius bistriatus* Wagler, 1829, *Isis von Oken* 22, col. 648.
*Burhinus*: Olson & Hilgartner 1982: 33 [Cuba].
*Burhinus* sp.: Acevedo-González & Arredondo 1982: table 1 [Cuba].
*Burhinus bistriatus*: Suárez 2020a: 7 [Cuba].

***History***.—*November 1980*: S. L. Olson identifies fossils of *Burhinus* at CZACC and OA (Olson & Hilgartner 1982: 33). *1982*: first published notice (5 August) as to presence in Cuban collections of fossil material referable to *Burhinus* (Olson & Hilgartner 1982: 33). Reported as '*Burhinus* sp.' by Acevedo-González & Arredondo (1982: table 1) without indicating specimens or locality. *May 1984*: fossils in OA (see 'Referred material') recorded as '*Burhinus* sp.' (Arredondo 1984: 16–17). *December 2000*: first record from asphalt deposits at Las Breas de San Felipe (Iturralde-Vinent *et al*. 2000: table 2). *22 May 2020*: some Cuban specimens identified as '*Burhinus bistriatus*'(Suárez 2020a: 7).

***Referred material***.—**Humerus**: right lacking distal end, MNHNCu 75.4783; distal end of right, MNHNCu 75.4792; distal ends of left, OA 2958, and right, OA 2959. **Tibiotarsus**: distal end of right, MNHNCu 75.4798. See Arredondo (1984: 16), Suárez (2020a: 7).

***Distribution***.—Cave and asphalt deposits in west Cuba (see Appendix). *Artemisa*. Caimito: **ACP** (Arredondo 1984: 16 ['*Burhinus* sp.'], Arredondo & Arredondo 2002a: table 1 ['*Burhinus* sp.'], 2002b: table 1 ['*Burhinus* sp.']), **ASA** (Suárez 2000b: table 1 ['*Burhinus* sp.'], Arredondo & Arredondo 2002a: table 1 ['*Burhinus* sp.']). *Mayabeque*. San José de las Lajas: **YCC** (Jiménez & Orihuela 2021: 169). *Matanzas*. Martí: **MLB** (Iturralde-Vinent *et al*. 2000: table 2 ['*Burhinus* sp.'], Suárez 2020a: 7).

***Direct $^{14}$C dating***.—None in Cuba. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005). For dating of *Burhinus* material from the Bahamas, see Jones O'Day (2002).

***Notes***.—Common in Pleistocene deposits, considered a palaeo-ecological indicator of arid open habitat (Feduccia 1980, Pregill & Olson 1981, Iturralde-Vinent *et al*. 2000). Some material referred to *Burhinus* from Cuba is of a different size (Suárez 2020a; WS & S. L. Olson unpubl.), and perhaps involves the smaller *B. nanus* Brodkorb, 1959, described from the Bahamas and considered a species, or a subspecies of *B. bistriatus* by some authors (see Olson & Hilgartner 1982: 33, Oswald & Steadman 2018: 363). *B. bistriatus* still inhabits the Greater Antilles, with the endemic *B. b. dominicensis* (Cory, 1883) resident on Hispaniola (AOU 1998, Raffaele *et al*. 1998, 2003, Keith *et al*. 2003, Latta *et al*. 2006).

## Family SCOLOPACIDAE Bonaparte
## Genus *Gallinago* Brisson, 1760

*Gallinago* Brisson, 1760, *Ornithologia*, vol. 5, pp. 298, 304. Type, by tautonymy, *Scolopax gallinago* Linnaeus.

### 5. †*Gallinago kakuki* Steadman & Takano, 2016
West Indian Snipe (Becasina Isleña)

*Gallinago kakuki* Steadman & Takano, 2016, *Zootaxa* 4109: 348.
*Capella delicata*: Wetmore 1937: 435 [Bahamas].
*Capella* sp.: Olson & Hilgartner 1982: 31 [Bahamas].
*Capella* sp.: Morgan 1994: 480 [Cayman Islands; see also Morgan 1977a,b].
*Capella* sp.: Suárez 2004b: 155 [Cuba].

***History***.—*October 1937*: three specimens from 'Great Exuma' (= Little Exuma *fide* Hecht 1955) identified as '*Capella delicata* (Ord.)', but said to probably 'represent an extinct species'


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of large size (Wetmore 1937: 435). *25 March 1977*: fossils from Cayman Brac, Cayman Islands, identified as a new, extinct large species of *Capella* (Morgan 1977a: 68–73, b: 21; see Morgan 1994: 480–481). *5 August 1982*: summary of the fossil record of this large snipe (as '*Capella* sp.') in the West Indies, with comparisons of known material, including new specimens identified from Banana Hole, New Providence, Bahamas (Olson & Hilgartner 1982: 31–33). *April 2004*: recorded from Cuba as '*Capella* sp.' on basis of four specimens, including one immature humerus which suggests the bird was a year-round resident in the Antillean subregion (Suárez 2004b: 157). *9 May 2016*: original description of *G. kakuki* published (Steadman & Takano 2016), which species seems to be more similar to Old World *Gallinago*.

***Holotype***.—Complete right humerus, UF 297382 (Steadman & Takano 2016: 348, figs. 3A [anconal], 4A [palmar]). Collected in 1958–60 by J. C. Dickinson *et al*. at the type locality (Steadman & Takano 2016: 348).

***Type locality***.—Banana Hole, New Providence, Bahamas (Steadman & Takano 2016: 348).

***Referred material***.—**Humerus**: right, MNHNCu 75.4709 (fig. 1: left [palmar]), OA 3138; left, MNHNCu 75.4711 (immature). **Ulna**: right, MNHNCu 75.4712 (fig. 1: right [palmar]). Cited material and figures are from Suárez (2004b).

***Distribution***.—Cave deposits in west and central Cuba (see Appendix). *Pinar del Río*. Los Palacios: **PEA** (Suárez 2004b: 155 ['*Capella* sp.']). *Sancti Spíritus*. Yaguajay: **SPH** and **SPS** (Suárez 2004b: 155–156 ['*Capella* sp.']).

***Direct $^{14}C$ dating***.—None in Cuba. For dating of associated fauna from PEA (17,406 ± 161 $^{14}C$ yr BP), see Suárez & Díaz-Franco (2003: 373).

***Notes***.—Remains of this snipe are sporadically found in Cuban cave deposits containing ancient barn owl pellets (*cf. Tyto furcata* and *T. noeli*). *G. kakuki* had a wider distribution in the West Indies that also included the Bahamas and Cayman Islands (Olson & Hilgartner 1982, Steadman & Takano 2016) where apparently it was a resident, endemic species (Suárez 2004b, Steadman & Takano 2016). Probably the first material to be collected was from Isla de la Juventud (= Isla de Pinos), west Cuba, as Peterson (1917: 359) noted 'few limb-bones of snipes' in the remains he studied, but this requires corroboration.

## Order CICONIIFORMES Bonaparte
## Family CICONIIDAE Sundevall
## Genus *Ciconia* Brisson, 1760

*Ciconia* Brisson, 1760, *Ornithologia*, vol. 1, p. 48; vol. 5, p. 361. Type, by tautonymy, *Ardea ciconia* Linnaeus.

### 6. †*Ciconia maltha* L. Miller, 1910
La Brea Stork (Cigüeña de La Brea)

*Ciconia maltha* L. Miller, 1910, *Univ. California Publ. Bull. Dept. Geol*. 5: 440.
*Jabiru mycteria*: Wetmore 1928: 2.
*Ciconia maltha*: Howard 1942: 202.
*Ciconia malttla*: Newton 2003: 266 (*lapsus calami*).
*Ciconia lydekkeri*: Agnolin 2009: 57.

***Holotype***.—Left tarsometatarsus, UCMP 11202 (Miller 1910: 440, Figs. 1* [proximal], 2* [distal]). Collected by members of the 'University of California' (Miller 1910: 439).

***Type locality***.—Rancho La Brea, Los Angeles, California, USA (see Miller 1910, Howard 1942, Wetmore 1956: 22, Brodkorb 1963: 289).

***Referred material***.—**Tibiotarsus**: distal left, AMNH unnumbered. **Tarsometatarsus**: proximal right, AMNH unnumbered (see Howard 1942).


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***Distribution***.—Spring deposit (not 'from a cave' as indicated by Howard 1942: 189) in central Cuba (see Appendix). *Cienfuegos*. Palmira: **CCM** (Wetmore 1928: 2 ['*Jabiru mycteria*'], Howard 1942: 201). For summary of continental distribution, see Wetmore (1956: 22, 1959: 8–9), Brodkorb (1963: 289–290), Emslie (1998: 26–27) and Kilmer & Steadman (2016: table 4).

***Direct $^{14}$C dating***.—None in Cuba. Two indirect conventional dates from its fossil locality in Cienfuegos. Late Pleistocene (CCM): >30,000 to 25,000 ± 2000 $^{14}$C yr BP (Kulp *et al*. 1952: 419, table 2 [two samples: pine cones and wood]).

***Notes***.—The two referred specimens (Howard 1942: 201–202) are the only known material of this taxon in Cuba. Formerly recorded as *Jabiru mycteria* (M. H. C. Lichtenstein, 1819) by Wetmore (1928: 2–3), reidentified as *Ciconia maltha* by Howard (1942: 202; see also Wetmore 1956: 22, 1959: 9). Navarro (2021: 58, table 4) confused *C. maltha* with another fossil congeneric taxon in Cuba, the smaller and undescribed *Ciconia* sp. (see below), which is restricted to tar seeps in Matanzas province (Suárez & Olson 2003a, Suárez 2020a).

### 7. *Ciconia* sp.

***Referred material***.—**Tibiotarsus**: distal end of right, MNHNCu 75.4599, formerly P4599 (Suárez & Olson 2003a: 151, fig. 1E [distal], Suárez 2020a: 9, fig. 4A [distal]). Collected 25 February 2001 by WS & Stephen Díaz Franco in San Felipe I, C area (Suárez & Olson 2003a: 151).

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (Suárez & Olson 2003a, Suárez 2020a).

***Direct $^{14}$C dating***.—None. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Extremely rare. Known from Cuba by a single specimen of a species smaller than *C. maltha* (Suárez & Olson 2003a: 151). Orihuela (2019: 58–59) incorrectly indicated 'type material' and 'type locality' for *Ciconia* sp., which is an undescribed species. Navarro (2021: 58, table 4) erroneously listed *Ciconia* sp. as the only representative of the genus in Cuba (see 'Notes' under *C. maltha*), indicating it was 'originally identified as *Jabiru mycteria* (Lichtenstein, 1819), by Wetmore (1928)' which was not the case.

## Genus *Mycteria* Linnaeus, 1758

*Mycteria* Linnaeus, 1758, *Syst. Nat*., edn. 10, vol. 1, p. 140. Type, by monotypy, *Mycteria americana* Linnaeus.

### 8. †*Mycteria wetmorei* Howard, 1935

Wetmore's Stork (Cayama de Wetmore)

*Mycteria wetmorei* Howard, 1935, *Condor* 37: 253.
*Mycteria americana*: L. Miller 1910: 446.
*Mycteria americana*: Campbell 1980: 121.
*Mycteria americana*: Emslie 1998: table 14.

***Holotype***.—Fragment of lower mandible, LACM K3527 (Howard 1935: 253, fig. 47: 1 [lateral], 2 [dorsal]). Collected by members of the Southern California Academy of Sciences (Howard 1935: 251).

***Type locality***.—'North bank of "pool" near Wilshire Boulevard, Rancho La Brea, Los Angeles, California', USA (Howard 1935: 253).

***Referred material***.—**Carpometacarpus**: proximal end of right, MNHNCu 75.4602 (fig. 1E [internal]). **Tibiotarsus**: distal end of right, MNHNCu 75.4603 (fig. 1D [distal]). **Tarsometatarsus**: left, MNHNCu 75.4757 (Suárez 2020a: 10, fig. 4: E [proximal], F [distal],


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G [anterior], H [medial], I [posterior]); proximal end of left (immature), MNHNCu 75.4604 (fig. 1H [anterior]); distal end of right, MNHNCu 75.4605 (fig. 1F [anterior]). Cited material and figures are from Suárez & Olson (2003a), other than where indicated.

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (Suárez & Olson 2003a, Suárez 2020a).

***Direct $^{14}$C dating***.—None in Cuba. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Very rare. *M. wetmorei* occurred sympatrically with *M. americana* Linnaeus, 1758, only in Cuba (*contra* Kirkconnell *et al*. 2020: 69) in the tar seep deposits (Suárez & Olson 2003a). Previous records of Wood Stork in fossil localities of North America, including Florida (see Emslie 1998), represent misidentifications, including of *M. wetmorei* (Olson 1991, Suárez & Olson 2003a).

## Order PELECANIFORMES Sharpe
## Family ARDEIDAE Leach
## Genus *Tigrisoma* Swainson, 1827

*Tigrisoma* Swainson, 1827, *Zool. J*. 3: 362. Type, by original designation, *Ardea tigrina* 'Latham' (= J. F. Gmelin, 1789) = *Ardea lineata* Boddaert.

### 9. ×*Tigrisoma mexicanum* Swainson, 1834
Bare-throated Tiger Heron (Garza Tigre Mejicana)

*Tigrisoma mexicana* Swainson, 1834, in Murray, *Encycl. Geogr*., p. 1383.

***Referred material***.—**Tarsometatarsus**: left, AC-33 (Olson & Suárez 2008a: 285, figs. 1B [anterior], 2A [anterior]). Collected during February–April 2004 by members of Arqueocentro [= Néstor A. Gómez, Lorenzo Morales and Raul Villavicencio Finalet], Sagua La Grande (Olson & Suárez 2008a: 285).

***Distribution***.—Sinkhole deposit in central Cuba (see Appendix). *Villa Clara*. Sagua La Grande: **VCB** (Olson & Suárez 2008a: 286).

***Direct $^{14}$C dating***.—None.

***Notes***.—Extremely rare. The single tarsometatarsus from Cuba referred to *T. mexicanum* is the first evidence of this genus in a fossil locality anywhere, and the first record of the subfamily Tigrisomatinae in the West Indies (Olson & Suárez 2008a).

## Order INCERTAE SEDIS
## Family †TERATORNITHIDAE L. Miller
## Genus †*Oscaravis* Suárez & Olson, 2009

*Oscaravis* Suárez & Olson, 2009a, *Proc. Biol. Soc. Wash*. 122: 106. Type, by monotypy, *Teratornis olsoni* Arredondo & Arredondo.

### 10. †*Oscaravis olsoni* (Arredondo & Arredondo, 2002)
Cuban Teratorn (Teratorno Cubano)

*Teratornis olsoni* Arredondo & Arredondo, 2002b, *Poeyana* 470–475: 16 [for 1999].
*Teratornis* sp.: Suárez & Arredondo 1997: 100.
*Teratornis olsoni*: Arredondo & Arredondo 2002b: 16.
'*Teratornis*' *olsoni*: Suárez 2004a: 124.
*Oscaravis olsoni*: Suárez & Olson 2009a: 111.


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***History***.—*1969*: holotype collected in a cave deposit from western Cuba by members of IGP (Arredondo & Arredondo 2002b). *Winter 1997*: first record of Teratornithidae in Cuba, the West Indies, and outside continental America, is announced (Suárez & Arredondo 1997). *13 December 2002*: original description (not '26 May 1999', see 'Notes') of *Teratornis olsoni* published (Arredondo & Arredondo 2002b), based on some of the material then known. *1 January 2009*: first revision of *T. olsoni* with description of new material from Cuban cave and asphalt deposits, and erection of the genus *Oscaravis* (Suárez & Olson 2009a).

***Holotype***.—Near-complete right femur, IGP/ACC 400-649, at CZACC (Arredondo & Arredondo 2002b: 16, figs. 1* [anterior], 2* left [anterior], 3*A: reversed [anterior], Suárez & Olson 2009a: 111, fig. 7, left in each pair: A [anterior], B [posterior], C [proximal], D [distal], Orihuela 2019: 59, fig. 2: A [anterior], B [posterior]). Collected in 1969 by members of IGP at the type locality (Arredondo & Arredondo 2002b: 15).

***Other material***.—**Quadrate**: incomplete right, OA 3205 (Arredondo & Arredondo 2002b: 16, fig. 4*: A [lateral], B [ventral], Suárez & Olson 2009a: 111, fig. 3, left in each pair: A [lateral], B [posterior], C [medial], D [ventral]). **Femur**: fragmentary distal half of right, OJ P-8 (as 'P-8', in the original description), at CZACC; internal condyle of left, OA 3151. See Arredondo & Arredondo (2002b: 16).

***Type locality***.—Cueva de Paredones (**ACP**), *c*.3 km south-west of Ceiba del Agua, municipality of Caimito, Artemisa [not 'Mayabeque' as stated by Orihuela 2019: fig. 2] province, Cuba (Arredondo & Arredondo 2002b: 16). Fig. 4.

***Distribution***.—Cave and asphalt deposits in west Cuba (see Appendix). *Artemisa*. Caimito: **ACP** = type locality (Suárez & Arredondo 1997: 100 ['*Teratornis* sp.'], Arredondo & Arredondo 2002a: table 1 ['*Teratornis* sp.], 2002b: 16 ['*Teratornis olsoni* sp. nov.']), **ASA** (Suárez & Arredondo 1997: 100 ['*Teratornis* sp.'], Suárez 2000b: 68 ['*Teratornis*'], Suárez & Olson 2009a: 111–112, figs. 4 = coracoid: B–D [dorsal], F [sternal], 5 = humerus: C [palmar], D [ventral], 6 = humerus: C [palmar], D [anconal], E [distal], 8 = tibiotarsi: B–C [anterior]).

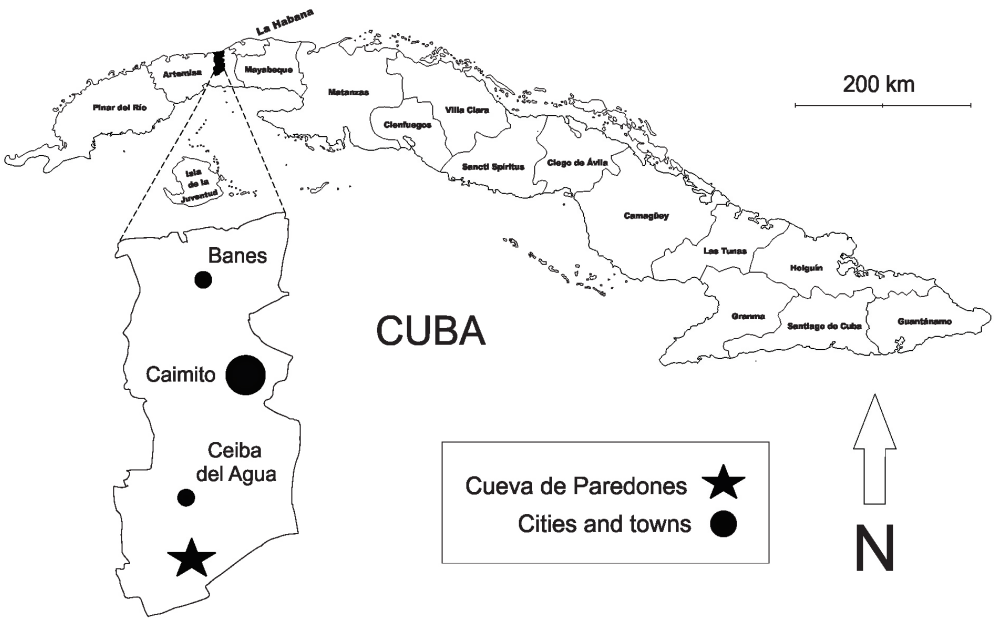


Figure 4. Cueva de Paredones (**ACP**), Caimito, western Cuba. Type locality of †*Oscaravis olsoni* (Arredondo & Arredondo), †*Gymnogyps varonai* (Arredondo) and †*Tyto cravesae* Suárez & Olson.



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*Mayabeque*. Quivicán: **YBL** (Jiménez Vázquez *et al*. 1995: 25 [‘Buitre gigante ind.’], Suárez & Arredondo 1997: 100 [‘*Teratornis* sp.’], Arredondo & Arredondo 2002b: 16 [‘*Teratornis olsoni* sp. nov.’]), **YIN** (Arredondo & Arredondo 2002b: 16 [after correction of the locality of OA 3205, by Suárez & Olson 2009a: 111]). *Matanzas*. Martí: **MLB** (Suárez & Olson 2009a: 112, fig. 8 = tarsometatarsus: E [anterior], Suárez 2020a: 10–12, fig. 5 = tibiotarsus: A [anterior], B [distal], C [medial]; fig. 5 = tarsometatarsi: D [anterior], E [posterior], F [distal]). See ‘Notes’.

***Direct $^{14}$C dating***.—None. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Not rare in Cuban Quaternary fossil localities, wherein it is the only known extinct avian family (Suárez & Olson 2009a). Formerly described (Arredondo & Arredondo 2002b) as a smaller species of the North American genus *Teratornis* L. Miller. Orihuela (2019: 57) erroneously mentioned the limited flight capabilities of the Cuban Teratorn, which is incorrect (see Olson & Alvarenga 2002: 704, Suárez & Olson 2009a: 114). While revising fossil mammals, for a study published elsewhere (Silva Taboada *et al*. 2008), I identified an additional fragmentary specimen referable to Teratornithidae. This was apparently collected in central Cuba by Carlos de la Torre *et al*. during their field work (see Brown 1913, Goldberg *et al*. 2017), but was obviously not seen by Wetmore (1928) for his study of fossil birds from Cuba. This fact probably indicates that the bone is not from Baños de Ciego Montero. The specimen is stored at the Facultad de Biología, Universidad de La Habana, mixed with fragmentary material of mammals of the same colour and degree of mineralisation (recalling fossils from Las Llanadas and sinkhole deposits in northern Villa Clara), and without a catalogue number. Although no precise date, locality or collectors are certainly known, probably the specimen constitutes the first material of the Teratornithidae collected in Cuba, but this requires further study.

The original description of the Cuban Teratorn was published in *Poeyana*, special number 470–475, for 26 May 1999. However, the issue was not printed until more than three years later, on 13 December 2002, as recorded in the Poeyana archives at the Instituto de Ecología y Sistemática (La Habana) library. Following the ICZN (1999, Art. 21.4), the original description of *T. olsoni* must be dated 13 December 2002. The same holds for original descriptions of other taxa published in the same issue, including *Gigantohierax suarezi* Arredondo & Arredondo (see below). Both these species were incorrectly cited as being published in 2003 by Arredondo Antúnez & Arredondo de la Mata (2012) and Arredondo de la Mata & Arredondo Antúnez (2012).

## Order CATHARTIFORMES Coues
## Family CATHARTIDAE Lafresnaye
## Genus *Gymnogyps* Lesson, 1842

*Gymnogyps* Lesson, 1842, *Écho du Monde Sav.* (2)9, no. 44, col. 1037. Type, by monotypy, *Vultur californianus* Shaw.

*Antillovultur* Arredondo, 1972c, *Mem. Soc. Cienc. Nat. La Salle* 31: 310 [for 1971]. Type, by monotypy, *A. varonai* Arredondo.

### 11. †*Gymnogyps varonai* (Arredondo, 1972)
### Cuban Condor (Cóndor Cubano)

*Antillovultur varonai* Arredondo, 1972c, *Mem. Soc. Cienc. Nat. La Salle* 31: 310 [for 1971].

*Antillovultur varonai*: Arredondo 1972c: 310.

*Gymnogyps varonai*: Emslie 1988: 213.

*Antillovultur varoni*: Arredondo 1996: 1 (*lapsus calami*).

*Gymnogyps* sp.: Suárez & Arredondo 1997: 100.



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*Antillobultor varonai*: Pradas 1998: 7 (*lapsus calami*).
*Gymnogyps varonae*: Vergara 2003: 454, 456 (*lapsus calami*).
*Gymnnogyps varonai*: Suárez 2004c: 15 (*lapsus calami*).

***History***.—*7 September 1959*: Arredondo and members of GEC collect the type series in a cave deposit in west Cuba (Arredondo 1972c: 209). *5 February 1971*: first news published of 'un Buitre cubano extinguido…aparentemente de la talla del actual Cóndor de los Andes' ['an extinct Cuban vulture...apparently about the size of the living Andean Condor'] (Arredondo 1971: 96). *1972*: original description (after March 1972, not '1971', see 'Notes') of '*Antillovultur*' *varonai* published (Arredondo 1972c). *May 1978*: S. L. Olson comments on similarities between the extinct genus *Antillovultur* and living *Gymnogyps* (Olson 1978: 103–104). *June 1988*: Cuban Condor treated as *Gymnogyps varonai* (Emslie 1988: 222). *1 February 2000*: cranial and postcranial elements from cave, asphalt and sinkhole deposits described, further evidencing it is a *Gymnogyps* (Suárez 2000a). *23 April 2003*: redescription of *G. varonai* published after first direct comparison with living and extinct North American congenerics (Suárez & Emslie 2003). *22 May 2020*: direct $^{14}$C dating published, on material from asphalt deposits (Suárez 2020a: table 2).

***Holotype***.—Proximal fragmentary left tarsometatarsus, DPUH 1254 (Arredondo 1972c, figs. 1—not 'MPUH' (*lapsus calami*) as in the figure legend—[anterior], 2*A [anterior], 3*D [anterior], 1976, figs. 1: A [anterior], B [posterior], 2*C [anterior], Suárez 2000a, fig. 1: 'A' = left [anterior], 'B' = right [posterior]). Collected 7 September 1959 by Oscar Arredondo [with Manuel Acevedo-González, Juan N. Otero and Walter M. Acevedo-González (see Morejón 1974: 85)], in 'Salón del Pozo', at the type locality (Arredondo 1972c: 309, 311).

***Other material***.—**Vertebra**: incomplete '7th' cervical, OA 848. **Humerus**: left lacking proximal end, GEC P-80, formerly GEC unnumbered, at CZACC (Arredondo 1972c: figs. 4 [palmar], 5*C: left [anconal], right [dorsal], 1976, fig. 1C [palmar]). **Tarsometatarsus**: trochlea IV of left, OA 847 (Arredondo 1972c: fig. 3*D [anterior], 1976: fig. 2*C [anterior]). See Arredondo (1972c: 311).

***Type locality***.—Cueva de Paredones (**ACP**), *c*.3 km south-west of Ceiba del Agua, municipality of Caimito [formerly San Antonio de los Baños], Artemisa [formerly La Habana] province, Cuba (Arredondo 1972c: 311). Fig. 4.

***Distribution***.—Cave, asphalt and sinkhole deposits over Cuba's main island (see Appendix). *Pinar del Río*. Minas de Matahambre: **PPD** (Suárez 2000a: 113). *Artemisa*. Caimito: **ACP** = type locality (Arredondo 1971: 96 [see 'History'], 1972a: table 1 ['Especie de Buitre ligeramente mayor que un Cóndor'], 1972c: 310 ['*Antillovultur varonai* n. gen., n. sp.'], 1975: 151 ['*Antillovultur varonai*'], Suárez & Arredondo 1997: 100 ['*Gymnogyps* sp.'], Suárez 2000a: 113, fig. 2* = tarsometatarsus: A [anterior], B [posterior], Suárez & Emslie 2003: 30, fig. 4 = tarsometatarsi: middle [anterior], right [anterior], Arredondo & Arredondo 2002a: table 1 ['*Antillovultur varonai*'], 2002b: table 1 ['*Antillovultur varonai*']), **ASA** (Suárez 2000a: 112–113, 2000b: 68 ['*Gymnogyps*'], 2004a: 124, Arredondo & Arredondo 2002a: table 1 ['*Antillovultur varonai*']). *Mayabeque*. Quivicán: **YIN** (Suárez 2000a: 113). *Matanzas*. Martí: **MLB** (Suárez 2000a: 112, fig. 4* = rostrum: A [dorsal], B [lateral], Iturralde-Vinent *et al*. 2000: table 2, Suárez & Emslie 2003: 30, fig. 2 = rostrum: middle [lateral], Suárez 2020a, fig. 7: A = humerus [anconal], B = coracoid [ventral], C = carpometacarpus [ventral], D = tibiotarsus [anterior], E = tibiotarsus [distal], F–J = tarsometatarsus: F [anterior], G [proximal], H [posterior], I [anterior], J [distal]). *Villa Clara*. Corralillo: **VSM** (Pradas 1998: 7 ['*Antillobultor* [*sic*] *varonai*'], Suárez 2000a: 112, fig. 3* = skull: A [dorsal], B [lateral], C [posterior], Suárez & Emslie 2003: 30, figs. 1 = skull: top row, middle [dorsal], bottom row, middle [posterior], 3 = tibiotarsus: left [anterior], Arredondo Antúnez & Villavicencio Finalet 2006: 163, tables I–II). *Holguín*.


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Mayarí: **OCS** (Arredondo 1984: 8 [‘*Antillovultur varonai*’], 1996: 1 [‘*Antillovultur varoni* [*sic*]’. This record has been cited with reservations, see Suárez 2000a, fig. 5]).

***Direct $^{14}C$ dating***.—Late Pleistocene (MLB): >41,000 $^{14}C$ yr BP (Suárez 2020a: table 2, tibiotarsus).

***Notes***.—The commonest cathartid in Cuban Late Pleistocene / Early Holocene deposits, from where it is known by most of its skeletal elements (Suárez 2000a, 2020a, Suárez & Emslie 2003). Approximately the same size (not ‘bigger’, as incorrectly indicated by Gutiérrez Domech 2010: 12, Gutiérrez Domech *et al*. 2018: 42) as Andean Condor *Vultur gryphus* Linnaeus, 1758, and larger than California Condor *Gymnogyps californianus* (see Arredondo 1971: 96, 1972c: 311, 1976: 172, 1984: 8). Comments on the taxonomic status of Cuban Condor by Navarro (2020: 51) are outdated, overlooking the taxon’s redescription (Suárez & Emslie 2003). The original description of *Antillovultur* (= *Gymnogyps*) *varonai* was not published in September–December 1971, as appears on *Mem. Soc. Cienc. Nat. La Salle* 31(90). Some evidence indicates it was printed after the description (March 1972) of the extinct barn owl *Tyto noeli* Arredondo, and probably before that of ‘*T. riveroi*’ Arredondo (December 1972 [but see Arredondo 1975: 159, 189]). On 5 February 1971, Arredondo (1971: 95–96) commented about his discoveries and progress with investigations concerning the two large *Tyto* species and the condor. Of the barn owls, he wrote that ‘aunque están descritas, no han sido aún dadas a conocer como especies nuevas’ [‘although they are described, they have not yet been released as new species’], and concerning the condor, ‘aún no está descrita, pero en un futuro se dará a conocer’[‘it is not yet described, but in the future it will be released’], indicating that both *Tyto* manuscripts were finished (one being in press, see Arredondo 1970b: 151) and he expected them to be published before that of the condor, which was still not finished. This accords with the original description of *T. noeli* (supposedly published 3–4 months after the condor paper), wherein the condor is listed in a table without a scientific name (Arredondo 1972a: table 1). This seems logical, as Arredondo had no means of easily modifying manuscripts in press outside Cuba (in this case Venezuela) (O. Arredondo pers. comm.). But, the barn owl paper, supposedly published a year after ‘*A*’. *varonai*, is cited in the condor’s original description as a source that had previously mentioned the presence of this scavenger in Cuba, with a precise indication of page numbers (Arredondo 1972c: 309, 322), year (= 1972), month (= March), and even the scientific name of the tytonid (Arredondo 1972c: 319, table 1). Or, in other words, a publication from 1972, is cited in all its details in a paper supposedly published the previous year, 1971. More precise information exists in an article on the history of the discovery of Cuban Condor and other fossil raptors by Arredondo, published by Morejón (1974: 85): ‘En septiembre de 1959 un grupo de investigadores, entre los cuales se encontraban...Manuel Acevedo-González, Juan N. Otero y Walter M. Acevedo-González, todos espeleólogos; y el paleontólogo Arredondo, encontraron en…la Cueva de Paredones...huesos de un ave que muy posteriormente, en 1972, pudieron ser clasificados como pertenecientes a una especie de buitre mayor que el actual cóndor de California. Se trata de un nuevo género y una nueva especie, y recibió la denominación de “Antillovultur varonai”...’ [‘In September 1959, a group of researchers, among them...Manuel Acevedo-González, Juan N. Otero and Walter M. Acevedo-González, all speleologists, and the palaeontologist Arredondo, found in...Cueva de Paredones...bones of a bird that much later, in 1972, was finally classified as belonging to a species of vulture larger than the living California Condor. It is a new genus and a new species, and received the name of “Antillovultur varonai”...’]. Considering the evidence from these papers, the publication date of the condor cannot be in the last quarter of 1971, but sometime after March 1972. Delays, even of a year, in the printing of some issues of *Mem. Soc. Cienc. Nat. La Salle* were common at the time (F. Rojas *in litt*.


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2021). As the precise date is unknown, according to the ICZN (1999, Art. 21.3 and 21.4), the date of publication for *Antillovultur* (= *Gymnogyps*) *varonai* Arredondo to be adopted is 31 December 1972, rather than September–December 1971, as has been generally accepted by the palaeontological community.

## Genus *Coragyps* Le Maout, 1853

*Coragyps* Le Maout, 1853, *Hist. Nat. Oiseaux*, p. 57, 66. Type, by monotypy, *Vultur urubu* Vieillot = *Vultur atratus* Bechstein.

### 12. †*Coragyps seductus* Suárez, 2020

Cuban Black Vulture (Zopilote Cubano)

*Coragyps seductus* Suárez, 2020a, *Zootaxa* 4780: 12.

***History***.—*May 2001*: first notification of an extinct small vulture 'larger than *C. aura*' from Cuba (Suárez 2001b: 110). *25–27 December 2002*: WS & Stephen Díaz Franco collect paratypes in San Felipe II, at the type locality. *22 May 2020*: original description published (Suárez 2020a).

***Holotype***.—Near-complete left tarsometatarsus, MNHNCu 75.4719 (Suárez 2020a: 12, fig. 6: A [anterior], B [posterior], C [distal]). Collected in San Felipe II on 24 February 2001 by WS and Stephen Díaz Franco (Suárez 2020a: 3).

***Other material***.—**Femur**: proximal half of left lacking trochanter, MNHNCu 75.4718 (fig. 6: E [anterior], F [posterior]). **Tarsometatarsus**: proximal left, MNHNCu 75.4720 (fig. 6: D [proximal]). Cited material and figures are from Suárez (2020a).

***Type locality***.—Las Breas de San Felipe (**MLB**), *c*.5.5 km west of town of Martí, San Felipe Valley, municipality of Martí, Matanzas province, Cuba (Suárez 2020a: 12; for description of the deposit, see Iturralde-Vinent *et al*. 2000). Fig. 5.

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (Suárez 2020a: 12).

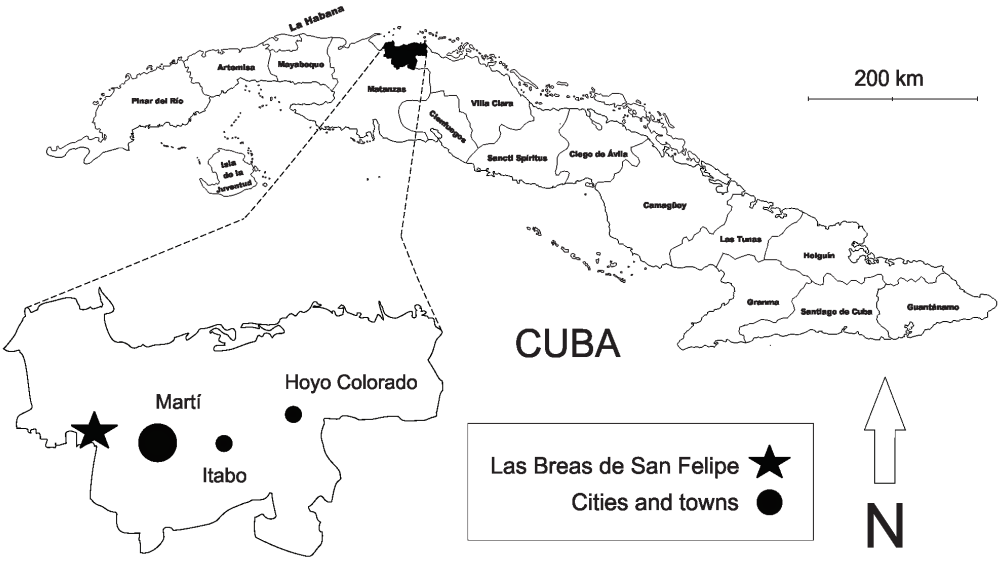


Figure 5. Las Breas de San Felipe (**MLB**), Martí, western Cuba. Type locality of †*Coragyps seductus* Suárez, †*Cathartes emsliei* Suárez & Olson, †*Gigantohierax itchei* Suárez, †*Buteogallus royi* Suárez, †*Buteo sanfelipensis* Suárez, †*Milvago carbo* Suárez & Olson and †*M. diazfrancoi* Suárez.



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***Direct $^{14}$C dating***.—None. For dating of other bird species at the type locality, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—The rarest extinct Cuban cathartid, restricted to its type locality. Larger and more robust than living Black Vulture *Coragyps atratus* (Bechstein, 1793) and similar in size to extinct *C. occidentalis* (L. Miller, 1909), but with tarsometatarsus slender, among other characters (Suárez 2020a: 12). Also, proximal foramina of the tarsometatarsus are more distally placed in the two Cuban specimens available (S. L. Olson & WS unpubl.) than in congeneric species, but this can be variable and requires further evaluation of additional, insular fossil material. A distal fragment of carpometacarpus from a cave deposit in ASA, western Cuba, probably involves this taxon, but it is insufficient in diagnostic characters for a positive identification (Suárez 2020a: 13). As with Cuban Condor, the Cuban Black Vulture seems to have diverged during the Quaternary, after colonisation probably from Florida, evolving rapidly in isolation and depending on an endemic, insular 'megafauna', where competitive carnivorous mammals were absent (see Arredondo 1976: 170, Morgan *et al*. 1980: 606, Suárez 2000a: 120, Suárez & Emslie 2003: 36, Silva Taboada *et al*. 2008: 328–329, Suárez & Olson 2020b: 341).

March (1863: 150–151) reported vultures observed and prepared for collection by him in Jamaica, including the 'John Crow Vulture [= *Cathartes aura*]', 'The Black, or Carrion Crow Vulture [= *Coragyps atratus*]' and another, unknown vulture species, of which he stated: 'In the autumn of 1828, I obtained from Great Salt Pond a specimen of a black Vulture, mottled with white spots, about the size of *Pandion carolinensis*. It was so obese, with deep fulvous fat, that I had much difficulty in preserving it in part. I sent the specimen to the Royal Dublin Society, but have received no information of its having been identified with any described species.' The specimen, or material that matches March's description, are unknown in the Dublin collection (P. Viscardi *in litt*. 2021). William T. March (1804–72) was a Jamaican native naturalist and collector (see Levy 2008, 2013). Although the bird he collected in 1828 could have been a leucistic *Cathartes aura* (see Zeiger *et al*. 2017), it is also possible that it was an individual of the Cuban (Antillean?) extinct species *Coragyps seductus*, which was larger than *C. atratus* (Suárez 2020a). If the skin still exists, and its identity, are the subject of pending investigations.

## Genus *Cathartes* Illiger, 1811

*Cathartes* Illiger, 1811, *Prodromus Syst. Mamm. Av*., p. 236. Type, by subsequent designation, *Vultur aura* Linnaeus.

### 13. †*Cathartes emsliei* Suárez & Olson, 2020

Emslie's Vulture (Aura de Emslie)

*Cathartes emsliei* Suárez & Olson, 2020b, *Bull. Brit. Orn. Cl*. 140: 335.
*Cathartes aura*: Jiménez Vázquez & Valdés Ruiz 1995: 62.
*Cathartes*? sp.: Suárez 2000a: 120.
*Cathartes* sp.: Arredondo & Arredondo 2002a: table 1.

***History***.—*1997*: first identified specimen (tarsometatarsus) of the type series collected by WS in a cave deposit in west Cuba (Suárez & Olson 2020b: 335). *February 2000*: comment published, clarifying that Turkey Vulture *C. aura* (Linnaeus, 1758) is unknown in Cuba from Pleistocene / Early Holocene deposits, where fossils represent another taxon (Suárez 2000a: 120). *May 2001*: the presence of two additional 'undescribed, smaller species' of vultures from Cuba is reported (Suárez 2001b: 110). *2020*: first record from asphalt deposits (22 May)


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at Las Breas de San Felipe, west Cuba (Suárez 2020a: 14), and the original description (21 September) of *C. emsliei* is published (Suárez & Olson 2020b).

***Holotype***.—Proximal half of left tarsometatarsus, MNHNCu 75.4752 (Suárez & Olson 2020b: 336, fig. 3: B [anterior], E [posterior]). Collected in San Felipe I on 27 December 2002 by WS and Stephen Díaz Franco (see Suárez 2020a: 3).

***Other material***.—**Scapula**: right, MNHNCu 75.692, formerly P-692 (fig. 1B [ventral]). **Coracoid**: fragmentary left, MNHNCu 75.4755, formerly P-691 (fig. 1D [dorsal]). **Tibiotarsus**: right without proximal end, MNHNCu 75.4750 (fig. 2A [anterior]); distal right, MNHNCu 75.4754, MNHNCu 75.4749 (fig. 2C [anterior]); distal left, MNHNCu 75.4748. **Tarsometatarsus**: proximal right, MNHNCu 75.4745, MNHNCu 75.4753, WS 778—immature (fig. 3: A [anterior], D [posterior]); distal half of right, MNHNCu 75.4746 (fig. 3: H [anterior], J [posterior]); proximal half of left, MNHNCu 75.4747; distal half of left, MNHNCu 75.4751 (fig. 3: G [anterior], I [posterior]). Cited material and figures are from Suárez & Olson (2020b).

***Type locality***.—Las Breas de San Felipe (**MLB**), *c*.5.5 km west of the town of Martí, San Felipe Valley, municipality of Martí, Matanzas province, Cuba (Suárez & Olson 2020b: 338; for description of the deposit, see Iturralde-Vinent *et al*. 2000). Fig. 5.

***Distribution***.—Cave, asphalt and sinkhole deposits in west and central Cuba (see Appendix). *Artemisa*. Caimito: **ACP** (WS unpubl.), **ASA** (Suárez 2004a: 124 ['a small species of vulture'], Suárez & Olson 2020b: 338). *Mayabeque*. San José de las Lajas: **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 ['*Cathartes aura*'], Rojas Consuegra *et al*. 2012: 10 ['*Cathartes* sp.', after being re-identified by WS (= '*C. aura*' of Jiménez Vázquez & Valdés Ruiz 1995)], Suárez & Olson 2020b: 335). *Matanzas*. Martí: **MLB** = type locality (Suárez 2020a: 14 ['*Cathartes* sp.'], Suárez & Olson 2020b: 336 ['*Cathartes emsliei* sp. nov.']). *Villa Clara*. Corralillo: **VSM** (WS unpubl.).

***Direct $^{14}C$ dating***.—None. For dating of other bird species at the type locality, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}C$ BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Uncommon in Quaternary deposits on the main island. Postcranial elements smaller compared to specimens of living *C. aura* (Suárez 2001b, 2004a, Suárez & Olson 2020b). Scarce material of *C. emsliei* from cave deposits in west Cuba, and from sinkhole deposits in Villa Clara province, central Cuba, are present at CZACC and AC, respectively (WS unpubl.). Emslie's Vulture is comparable in size to the extinct, tiny *Wingegyps cartellei* Alvarenga & Olson, 2004, from the Pleistocene of Brazil (see Nascimento & Silveira 2020: 502–503), but the latter is similar to *Gymnogyps* condors rather than to *Cathartes* (Alvarenga & Olson 2004: 3).

## Order ACCIPITRIFORMES Vieillot
## Family ACCIPITRIDAE Vieillot
## Genus †*Gigantohierax* Arredondo & Arredondo, 2002

*Gigantohierax* Arredondo & Arredondo, 2002a, *Poeyana* 470–475: 10 [for 1999]. Type, by original designation, *G. suarezi* Arredondo & Arredondo.

*Gygantohierax* Arredondo Antúnez & Arredondo de la Mata 2012: 298 (*lapsus calami*).

### 14. †*Gigantohierax suarezi* Arredondo & Arredondo, 2002
Suárez's Giant Eagle (Águila Gigante de Suárez)

*Gigantohierax suarezi* Arredondo & Arredondo, 2002a, *Poeyana* 470–475: 10 [for 1999].

*Aquila borrasi*: Arredondo 1970a: 3 (part).

*Titanohierax borrasi*: Olson & Hilgartner 1982: 28 (part).



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***History***.—*July 1954*: first material collected by members of SEC in a cave deposit in western Cuba (Arredondo 1955: 29, 1958: 11, 1961: 20, 1964: 19, 1970a: 1–2, 1971: 94). *December 1955*: a drawing of an ungual phalanx, digit I, is labelled 'ave prehistórica, tal vez andadora' ['prehistoric bird, maybe a walker'] (Arredondo 1955: 26). *July 1958*: an incomplete right femur and the same ungual phalanx are figured and tentatively identified as a supposed larger species of terror bird than *Ornimegalonyx oteroi* (see Arredondo 1958). The length of the phalanx is compared to one of '*Phororhacos longissimus*' (Arredondo 1958: 11). *27 March 1959*: B. Patterson (MCZ, *in litt*. to O. Arredondo) mentions a large eagle identified (see 'Notes') among Cuban material sent to him for study (Arredondo 1964: 21, 1970a: 2). *1961*: first published notice in Cuba of an extinct eagle from the island (Arredondo 1961: 20; see also Arredondo 1964: 19, 21, 90). *January 1970*: original description of '*Aquila*' *borrasi* published (Arredondo 1970a) based on a composite type series including some specimens at MCZ (Arredondo 1970a: 3–4, see *Buteogallus borrasi*). *5 August 1982*: species transferred to extinct genus *Titanohierax* Wetmore (Olson & Hilgartner 1982: 28). *16 February 1995*: Jesús Martínez González and WS collect the holotype (Arredondo & Arredondo 2002a: 9). *13 December 2002*: original description (not '26 May 1999', see 'Notes' under *Oscaravis olsoni*) of *Gigantohierax suarezi* is published (Arredondo & Arredondo 2002a: 10). The type series includes some large specimens at MCZ, formerly described as '*Aquila*' *borrasi*. *22 May 2020*: first record in asphalt deposits, with description of previously unknown skeletal elements (Suárez 2020a: 22–25).

***Holotype***.—Left femur, MNHNCu 75.574, original number 'MNHNH. P-574' (Arredondo & Arredondo 2002a: 10, figs. 1* [anterior], 3*A [posterior]; see Díaz-Franco 2004: 156, Herrera-Uria *et al*. 2015: 114). Collected 16 February 1995 by Jesús Martínez González and WS in the deposit known as El Sumidero (see Suárez 2000b) at the type locality (Arredondo & Arredondo 2002a: 9). The holotype was not 'discovered since the late 1950s' (*contra* Orihuela 2019: 60).

***Other material***.—**Femur**: right lacking trochanter and condyles, SEC P-26, at MCZ (Arredondo 1958: 12, fig. left unnumbered: top [anterior], 1964: 19, fig. left unnumbered: right [anterior], 1970a: 4, fig. 7 [anterior], 1971: 96, fig. top left unnumbered: A, left [anterior], Arredondo & Arredondo 2002a: 9–10, fig. 2* [anterior]). **Tarsometatarsus**: three shaft fragments of right, WS 80120.E. **Phalanges**: ungual phalanx, digit I, SEC P-31, at MCZ (Arredondo 1955: 27, fig. unnumbered*: centre [lateral], 1958: 10, fig. left unnumbered*: 2 [lateral], 12, fig. left unnumbered: middle right [lateral], 1970a: 4, fig. 3A [lateral], 1971: 96, fig. top left unnumbered: A, top [lateral], bottom* [lateral], Arredondo & Arredondo 2002a: 9–10, fig. 4A*:[lateral]).

***Type locality***.—Cueva de Sandoval (**ASA**), *c*.4 km south of Vereda Nueva, municipality of Caimito, Artemisa [formerly La Habana] province, Cuba (Arredondo & Arredondo 2002a: 10). Fig. 6.

***Distribution***.—Cave, asphalt and sinkhole deposits in west and central Cuba (see Appendix). *Artemisa*. Caimito: **ACP** (Arredondo 1955: 26 ['ave prehistórica, tal vez andadora'], 1958: 11 ['especie mucho mayor'], 1964: 19 ['Aguila cubana de la prehistoria'], 1970a: 4 ['*Aquila borrasi* sp. nov.'(part)], figs. 5*A= ungual phalanx [lateral], 9* = ungual phalanx [lateral], see 'Notes' under *Buteogallus borrasi*; 1971: 96 ['*Aquila borrasi* (part)'], Arredondo & Arredondo 2002a: 9–10; WS unpubl.), **ASA** = type locality (Suárez 2000b: table 1 ['Accipitridae indeterminate'], Arredondo & Arredondo 2002a: 10 ['*Gigantohierax suarezi* n. gen., n. sp.']), **ACF** (Arredondo & Arredondo 2002a: 10). *Mayabeque*. Quivicán: **YIN** (WS unpubl.). *Matanzas*. Jagüey Grande: **MFJ** (WS unpubl.), Martí: **MLB** (Suárez 2020a, fig. 11 = humerus: A [palmar], B [anconal], C = carpometacarpus [external], D = tarsometatarsus [distal], E [idem: anterior], F [idem: medial], G [idem: posterior], H = digit


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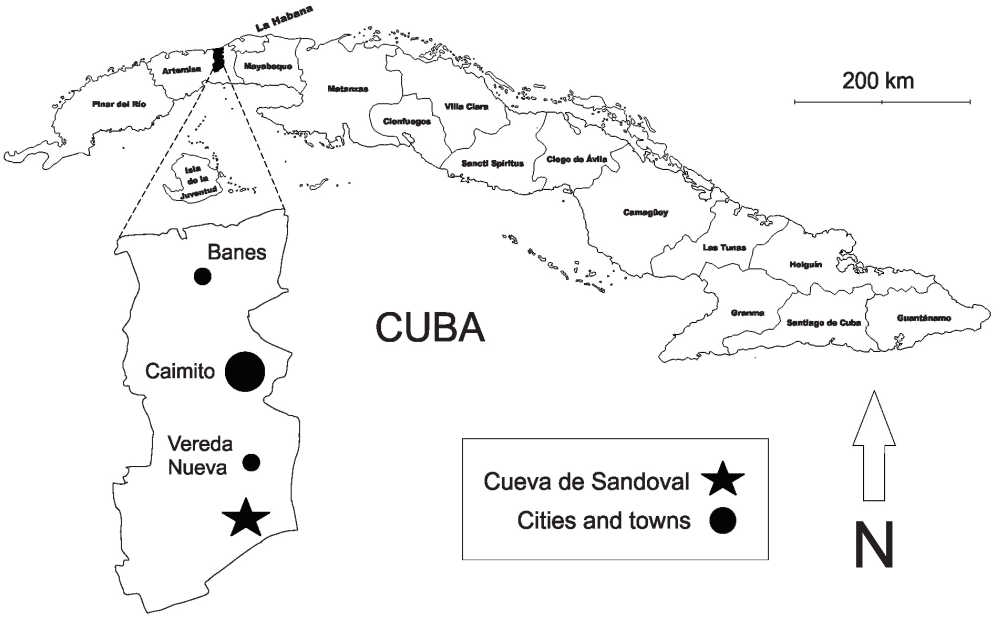


Figure 6. Cueva de Sandoval (**ASA**), Caimito, western Cuba. Type locality of †*Gigantohierax suarezi* Arredondo & Arredondo and †*Falco kurochkini* Suárez & Olson.

I, phalanx 1 [dorsal], I = ungual phalanx, digit I [lateral]). *Villa Clara*. Sagua La Grande: **VCB** (WS unpubl.).

***Direct $^{14}$C dating***.—None. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Common in Cuban Quaternary deposits. This taxon is the largest Accipitridae ever known from the Americas, larger than the living Harpy Eagle *Harpia harpyja* (Linnaeus, 1758) or any of the extinct described species there (Arredondo & Arredondo 2002a: 10, Suárez 2020a: 22); the genus seems to have been also present on Hispaniola (Suárez 2020a: 25). Another paratype of *Aquila* (= *Buteogallus*) *borrasi*, the ungual phalanx GEC unnumbered, at CZACC, from ACP (Arredondo 1970a: 4), is referred herein to *G. suarezi* (see 'Notes' under *B. borrasi*). According to B. Patterson's notes comparing fossil material from Cuba with museum specimens, femur SEC P-26 (see 'Other material') was considered by him as a 'Giant Cuban Cathartid', instead of 'Accipitridae', as he identified other bones in the sample. Arredondo correctly assumed (*contra* Patterson's notes) that the largest femur was an Accipitridae (now *G. suarezi*), and included it in the type series of '*Aquila*' *borrasi* (see Arredondo 1970a: 4, Arredondo 1984: 11). On the other hand, the skeleton of *G. suarezi* is similar to some Old World vultures in characters (Suárez & Olson 2021: 264, Suárez *et al*. unpubl.), which confused B. Patterson to the point that he considered the large Cuban femur as belonging to a cathartid. A more complete study of the anatomy and relationships of this taxon will be presented elsewhere (Suárez *et al*. unpubl.).

### 15. †*Gigantohierax itchei* Suárez, 2020
Itche's Eagle (Águila de Itche)

*Gigantohierax itchei* Suárez, 2020a, *Zootaxa* 4780: 25.


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***Holotype***.—Distal third of right tarsometatarsus lacking trochlea IV, MNHNCu 75.4869 (Suárez 2020a: 25, fig. 11: M [anterior], N [medial], O [posterior], P [distal]). Collected in San Felipe II, during 25–28 November 1998 by members of the Depto. de Geología y Paleontología, MNHNCu (see 'Type locality').

***Other material***.—**Femur**: proximal end of fragmentary right, MNHNCu 75.4725 (Suárez 2020a: 25, fig. 11: J [anterior], K [posterior], L [lateral]).

***Type locality***.—Las Breas de San Felipe (**MLB**), *c*.5.5 km west of the town of Martí, San Felipe Valley, municipality of Martí, Matanzas province, Cuba (Suárez 2020a: 25; for description of this deposit see Iturralde-Vinent *et al*. 2000). Fig. 5.

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (Suárez 2020a: 25).

***Direct $^{14}$C dating***.—None. For dating of other bird species at the type locality, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Very rare. Unknown from other Quaternary deposits in Cuba. This taxon is *c*.29% smaller than *Gigantohierax suarezi*. The holotype, MNHNCu 75.4869, was for some time held in the same collection under the incorrect catalogue number P4569, preoccupied by material of *Milvago carbo* (see below).

## Genus *Buteogallus* Lesson, 1830

*Buteogallus* Lesson, 1830, *Traité d'Orn*., livr. 2, p. 83. Type, by monotypy, *B. cathartoides* Lesson = *Falco aequinoctialis* J. F. Gmelin.

### 16. *Buteogallus* cf. †*B. fragilis* (L. Miller, 1911)

Fragile Eagle (Águila Frágil)

*Geranoaëtus fragilis* L. Miller, 1911, *Univ. California Publ. Bull. Dept. Geol*. 6: 315.
*Urubitinga fragilis*: Howard 1932: 16.
*Buteogallus fragilis*: Howard 1946: 117.

***Holotype***.—Left tarsometatarsus, UCMP 12757 (Miller 1911: 315, fig. 5*: A [proximal], B [anterior]).

***Type locality***.—Rancho La Brea, Los Angeles, California, USA (Miller 1911; see Howard 1932, Wetmore 1956: 45, Brodkorb 1964: 269).

***Referred material***.—**Tibiotarsus**: distal end of right, MNHNCu 75.4735 (fig. 8I [anterior]). **Tarsometatarsus**: distal shaft segment of left, MNHNCu 75.4736 (fig. 8J [posterior]). Cited material and figures are from Suárez (2020a).

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (San Felipe II, Suárez 2020a: 17).

***Direct $^{14}$C dating***.—None in Cuba. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Extremely rare in the archipelago, where unknown outside tar seeps. The Cuban material referred to *B. fragilis* constitutes the first record of this taxon in the West Indies and outside continental America (Suárez 2020a: 17).

### 17. †*Buteogallus borrasi* (Arredondo, 1970)

Borrás's Hawk (Gavilán de Borrás)

*Aquila borrasi* Arredondo, 1970a (part), *Cienc. Biol. Univ. Habana* (4)8: 3.
*Aquila borrasi*: Arredondo 1970a: 3 (part).


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*Aquila borraisi*: Acevedo González *et al*. 1975: VIII (typographical error).
*Aquila* sp.: Fischer 1977: 214.
*Sarcoramphus* sp.: Acevedo-González & Arredondo 1982: table 1.
*Titanohierax borrasi*: Olson & Hilgartner 1982: 28 (part).
*Sarcoramphus* sp.?: Arredondo 1984: 9.
*Aquila* sp.: Arredondo 1984: 12.
*Titaniohierax borrasi*: Milberg & Tylberg 1993: 243 (*lapsus calami*).
*Sarcoramphus*? sp.: Suárez 2000a: 120.
*Tytanohierax borrasi*: Vergara 2003: 454 (*lapsus calami*).
*Aquila borrage*: Newton 2003: 267 (*lapsus calami*).
'*Aquila*' *borrasi*: Suárez 2004a: 121.
*Buteogallus borrasi*: Suárez & Olson 2008: 289.
*Buteogallus borras*: Hunt & Lucas 2018: 285 (*lapsus calami*).
*Aguila borrasi*: Orihuela 2019: 60 (*lapsus calami*).

**History**.—*27 March 1959*: B. Patterson (MCZ, *in litt*. to O. Arredondo) reports a large eagle identified in the Cuban material sent to him for study (Arredondo 1964: 21). *1961*: first published notification in Cuba about the presence of an extinct eagle on the island (Arredondo 1961: 20; see Arredondo 1964: 19, 21, 90). *February 1968*: Noel González Gotera and Arredondo collect the holotype in a cave deposit in western Cuba (Arredondo 1970a: 2). *January 1970*: original description of *Aquila borrasi* published (Arredondo 1970a), based on a composite type series including material at MCZ (Arredondo 1970a: 3–4, see *Gigantohierax suarezi*). *5 August 1982*: species transferred to the extinct genus *Titanohierax* Wetmore (Olson & Hilgartner 1982: 28). *December 2000*: first record in Cuban asphalt deposits (Iturralde-Vinent *et al*. 2000: table 2). *13 December 2002*: two large specimens of the type series included in the original description of *Gigantohierax suarezi* (Arredondo & Arredondo 2002a). *April 2004*: generic position of *Titanohierax borrasi* questioned by Suárez (2004a: 124). *2008*: Borrás's Hawk redescribed on basis of additional fossil material and reassigned to *Buteogallus* (Suárez & Olson 2008: 289).

***Holotype***.—Left tarsometatarsus lacking distal end, DPUH 1250 (Arredondo 1970a: 4, fig. 1 [anterior], 1971: 96, fig. top left unnumbered: A, centre [anterior], 1976: fig. 3 [anterior]). Collected 11 February 1968 by Noel González Gotera and Oscar Arredondo at the type locality (Arredondo 1970a: 4), in a place known as 'Bolsón de los Huesos del Salón del Depósito' (see Acevedo González *et al*. 1975: 16, 18, figs. 4–5).

***Other material***.—**Phalanges**: pedal phalanx, OA 674 (1000B), at CZACC (Arredondo 1970a: 15, fig.5*: C [lateral], D [dorsal]); ungual phalanx, digit IV, SEC P-32, at MCZ (Arredondo 1970a: 4, fig. 5*: B [lateral]); ungual phalanx, digit IV, OA 675 (1000A), at CZACC (Arredondo 1970a: 14, fig. 4 [lateral]). Three specimens, a femur and two ungual phalanges, formerly paratypes of '*Aquila*' *borrasi*, represent *Gigantohierax suarezi* (see 'History' and 'Notes'). Other material mentioned in the original description at MCZ (Arredondo 1970a: 2, fig. 3: B [lateral], C [lateral], see Olson & Hilgartner 1982: 28), need re-evaluation.

***Type locality***.—Cueva del Túnel (**YTU**), *c*.3 km south-east of La Salud, municipality of Quivicán, Mayabeque [formerly La Habana] province, Cuba (Arredondo 1970a: 4, see Acevedo González *et al*. 1975: 18). Fig. 7.

***Distribution***.—Cave, asphalt and sinkhole deposits in west and central Cuba (see Appendix). *Artemisa*. Caimito: **ACP** (Arredondo 1970a: 4 ['*Aquila borrasi* sp. nov.' (part), see 'Notes']; 1972a: table 1 ['*Aquila borrasi*' (part)], 1972c: table 1 ['*Aquila borrasi*' (part)], 1975: 151 ['*Aquila borrasi*' (part)], 1984: 11 ['*Aquila borrasi*' (part)], 12 ['*Aquila* sp.'], Suárez & Olson 2008: 290–291, fig. 1: A = tarsometatarsus [anterior], fig. 2: A = humerus [anconal], B = ulna [palmar], fig. 3: C = tarsometatarsus [anterior], Arredondo & Arredondo 2002a: table 1 ['*Titanohierax borrasi*']), **ASA** (Suárez 2000b: table 1 ['*Titanohierax borrasi*'], Suárez & Olson 2008: 291, fig. 3: E = tibiotarsus [anterior], Arredondo & Arredondo 2002a: table


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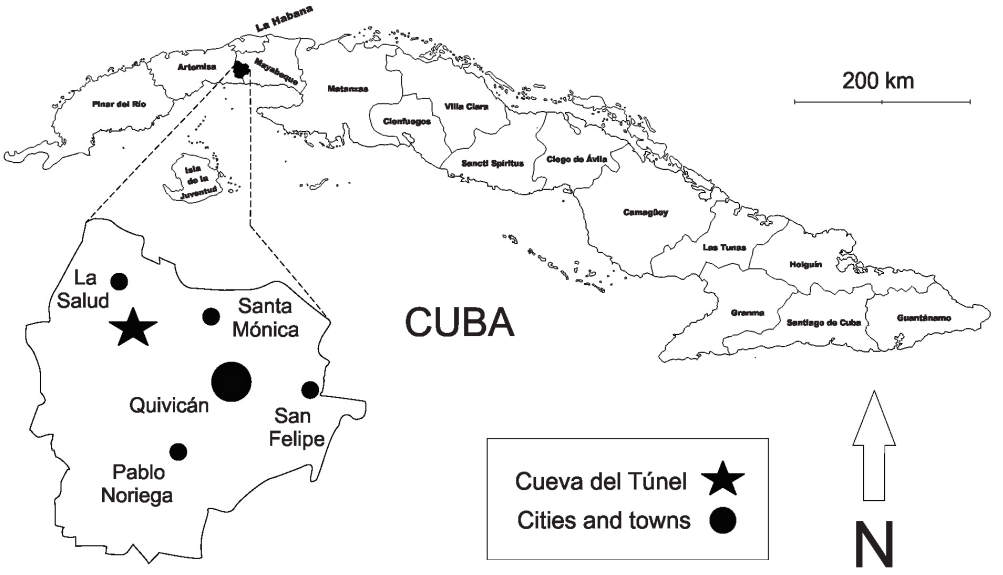


Figure 7. Cueva del Túnel (**YTU**), Quivicán, western Cuba. Type locality of †*Buteogallus borrasi* (Arredondo) and †*Tyto noeli* Arredondo.

1 ['*Titanohierax borrasi*']). Bauta: **ALA** (Fischer 1977: 214 ['*Aquila* sp.'], Arredondo 1984: 12 ['*Aquila* sp.'], Suárez & Olson 2008: 291). *La Habana*. Boyeros: **HCI** (Arredondo 1984: 9–10 ['*Sarcoramphus* sp.?', reidentified by Suárez 2001b: 110, as '*Titanohierax borrasi*', fig. 1* = ulna: A [internal], B [external], C [distal], see section III, Suárez & Olson 2008: 291). *Mayabeque*. Quivicán: **YTU** = type locality (Arredondo 1970a: 3–4 ['*Aquila borrasi* sp. nov.'], 1971: 96 ['*Aquila borrasi*'], 1972a: table 1 ['*Aquila borrasi*'], 1975: 154 ['*Aquila borrasi*'], Acevedo González *et al*. 1975: 18 ['*Aquila borrasi*'], Arredondo 1976: 175 ['*Aquila borrasi*'], Suárez & Olson 2008: 291), **YIN** (Suárez & Olson 2008: 291), **YBL** (Suárez & Olson 2008: 291, fig. 2 = tibiotarsus [anterior]). San José de las Lajas: **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 ['*Titanohierax borrasi*'], Rojas Consuegra *et al*. 2012: 6, 10 ['*Titanohierax borrasi*'], Suárez & Olson 2008: 291), **YCC** (Jiménez & Orihuela 2021: 169). *Matanzas*. Martí: **MLB** (Iturralde-Vinent *et al*. 2000: table 2 ['*Titanohierax borrasi*'], Suárez & Olson 2008: 291–293, Suárez & Olson 2009b, fig. 1: C = tarsometatarsus [anterior], Suárez 2020a: 16–17, fig. 8 = tarsometatarsus: A [anterior], B [posterior], C [proximal], D = tarsometatarsus [posterior], E = tibiotarsus [anterior], F = idem [distal], G = digit I, phalanx 1 [plantar], H = ungual phalanx, digit II [lateral]). *Villa Clara*. Corralillo: **VSM** (Suárez & Olson 2008: 293). Sagua La Grande: **VHC** (Suárez & Olson 2008: 293). *Sancti Spíritus*. Yaguajay: **SPF** (Arredondo 1984: 12 ['*Aquila* sp.'], Suárez & Olson 2008: 293). Jatibonico: **SPL** (Aranda *et al*. 2017: 115 [on p. 118 as '*Buteogallus* sp.'], fig. 1E = digit I, phalanx 1 [ventral], Martínez-López 2019: fig. 5f–g = digit I, phalanx 1: f [ventral], g [dorsal]).

***Direct $^{14}$C dating***.—None. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—The commonest extinct Accipitridae in Cuban fossil deposits (Suárez 2004a, Suárez & Olson 2008, Suárez 2020a). Originally described in *Aquila* Brisson (Arredondo


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1970a), transferred to *Titanohierax* Wetmore (Olson & Hilgartner 1982), and finally redescribed under *Buteogallus* (Suárez & Olson 2008), this is an extinct eagle-size hawk with general morphology resembling the living *B. urubitinga* J. F. Gmelin, 1788, but *c*.33% larger. Material from CCM identified by Wetmore (1928: 3–4) as *Geranoaetus melanoleucus* (Vieillot, 1819) probably is this species (Suárez 2020a: 17, see section II). Arredondo (1984: 11) commented about some femora from PPD (see also Arredondo 1976: 175) that 'parecen corresponder a esta especie' ['seem to correspond to this species']. I have found no evidence, until now, of large Accipitridae at this locality. The paratype ungual phalanx, digit I, GEC unnumbered, at CZACC, from ACP (see Arredondo 1970a: 4, figs. 5*A, 9* [not figures of SEC P-31, *contra* Arredondo & Arredondo 2002a: 9], table 2), is re-identified herein as *Gigantohierax suarezi*, based on its size and characters. Material recorded as '*Titanohierax* cf. *T. gloveralleni*', from Crab Cave, Grand Cayman, Cayman Islands (Morgan 1994: 479–480, fig. 22.5A = mandible [dorsal]), seems to represent one of the large, extinct species of *Buteogallus* now known from Cuba, including Borrás's Hawk (Suárez 2004a, Suárez & Olson 2008, 2021).

### 18. †*Buteogallus royi* Suárez, 2020
Roy's Hawk (Gavilán de Roy)

*Buteogallus royi* Suárez, 2020a, *Zootaxa* 4780: 20.

***Holotype***.—Left tarsometatarsus, MNHNCu 75.4909 (Suárez 2020a: 20, figs. 9C [anterior], 10: A [anterior], B [medial], C [posterior]). Collected in San Felipe I, C area, on 12 May 2009 by WS and Stephen Díaz Franco.

***Type locality***.—Las Breas de San Felipe (**MLB**), *c*.5.5 km west of Martí, San Felipe Valley, municipality of Martí, Matanzas province, Cuba (Suárez 2020a: 21; for description of this deposit see Iturralde-Vinent *et al*. 2000). Fig. 5.

***Other material***.—**Ulna**: distal third of right, MNHNCu 75.4737, San Felipe II (Suárez 2020a: 21, fig. 10: D [dorsal], E [ventral]).

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (San Felipe I and II, Suárez 2020a: 21).

***Direct $^{14}$C dating***.—None. For dating of other bird species at the type locality, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Extremely rare and unknown outside tar seeps in the west of the archipelago. Roy's Hawk is currently the smallest of the known extinct species of *Buteogallus* from Cuba (Suárez 2020a).

### 19. †*Buteogallus irpus* Suárez & Olson, 2021
Wolf Hawk (Gavilán Lobo)

*Buteogallus irpus* Suárez & Olson, 2021, *Bull. Brit. Orn. Cl.* 141: 259.
*Titanohierax gloveralleni*: Woods 1980: 8 (part) [Hispaniola].
*Titanohierax* sp.: Olson & Hilgartner 1982: 28 [Hispaniola].
*Amplibuteo* sp.: Suárez & Arredondo 1997: 100 [Cuba].
*Amplibuteo woodwardi*: Suárez 2004a: 121 [Cuba].

***History***.—*24 April 1978*: Charles Woods (UF) collects the holotype in a cave deposit in the Dominican Republic (Suárez & Olson 2021: 260; see Olson & Hilgartner 1982: 28). *July 1980*: material of large Accipitridae from Hispaniola referred to *Titanohierax gloveralleni* Wetmore by Woods (1980: 8). *5 August 1982*: holotype identified as '*Titanohierax* sp.' by Olson & Hilgartner (1982: 28). *2 March 1995*: paratype collected in a cave deposit in western Cuba (Suárez & Olson 2021: 259; see Suárez 2004a: 121). *Winter 1997*: mentioned for Cuba


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as '*Amplibuteo* sp.' by Suárez & Arredondo (1997: 100–101). *April 2004*: Cuban material compared with continental fossil taxa and identified as *A. woodwardi* L. Miller, but shows some differences interpreted as individual variation (Suárez 2004a: 122). *10 September 2021*: original description of *Buteogallus irpus* published (Suárez & Olson 2021) based on fossils from Hispaniola and Cuba, with the extinct genus *Amplibuteo* Campbell, 1979, treated as synonym of *Buteogallus*.

***Holotype***.—Left tarsometatarsus lacking proximal end, USNM PAL 299573 (Suárez & Olson 2021: figs. 1: A [anterior], B [medial], C [distal], D [posterior], E [lateral], 2: A [anterior]). Collected on 24 April 1978 by Charles Woods, under 60 cm of red earth, at the type locality (Suárez & Olson 2021; see also Olson & Hilgartner 1982: 28).

***Other material***.—**Partial skeleton**: WS 365 (see Suárez 2004a: Figs. 1–2), including: one cervical (axis) and three thoracic vertebrae, seven fragments of ribs, fragmentary pelvis (fig. 2E [lateral]), proximal fragmentary right humerus (fig. 2A [palmar], B [anconal]), distal fragments of left humerus (fig. 2C [palmar]), segment of shaft of left ulna (fig. 2D [palmar]), left fragmentary femur without distal end (fig. 2G [anterior]), proximal and distal fragmentary ends of right femur (fig. 2F–F′ [anterior]), shaft of left tibiotarsus (fig. 2I [posterior]), proximal right fibula (fig. 2H [internal]), left tarsometatarsus lacking inner calcaneal ridge, part of the metatarsal facet, wing of trochlea II, and posterior surface of trochlea III (fig. 1A [anterior], fig. 2J [anterior], K [proximal], L [posterior], Suárez & Olson 2008: fig. 1C [anterior], 2021: fig. 2B [anterior]), left digit I, phalanx 1 (fig. 2M [dorsal]) and phalanx 2 (fig. 2N [lateral]), left digit III, phalanx 2 and phalanx 3, right digit III, phalanx 4 (fig. 2O [lateral]), right digit IV, phalanx 4. Collected on 2 March 1995 by WS. Cited figures are from Suárez (2004a), other than where indicated.

***Type locality***.—Cueva de las Abejas (18°01′N, 71°67′W; elevation *c*.20 m), near Cabo Rojo, 8 km south-east of Pedernales, Pedernales province, Dominican Republic. Quaternary, probably late Pleistocene, but not directly dated (Suárez & Olson 2021: 260; see Olson & Hilgartner 1982: 28, Steadman *et al*. 2019: 321).

***Distribution***.—Cave deposit in west Cuba (see Appendix). *Artemisa*. Caimito: **ASA** ([Sandoval III low deposit, see Suárez 2000b: 67–68] Suárez & Arredondo 1997: 100–101 ['*Amplibuteo* sp.'], Suárez 2004a: 121 ['*Amplibuteo woodwardi*'], Suárez & Olson 2021: 259 ['*Buteogallus irpus*, sp. nov.']).

***Direct $^{14}$C dating***.—None.

***Notes***.—Very rare, known from a single cave deposit in west Cuba and the type locality in south-central Hispaniola (Suárez & Olson 2021). *B. irpus* possesses a tarsometatarsus within the size range of the extinct continental species *B. woodwardi* (L. Miller, 1911) and *B. hibbardi* (Campbell, 1979), but relatively shorter and more robust, with reduced trochleae (Suárez & Olson 2021). Although currently synonyms of the genus *Buteogallus*, both *Harpyhaliaetus* Lafresnaye and *Heterospizias* Sharpe were incorrectly cited in place of the former by Suárez & Olson (2021: 259) when listing characters 9 and 10 of '*Amplibuteo*' described by Campbell (1979: 77). These characters of the distal tarsometatarsus (trochleae) are of specific value and their presence is variable in living and extinct species currently in *Buteogallus*, as partially described by Campbell (1979: 74). The extinct genus *Titanohierax*, described from the Bahamas (Wetmore 1937) and currently unknown outside those islands (Suárez & Olson 2008, Suárez 2020a), was erroneously considered to be more widely distributed in the West Indies (*cf*. Woods 1980, Olson & Hilgartner 1982, Morgan 1977a,b, 1994, Morgan *et al*. 2019). See *Buteogallus borrasi*. A re-evaluation of some fossils representing large members of Accipitridae from continental deposits in North America probably will shed more light on the taxonomy and distribution of *T. gloveralleni*.



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## Genus *Buteo* Lacépède, 1799

*Buteo* Lacépède, 1799, *Tabl. Mamm. Oiseaux*, p. 4. Type, by tautonymy, *Falco buteo* Linnaeus.

### 20. ×*Buteo lineatus* (J. F. Gmelin, 1788)

Red-shouldered Hawk (Gavilán de Hombros Rojos)

*Falco lineatus* J. F. Gmelin, 1788, *Syst. Nat*., edn. 13, vol. 1, pt. 1, p. 268.
*Calohierax quadratus*: Wetmore 1937: 429.
*Buteo* sp.: Olson & Hilgartner 1982: 26.
*Buteo lineatus*: Olson 2000: 60.
*Buteo quadratus*: Oswald & Steadman 2018: 363.
*F*[*alco*]. *lineatus*: Orihuela 2019: 60.

***Referred material***.—**Femur**: proximal end of right, MNHNCu 75.4614 (fig. 1A, right [anterior]). **Tibiotarsus**: distal halves of right, MNHNCu 75.4615 (fig. 1B, right [anterior]), and left, MNHNCu 75.4616; distal end of left, MNHNCu 75.4617. **Tarsometatarsus**: distal halves of right, MNHNCu 75.4618 (fig. 1C, right [anterior]), and left, MNHNCu 75.4619. Cited material and figures are from Suárez & Olson (2003b). Specimens collected in San Felipe II during 25–28 November 1998 (not '1988' as stated [*lapsus calami*] in Suárez & Olson 2003b: 71) by members of Depto. de Geología y Paleontología, MNHNCu. Catalogue numbers for this material in Suárez (2020a: 27) are incorrect.

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (San Felipe II, Suárez & Olson 2003b: 71, Suárez 2020a: 27). For fossil localities in the Bahamas (as '*Buteo quadratus*'), see Steadman & Franklin (2020). For current continental distribution, see Dykstra *et al*. (2020).

***Direct $^{14}$C dating***.—None in Cuba. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Very rare in Cuba (Suárez & Olson 2003b, Suárez 2020a). Orihuela (2019: 60) indicated that 'Cuban remains [of *Buteo lineatus*] were described as "more consistently robust" than the comparative material of the Grey Hawk (*Buteo nitidus*)', but the reverse is true (Suárez & Olson 2003b: 71). Also recorded from Quaternary deposits in the Bahamas (Olson 2000; see Olson & Hilgartner 1982, Steadman & Franklin 2020), where it was originally described (Wetmore 1937) as *Calohierax quadratus* Wetmore. The latter species is considered valid under *Buteo* by some authors (see Oswald & Steadman 2018, Steadman & Franklin 2020).

### 21. †*Buteo sanfelipensis* Suárez, 2020

San Felipe's Hawk (Gavilán de San Felipe)

*Buteo sanfelipensis* Suárez, 2020a, *Zootaxa* 4780: 28.

***Holotype***.—Left tarsometatarsus without trochlea IV, MNHNCu 75.4910 (Suárez 2020a: 28, fig. 10 F [anterior], G [medial], H [posterior]). Collected in San Felipe I on 14 May 2009 by WS and Stephen Díaz Franco.

***Type locality***.—Las Breas de San Felipe (**MLB**), *c*.5.5 km west of the town of Martí, San Felipe Valley, municipality of Martí, Matanzas province, Cuba (Suárez 2020a: 28; for description of this deposit see Iturralde-Vinent *et al*. 2000). Fig. 5.

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (Suárez 2020a: 28).

***Direct $^{14}$C dating***.—None. For dating of other bird species at the type locality, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct


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mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Unknown from other Quaternary deposits in Cuba, being the rarest extinct species of Accipitridae in the country's fossil record. Known only by the tarsometatarsus, which resembles the equivalent element in Swainson's Hawk *B. swainsoni* Bonaparte, 1838, and Rough-legged Buzzard *B. lagopus* (Pontoppidan, 1763) in size and general morphology, but shorter, among other characters (Suárez 2020a: 28). Much larger and distant in morphology to living species in Cuba (see Kirkconnell *et al*. 2020) of the genera *Chondrohierax* Lesson, *Elanoides* Vieillot, *Circus* Lacépède, *Ictinia* Vieillot, or *Rostrhamus* Lesson (S. L. Olson & WS unpubl.), which are currently unknown in the archipelago's fossil record.

## Order STRIGIFORMES Wagler
## Family TYTONIDAE Ridgway
## Genus *Tyto* Billberg, 1828

*Tyto* Billberg, 1828, *Syn. Faun. Scand*., vol. 1, pt. 2, tab. A, p. 2. Type, by monotypy, *Strix flammea* Linnaeus = *Strix alba* Scopoli

### 22. †*Tyto pollens* Wetmore, 1937
Bahamian Giant Barn Owl (Lechuza Gigante de las Bahamas)

*Tyto pollens* Wetmore, 1937, *Bull. Mus. Comp. Zoöl*. 80: 436.
*Tyto riveroi*: Arredondo 1972b: 131.
T[*yto*]. *Triveroi*: Arredondo 1982: 36 (typographical error).
*Tyto pollens*: Suárez & Olson 2015: 539.

***History***.—*1937*: Vivienne Knowles collects the type series in the Bahamas and the original description (October) of *T. pollens* is published (Wetmore 1937). *3 June 1959*: additional specimens from Banana Hole, New Providence, Bahamas, are described and illustrated by Brodkorb (1959: 357–358, pl. 1, figs. 5 = tibiotarsus [anterior], 6 = tarsometatarsus [anterior]). *April 1970*: Manuel Rivero de la Calle presents to O. Arredondo the first known material from Cuba, collected in 'Galería de los Megalocnus', Cueva de Bellamar, western Cuba (Arredondo 1972b: 131). *1972*: original description of '*Tyto riveroi*' published (Arredondo 1972b). *23 September 2015*: first direct comparisons between Bahamian and Cuban giant barn owls (including previously unrecorded material) reveal '*Tyto riveroi*' to be a junior subjective synonym of *T. pollens*, and expand the ancient range of the latter to Cuba (Suárez & Olson 2015).

***Holotype***.—Left femur, MCZ 2262 (Wetmore 1937: 436–437, figs. 10* [anterior], 11* [posterior], 12* [lateral], 13* [distal], 14* [medial]). Collected during early 1937 by Vivienne Knowles (Wetmore 1937: 427, 437).

***Type locality***.—Cave deposit on 'Great Exuma [= Little Exuma *fide* Hecht 1955]', Bahama Islands (Wetmore 1937: 437; see Suárez & Olson 2015: 540).

***Referred material***.—**Tarsometatarsus**: proximal half of right, CZACC unnumbered; proximal end of right, OA 3215 (Suárez & Olson 2015: 539, fig. 6: D [anterior]); distal half of left, DPUH 1252 (holotype of '*T. riveroi*', Arredondo 1972b: 132, figs. 1 [anterior], 2 [posterior], 3 [lateral], 4* = reversed: D, top row [distal], bottom row [anterior], Arredondo 1976: 185, fig. 11: C [anterior], D [posterior], E [lateral], 1982: 39, fig. 2*: left [anterior], right [posterior]). Collected by Manuel Rivero de la Calle in 'Galería de los Megalocnus', Cueva de Bellamar (see Arredondo 1972b: 131, Suárez & Olson 2015: 540).

***Distribution***.—Cave deposit in west Cuba (see Appendix). *Matanzas*. Matanzas: **MBE** (Arredondo 1972b: 132 ['*Tyto riveroi* sp. nov.'], Suárez & Olson 2015: 539). For fossil localities in the Bahamas see Wetmore (1937: 437), Brodkorb (1959: 357–358), Olson & Hilgartner


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(1982: 36–37), Suárez & Olson (2015: 540) and Steadman & Franklin (2020: SI appendix, table S1).

***Direct $^{14}C$ dating***.—None.

***Notes***.—The largest *Tyto* in the Americas (Olson & Hilgartner 1982: 36, Steadman & Hilgartner 1999: 79, Suárez & Olson 2015: 540) and the rarest of the giant barn owls in Cuban fossil deposits (see 'Notes' under *T. cravesae*). *T. pollens* probably evolved in Cuba and subsequently colonised the Bahamas (Suárez & Olson 2015: 549), where it is recorded from Quaternary deposits on some islands of the Great Bahama Bank (Suárez & Olson 2015, Steadman & Franklin 2020).

## 23. †*Tyto noeli* Arredondo, 1972

Noel's Giant Barn Owl (Lechuza Gigante de Noel)

*Tyto noeli* Arredondo, 1972a (part), *Bol. Soc. Venez. Cienc. Nat*. 29: 416.
*Tyto noelli*: Arredondo 1972a: table 5 (*lapsus calami*).
*Tyto neddi*: Steadman & Hilgartner 1999: 76.
*Tyto noelii*: Bolufé Torres 2016: 41 (*lapsus calami*).

***History***.—*7 September 1959*: first material collected by O. Arredondo and members of GEC at a cave deposit in western Cuba (Arredondo 1972a: 416). *3 March 1968*: the holotype is secured by O. Arredondo and N. González Gotera in a cave in western Cuba (Arredondo 1972a: 417). *5 February 1971*: first published news of this extinct large barn owl (Arredondo 1971: 95–96). *March 1972*: original description published (Arredondo 1972a) based on a composite type series (see 'Notes'). *December 2003*: material of *T. noeli* from Cueva El Abrón, western Cuba, is dated ($^{14}C$), the first extinct bird from Cuba to be so analysed (Suárez & Díaz-Franco 2003: 373). *23 September 2015*: first direct comparisons between all large extinct barn owls in the West Indies (Suárez & Olson 2015), with result that '*Tyto neddi*' described on fragmentary material from Barbuda, Lesser Antilles (Steadman & Hilgartner 1999: 76), is considered a junior synonym of *T. noeli*. Fossils from Jamaica are also identified as the latter taxon.

***Holotype***.—Right tarsometatarsus, DPUH 1251 (Arredondo 1972a: 416–417, fig. 1 [anterior], 1972b, fig. 4*B: top [distal], bottom [anterior], 1975: fig. 23B [anterior], 1976: 183, fig. 11B [anterior], 1982: 38, fig. 1 [image with wrong number '3']: right [anterior]). Collected on 3 March 1968 by Noel González Gotera and Oscar Arredondo at the type locality (Arredondo 1972a: 417).

***Other material***.—**Coracoid**: right, OA 839 (Arredondo 1972a: 417, fig. 2 [images in figs. 2 and 4 of the original description are therein reversed]: 6 [ventral], 1976: 183, fig. 10e: right [ventral]). **Ulna**: proximal, OA 806 (Arredondo 1972a: 417, fig. 2: 5, top [palmar], 1976: 183, fig. 10b: bottom right [palmar]), and distal, OA 815 (Arredondo 1972a: 417, fig. 2: 5, bottom [palmar], 1976: 183, fig. 10b: top right [palmar]), ends of right. **Femur**: right, OA 818 (Arredondo 1972a: 417, fig. 2: 1 [anterior], 1976: 183, fig. 10d: right [anterior], 1982: 38, fig. 1 [image wrongly numbered '3']: left [anterior]); left, OA 834. **Tibiotarsus**: proximal half of right, OA 827; shaft of right, OA 822; distal end of left, OA 812. These three specimens formed a reconstructed element (Arredondo 1972a: 417, fig. 2: 3 [posterior], 1976: 183, fig. 10c: right [posterior]). Collected by O. Arredondo and members of GEC in September 1959 (see 'History') at 'Salón del Pozo', **ACP**, and during November–December 1963 and January–March 1968 by N. González Gotera and Arredondo at the type locality (Arredondo 1972a: 415–416). See *T. cravesae* Suárez & Olson for specimens formerly included in the type series of *T. noeli*.

***Type locality***.—Cueva del Túnel (**YTU**), *c*.3 km south-east of La Salud, municipality of Quivicán, Mayabeque [formerly La Habana] province, Cuba (Arredondo 1972a: 417). Type


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material from this locality was collected at a place known as 'Bolsón de los Huesos del Salón del Depósito' (see Acevedo González *et al*. 1975: 16, 19–20, figs. 4–5). Fig. 7.

***Distribution***.—Cave deposits across the Cuban archipelago (see Appendix). *Pinar del Río*. Los Palacios: **PEA** (Suárez & Díaz-Franco 2003: 373, Suárez 2004b: 156–157). *Artemisa*. Caimito: **ACP** (Arredondo 1972a: 417 [part], 1972c: table 1 [part], 1982: 39 [part], 1984: 21 [part], Suárez & Olson 2001a: 37, Arredondo & Arredondo 2002a: table 1 [part], 2002b: table 1 [part], Suárez & Olson 2015: 541), **ASA** (Suárez 2000b: table 1, Suárez & Olson 2001a: 37, Arredondo & Arredondo 2002a: table 1, Suárez 2004a: 124, Suárez & Olson 2015: 541–542). *La Habana*. Boyeros: **HCI** (Arredondo 1976: 183, 1982: 39, 1984: 21, Suárez & Olson 2015: 542). *Mayabeque*. Quivicán: **YBL** (Jiménez Vázquez *et al*. 1995: 25, Arredondo & Arredondo 2002b: table 1, Suárez & Olson 2015: 542), **YTU** = type locality (Arredondo 1972a: 416 ['*Tyto noeli* sp. nov.' (part)], 1976: 183 [part], Acevedo González *et al*. 1975: 19 [part], Arredondo 1982: 38 [part], 1984: 21 [part], Arredondo & Arredondo 2002b: table 1 [part], Suárez & Olson 2015: 542), **YIN** and **YCH** (Suárez & Olson 2015: 542), **YCC** (Jiménez & Orihuela 2021: 169). *Matanzas*. Cárdenas: **MCE** (Orihuela 2013: 13, 2019: 62, fig. 4 = ulna: A [palmar], B [anconal], D [dorsal]). *Sancti Spíritus*. Yaguajay: **SPS** (Suárez 2004b: 157). Sancti Spíritus: **SPM** (Arredondo 1976: 183, 1982: 39, 1984: 21, Suárez & Olson 2015: 542). *Ciego de Ávila*. Florencia: **GCJ** (Suárez & Olson 2015: 542). *Holguín*. Gibara: **OCB** (*cf*. LMR).

***Direct $^{14}C$ dating***.—Late Pleistocene (PEA): 17,406 ± 161 $^{14}$C yr BP. Calibration (95% confidence interval) of same sample gave ages from 21,474 to 20,050 $^{14}$C yr BP (Suárez & Díaz-Franco 2003: 373, long bones). For discussion of age of material from other islands, see Suárez & Olson (2015: 543).

***Notes***.—The commonest and smallest of the three (not 'four large barn-owls' as stated by Orihuela 2019: 57) Cuban giant barn owls in cave deposits (Arredondo 1984: 22, Suárez & Olson 2015: 542) is currently unknown from tar seep or sinkhole deposits (Suárez 2020a: 29–30). The composite type series of this taxon included specimens of the larger *T. cravesae*. Also recorded from cave deposits in Jamaica, Greater Antilles, and Barbuda, Lesser Antilles (Suárez & Olson 2015: 543).

### 24. †*Tyto cravesae* Suárez & Olson, 2015
### Craves's Giant Barn Owl (Lechuza Gigante de Craves)

*Tyto cravesae* Suárez & Olson, 2015, *Zootaxa* 4020: 545.
*Tyto noeli*: Arredondo 1972a: 416 (part).
*Tyto* sp.: Iturralde-Vinent *et al*. 2000: 309, table 2.

***History***.—*March 1972*: first known material described as *Tyto noeli* (see Arredondo 1972a, Suárez & Olson 2015: 547). *5 June 1998*: holotype collected by WS in a cave wall cavity at the type locality, western Cuba (Suárez & Olson 2015: 545). *23 September 2015*: original description published (Suárez & Olson 2015), including some specimens formerly in the type series of *T. noeli* (see 'Other material'). *22 May 2020*: single specimen known from asphalt deposits (a paratype) illustrated (Suárez 2020a).

***Holotype***.—Associated postcranial elements of one individual, MNHNCu 75.590 (cited figures from Suárez & Olson 2015), consisting of proximal half of a left humerus (fig. 3A [anconal]), proximal end of a right ulna, a near-complete right carpometacarpus (fig. 3C [external]) and a near-complete right femur (fig. 4: C [anterior], G [internal]). Collected 5 June 1998 by WS in an amoeboid-shaped patch of red clay matrix, in a wall cavity near (*c*.30 m) 'Salón del Pozo' (not 'Type locality: Salón del Pozo', as stated by Orihuela 2019: 62) at the type locality (Suárez & Olson 2015: 546).

***Other material***.—**Coracoid**: sternal end of left, OA 832 (Suárez & Olson 2015: fig. 2D [dorsal]). **Humerus**: proximal end of right, OA 826 = paratype of *T. noeli* (Arredondo 1972a:


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417, fig. 2 [images in figs. 2 and 4 of the original description are therein reversed]: 4, top [anconal], 1976: 183, fig. 10a: top right [anconal]); distal half of right, OA 804 = paratype of *T. noeli* (Arredondo 1972a: 417, fig. 4: 4, bottom [anconal], 1976: 183, fig. 10a: bottom right [anconal]); shaft of left, WS 077. **Femur**: left lacking a proximal segment of shaft, MNHNCu 75.594 (Suárez & Olson 2015, fig. 4: D [anterior], E [internal]); proximal end of left, CZACC unnumbered. **Tibiotarsus**: distal half, MNHNCu 75.593 (Suárez & Olson 2015: fig. 5F [anterior]), and distal end, OA 831 = paratype of *T. noeli* (Suárez & Olson 2015: fig. 5E [anterior]), of left. **Tarsometatarsus**: right, MNHNCu 75.596 (Suárez & Olson 2015: 547, Figs. 6C: proximal portion [anterior], 7D [anterior], 8A: proximal portion [internal]); right lacking distal end, OA 828 = paratype of *T. noeli* (Arredondo 1972a: 417, fig. 2: 2 [anterior], Suárez & Olson 2015: fig. 7E [anterior]); proximal, MNHNCu 75.595, immature (Suárez & Olson 2015: fig. 6B [anterior]) and distal, MNHNCu 75.592 (Suárez & Olson 2015: fig. 6H [anterior]), WS 09I, immature (Suárez & Olson 2015: fig. 6G [anterior]) ends of right; shaft of right, CZACC unnumbered; distal ends of left, MNHNCu 75.591, MNHNCu 75.4801 (Suárez 2020a: 30–31, fig. 12: A [anterior], B [distal]). See Suárez & Olson (2015: 547).

***Type locality***.—Cueva de Paredones (**ACP**), *c*.3 km south-west of Ceiba del Agua, municipality of Caimito (not 'San Antonio de los Baños' as stated by Orihuela 2019: 62), Artemisa province, Cuba (Suárez & Olson 2015: 246). Fig. 4.

***Distribution***.—Cave and asphalt deposits in west Cuba (see Appendix). *Artemisa*. Caimito: **ACP** = type locality (Suárez & Olson 2015: 545–546 ['*Tyto cravesae*, new species']), **ACT** (Suárez & Olson 2015: 547). *Mayabeque*. Quivicán: **YBL** and **YTU** (Suárez & Olson 2015: 547). *Matanzas*. Cárdenas: **MCE** (Orihuela 2019: 62), Martí: **MLB** (Suárez & Olson 2015: 547, Suárez 2020a: 30 [see 'Other material']). *Sancti Spíritus*. Sancti Spíritus: **SPC** (*cf.* CLV).

***Direct $^{14}$C dating***.—None. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Not 'the rarest of Cuban tytonid owls' as claimed by Orihuela (2019: 62; see *T. pollens* above). *T. cravesae* is about the size of *T. ostologa* from Hispaniola, being less robust, but having a femur with the deepest shaft of all known West Indian giant barn owls (Suárez & Olson 2015: 548). None of the Cuban large barn owls exhibits (*contra* Orihuela 2019: 57) 'anatomical adaptations that suggest pronounced ground-dwelling'.

### 25. †*Tyto maniola* Suárez & Olson, 2020
### Cuban Dwarf Barn Owl (Lechuza Enana de Cuba)

*Tyto maniola* Suárez & Olson, 2020a, *Zootaxa* 4830: 552.
*Tyto* sp.: Suárez 2020a: 29.

***History***.—*February–March 1997*: two specimens collected in cave deposits in west Cuba (Suárez & Olson 2020a: 558). *November 1998*: holotype collected by members of MNHNCu in asphalt deposits (Suárez & Olson 2020a: 558). *December 2003*: first notice of this extinct, small barn owl, appears in the original description of a fossil phyllostomid bat from Cuba (Suárez & Díaz-Franco 2003: 375). *14 August 2020*: original description published (Suárez & Olson 2020a).

***Holotype***.—Proximal half of left tarsometatarsus, MNHNCu 75.4651 (Suárez & Olson 2020a: 552, fig. 6: A [anterior], B [posterior], C [proximal], D [external], E [internal]; fig. 7B [anterior]). Collected in San Felipe II during 25–28 November 1998 by members of Depto. de Geología y Paleontología of MNHNCu.

***Other material***.—**Humerus**: right, WS 0.435, immature (fig. 3B [dorsal]). **Ulna**: near-complete right, WS 0.436, fig. 3F [palmar]). **Carpometacarpus**: right fragmentary, MNHNCu


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75.4654. **Tarsometatarsus**: proximal right, MNHNCu 75.4656; distal right, MNHNCu 75.4652 (fig. 7F [anterior]); proximal left without inner calcaneal ridge, MNHNCu 75.4655 (fig. 7: C [anterior]), H [proximal]); distal left, MNHNCu 75.4657 (fig. 7: G [anterior], I [distal]). Cited material and figures from Suárez & Olson (2020a).

***Type locality***.—Las Breas de San Felipe (**MLB**), *c*.5.5 km west of the town of Martí, San Felipe Valley, municipality of Martí, Matanzas province, Cuba (Suárez & Olson 2020a: 552; for description of this deposit see Iturralde-Vinent *et al*. 2000). Fig. 5.

***Distribution***.—Cave and asphalt deposits in west Cuba (see Appendix). *Pinar del Río*. Los Palacios: **PEA** (Suárez & Díaz-Franco 2003: 375 ['small, undescribed species of *Tyto*'], Suárez 2004b: 156 ['a new species of *Tyto*'], Suárez & Olson 2020a: 556 [but not 'municipality of La Palma']). *Artemisa*. Caimito: **ACP** (Suárez & Olson 2020a: 556). *Matanzas*. Martí: **MLB** = type locality (Suárez & Olson 2020a: 552 ['*Tyto maniola*, new species']).

***Direct $^{14}C$ dating***.—None. For dating of other bird species at the type locality, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}C$ BP), see Jull *et al*. (2004) and Steadman *et al*. (2005). For dating of associated fauna at **PEA** (*Tyto noeli*), see Suárez & Díaz-Franco (2003: 373).

***Notes***.—Uncommon, currently unknown from sinkhole deposits. The smallest Cuban tytonid, living or extinct, being also smaller when compared to skeletal elements of Ashy-faced Owl *T. glaucops* (Kaup, 1852) —and its synonym *T. cavatica* Wetmore, 1920—of Hispaniola (Suárez & Olson 2020a: 556).

## Family STRIGIDAE Leach
## Genus *Pulsatrix* Kaup, 1848

*Pulsatrix* Kaup, 1848, *Isis von Oken* 41, col. 771. Type, by monotypy, *Strix torquata* Daudin = *Strix perspicillata* Latham.

*Pulsartrix* Suárez 2020a: 31 (*lapsus calami*).

### 26. †*Pulsatrix arredondoi* Brodkorb, 1969
Arredondo's Owl (Búho de Arredondo)

*Pulsatrix arredondoi* Brodkorb, 1969, *Quart. Jour. Fla. Acad. Sci*. 31: 112 [for 1968].

*Pulstarix arredondoi*: Louchart 2005: table 2 (*lapsus calami*).

*Puslatrix arredondoi*: Orihuela 2019: 62 (*lapsus calami*).

*Puslatrix arredondoi*: Orihuela *et al*. 2020a: table 1 (*lapsus calami*).

***Holotype***.—Left tarsometatarsus, PB 8420 (Brodkorb 1969: 112, fig. 1: left [anterior], top [proximal], bottom [distal], right [internal], Arredondo 1975, fig. 19*: B [anterior], 1982: 41, fig. 4: left [anterior], right [lateral, not 'posterior']). Collected in 1960 by O. Arredondo (Brodkorb 1969: 112).

***Type locality***.—Cueva de Paredones (**ACP**), *c*.3 km south-west of Ceiba del Agua, municipality of Caimito [formerly San Antonio de los Baños], Artemisa [formerly La Habana] province, Cuba (Brodkorb 1969: 112 [= 'Caverna Paredones']). Fig. 4.

***Referred material***.—**Tarsometatarsus**: right lacking calcaneal ridge, CZACC 6.4126 (Arredondo & González Gotera 1982: 2); incomplete left, OA 3216 (*cf*. Arredondo & Olson 1994: 436); left without part of the calcaneal ridge and portions of trochleae III and IV, CAZGA-267 (Jiménez & Orihuela 2021: 166–167, fig. 2B [anterior]); proximal half of left, MNHNCu 75.4808 (Suárez 2020a: 31, fig. 12: C [anterior], D [proximal]); fragmentary distal left lacking trochlea IV and lateral border, CAZGA-268 (= 'CAZG04' and 'CAZGA04' of Orihuela 2019: 63, fig. 6 [not 'right']: A [anterior], B [posterior], Jiménez & Orihuela 2021: 167, fig. 2A [anterior]).



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***Distribution***.—Cave and asphalt deposits in west Cuba (see Appendix). *Artemisa*. Caimito: **ACP** = type locality (Brodkorb 1969: 112 ['*Pulsatrix arredondoi*, new species'], Arredondo 1972a: table 1, 1972c: table 1, 1975: 150, 1976: table 1, 1982: 41, 1984: 25, Arredondo & González Gotera 1982: 1, Arredondo & Arredondo 2002a: table 1, 2002b: table 1; WS unpubl.). *Mayabeque*. San José de las Lajas: **YCC** (Jiménez & Orihuela 2021: 166–167, fig. 2 = tarsometatarsus: B [anterior]), **YCM** (Orihuela 2019: 63, fig. 6 = tarsometatarsus [left not 'right']: A [anterior], B [posterior], Jiménez & Orihuela 2021: 166–167, fig. 2A [anterior]). *Matanzas*. Cárdenas: **MCA** (Arredondo & Olson 1994: 436), Martí: **MLB** (Suárez 2020a: 31, fig. 12 = tarsometatarsus: C [anterior], D [proximal]). *Sancti Spíritus*. Sancti Spíritus: **SPC** (*cf*. Orihuela 2019: 63, Suárez 2020a: 31, Jiménez & Orihuela 2021: 169).

***Direct $^{14}$C dating***.—Late Holocene (YCM): 1,390 ± 30 $^{14}$C yr BP (680–600 BC) (Orihuela 2019: 63, tarsometatarsus; see also Jiménez & Orihuela 2021: 170).

***Notes***.—Arredondo's Owl is the only *Pulsatrix* in the Antillean subregion (Brodkorb 1969: 112, Olson 1978: 106, Arredondo 1982: 41, 1984: 25), and was not of large size (*contra* Gutiérrez Domech *et al*. 2018: 42). Its remains are uncommon in Cuban cave or asphalt deposits, being currently unknown from sinkholes. Jiménez & Orihuela (2021: 169) indicated the presence of this taxon at two localities in the province of Artemisa and one in Matanzas, but the reverse is true (see 'Distribution'). Material from SPC, central Cuba, consists of a tarsometatarsus identified during early 1990 (O. Jiménez Vázquez *in litt*. 2021). Although the locality has been cited in the subsequent literature, the specimen was never mentioned. The tarsometatarsus is the only described skeletal element of *P. arredondoi* (Brodkorb 1969, Arredondo & González Gotera 1982, Arredondo 1984, Suárez 2020a, Jiménez & Orihuela 2021).

## Genus *Bubo* Duméril, 1805

*Bubo* Duméril, 1805, *Zool. Anal*., p. 34. Type, by subsequent monotypy, *Strix bubo* Linnaeus.

### 27. †*Bubo osvaldoi* Arredondo & Olson, 1994

Osvaldo's Owl (Búho de Osvaldo)

*Bubo osvaldoi* Arredondo & Olson, 1994 (part), *Proc. Biol. Soc. Wash*. 107: 438.
*Tyto riveroi*: Salgado *et al*. 1992: 28, table 1.

***History***.—*July 1991*: holotype collected by O. Jiménez Vázquez and C. Morales in a cave deposit at Sierra de Galeras, western Cuba (see 'Holotype'). *4 October 1994*: original description published (Arredondo & Olson 1994). *9 December 2020*: type series of *B. osvaldoi* revealed to be composite, and only specimens from the type locality represent this species (Suárez 2020b).

***Holotype***.—Right tarsometatarsus lacking proximal end above tubercle for tibialis anticus, MNHNCu 75.27, formerly MNHNCu-27.1 (Arredondo & Olson 1994: 438, fig. 1: B [posterior], C [anterior], D [distal], Orihuela 2019: 63, fig. 5: A [anterior], B [posterior]). Collected on 2 July 1991 (no collecting date appears in the original description, but was not '1992' as reported in Díaz-Franco 2004: 156 and Herrera-Uria *et al*. 2015: 113) by Osvaldo Jiménez Vázquez and Carlos Morales at 'Pozo del Búho', in the type locality (O. Jiménez Vázquez *in litt*. 2021).

***Other material***.—**Femur**: right lacking internal condyle and abraded about the trochanter, MNHNCu 75. 4908, formerly MNHNCu 27.3 (Arredondo & Olson 1994: 38, fig. 2: B [anterior], Suárez 2020b, fig. 1: D [anterior]). **Tarsometatarsus**: shaft of left, MNHNCu 75.4907, formerly MNHNCu 27.2. For discussion of incorrect data concerning the type series, see 'Notes'.


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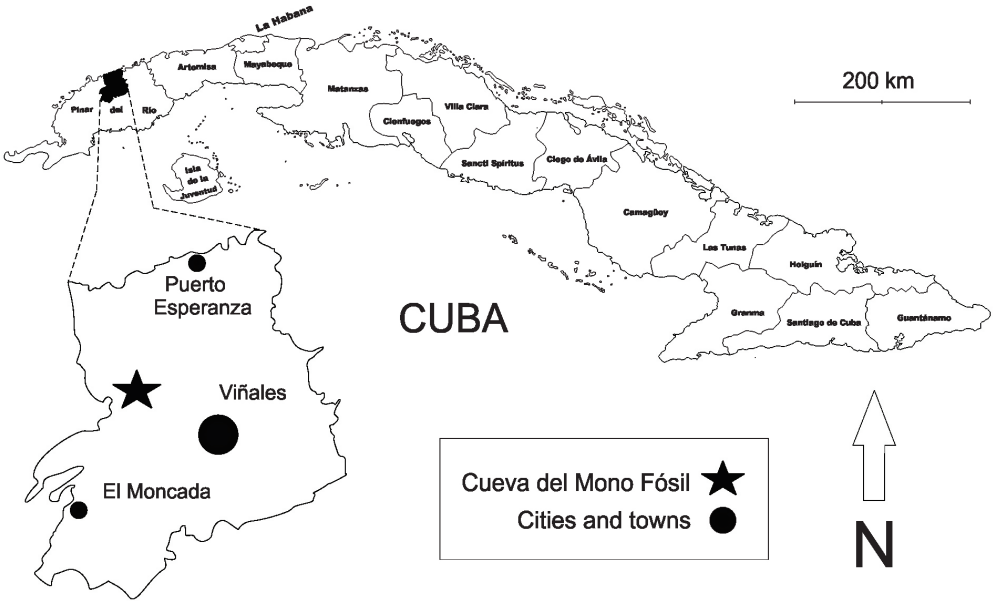


Figure 8. Cueva del Mono Fósil (**PMF**), Viñales, western Cuba. Type locality of †*Bubo osvaldoi* Arredondo & Olson.

***Type locality***.—Cueva del Mono Fósil (**PMF**), Sierra de Galeras, municipality of Viñales, Pinar del Río province, Cuba (Arredondo & Olson 1994: 438; see Rivero & Arredondo 1991, Salgado *et al*. 1992, Arredondo & Rivero 1997). Fig. 8.

***Distribution***.—Cave deposit in west Cuba (see Appendix). *Pinar del Río*. Viñales: **PMF** (Arredondo & Olson 1994: 438).

***Direct $^{14}C$ dating***.—None.

***Notes***.—Extremely rare, unknown away from the type locality. The type series of *B. osvaldoi* was a composite, including two fossil bones from eastern Cuba that belong to another large strigid, *Ornimegalonyx ewingi* Suárez, of about the same size (Suárez 2020b: 391). The catalogue numbers 'MNHNCu P4607' and 'MNHNCu P4608', assigned by Díaz-Franco (2004: 156), replicated by Herrera-Uria *et al*. (2015: 114), represent a *lapsus calami* (= the digit 9 was substituted by digit 6 on both specimens; S. Díaz-Franco & WS pers. obs.), maintained until today. Both numbers are in use for another taxon in the same collection (Suárez & Olson 2003b: 73). In addition, incorrect data concerning the collection date and collector of the paratype femur (MNHNCu 75. 4908) was also republished (Herrera-Uria *et al*. 2015: 114). The femur was secured at Cueva Alta, in the type locality, by other members (names unknown) of GEPAB, on a different (unknown) date to both tarsometatarsi (O. Jiménez Vázquez *in litt*. 2021).

## Genus †*Ornimegalonyx* Arredondo, 1958

*Ornimegalonyx* Arredondo, 1958, *El Cartero Cubano* 17(7): 11. Type, by monotypy (*contra* Brodkorb 1961: 634), *O. oteroi* Arredondo.

### 28. †*Ornimegalonyx oteroi* Arredondo, 1958

Cuban Giant Owl (Búho Gigante Cubano)

*Ornimegalonyx oteroi* Arredondo, 1958, *El Cartero Cubano* 17(7): 11.

*Ornimegalonyx* sp.: Arredondo 1964: 21.

*Ornimegalonyx acevedoi*: Arredondo, 1982: 45.



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*Ornimegalonyx minor*: Arredondo 1982: 46.
*Ornimegalonyx gigas*: Arredondo 1982: 47.
*Cathartes aura*: Arredondo 1984: 9 (see Suárez 2001b: 110).
*Ornimegalonix oteroi*: Weesie 1988: 62 (*lapsus calami*).
*Ornimegalonix oteroi*: Arredondo Antúnez 2007: 153 (*lapsus calami*).
*Ornimegalonix gigas*: Arredondo Antúnez 2007: 153 (*lapsus calami*).
*Ornimegalonix minor*: Arredondo Antúnez 2007: 153 (*lapsus calami*).
*Ornimegalonix acevedoi*: Arredondo Antúnez 2007: 153 (*lapsus calami*).
*Ornimegalonix minor*: Gutiérrez Domech 2010: 12 (*lapsus calami*).
*Ornimegalonix oteroi*: González Alonso 2011: 270 (*lapsus calami*).
*Ornimegalonix oteroi*: González Alonso 2012: 207, 208 (*lapsus calami*).
*Ornimegalonix oteroi*: Aranda *et al*. 2020: 2 (*lapsus calami*).

***History***.—*2 January 1954*: members of SEC collect the type material of what is initially considered a terror bird, family Phorusrhacidae Ameghino, at a cave deposit in western Cuba (Arredondo 1954, 1955, 1956, 1957a,b, 1958). *July 1958*: original description of *Ornimegalonyx oteroi* published (Arredondo 1958; see Brodkorb 1961). *27 March 1959*: B. Patterson (MCZ, *in litt*. to O. Arredondo) reports an enormous owl identified in Cuban material sent to him for study (Arredondo 1964: 21). *May 1961*: lectotype designated and *O. oteroi* removed from Phorusrhacidae to Strigidae (Brodkorb 1961). *July 1982*: three additional species of *Ornimegalonyx* described from Cuba, *O. acevedoi*, *O. minor* and *O. gigas* (Arredondo 1982: 45–47). *December 2000*: first record in asphalt deposits at Las Breas de San Felipe, western Cuba (Iturralde-Vinent *et al*. 2000: 309, table 2). *2002*: morphofunctional analysis of *O. oteroi* conducted (Alegre Lago 2002). *2020*: direct $^{14}$C dating of material (22 May) from Las Breas de San Felipe (Suárez 2020a: table 1). Species described by Arredondo (1982) considered (9 December) junior subjective synonyms of *O. oteroi* (Suárez 2020b).

***Lectotype***.—Left tarsometatarsus lacking distal end, SEC P-383.E, at MCZ, designated by Brodkorb (1961: 634) (Arredondo 1954: 48, fig. top right unnumbered: top centre [anterior], 1955: 26, fig. unnumbered*: left [anterior], 1958: 12, fig. top unnumbered: bottom centre [anterior], 1964: 19, fig. right unnumbered: top centre [anterior], 1975: 135, figs. 1: top centre [anterior], 2*: right [anterior], 1976, figs. 5: top centre [anterior], 7*: b [anterior], 1982, figs. 5: top centre [anterior], 6* [anterior]). Collected on 2 January 1954 by Manuel Rivero de la Calle, Juan N. Otero and O. Arredondo, on the floor of the main gallery at the type locality (see Arredondo 1954: 46, 1975: 134).

***Other material***.—Skeletal elements from the same individual, SEC P-383.E (see Arredondo 1958: 10). **Skull**: small fragments (Arredondo 1955: 25, 1975: 136). **Mandible**: articular portions (Arredondo 1975: 136, figs. 13* [lateral], 14* [ventral], 1976: 177, fig. 9*A [ventral], 1982: 42, fig. 10*A [lateral]). **Vertebra**: few of unknown position (Arredondo 1975: 136). **Sternum**: fragments (Arredondo 1975, fig. 11*: A [lateral], B [ventral], 1976: 177, figs. 8*: left [ventral], right [lateral]). **Rib**: fragments of unknown laterality (Arredondo 1955: 25, 1975: 136). **Scapula**: one of unknown laterality (Arredondo 1976: 177). **Humerus**: fragments of right and left (Arredondo 1975: 136, 1976: 177, 1982: 43). **Ulna**: fragments of right and left (Arredondo 1955: 25, 1975: 136). **Radius**: fragments of right and left (Arredondo 1955: 25, 1975: 136). **Carpometacarpus**: proximal left (Arredondo 1975: 148, fig. 12*: A [lateral], Arredondo 1982: 42, fig. 10*A [lateral]). **Femur**: left without internal condyle (Arredondo 1954: 48, fig. top right unnumbered: top right [posterior], 1955: 25, 1958: 12, fig. top unnumbered: left bottom [posterior], 1964: 19, fig. right unnumbered: top right [posterior], 1975: 135, figs. 1: top right [posterior], 2*: left [posterior], 1976: figs. 5 [posterior], 7*C [posterior]; 1982, figs. 5: right [posterior]), fragments of right (Arredondo 1976: 177). **Tibiotarsus**: right fragmentary (Arredondo 1954: 48, fig. top right unnumbered: left [posterior], 1955: 25, 1958: 12, fig. top unnumbered: right [posterior], 1964: 19, fig. right unnumbered: left [posterior], 1975: 135, fig. 1: left [posterior], 1976: fig. 5 [posterior],


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1982, fig. 5: left [posterior]), fragments of left (Arredondo 1976: 177). **Tarsometatarsus**: fragments of right (Arredondo 1976: 177). **Phalanges**: pedals (Arredondo 1954: 48, fig. top right unnumbered: bottom right [ventral], 1955: 25, 1958: 12, fig. top unnumbered: top left [ventral], 1964: 19, fig. right unnumbered: bottom right [ventral], 1975: 135, fig. 1 bottom: right [ventral], 1976: figs. 5: bottom right [ventral], 1982, figs. 5: bottom right [ventral]), unguals (Arredondo 1954: 48, fig. top right unnumbered: bottom centre [lateral], 1955: 26, fig. unnumbered*: top centre [lateral], 1958: 10, fig. left*: 3 [lateral], 12, fig. top unnumbered: top centre [lateral], 1964: 19, fig. right unnumbered: bottom centre [lateral], 1975: 135, fig. 1 bottom: centre [lateral], 1976: fig. 5: bottom centre [lateral], 1982: fig. 5: bottom centre [lateral]). Date, locality and collectors as in 'Lectotype'.

***Type locality***.—Caverna de Pío Domingo (**PPD**), Sierra de Sumidero, municipality of Minas de Matahambre, Pinar del Río province, Cuba (Arredondo 1958: 10). Fig. 3.

***Distribution***.—Cave and asphalt deposits in west and central Cuba (see Appendix). *Pinar del Río*. Minas de Matahambre: **PCH** (Alegre Lago 2002: 12–13; see Arredondo & Olson 1994: fig. 1A = tarsometatarsus [anterior]), **PPD** = type locality (Arredondo 1954: 48 ['especie grande de ave prehistórica'], 96 ['ave prehistórica de grandes y fuertes uñas'], 1955: 26 ['ave prehistórica, tal vez andadora'], 1958: 11 ['*Ornimegalonyx oteroi*…nueva especie'; see Brodkorb 1961], 1975: 144, figs. 10*A = digit II, phalanx 2: top [lateral], bottom [ventral], 10*C = ungual phalanx [lateral], 11* = sternum: A [lateral], B [ventral], 151, fig. 13* = hypothetical skull and mandible reconstruction [lateral], 152, fig. 14* = mandible [ventral], 182, fig. 28* = skeleton [lateral], 1982: 42, figs. 16* = skull [ventral], 17*= mandible [ventral], 1984: 26, Alegre Lago 2002: 15). *Artemisa*. Caimito: **ACP** (Arredondo 1964: 19, fig. left unnumbered, centre = tibiotarsus: top [lateral], bottom [posterior]; left = tarsometatarsus [posterior], 21, fig. bottom unnumbered: skull [posterior], 1971: 96, fig. bottom left unnumbered* = skull: 1 [ventral], 2 [lateral], 1972a: table 1, 1972c: table 1, 1975: 137, fig. 3 = tarsometatarsus [posterior], fig. 4* = idem: left [anterior], centre [posterior], right [proximal], 138, fig. 7 = tibiotarsus [lateral], 141 ['*Ornimegalonyx* sp.'], fig. 9 'A' = left: femur [posterior], 9'B' = right: femur [posterior], 144, fig. 10*D = digit IV, phalanx 2: top [lateral], bottom [dorsal], 147, fig. 11* = sternum: A [lateral], B [ventral], 155 ['*Ornimegalonyx* sp.'], figs. 15 = skull: A [anterior], B [ventral], 16* = skull [ventral], 1976: 177, figs. 4: a = tibiotarsus [lateral], b = tarsometatarsus [posterior], 8* = sternum: left [ventral], right [lateral], 9 = skull: b [anterior], c [ventral], 1982: 42, figs. 7: tarsometatarsus [posterior], fig. 8* idem: left [anterior], centre [posterior], right [proximal], fig. 14 = femur [posterior], 46 ['*Ornimegalonyx minor* sp. nov.'; see Suárez 2020b], 28 ['*Ornimegalonyx minor*'], Arredondo & Arredondo 2002a: table 1, 2002b: table 1, Alegre Lago 2002: 13–15, pl. 1: A = sternum [ventral]), C = scapula: 1 [ventral], 2 [dorsal], pl. 7 = tibiotarsus: A [posterior], B [anterior], pl. 8 = tarsometatarsus: A [anterior], B [posterior]), **ACA** (Arredondo 1955: 4 ['ave fósil andadora'], 1958: 11, 1975: 148, 1982: 42, 1984: 26), **ASA** (Suárez 2000b: table 1, Alegre Lago 2002: 13–15, pl. 3B = ulna: 1 [ventral], 2 [dorsal], Arredondo & Arredondo 2002a: table 1, 2002b: table 1), **AQS** (WS unpubl.). Bauta: **ACL** (Arredondo 1984: 8–9 ['*Cathartes aura*', reidentified by Suárez 2001b: 110]). *La Habana*. Marianao: **HFT** (Alegre Lago 2002: 14). *Mayabeque*. Bejucal: **YCT** (Alegre Lago 2002: 14). Quivicán: **YBL** (Jiménez Vázquez *et al*. 1995, Alegre Lago 2002: 14–15, pl. 3A = radius: 2 [palmar], Arredondo & Arredondo 2002b: table 1), **YIN** and **YCH** (Alegre Lago 2002: 14–15), **YTU** (Arredondo 1964: 21 ['*Ornimegalonyx*'], Acevedo González *et al*. 1975: 19, Arredondo 1975: 138, fig. 6* = tarsometatarsus: left [anterior], right [medial], 144, fig. 10*B = digit II, phalanx 2: top [lateral], bottom [ventral], 183, fig. 29* = hypothetical external aspect [lateral], 1982: 42, 1984: 26, Alegre Lago 2002: 14–15). San José de las Lajas: **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 ['*Ornimegalonyx* sp.'], Rojas Consuegra *et al*. 2012: 10 ['*Ornimegalonyx* sp.'], Alegre Lago 2002: 13–15). *Matanzas*. Cardenas: **MCQ** (Arredondo 1964: 21 ['un



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ejemplar mayor que el de "Pío Domingo"'], 1975: 137 ['*Ornimegalonyx* cf. *oteroi*'], fig. 5* = tarsometatarsus: left [anterior], right [posterior], 183, fig. 29* = hypothetical external aspect [lateral], 1982: 45 ['*Ornimegalonyx acevedoi* sp. nov.'], fig. 12* = tarsometatarsus: left [anterior], right [posterior], 1984: 27–28 ['*Ornimegalonyx acevedoi*']), **MCB** (Orihuela 2019, fig. 7 = tarsometatarsus: A [anterior], B [posterior], C [lateral]). Martí: **MLB** (Iturralde-Vinent *et al*. 2000: table 2, Alegre Lago 2002: 14–15, Suárez 2020a: 31–32, fig. 12E–H = tarsometatarsus: E [anterior], F [proximal], G [distal], H [posterior]). Jagüey Grande: **MFJ** (*cf*. CLV). *Sancti Spíritus*. Yaguajay: **SPH** (Arredondo 1964: 21 ['*Ornimegalonyx*'], Alegre Lago 2002: 13, pl. 1B = coracoid [internal], 2 = humerus: A [anconal], B [palmar], 6 = femur: A [posterior], B [anterior]). Sancti Spíritus: **SPC** (Arredondo 1964: 21, 1975: 141, fig. 8* = femur [anterior], Arredondo 1982: 47 ['*Ornimegalonyx gigas* sp. nov.'], fig. 15* = femur [anterior]), Arredondo 1984: 29 ['*Ornimegalonyx gigas*']). *Camagüey*. Sierra de Cubitas: **CEN** (Kurochkin & Mayo 1973 ['*Ornimegalonyx*']). Isla de la Juventud: **IPE** (Arredondo 1982: 42).

***Direct $^{14}$C dating***.—Late Pleistocene (MLB): 22,000 ± 2,600 $^{14}$C yr BP (Suárez 2020a: table 2, tarsometatarsus).

***Notes***.—The commonest of the Cuban extinct species of Strigidae, its remains are frequently present in fossil deposits at low elevations (see Suárez & Olson 2015: 550). *O. oteroi* is the largest owl ever known, living or extinct (Arredondo 1975, 1976, 1982, 1984, Olson 1978, 1985; see also Alcover *et al*. 1999, Louchart 2005), a weak flier (but not 'flightless', see Alegre Lago 2002) with considerable sexual and individual variation (Arredondo 1975, Alegre Lago 2002, Suárez 2020b). *Ornimegalonyx* is a member of the Striginae, closely related to the modern genera *Strix* Linnaeus and *Ciccaba* Wagler, as noted by E. Kurochkin (Olson 1978, 1984). Erection of a separate subfamily for the Cuban taxon, announced by Arredondo Antúnez (2007: 153), is not supported by osteological characters. Some authors, in early studies of *Ornimegalonyx* (*cf*. Arredondo 1964, Kurochkin & Mayo 1973), but also more recently (Morgan & Albury 2013), called it a 'flightless barn owl' (= Tytonidae) which is incorrect (see comment in Arredondo 1975: 134, footnote).

## 29. †*Ornimegalonyx ewingi* Suárez, 2020
Ewing's Owl (Búho de Ewing)

*Ornimegalonyx ewingi* Suárez, 2020b, *Bull. Brit. Orn. Cl*. 140: 391.
*Bubo osvaldoi*: Arredondo & Olson 1994: 438 (part).

***History***.—*January 1947*: Abelardo Moreno (Museo Felipe Poey, La Habana) sends to A. Wetmore (USNM) two fossil bones (type material) of a large bird collected in a 'mine' in eastern Cuba (Arredondo & Olson 1994: 436, 438, Suárez 2020b: 391). *15 January 1959*: Wetmore (1959: 15) announces the presence of an undescribed, extinct 'large barn owl' (*Tyto*) from 'a cave in eastern Cuba' (see Brodkorb 1959: 357, Olson's footnote in Arredondo 1976: 172, Olson 1978: 105). *4 October 1994*: material identified by Wetmore (1959), and three other fossils from western Cuba, are described as *Bubo osvaldoi* (Arredondo & Olson 1994). *9 December 2020*: the type series of *B. osvaldoi* is revealed to be composite—including specimens from eastern Cuba representative of another large extinct owl—when the original description of *O. ewingi* is published (Suárez 2020b).

***Holotype***.—Right femur without anterior surface of head, piece of posterior face of shaft, and internal condyle, USNM 447022 (Arredondo & Olson 1994: figs. 2A [anterior], 3*: A [posterior], B [anterior], C [proximal], Suárez 2020b: fig. 1C [anterior]). Collector and date unknown (Arredondo & Olson 1994: 438, Suárez 2020b: 391; see Mayo 1980: 223).


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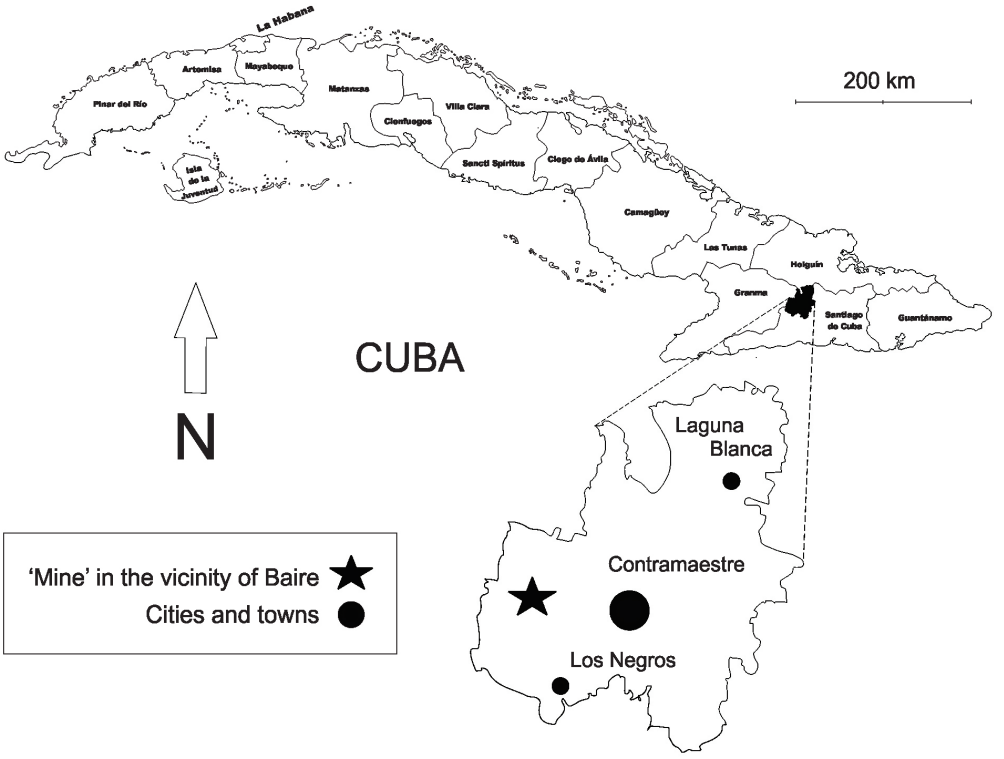


Figure 9. A 'mine' in the vicinity of Baire (**SMB**), Contramaestre, eastern Cuba. Type locality of †*Ornimegalonyx ewingi* Suárez. Note the star covers Baire and environs, but the precise location of the deposit is currently unknown.

***Other material***.—**Humerus**: left without proximal end and external part of distal articulation, USNM 447023 (Arredondo & Olson 1994: figs. 3*D [palmar], 4B [palmar], Suárez 2020b: fig. 1B [palmar]). See Suárez (2020b: 391).

***Type locality***.—A 'mine' in the vicinity of Baire (**SMB**), municipality of Contramaestre, Santiago de Cuba [formerly Oriente] province, Cuba (Suárez 2020b; see Arredondo & Olson 1994: 438, and 'Notes'). Fig. 9.

***Distribution***.—Restricted to the type locality in east Cuba (see Appendix). *Santiago de Cuba*. Contramaestre: **SMB** (Suárez 2020b: 391).

***Direct $^{14}C$ dating***.—None.

***Notes***.—Extremely rare. The smallest *Ornimegalonyx* (*c*.30% smaller than *O. oteroi*). The type series of *O. ewingi* represents the first material to be collected of the genus (Suárez 2020b). Apparently, the type locality is the same deposit named by Aguayo & Howell Rivero (1955: 1302) as 'minas de manganeso en Baire, Oriente' ['manganese mines in Baire, Oriente'], from where several mammalian fossils were sent to Museo Felipe Poey in 1942 (see Aguayo 1950: 122). Mayo (1980: 225) considered the locality to be possibly a cave (see Silva Taboada *et al*. 2008: 413). According to a distributional map published by Park (1942: pl. 21), a number of mines of this kind were known at that time not far from Baire. Some specimens from asphalt deposits at Las Breas de San Felipe, western Cuba, perhaps involve this taxon (Suárez 2020a: 32, 2020b: 391).


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## Order FALCONIFORMES Sharpe
## Family FALCONIDAE Leach
## Genus *Caracara* Merrem, 1826

*Caracara* Merrem, 1826, *in* Ersch & Gruber, *Allg. Encycl. Wiss. Kunste* 15: 159. Type, by subsequent designation, *Falco plancus* J. F. Miller.

### 30. †*Caracara creightoni* Brodkorb, 1959
Creighton's Caracara (Caraira de Creighton)

*Caracara creightoni* Brodkorb, 1959, *Bull. Fla. State Mus*. 4: 353.
*Polyborus plancus*: Olson 1976: 363.
*Polyborus creightoni*: Olson 1982: 36.
*Caracara plancus* ssp.: Jiménez Vázquez 1997a: 49.
*Caracara creigthoni*: Suárez 2000a:120 (*lapsus calami*).
*Caracara creigthoni*: Suárez 2004c:1, 10 (*lapsus calami*).
*Caracara creigthoni*: Suárez 2020a: table 1 (*lapsus calami*).

***History***.—*28 August 1958*: holotype collected by J. C. Dickinson and W. Auffenberg at a cave deposit in the Bahamas (Brodkorb 1959: 353, 1964: 292). *3 June 1959*: original description published (Brodkorb 1959). *22 January 1976*: the single specimen known is considered a synonym (Olson 1976: 363) of living *C. plancus* (J. F. Miller, 1777). *5 August 1982*: two additional fossils, a left quadrate and a distal end of a left tibiotarsus from the type locality provide characters to support the extinct species' validity (Olson & Hilgartner 1982: 28–31, fig. 2: B = tibiotarsus [anterior], D = idem [distal], F = quadrate [medial], H = idem [ventral]). *Winter 1997*: first record published from Cuba based on specimens from two cave deposits in the west (Suárez & Arredondo 1997: 101). *25 May 2001*: species redescribed on basis of cranial and postcranial material from cave and sinkhole deposits in central and west Cuba (Suárez & Olson 2001a). *11 August 2003*: identified in tar seeps at Las Breas de San Felipe, with description of previously unknown skeletal elements (Suárez & Olson 2003c: 307; see Suárez 2020a: 32–35). *11 December 2007*: a well-preserved skull and its respective mandible reported from a blue hole, Sawmill Sink, Great Abaco, Bahamas (Steadman *et al*. 2007: fig. 6 [lateral]). *3 October 2014*: first direct $^{14}$C dating on material (femur) from Great Abaco, Bahamas (Steadman & Franklin 2015: table 2, fig. 3: a [posterior], b [anterior]). *November 2019*: mitochondrial genome data obtained from a late Holocene (2,500 yr BP) right femur, Great Abaco, Bahamas (Oswald *et al*. 2019).

***Holotype***.—Incomplete left carpometacarpus, UF 3153 (Brodkorb 1959: 353, pl. 1, fig. 7 [lateral]). Collected 28 August 1958 by J. C. Dickinson and W. Auffenberg (Brodkorb 1959: 353, 1964: 292).

***Type locality***.—Banana Hole, New Providence Island, Bahamas (Brodkorb 1959: 351; see Olson & Pregill 1982: 4–5).

***Referred material***.—**Skull**: incomplete, OA 3928 (Suárez & Olson 2001b: 502, figs. 1B [lateral], 2B [dorsal]); rostrum, MNHNCu 75.4742 (Suárez 2020a: 32, fig. 13: A [lateral], B [dorsal]). **Notarium**: fragmentary, MNHNCu 75.4579. **Humerus**: proximal end of right, WS 1035 (Suárez & Olson 2003c: 305, fig. 2C [anconal]); shaft of right, MNHNCu 75.4759; left lacking proximal end, MNHNCu 75.4817 (Suárez 2020a: 32, fig. 13C [palmal]); proximal half of left, MNHNCu 75.4818 (Suárez 2020a: 32, fig. 13D [palmal]). **Ulna**: left, MPSG 75 (Suárez & Olson 2001b: 502, fig. 3A: left [internal]). **Carpometacarpus**: right lacking minor metacarpal, MPSG 77 (Suárez & Olson 2001b: 502, fig. 3B: left [internal]); left, MNHNCu 75.4819 (Suárez 2020a: 32, fig. 13E [internal]); proximal half of left, MPSG 110. **Femur**: left, WS 1933 (Suárez & Olson 2003c: 305, fig. 2A [anterior], Jones *et al*. 2013, fig. 5*: 5 [posterior]); distal end of left, WS 0209; proximal half of right, WS 0142; proximal end of right, WS 587. **Tibiotarsus**: left lacking internal condyle, MPSG 79 (Suárez & Olson 2001b: 502, fig. 3D: left


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[anterior]); distal end of right lacking posterior rim of internal condyle, MPSG 83; distal halves of right, MNHNCu 75.4852–4853; distal ends of right, MNHNCu 75.4854–4856; shaft of left, MNHNCu 75.4851; distal ends of right, MNHNCu 75.4584–4585; distal ends of left, MNHNCu 75.4580–4583. **Tarsometatarsus**: right, MNHNCu 75.4820 (Suárez 2020a: 32, fig. 13: D [anterior]) and 75.4827–4828; proximal halves of right, MNHNCu 75.4844–4847; proximal ends of right, MNHNCu 75.4848–4850; right lacking proximal ends, MNHNCu 75.4829–4831; distal end of right, MNHNCu 75.4839; left, MPSG 103 (Suárez & Olson 2001b: 502, fig. 3C: left [anterior]); left without distal end, MNHNCu 75.4840; proximal ends of left, MNHNCu 75.4841–4843; distal halves of left, MNHNCu 75.4832–4835, MPSG 106; distal ends of left, MNHNCu 75.4592–4593, MNHNCu 75.4836–4838; distal ends of right, MNHNCu 75.4586–4591.

***Distribution***.—Cave, asphalt and sinkhole deposits in west and central Cuba (see Appendix). *Artemisa*. Caimito: **ACP** (Suárez & Olson 2003c: 305), **ASA** (Suárez & Arredondo 1997: 101, Suárez 2000b: table 1 ['*Caracara* sp.'], Suárez & Olson 2003c: 305). *Mayabeque*. Quivicán: **YTU** (Suárez & Olson 2003c: 307 ['*Caracara plancus* ssp.' of Jiménez Vázquez 1997a: 49]). *Matanzas*. Cárdenas: **MCA** (Suárez & Arredondo 1997: 101, Suárez & Olson 2001b: 502), Martí: **MLB** (Iturralde-Vinent *et al*. 2000: table 2 ['*Caracara* sp.'], Suárez & Olson 2003c: 307, Suárez 2020a: 32). Jagüey Grande: **MFJ** (*cf*. CLV). *Villa Clara*. Corralillo: **VSM** (Suárez & Olson 2001b: 502, Arredondo Antúnez & Villavicencio Finalet 2006: tables I–II).

***Direct $^{14}$C dating***.—None from Cuba. Bahamas, Late Holocene (Sawmill Sink): 2,650 to 2,350 Cal BP (Steadman & Franklin 2015: table 2, femur).

***Notes***.—Common in Quaternary deposits in Cuba, from where the species seems to have originated and subsequently colonised the Lucayan Archipelago. Recorded from Cuba by Suárez & Arredondo (1997: 101), with additional material subsequently reported and the species redescribed (Suárez & Olson 2001b, 2003c, Suárez 2020a). One record from Dolphin Cave on Grand Cayman, Cayman Islands (Morgan 1994: 480 ['*Polyborus creightoni*']) is considered erroneous (Suárez & Olson 2001b: 507, Olson 2008: 265). The main features of Creighton's Caracara vs. congenerics is the presence of a massive and differently shaped rostrum (Suárez & Olson 2001b: 502, 2014: 308, Suárez 2020a: 33). Orihuela (2019: 61) commented that 'Suárez & Olson (2001a) hypothesised a recent arrival to Cuba [of *C. creightoni*], along with *Cathartes*.' but this is a misinterpretation (see Suárez 2020a: 35). Figueredo (2011: 11) cited the species as 'ave de rapiña sin vuelo' ['flightless bird of prey'], which is incorrect. For material and distribution of *C. creightoni* in the Bahamas, see Brodkorb (1959), Olson (1976), Olson & Hilgartner (1982), Steadman *et al*. (2007) and Steadman & Franklin (2015, 2020).

## Genus *Milvago* Spix, 1824

*Milvago* Spix, 1824, *Avium species novae Brasil*, Bd. 1, p. 12. Type, by monotypy, *Milvago ochrocephalus* Spix = *Polyborus chimachima* Vieillot.

### 31. †*Milvago carbo* Suárez & Olson, 2003

Cuban Caracara (Caraira Cubana)

*Milvago carbo* Suárez & Olson, 2003c, *Proc. Biol. Soc. Wash*. 116: 302.

***Holotype***.—Near-complete right tarsometatarsus, MNHNCu 75.4569, formerly P4569 (Suárez & Olson 2003c: 302, fig. 1: A [anterior], B [medial], C [posterior]; see Herrera-Uria *et al*. 2015: 114–115, not 'P456' [*lapsus calami*] as appears in Díaz-Franco 2004: 157). Collected in San Felipe II during expeditions conducted in 1998 by the Depto. de Geología y Paleontología, MNHNCu [= Stephen Díaz Franco, Manuel Iturralde Vinent and Reinaldo



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Rojas Consuegra. Not 'W. Suárez, and S. Díaz-Franco' as indicated by Herrera-Uria *et al*. 2015: 115. See Iturralde-Vinent *et al*. 2000: 301] (Suárez & Olson 2003c: 302).

***Other material***.—**Notarium**: fragmentary, MNHNCu 75.4567. **Tibiotarsus**: distal ends of left, MNHNCu 75.4568, MNHNCu 75.4570–4571. **Tarsometatarsus**: proximal half of left without part of inner and outer calcaneal ridges, MNHNCu 75.4572; shaft of left, MNHNCu 75.4573; proximal end of right, MNHNCu 75.4574; distal halves of right, MNHNCu 75.4575–4576 (latter with abrasion); distal ends of left, MNHNCu 75.4577–4578. See Suárez & Olson (2003c: 303), Díaz-Franco (2004: 157), Herrera-Uria *et al*. (2015: 115).

***Type locality***.—Las Breas de San Felipe (**MLB**), *c*.5.5 km west of the town of Martí, San Felipe Valley, municipality of Martí, Matanzas province, Cuba (Suárez & Olson 2003c: 302–303; for description of this deposit see Iturralde-Vinent *et al*. 2000). Fig. 5.

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (Suárez & Olson 2003c: 302–303, Suárez 2020a: 35–36).

***Direct $^{14}$C dating***.—None. For dating of other bird species at the type locality, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Very rare, known only from tar seeps in west Cuba. The largest representative of the genus *Milvago*, living or extinct (Suárez & Olson 2003c, Suárez 2020a). The smaller taxon recorded as *Milvago* sp. (see below) by Suárez & Arredondo (1997: 101) is not a synonym of the much larger *M. carbo* (*contra* Kirkconnell *et al*. 2020: table 4).

## 32. †*Milvago diazfrancoi* Suárez, 2020

Díaz Franco's Caracara (Caraira de Díaz Franco)

*Milvago diazfrancoi* Suárez, 2020a, *Zootaxa* 4780: 36.

***Holotype***.—Left tarsometatarsus lacking trochleae II and IV, MNHNCu 75.4610 (Suárez 2020a: 36, fig. 14: A [anterior], B [posterior]). Collected on 14 May 2009 by WS and Stephen Díaz Franco in San Felipe I, at the type locality (Suárez 2020a: 36).

***Other material***.—**Tibiotarsus**: distal third of left, MNHNCu 75.7021 (fig. 14: F [distal], G [anterior]). **Tarsometatarsus**: distal half of right, MNHNCu 75.7022; distal end of right, MNHNCu 75.4826; proximal half of right, MNHNCu 75.4825 (fig. 14: C [anterior]); distal half of left, MNHNCu 75.7023 (fig. 14: D [posterior], E [anterior]); distal end of left, MNHNCu 75.4824. Cited material and figures are from Suárez (2020a).

***Type locality***.—Las Breas de San Felipe (**MLB**), *c*.5.5 km west of the town of Martí, San Felipe Valley, municipality of Martí, Matanzas province, Cuba (Suárez 2020a; for description of locality see Iturralde-Vinent *et al*. 2000). Fig. 5.

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (Suárez 2020a).

***Direct $^{14}$C dating***.—None. For dating of other bird species at the type locality, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Very rare. *M. diazfrancoi* is about the size of *M. alexandri* [= *Milvago wetmorei* Arredondo 1982: 36 (*lapsus calami*)] Olson, 1976, from Haiti, with a slenderer tarsometatarsus in the former, among other distinguishing characters (Suárez 2020a: 36; see Olson 1976: fig. 1). Both taxa appear related to the continental modern-day Yellow-headed Caracara *M. chimachima* (Olson 1976: 359, Suárez 2020a: 36–37), which is present in the fossil record of Florida (Emslie 1998: 44–46).



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### 33. *Milvago* sp.

***Referred material***.—**Tarsometatarsus**: proximal left, WS 977.

***Distribution***.—Cave deposit in west Cuba (see Appendix). *Artemisa*. Caimito: **ACP** (Suárez & Arredondo 1997: 101).

***Direct $^{14}$C dating***.—None.

***Notes***.—The rarest and least known of the Cuban extinct caracaras. Orihuela (2019: 60–61) erroneously considered the *Milvago* sp., recorded by Suárez & Arredondo (1997: 101), as another Cuban species in the genus (*M. diazfrancoi*, described a year after Orihuela's paper), indicating 'Type locality: San Felipe tar pits, Martí, Matanzas province...' for it, but the present taxon has never been found in Cuban asphalt deposits (see Suárez 2020a: 36). At the same time, *Milvago* sp. was also incorrectly treated by Orihuela (2019: 60–61) as a synonym of the much larger extinct *Caracara creightoni* (see Suárez 2020a: 35, and 'Notes' under *M. carbo*).

## Genus *Falco* Linnaeus, 1758

*Falco* Linnaeus, 1758, *Syst. Nat*., edn. 10, vol. 1, p. 88. Type, by subsequent designation, *F. subbuteo* Linnaeus (AOU Comm., 1886).

### 34. ×*Falco femoralis* Temminck, 1822

Aplomado Falcon (Halcón Aplomado)

*Falco femoralis* Temminck, 1822, *Color Planches*, livr. 21, pl. 121 and text.

***Referred material***.—**Carpometacarpus**: right without minor metacarpal, MNHNCu 75.4606 (fig. 1D: right [internal]); right lacking distal end and minor metacarpal, MNHNCu 75.4607. **Tibiotarsus**: distal end of left, MNHNCu 75.4608. **Tarsometatarsus**: proximal end of left, MNHNCu 75.4609 (fig. 1E: right [anterior]). Cited material and figures are from Suárez & Olson (2003b). Collected on 25 February 2001 by Stephen Díaz Franco and WS, in San Felipe I, area C.

***Distribution***.—Asphalt deposits in west Cuba (see Appendix). *Matanzas*. Martí: **MLB** (Suárez & Olson 2003b: 73).

***Direct $^{14}$C dating***.—None. For dating of other bird species at MLB, see *Antigone cubensis*, *Gymnogyps varonai* and *Ornimegalonyx oteroi*, and of associated extinct mammals (*Parocnus browni* = 11,880 ± 420 to 4,960 ± 280 years $^{14}$C BP), see Jull *et al*. (2004) and Steadman *et al*. (2005).

***Notes***.—Very rare. Fossils from Las Breas de San Felipe are the only available material of this falcon in Cuba (Suárez & Olson 2003b). The species has also been reported from a prehistoric deposit on Middle Caicos, Bahamas (Steadman & Franklin 2020).

### 35. †*Falco kurochkini* Suárez & Olson, 2001

Cuban Falcon (Halcón Cubano)

*Falco kurochkini* Suárez & Olson, 2001a, *Proc. Biol. Soc. Wash*. 114: 35.

***History***.—*1973*: Eugene N. Kurochkin collects the first specimen, an incomplete tarsometatarsus at Cueva de los Fósiles, Camagüey province (Suárez & Olson 2001a: 34; see Olson 1985, Olson & Kurochkin 1987). *4 May 1997*: holotype collected by WS in a cave deposit in western Cuba (Suárez & Olson 2001a: 35). *Autumn 2000*: specimens of the type series from western Cuba recorded as 'Falconidae indeterminate' (Suárez 2000b: table 1). *19 April 2001*: original description published (Suárez & Olson 2001a). *April 2004*: reported from



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its westernmost known fossil locality (Suárez 2004b: 156), Cueva El Abrón, an ancient barn owl pellet deposit in mountains of Pinar del Río province (Suárez & Díaz-Franco 2003: 375).

***Holotype***.—Left tarsometatarsus, MNHNCu 75.3229, formerly P3229, WS 1054 (Suárez & Olson 2001a: 35, fig. 2D [anterior]; see also Díaz-Franco 2004: 157, Herrera-Uria *et al*. 2015: 114). Collected 4 May 1997 by WS in a small sink known as 'El Sumidero', at the type locality (Suárez & Olson 2001a; 35; see Suárez 2000b).

***Other material***.—**Coracoid**: right, MNHNCu 75.3209 (fig. 1A [ventral]); left, USNM 510237. **Humerus**: left, MNHNCu 75.3210 (fig. 1B [anconal]), USNM 510238; left lacking pectoral crest, USNM 510239; incomplete left, MNHNCu 75.3211; proximal left, MNHNCu 75.3212–3214; right lacking proximal end, MNHNCu 75.3215; proximal right, USNM 510238; distal right, USNM 510241. **Ulna**: proximal right, MNHNCu 75.3217, USNM 510242; distal right, MNHNCu 75.3219; proximal left, MNHNCu 75.3216 (fig. 1C [internal]); distal left, MNHNCu 75.3218, USNM 510249 (fig. 1C [internal]). **Carpometacarpus**: proximal right, MNHNCu 75.3220 (fig. 1D [external]). **Notarium**: incomplete, MNHNCu 75.3221 (fig. 2A [ventral]). **Femur**: left, MNHNCu 75.3222 (fig. 2B [anterior]), USNM 510243; distal half of right, MNHNCu 75.3226; left lacking distal end, MNHNCu 75.3223; proximal left, MNHNCu 75.3224–3225, USNM 510244. **Tibiotarsus**: right, MNHNCu 75.3227 (fig. 2C [anterior]); left, USNM 510245; proximal half of left, USNM 510246; right lacking proximal end, MNHNCu 75.3230; distal right, MNHNCu 75.3228. **Tarsometatarsus**: right lacking proximal end, USNM 510247; left lacking distal end, IGP/ACC 406-3 (fig. 2E [anterior]); shaft of left, USNM 510248. Cited material and figures are from Suárez & Olson (2001a). See also Díaz-Franco (2004: 157), Herrera-Uria *et al*. (2015: 114).

***Type locality***.—Cueva de Sandoval (**ASA**), *c*.4 km south of the town of Vereda Nueva, municipality of Caimito, Artemisa [formerly La Habana] province, Cuba (Suárez & Olson 2001a: 35). Fig. 6.

***Distribution***.—Cave deposits in west and central Cuba (see Appendix). *Pinar del Río*. Los Palacios: **PEA** (Suárez 2004b: 156). *Artemisa*. Caimito: **ACP** (Suárez & Olson 2001a: 36), **ASA** = type locality (Suárez 2000b: table 1 ['Falconidae indeterminate'], Suárez & Olson 2001a: 35–36 ['*Falco kurochkini*, new species']). *Mayabeque*. San José de las Lajas: **YCC** (Jiménez & Orihuela 2021: 169). *Camagüey*. Sierra de Cubitas: **CFO** (Suárez & Olson 2001a: 36).

***Direct $^{14}$C dating***.—None. For dating of associated fauna at PEA (17,406 ± 161 $^{14}$C yr BP), see Suárez & Díaz-Franco (2003: 373).

***Notes***.—Known by most postcranial elements. Present in some cave deposits (Suárez 2000b: 67, 2004b: 156, Jiménez & Orihuela 2021: 169) containing ancient barn owl pellets (*cf. Tyto furcata* and *T. noeli*), as this extinct falcon was frequently predated by tytonids. *F. kurochkini* had marked terrestrial habits with hindlimb elements slenderer than in any congeneric (Suárez & Olson 2001a: 37).

## Order Psittaciformes Wagler
## Family Psittacidae Rafinesque
## Genus *Ara* Lacépède, 1799

*Ara* Lacépède, 1799, *Tabl. Oiseaux*, p. 1. Type, by subsequent designation, *Psittacus macao* Linnaeus (see Ridgway 1916: 119).

### 36. †*Ara tricolor* Bechstein, 1811
### Cuban Macaw (Guacamayo Cubano)

*Ara tricolor* Bechstein, 1811, *in* Latham, *Allg. Ueber*. 4(1): 64, pl. 1.
Le petit Ara d'Aubenton, 1779, *Planches Enl*. 641.
L'Ara tricolor Levaillant, 1801: 13.


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*Macrocercus aracanga*: Vieillot, 1816: 258.
*Macrocercus tricolor*: Vieillot, 1816: 262.
*Psittacus tricolor*: Kuhl, 1820: 16.
*S*[*ittace*]. *tricolor*: Wagler, 1832: 669, 733.
*Arara tricolor*: Brehm, 1842: 3.
*Sittace*? *lichtensteini*: Wagler, *fide* Bonaparte 1856.
*Ara cubensis* Wetherbee, 1985: 174.

***Type specimen***.—Neontological material (extinct during second half of 19th century): adult mounted, MNHN CG 2000–726, with no date, precise locality, or collector (see Kirkconnell *et al*. 2020, pl. 58).

***Referred material***.—**Skull**: lacking zygomatic arches, right portion of frontal area, and most of bone around otic regions, AC-7 (Olson & Suárez 2008b: 287–288, fig. 1B: top [ventral], middle [dorsal], bottom [lateral]); rostrum, IGP/ACC unnumbered, at CZACC (Arredondo 1984: 18). **Carpometacarpus**: proximal half of right, AMNH unnumbered (Wetmore 1928: 4).

***Distribution***.—Cave and sinkhole deposits in west and central Cuba (see Appendix). *Artemisa*. Caimito: **ACP** (Arredondo 1984: 18, Arredondo & Arredondo 2002a: table 1, 2002b: table 1). *Cienfuegos*. Palmira: **CCM** (Wetmore 1928: 4). *Villa Clara*. Sagua La Grande: **VCB** (Olson & Suárez 2008b: 287–288).

***Direct $^{14}C$ dating***.—None. For two indirect conventional dating from CCM (>30,000 to 25,000 ± 2,000 $^{14}C$ yr BP), see Kulp *et al*. (1952: 419, table 2 [two samples: pine cones and wood]).

***Notes***.—Rare in Cuban Quaternary fossil localities with swampy palaeo-environmental indicators (Olson & Suárez 2008b). One record from a cave deposit in Mayabeque province (Arredondo & Arredondo 2002b: table 1) is erroneous (see section III). Fossils from Long Island, Bahamas, recently referred to Cuban Macaw by Steadman & Franklin (2020: table 1 [‘*Ara* cf. *tricolor*’]). For archaeological records see Jiménez & Orihuela (2021: 171–172). For a summary of its distribution in historical times, natural history, taxonomy, phylogenetic position and skin specimens in collections, see Wiley & Kirwan (2013), Hume (2017), Johansson *et al*. (2018), Provost *et al*. (2018) and Kirkconnell *et al*. (2020).

## II—SPECIES OF DUBIOUS IDENTITY

***Geranoaetus melanoleucus*** (Vieillot, 1819).—Wetmore (1928: 3–4) recorded an incomplete left carpometacarpus (‘AM [= AMNH] 6190’, figs. 1* [internal], 2* [proximal]) and an ungual phalanx (AMNH unnumbered) as ‘*Geranoaëtus melanoleucus*’ (see also Brodkorb 1964: 281 [= ‘*Buteo fuscescens* (Vieillot)’]) from **CCM**, which material was subsequently referred by Acevedo-González & Arredondo (1982: table 1) and Arredondo (1984: 10) to the extant subspecies *G. m. australis* Swann, 1922. However, this material probably represents *Buteogallus borrasi*, the commonest extinct accipitrid found in Cuban Quaternary deposits (see section I), with a carpometacarpus similar in morphology including size (see Suárez 2020a: 17).

## III—MISIDENTIFIED & SYNONYMISED TAXA

**†Phorusrhacidae** Ameghino, 1889.—Extinct family recorded as ‘Phororhacidae’ from **PPD**, **ACP** and **ALA** by Arredondo (1954: 92, 1955: 25–30, 1956: 5, 1957a: 72, 84, 1957b: 10–13, 1958: 10), based on postcranial elements and a large eggshell from an unidentified bird (Arredondo 1955: 26, unnumbered fig.*: bottom centre). Six species in this family (not ‘four’ as noted by Brodkorb 1961: 634) were reported by Arredondo (1958: 10, 12) as possibly


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present in Cuba. The material was later referred to Strigidae, *Ornimegalonyx oteroi* (Brodkorb 1961, Bond 1964, Arredondo 1975, 1976), and Accipitridae, *Gigantohierax suarezi* (Arredondo & Arredondo 2002a; specimens formerly listed under '*Aquila*' *borrasi*, see Arredondo 1961, 1964, 1970a). Cited by Herrera Fritot (1957: 33), Pérez de Acevedo (1957: 273), Koopman (1958: 2) and Paula Couto (1967: 7). Koopman (1958: 2) reproduced information sent by Arredondo of 'an unknown bird allied to the extinct *Phororacos* of Argentina', but with a footnote: 'this identification maybe is erroneous'. ***Coccyzus vetula*** (Linnaeus, 1758).—Jamaican Lizard Cuckoo was indicated for Cuba as '*Sarothera* [*sic*] *vetula*' by Olson (1978: 114), based on two specimens, a fragmentary pelvis (Av. 875/67) and a partial left humerus (Av. 876/67), recorded from **PPD** as '*Saurothera merlini* d'Orbigny, 1839' by Fischer & Stephan (1971b: 597). I have examined additional material of *Coccyzus* from other cave deposits in western Cuba. Comparison with *C. vetula* indicates it is not the Jamaican species. Instead, some of the fossils agree in osteological characters and size with skeletal elements of the modern-day subspecies of Great Lizard Cuckoo *C. merlini decolor* (Bangs & Zappey, 1905), resident on Isla de la Juventud (= Isla de Pinos), and *C. m. santamariae* (Garrido, 1971) on some cays off northern Cuba (Kirkconnell *et al*. 2020: 139–140). Both subspecies seem to be more related taxonomically to these fossils than to the modern-day populations (also present in deposits of Holocene age, or maybe older) in the west of the archipelago. The same seems to be true for Bahamian *C. m. bahamensis* and a fossil humerus identified as '*Saurothera merlini*' from Grand Cayman, Cayman Islands (Morgan 1994: 482). The name *C. bahamensis* (H. Bryant, 1864), the oldest available, probably should be applied to some of these fossils. *C. merlini* apparently evolved in eastern Cuba, from where it colonised the rest of the main island. ***Rallus sumiderensis*** Fischer & Stephan, 1971.—Invalid species, described as extinct, based on abundant material from **PPD** (Fischer & Stephan 1971b: 593, table 1), but synonymised by Olson (1974: 445–447, table 2) with the relict Cuban endemic Zapata Rail *Cyanolimnas cerverai* Barbour & Peters, 1927 (see Olson 1977: 372, 1978: 107), which is similar in osteological characters and external morphology to the genus *Neocrex* Sclater & Salvin, 1869, of which *C. cerverai* probably represents only a highly specialised, near-flightless insular representative (WS unpubl.). ***†Fulica picapicensis*** Fischer & Stephan, 1971 (part).—An incomplete right ulna (Av. 843/67), paratype of *Fulica* (= *Nesotrochis*) *picapicensis* (Fischer & Stephan 1971b: 595), does not represent this taxon, but is probably a columbid (Olson 1974: 441, footnote; see 'Notes' under *N. picapicensis*). ***Jabiru mycteria*** (M. H. C. Lichtenstein, 1819).—A distal left tibiotarsus and proximal right tarsometatarsus (both AMNH unnumbered) from **CCM** were identified by Wetmore (1928: 2) as a Jabiru, but later referred to *Ciconia maltha* L. Miller, 1910, by Howard (1942: 202). ***†Xenicibis* sp.**—Recorded in Cuba by Acevedo-González & Arredondo (1982: table 1) without reference to specimens or a locality, and by Arredondo (1984: 6–7) based on material from **PPD** (which was incorrectly considered the 'type locality' for '*Xenicibis*' sp. by Gutiérrez Domech *et al*. 2018: 45) including a left humerus (OA 2969), a fragmentary distal left tibiotarsus (OA 2970a), two pieces of a left tarsometatarsus (OA 2971) and a phalanx (OA 2972). These were reidentified (Suárez 2001a) as a Limpkin *Aramus guarauna* Linnaeus, 1766. The extinct flightless ibis *Xenicibis xympithecus* Olson & Steadman, 1977 (= *Xenicibus xympithecus* Olson 1978: 115 [*lapsus calami*], *Xenioibis xympitheous* Arredondo 1984: 6 [typographical error]) is endemic to Jamaica (see Olson & Steadman 1977, 1979, Longrich & Olson 2011), and the genus is unknown in Cuba (Suárez 2001a). ***†Teratornis*** L. Miller, 1909.—Material of the Cuban Teratorn formerly recorded as '*Teratornis* sp.' by Suárez & Arredondo (1997: 100) and described as '*Teratornis*' *olsoni* Arredondo & Arredondo, 2002, is now relocated under the genus *Oscaravis* (Suárez & Olson 2009a). ***Antillovultur*** Arredondo, 1972.—Extinct genus erected for Cuban Condor '*A.*' *varonai* Arredondo, but considered a junior synonym of


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*Gymnogyps* Lesson (Emslie 1988, Suárez 2000a, Suárez & Emslie 2003). ***Sarcoramphus* sp.**?—First mentioned for Cuba in Acevedo-González & Arredondo (1982: table 1) without reference to material or locality. Subsequently, a single specimen (not a 'Few specimens… were assigned to *Sarcoramphus* (? sp.)' as reported by Orihuela 2019: 60), a distal fragment of left ulna (OA 2973) collected at **HCI** by O. Arredondo in July 1972, was tentatively recorded as '*Sarcoramphus* sp.?' (Arredondo 1984: 9), but reidentified as *Buteogallus borrasi* (Suárez 2001b, see section I). *Sarcoramphus* was not mentioned (*contra* Orihuela 2019: 60), nor were specimens 'assigned to' it, by Iturralde-Vinent *et al*. (2000). ***Cathartes aura*** (Linnaeus, 1758).—A proximal left ulna (OA 2974) from **ALA** was recorded as a Turkey Vulture (Arredondo 1984: 8), but the specimen is of the extinct Cuban Giant Owl *Ornimegalonyx oteroi* (Suárez 2001b: 110). Material from **YCI** reported as *C. aura* by Jiménez Vázquez & Valdés Ruiz (1995: 62) was reidentified as the smaller, extinct *C. emsliei* (Suárez & Olson 2020b: 335). **Cathartidae gen. et sp. indet.**—Comments in Arredondo (1976: 172, table 1) on fossils from **YTU**, identified as a 'large species of vulture' and recorded (Arredondo 1976: table 1) as 'Vulturidae gen. and sp. indet.', were later considered by him to have been misidentified (Suárez 2001b: 110). ***Pandion* sp.**—Arredondo Antúnez & Villavicencio Finalet (2006: tables I–II) recorded a '*Pandion* sp.' from **VSM**. I examined the fragmentary material on which this is based and found it does not represent a Pandionidae Sclater & Salvin, but a medium-sized Accipitridae (WS unpubl.). ***Aquila* sp.**—Cited by Fischer (1977: 214) from **ALA** without specifying material and by Arredondo (1984: 12) from **ACP** and **SPF** based on specimens of *Buteogallus borrasi* (see Suárez & Olson 2008), formerly described in *Aquila* Brisson (see section I). ***Tyto alba*** (Scopoli, 1769).—A proximal right tarsometatarsus (MNHNCu unnumbered) from **SPL** was identified as '*Tyto alba*' by Aranda *et al*. (2017: 118, fig. 1H [anterior]). Based on characters visible in the published photograph, the bone is of a New World *Cathartes* vulture, and is herein reidentified as *Cathartes* sp. Although by size the specimen probably represents *C. aura*, which is very common in modern late Holocene deposits (being occasionally intrusive in some older cave deposits), the specific identity and age of this bone will be subject to further comparisons and a direct $^{14}$C dating. ***Tyto riveroi*** Arredondo, 1972.—Described from **MBE** by Arredondo (1972b) based on a distal tarsometatarsus (DPUH 1252) of the large barn owl *Tyto pollens* Wetmore, 1937 (Suárez & Olson 2015: 539–540, see section I). ***Ornimegalonyx acevedoi, O. minor*** and ***O. gigas*** Arredondo, 1982.—These three supposed taxa were described from **MCQ**, **ACP** and **SPC**, respectively, by Arredondo (1982: 45–47), based on material of *O. oteroi* Arredondo, 1958, exhibiting sexual and individual variations (Suárez 2020b, see section I). ***Gymnoglaux* sp.**—Mentioned by Arredondo (1972a: table 1, 1972c: table 1, 1975: 150, 1976: 131) and Acevedo-González & Arredondo (1982: table 1), without indicating material or locality, and recorded as different from living '*Gymnoglaux*' (= *Margarobyas*) *lawrencii* (Sclater & Salvin, 1868) by Arredondo (1982: 41–42, 1984: 23–24), on the basis of a complete right (OA 2939) and distal end of left (OA 2940) tarsometatarsus from **ACP**. The validity of this supposed extinct taxon was rejected by Arredondo himself on 2 February 2000, when he and I considered describing it and finally compared the fossils with an adequate series of Bare-legged Owl material (O. Arredondo & WS unpubl.). Specimens referable to *Margarobyas* Olson & Suárez from fossil deposits in western Cuba (e.g., **PEA**, **ACP**, **ASA**), were compared with partial skeletons and isolated elements (representing >30 individuals) of *M. lawrencii* obtained from fresh pellets of *Tyto furcata* (WS unpubl.) throughout the main island, in which the endemic owl is its principal avian prey in some habitats (see Suárez 1998). Both fossil and modern specimens are indistinguishable in size and osteological characters. Material from fossil deposits in eastern Cuba is also variable (S. L. Olson pers. comm.), as is true of *Glaucidium siju* (d'Orbigny, 1839). External morphology in *M. lawrencii* is equally


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subject to considerable variation across the Cuban archipelago, where the subspecies *M. l.* '*exsul*' described by Bangs (1913: 91) for western Cuba and Isla de Pinos (= Isla de la Juventud), is considered invalid (Ripley & Watson 1956: 4, Bond 1957: 12, Parkes 1963: 130; see Kirkconnell *et al*. 2020: 240). ***Margarobyas abronensis*** Zelenkov & González 2021.—A species recently described based on fossils derived from barn owl predation in **PEA** and identified by the authors as the same taxon (= '*Gymnoglaux* sp.', see above) recorded by Arredondo (1984). Material from lower levels in El Abrón (= Late Pleistocene; Suárez & Díaz-Franco 2003: 373), including humeri, femora, tibiotarsi and tarsometatarsi, was collected, compared and identified as '*Gymnoglaux*' *lawrencii* by Suárez & Díaz-Franco (2011). Characters described as specific to '*M. abronensis*', including those of the tarsometatarsus, based on comparison apparently with a single skeleton of *M. lawrencii*, are present (and highly variable) in the living species, especially when examining both sexes. The fossil taxon was diagnosed as 'slightly smaller than extant *M. lawrencii*'. Although a chronocline consisting of a post-Pleistocene increase in size is present in some vertebrates from El Abrón (WS & S. Díaz-Franco unpubl.) and other Cuban stratified Quaternary deposits (see Silva Taboada 1974, 1979: 368), a modern tarsometatarsus (total length 33.7 mm) of *M. lawrencii* reported by Arredondo (1982: 42, 1984: 24) from Isla de la Juventud, western Cuba, is smaller than in '*M. abronensis*' (total length 35.7 mm, see Zelenkov & González 2021: table 1). Material (tarsometatarsi) originally identified as '*Gymnoglaux* sp.' by O. Arredondo from **ACP** is, contrarily, larger (total length 37.5 mm) than '*M. abronensis*' and near the largest limit of *M. lawrencii* recorded by Arredondo (1982: 42, 1984: 24). In addition, some paratypes of '*M. abronensis*' (Zelenkov & González 2021, figs. 1: K = quadrate [caudal], 3: J = ulna [ventral]) are more similar in size and characters to equivalent elements of the modern individual used for comparisons, and figured in the original description, but measurements were not presented. *Margarobyas abronensis* Zelenkov & González, 2021, is considered herein a junior subjective synonym of *Margarobyas lawrencii* (Sclater & Salvin, 1868). See section IV for the fossil record of *M. lawrencii*. †***Amplibuteo woodwardi*** (L. Miller, 1911).—Originally recorded as *Amplibuteo* sp. from **ASA** (Suárez & Arredondo 1997: 100–101), based on a partial skeleton (later numbered WS 365). Subsequently, it was identified as *A. woodwardi* by Suárez (2004a), albeit with some differences from the continental taxon. The extinct genus *Amplibuteo* Campbell is now considered a junior synonym of *Buteogallus* Lesson and the Cuban material, along with a fossil from Hispaniola, was described (Suárez & Olson 2021) as the Antillean extinct species *B. irpus*. Navarro (2022: table 5) erroneously included both *A. woodwardi* and *B. irpus* as present in the fossil record of Cuba, overlooking the taxonomic history of the latter (see section I). ***†Titanohierax*** Wetmore, 1937.—Extinct genus described from the Bahamas (Wetmore 1937), combined for some time in the binomen *Titanohierax borrasi* (*cf.* Olson & Hilgartner 1982). The Cuban species (see section I) was redescribed in *Buteogallus* Lesson on the basis of abundant and more complete material (Suárez & Olson 2008). ***Caracara plancus*** **ssp**.—The left tarsometatarsus (GEPAB-P294) that constituted this record (Jiménez Vázquez 1997a: 49) from **YTU** was reidentified as the extinct *Caracara creightoni* (Suárez & Olson 2003c: 36). ***Milvago*** **sp**.—Although *Milvago* is well represented in the Cuban fossil record (Suárez & Olson 2003c, Suárez 2020a), the first indication by Acevedo-González & Arredondo (1982: table 1) was in error (O. Arredondo pers. comm.). The subsequent deletion of this record (*cf.* Arredondo 1984) was made without comment (see Suárez 2020a: 36), and the material (or taxon) on which it was based is currently unknown. ***†Ara tricolor*** Bechstein, 1811.—One record from **YBL** (Arredondo & Arredondo 2002b: table 1 ['*Ara cubensis*']) based on a tibiotarsus collected by O. Jiménez Vázquez, but the specimen is a Cuban Parrot *Amazona leucocephala* (Linnaeus, 1758) (O. Jiménez Vázquez *in litt*. 2021). ***?Scytalopus*** **sp**.—A supposed extinct tapaculo (Rhinocryptidae


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Wetmore) was recorded from cave deposits in western (**ISC**) and central (**CFO**) Cuba (Olson & Kurochkin 1987), and from Mayabeque (**YBL**) province (Jiménez Vázquez *et al*. 2005), based on specimens of the endemic Zapata Wren *Ferminia cerverai* Barbour (see Suárez & Olson 2020a: 559). ***Dolichonyx kruegeri*** Fischer & Stephan, 1971.—Described from **PPD** by Fischer & Stephan (1971b: 597) on a composite type series (Olson & Hilgartner MS), including the endemic Cuban Oriole *Icterus melanopsis* (Wagler, 1829) and migrant Bobolink *Dolichonyx oryzivorus* (Linnaeus, 1758). The latter was a common bird in Cuba in the past, migrating in large numbers throughout the archipelago (Gundlach 1876: 87–88, 1893: 117–118), with remains found in some fossil deposits derived from barn owl pellets (WS pers. obs.). Treated as a synonym of '*Agelaius phoeniceus* (Linnaeus)' by Brodkorb (1978: 201). Acevedo-González & Arredondo (1982: table 1) and Arredondo (1984: 31–32), supposedly refined the identification to '*Agelaius phoeniceus assimilis* Lembeye'—which is currently considered a species, Red-shouldered Blackbird (see Kirkconnell *et al*. 2020: 319)—but skeletal elements of the latter taxon seem too large to match the fossil material (Olson & Hilgartner MS). Orihuela (2019: 64) incorrectly considered *D. kruegeri* as a 'Forgotten record since the original description', ignoring its taxonomic history as a synonym, and going further, as 'Likely extirpated or accidental record'. Following Orihuela (2019: 64), this invalid taxon was erroneously listed again in two consecutive lists of Cuban fossil birds compiled by Navarro (2020: 42, 2021: table 4). **'Unidentified bird'**.—MacPhee & Iturralde-Vinent (1994: table 2, 1995: table 1) recorded an 'unidentified bird' from Domo de Zaza (Early Miocene, Lagunitas Formation), Sancti Spíritus province, south-central Cuba, a locality with terrestrial and marine vertebrate remains. About two decades ago (*cf*. Suárez 2004c: 7), I examined the heavily worn, undiagnostic small specimen on which this record was based; although its identity remains uncertain, its morphology differs from any skeletal element in members of the class Aves.

## IV—CUBAN NEOSPECIES IN FOSSIL DEPOSITS

([E]endemic, [I]intrusive)

**ANATIDAE**.—***Dendrocygna arborea*** (Linnaeus, 1758): **MLB** (Suárez 2020a: 6). ***Anas platyrhynchos*** Linnaeus, 1758: **CCM** (Wetmore 1928: 3 ['*Anas platyrhyncha*']). **PODICIPEDIDAE**.—***Podilymbus* cf. *podiceps*** (Linnaeus, 1758): [I]**ASC** (*cf*. Acevedo-González & Arredondo 1982: table 1 ['*P*[*odilymbus*]. cf. *podiceps antillarum*'], Arredondo 1984: 3–4 ['*Podilymbus* cf. *podiceps antillarum*']). **COLUMBIDAE**.—***Patagioenas inornata*** (Vigors, 1827): **ACP** and **ASA** (WS unpubl.). ***Columbina passerina*** (Linnaeus, 1758): **ACP** (WS unpubl.), **YBL** (Jiménez Vázquez *et al*. 2005: 98), **YCC** (Jiménez & Orihuela 2021: 169), **MAF** (*cf*. CLV). ***Columbina* cf. *passerina***: **ACP** (*cf*. Acevedo-González & Arredondo 1982: table 1 ['*C*[*olumbina*]. cf. *passerina aflavida*'], Arredondo 1984: 17–18 ['*Columbina* cf. *passerina aflavida*']). ***Zenaida aurita*** (Temminck, 1809): **ASA** (Suárez & Arredondo 1997: 101 ['*Zenaida aurita zenaida*'], Suárez 2000b: table 1). ***Zenaida* cf. *aurita***: **YBL** (Jiménez Vázquez *et al*. 2005: 98). ***Zenaida macroura*** (Linnaeus, 1758): **ACP** (*cf*. Acevedo-González & Arredondo 1982: table 1 ['*Z*[*enaida*]. cf. *macroura*'], Arredondo 1984: 17). **Columbidae indet.**: **PPD** (Olson 1974: 441 [footnote: 'possibly columbid'], **YBL** (Jiménez Vázquez *et al*. 1995: 25 ['Bolumbidae [*sic*] ind.'], Jiménez Vázquez *et al*. 2005: 98 ['Columbidae indeterminado']), **YCC** (Jiménez & Orihuela 2021: 169), **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 ['Columbidae ind.']). **CUCULIDAE**.—***Crotophaga ani*** Linnaeus, 1758: **ACP** and **ASA** (Suárez & Arredondo 1997: 101, Suárez 2000b: table 1), **YBL** (Jiménez Vázquez *et al*. 2005: 99). ***Coccyzus merlini*** d'Orbigny, 1839: **PPD** (Fischer & Stephan 1971b ['*Saurothera merlini*']), **YBL** (Jiménez Vázquez *et al*. 2005: 99 ['*Saurothera merlini*']), **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 ['*Sauruthera* [*sic*] *merlini*'], Rojas Consuegra *et al*. 2012: 10 ['*Saurothera merlini*']), **MCP** (Díaz



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Franco 1999: 13 ['*Saurothera merlini* ssp.']), **MFJ** (*cf*. CLV). ***Coccyzus* cf. *merlini***: **ACP** (*cf*. Acevedo-González & Arredondo 1982: table 1 ['*S*[*aurothera*]. cf. *merlini*'], Arredondo 1984: 19 ['*Saurothera* cf. *merlini*']). ***Coccyzus* sp**.: **ACP**, **ACT** (WS unpubl.), **ASA** (Suárez 2000b: table 1 ['*Saurothera* sp.']), **YTU** and **YCI** (WS unpubl.). See *Coccyzus vetula* in section III. **CAPRIMULGIDAE**.—***Chordeiles gundlachii*** Lawrence, 1856: **ASA** (Suárez 2000b: table 1). ***Chordeiles* cf. *gundlachii***: **ACP** (*cf*. Acevedo-González & Arredondo 1982: table 1 ['*Ch*[*ordeiles*]. cf. *minor gundlachii*'], Arredondo 1984: 30 ['*Chordeiles* cf. *minor gundlachii*']). **APODIDAE**.—***Streptoprocne zonaris*** (Shaw, 1796): **ACP** (WS unpubl.). **Apodidae indet.**: **PEA** (Suárez & Olson 2020b: 559 ['a large species of swift' = *Cypseloides*/*Streptoprocne*]). **RALLIDAE**.—[E]***Cyanolimnas cerverai*** Barbour & Peters, 1927: **PPD** (Fischer & Stephan 1971b: 593 ['*Rallus sumiderensis*', see section III]), **PEA** (Suárez MS), **ISC** (Olson 1974: 445, table 2), **ACP** (Suárez MS), **ASA** (Suárez 2000b: table 1), **HGA** (Arredondo 1984: 15), **YIN** (Suárez MS), **YCC** (Jiménez & Orihuela 2021: 169), **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62, Rojas Consuegra *et al*. 2012: 10), **MFJ** (*cf*. CLV), **SPH** and **SPS** (Suárez MS). ***Rallus crepitans*** J. F. Gmelin, 1789: **PEA** (Suárez & Díaz-Franco 2011 ['*Rallus longirostris*']). ***Rallus* sp**.: **YCC** (Jiménez & Orihuela 2021: 169), **SPS** (Suárez 2004b: 157). ***Gallinula galeata*** (M. H. C. Lichtenstein, 1818): **CCM** (Wetmore 1928: 4 ['*Gallinula chloropus*'], Brodkorb 1967: 135 ['*Gallinula chloropus*'], Acevedo-González & Arredondo 1982: table 1 ['*G*[*allinula*]. *chloropus cerceris*'], Arredondo 1984: 14 ['*Gallinula chloropus cerceris*']). **ARAMIDAE**.—***Aramus guarauna*** (Linnaeus, 1766): **PPD** (Arredondo 1984: 6–7 ['*Xenicibis* sp.'], Suárez 2001a: 109. See *Xenicibis* sp. in section III). **CICONIIDAE**.—***Mycteria americana*** Linnaeus, 1758: **MLB** (Suárez & Olson 2003a: 151, Suárez 2020a: 10). **ARDEIDAE**.—***Ixobrychus exilis*** (J. F. Gmelin, 1789): **ACP** (WS unpubl.), **CCM** (Wetmore 1928: 2). ***Ardea alba*** Linnaeus, 1758: **CCM** (Wetmore 1928: 1 ['*Casmerodius albus*'], 2 ['*Casmerodius albus egretta*'], Arredondo 1984: 4–5 ['*Egretta alba egretta*']). **CATHARTIDAE**.—***Cathartes aura*** (Linnaeus, 1758): [I]**YTU** (Arredondo & Varona 1974: 5, Acevedo González *et al*. 1975: 18–19 ['*Cathartes aura aura*'], Arredondo 1975: 18, 1976: table 1, Acevedo-González & Arredondo 1982: table 1, Arredondo 1984: 8–9), **YCN** (Orihuela 2019: 59). See *Ornimegalonyx oteroi* section I and *Tyto alba* section III. **ACCIPITRIDAE**.—***Accipiter striatus*** Vieillot, 1808: **ACP** (Suárez & Arredondo 1997: 100 ['*Accipiter striatus fringilloides*']), **YCI** (Rojas Consuegra *et al*. 2012: 10 ['*Accipiter striatus* ssp.'], **MLB** (Iturralde-Vinent *et al*. 2000: table 2 ['*Accipiter* sp.'], Suárez 2020a: 16). [E]***Accipiter gundlachi*** Lawrence, 1860: **ASA** (Suárez 2000b: table 1), **YTU** (Suárez & Arredondo 1997: 100 ['*Accipiter gundlachi gundlachi*']). ***Buteo platypterus*** (Vieillot, 1823): **PEA** (Suárez & Díaz-Franco 2011), **ACP** (Suárez & Arredondo 1997: 100 ['*Buteo platypterus cubanensis*']), **ASA** (Suárez 2000b: table 1), **MLB** (Suárez & Olson 2003b: 73 ['*B*[*uteo*]. *platypterus cubanensis*'], Suárez 2020a: 27). ***Buteo jamaicensis*** (J. F. Gmelin, 1788): **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62, Jiménez Vázquez 1997a: 49 ['*Buteo jamaicensis* ssp.'], Rojas Consuegra *et al*. 2012: 10 ['*Buteo jamaicensis solitudinis*'], **MLB** (Suárez 2020a: 28). ***Buteo* sp**.: **PPD** (Fischer & Stephan 1971b: 593 ['*Buteo*']). **TYTONIDAE**.—***Tyto furcata*** (Temminck, 1827): **PEA** (Suárez & Díaz-Franco 2003: 375 ['*Tyto alba*']), **ACP** (Arredondo 1972a: table 1 ['*Tyto alba* ssp.'], 1972c: table 1 ['*Tyto alba* ssp.'], 1975: 150 ['*Tyto alba* ssp.'], 1976: 171 ['*Tyto alba furcata*'], 1982: 40–41 ['*Tyto alba* ssp.'], 1984: 19 ['*Tyto alba furcata*'], 20 ['*Tyto alba* ssp.']), **ASA** (Suárez 2000b: table 1 ['*Tyto alba*']), **YBL** (Jiménez Vázquez *et al*. 2005: 89 ['*Tyto alba*'], **MLB** (Suárez 2020a: 29). **STRIGIDAE**.—[E]***Margarobyas lawrencii*** (Sclater & Salvin, 1868): **PEA** (Suárez & Díaz-Franco 2011 ['*Gymnoglaux lawrencii*'], Zelenkov & González 2021 ['*Margarobyas abronensis*, sp. nov.']), **ACP** (Arredondo 1972a: table 1 ['*Gymnoglaux* sp.'], 1972c: table 1 ['*Gymnoglaux* sp.'], 1975: 150 ['*Gymnoglaux* sp.'], 1976: table 1 ['*Gymnoglaux* sp.'], 1982: 41 ['*Gymnoglaux* sp.'], 1984: 23 ['*Gymnoglaux* sp.', see *Gymnoglaux* sp. in section III], Arredondo & Arredondo 2002a: table 1 ['*Gymnoglaux* sp.'], 2002b: table 1 ['*Gymnoglaux* sp.']), **ASA**, **APR** and **ACH**


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(WS unpubl.), **YBL** (Jiménez Vázquez *et al*. 2005: 98 ['*Gymnoglaux lawrencii*']), **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 ['*Gymnoglaux lawrencii*'], Jiménez Vázquez 1997a: 49 ['*Gymnoglaux lawrencii* ssp.'], Rojas Consuegra *et al*. 2012: 10 ['*Otus lawrencii* ssp']), **YCN** (Orihuela *et al*. 2020b: table 4), **MCP** (Díaz Franco 1999: 13 ['*Otus lawrencii*']), **MLB** (Suárez 2020a: 31), **MFJ** and **MAF** (*cf*. CLV), **VSM** (Arredondo Antúnez & Villavicencio Finalet 2006: tables I–II ['*Gymnoglaux lawrencii*']). [E]***Glaucidium siju*** (d'Orbigny, 1839): **PCA** (*cf*. Acevedo-González & Arredondo 1982: table 1, Arredondo 1984: 24–25), **PEA**, **ACP** and **ACH** (WS unpubl.), **YBL** (Jiménez Vázquez *et al*. 2005: 98), **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 ['Cf. *Glaucidium*'], Rojas Consuegra *et al*. 2012: 10 ['*Glaucidium siju* ssp']). ***Athene cunicularia*** (Molina, 1782): **PEA** (Suárez 2004b: 156), **ACP** (*cf*. Suárez & Arredondo 1997: 101 ['*Athene* [*Speotyto*] *cunicularia*']), **ASA** (Suárez 2000b: table 1 ['*Speotyto cunicularia*']). **TROGONIDAE**.—[E]***Priotelus temnurus*** (Temminck, 1825): **PEA** (WS unpubl.), **ACP** and **ACH** (WS unpubl.), **MCP** (Díaz Franco 1999: 13 ['*Priotelus temnurus* ssp.']). **TODIDAE**.—[E]***Todus multicolor*** Gould, 1837: **PEA** (Zelenkov & González 2020), **YBL** (Jiménez Vázquez *et al*. 2005: 98). **PICIDAE**.—***Melanerpes superciliaris*** (Temminck, 1827): **YBL** (Jiménez Vázquez 1997a: 49 ['*Melanerpes superciliaris* ssp.'], Jiménez Vázquez *et al*. 2005: 98). ***Sphyrapicus varius*** (Linnaeus, 1766): **YBL** (Jiménez Vázquez 1997a: 49 ['*Sphyrapicus varius* ssp.']). [E]***Xiphidiopicus percussus*** (Temminck, 1826): **PEA** (WS unpubl.), **ASA** (Suárez 2000b: table 1), **APR** and **ACH** (WS unpubl.), **YBL** (Jiménez Vázquez *et al*. 2005: 98). ***Xiphidiopicus* cf. *percussus***: **ACP** (*cf*. Acevedo-González & Arredondo 1982: table 1, Arredondo 1984: 30–31). [E]***Colaptes fernandinae*** Vigors, 1827: **ASA** (Suárez & Arredondo 1997: 101, Suárez 2000b: table 1). ***Colaptes* sp.**: **YBL** (Jiménez Vázquez *et al*. 2005: 98). ***Campephilus principalis*** (Linnaeus, 1758): **YCA** (Jiménez & Orihuela 2021: 170). **Picidae indet**. **YBL** (Jiménez Vázquez *et al*. 2005: 98 ['Picidae indeterminado']). **FALCONIDAE**.—***Falco sparverius*** Linnaeus, 1758: **ACP** (Suárez & Olson 2001a: 37), **ASA** (Suárez 2000b: table 1), **YBL** (Jiménez Vázquez 1997a: 49 ['*Falco sparverius* ssp.']), **MLB** (Suárez 2020a: 38). **PSITTACIDAE**.—[E]***Psittacara euops*** (Wagler, 1832): **PEA** (Suárez & Díaz-Franco 2011 ['*Aratinga euops*'], Suárez & Olson 2020a: 559), **YCN** (Orihuela *et al*. 2020b: 17, table 4 ['*Psittacara eups* [*sic*]']). ***Amazona leucocephala*** (Linnaeus, 1758): **PEA** (Suárez & Díaz-Franco 2011), **YBL** (Arredondo & Arredondo 2002b: table 1 ['*Ara cubensis*'], see *Ara tricolor* section III), **MCP** (Díaz Franco 1999: 13 ['*Amazona leucocephala* ssp.']). **CORVIDAE**.—***Corvus palmarum*** (Württemberg, 1835): **ASA** (Suárez & Arredondo 1997: 101 ['*Corvus palmarum* cf. *minutus*'], Suárez 2000b: table 1 ['*Corvus minutus*']), **MLB** (Suárez 2020a: 38). ***Corvus nasicus*** Temminck, 1826: **MLB** (Iturralde-Vinent *et al*. 2000: table 2, Suárez 2020a: 39). ***Corvus* cf. *nasicus***: **MCE** (Orihuela 2013: 13). ***Corvus* sp.**: **YCI** (Rojas Consuegra *et al*. 2012: 11). **HIRUNDINIDAE**.—***Petrochelidon fulva*** (Vieillot, 1808): **ASA** (Suárez & Arredondo 1997: 101 ['*Hirundo fulva cavicola*'], Suárez 2000b: table 1), **YBL** (Jiménez Vázquez *et al*. 2005: 98). **TROGLODYTIDAE**.—[E]***Ferminia cerverai*** Barbour, 1926: **PEA** (Suárez & Olson 2020a: 559), **ACP** and **ASA** (WS unpubl.), **ISC** (Olson & Kurochkin 1987: 353 ['?*Scytalopus* sp.']), **YBL** (Jiménez Vázquez *et al*. 2005: 99 ['?*Scytalopus* sp.']), **CFO** (Olson & Kurochkin 1987: 354 ['?*Scytalopus* sp.']). See ?*Scytalopus* sp. section III. **MIMIDAE**.—***Mimus polyglottos*** (Linnaeus, 1758): **YBL** (Jiménez Vázquez *et al*. 2005: 99). ***Mimus* cf. *polyglottos***: **ACP** (*cf*. Acevedo-González & Arredondo 1982: table 1 ['*M*[*imus*]. cf. *polyglottos orpheus*'], Arredondo 1984: 33–34 ['*Mimus* cf. *polyglottos orpheus*']). ***Mimus* sp.**: **ASA** (Suárez 2000b: table 1). **PASSERELLIDAE**.—[E]***Torreornis inexpectata*** Barbour & Peters, 1927: **PEA** (Suárez 2004b: 156), **ACP** (*cf*. Pregill & Olson 1981: 85, Acevedo-González & Arredondo 1982: table 1 ['*Torreornis* sp.'], Suárez & Arredondo 1997: 101), **ASA** (Suárez 2000b: table 1), **YBL** (Jiménez Vázquez *et al*. 2005: 99), **MCP** (Díaz Franco 1999: 13 ['*Torreornis inexpectata* ssp.']), **SPH** (Suárez MS), **SPS** (Suárez 2004b: 157), **SCI** (*cf*. Pregill & Olson 1981: 85, González Alonso *et al*. 1986: 7). **ICTERIDAE**.—***Dolichonyx***


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***oryzivorus*** (Linnaeus, 1758): **PPD** (Fischer & Stephan 1971b: 597 [‘*Dolichonyx kruegeri*, n. sp.’ (part)], Brodkorb 1978: 201 [‘*Agelaius phoeniceus*’], Acevedo-González & Arredondo 1982: table 1 [‘*A*[*gelaius*]. *phoeniceus assimilis*’], Arredondo 1984: 31 [‘*Agelaius phoeniceus assimilis*’]. See *Dolichonyx kruegeri* section III), **ACP**, **ASA** and **YIN** (WS unpubl.), **SCI** (Olson & Hilgartner MS). ***Sturnella magna*** (Linnaeus, 1758): **ASA** (Suárez & Arredondo 1997: 101 [‘*Sturnella magna hippocrepis*’], Suárez 2000b: table 1), **YBL** (Jiménez Vázquez *et al*. 2005: 99). [E]***Icterus melanopsis*** (Wagler, 1829): **PPD** (Fischer & Stephan 1971b: 597 [‘*Dolichonyx kruegeri*, n. sp.’ (part), see section III]). ***Agelaius humeralis*** (Vigors, 1827): **ACP** (*cf*. Acevedo-González & Arredondo 1982: table 1, Arredondo 1984: 32). ***Agelaius* sp.**: **YBL** (Jiménez Vázquez *et al*. 2005: 99). [E]***Ptiloxena atroviolacea*** (d’Orbigny, 1839): **ACP** and **HCI** (*cf*. Acevedo-González & Arredondo 1982: table 1 [‘*A*[*gelaius*]. *atroviolaceus*’], Arredondo 1984: 32–33 [‘*Dives* cf. *atroviolaceus*’]), **YBL** (Jiménez Vázquez *et al*. 2005: 99 [‘*Dives atroviolacea*’]), **YCI** (Jiménez Vázquez & Valdés Ruiz 1995: 62 [‘*Dives atroviolácea* [*sic*]’], Rojas Consuegra *et al*. 2012: 11 [‘*Dives atroviolacea*’]). **THRAUPIDAE**.—***Tiaris* sp.**: **YBL** (Jiménez Vázquez *et al*. 2005: 99). [E]***Melopyrrha nigra*** (Linnaeus, 1758): **YBL** (Jiménez Vázquez *et al*. 2005: 99).

***Notes***.—The woodpeckers *Xiphidiopicus percussus* and *Colaptes fernandinae*, considered Cuban endemics in the modern era (see Kirkconnell *et al*. 2020) have been identified, or material referred to them, from Quaternary deposits in the Bahamas (Steadman & Franklin 2020).

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**Appendix: Cuban Quaternary deposits with avian remains**

Ordered from west to east —the special municipality (*sm*) of Isla de La Juventud (= Isla de Pinos) is at the end—by provinces, including municipality (*m*), near location (*l*) and locality (with its respective acronym). For map of localities, see Fig. 1.

**1. Pinar del Río**

Guane (*m*). Sierra de San Carlos (*l*): **PCA**.—Cueva de los Carabalíes, **PCH**.—Cueva de Chefa [Sistema Cavernario Majaguas-Canteras].
Minas de Matahambre (*m*). Sumidero (*l*): **PPD**.—Caverna [or 'Cueva'] de Pío Domingo.
Viñales (*m*). Sierra de Galeras (*l*): **PMF**.—Cueva del Mono Fósil.
Los Palacios (*m*). Sierra de La Güira (*l*): **PEA**.—Cueva El Abrón.

**2. Artemisa**

Caimito (*m*). Sierra de Anafe (*l*): **ACA**.—'Cueva de la Sierra de Anafe' (*cf*. Arredondo 1958: 11. This uncertain locality, a cave formerly in the municipality of Guanajay and province of Pinar del Río, is the same mentioned by Arredondo 1955: 4, 30, 1976: 177, 1982: 42, 1984: 26, according to O. Arredondo pers. comm. Not 'Abra de San Andrés' or 'Abra de Andrés', which is a different deposit in Sierra de Anafe, *contra* Morgan & Ottenwalder 1993: 160), **APR**.—Cueva Prieta, **ACH**.—Cueva del Ahorcado, **ACT**.—Cueva del Campo de Tiro. Ceiba del Agua (*l*): **ACP**.—Cueva de Paredones, **ASC**.—Cueva Siete Caballerías. Vereda Nueva (*l*): **ACF**.—Cueva del Fósil, **ASA**.—Cueva de Sandoval, **AQS**.—Cueva de Quito Suárez.


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Bauta (*m*). Near [*c*.2 km south-west] Playa Santa Fé [La Habana] (*l*): **ALA**.—Cueva Lamas, **ACL**.—'Cueva próxima a la Cueva Lamas' [*cf*. Arredondo 1984: 8].

**3. La Habana**
Marianao (*m*). Marianao (*l*): **HFT**.—Fisuras en Túnel Popular.
Boyeros (*m*). Calabazar [Reparto América] (*l*): **HGA**.—Gruta del Reparto América. Calabazar [Reparto El Globo] (*l*): **HCI**.—Cueva del Indio.

**4. Mayabeque**
Bejucal (*m*). Cuatro Caminos (*l*): **YCT**.—Cueva La Trampa.
Quivicán (*m*). La Salud (*l*): **YTU**.—Cueva del Túnel, **YIN**.—Cueva de Insunsa, **YCH**.—Cueva del Chicharrón. Aguacate (*l*): **YBL**.—Cuevas Blancas.
San José de las Lajas (*m*). Las Charcas (*l*): **YCC**.—Cuevas de Las Charcas, **YCA**.—Cueva del Aguacate, **YCM**.—Cueva de los Muertos. Tapaste (*l*): **YCI**.—Cueva del Indio.
Madruga (*m*). Loma del Palenque (*l*): **YCN**.—Cueva de los Nesofontes.

**5. Matanzas**
Matanzas (*m*). Matanzas (*l*): **MBE**.—Cueva de Bellamar [Sistema Cavernario Bellamar].
Cárdenas (*m*). Carbonera (*l*): **MCE**.—Cueva La Centella (or 'Cueva Centella'), **MCP**.—Cueva del Campamento. Camarioca (*l*): **MCQ**.—Cueva de Quinto. Cantel (*l*): **MCA**.—Cueva Calero.
Jagüey Grande (*m*). Jagüey Grande (*l*): **MFJ**.—Fisuras en Canteras J-4. Agramonte (*l*): **MCB**.—Cueva Beruvides, **MAF**.—Cueva Afán.
Martí (*m*). Valle de San Felipe (*l*): **MLB**.—Las Breas de San Felipe.

**6. Cienfuegos**
Palmira (*m*). Ciego Montero (*l*): **CCM**.—Baños de Ciego Montero.

**7. Villa Clara**
Corralillo (*m*). El Charcón (*l*): **VSM**.—Solapa del Megalocnus.
Sagua La Grande/Quemado de Güines [shared territory] (*m*). Mal Páez (*l*): **VHC**.—Casimba Hueco Chico, **VCB**.—Casimba en los Buentes.

**8. Sancti Spíritus**
Yaguajay (*m*). Cayo Salinas (*l*): **SPF**.—Cueva Funeraria de Los Niños [= 'Cueva de los Niños' or 'Cueva de los Sacrificios' (Arredondo 1984: 12)]. Cayo Palma (*l*): **SPS**.—Cueva del Salón. Caguanes (*l*): **SPH**.—Cueva de Humboldt.
Sancti Spíritus (*m*). Sancti Spíritus (*l*): **SPC**.—Cantera de los Hornos de Cal, **SPM**.—'Cantera situada cerca de la Loma de Mozas' [= Moza] (*cf*. Arredondo 1984: 21, Suárez & Olson 2015: 542. Perhaps the same as **SPC** and formerly recorded as 'quarries near Sancti Spiritus [*sic*]' or 'Canteras de Sancti Spíritus' by Arredondo 1976: 183, 1982: 38–39).
Jatibonico (*m*). Sierra de Jatibonico (*l*): **SPL**.—Casimba de Las Llanadas.

**9. Ciego de Ávila**
Florencia (*m*). Loma de los Rubíes (*l*): **GCJ**.—Cueva de la Jutía.

**10. Camagüey**
Sierra de Cubitas (*m*). Sierra de Cubitas (*l*): **CFO**.—Cueva de los Fósiles, **CEN**.—Cueva del Centenario.

**11. Holgu*ín***
Gibara (*m*). Polja del Cementerio (*l*): **OCB**.—Cueva La Bandera.
Mayarí (*m*). Seborúco (*l*): **OCS**.—Cueva de Seborúco.

**12. Santiago de Cuba**
Contramaestre (*m*). Baire (*l*): **SMB**.—'Mina' [or 'Cueva'] cerca de Baire.
Santiago de Cuba (*m*). Daiquirí (*l*): **SCI**.—Cueva de los Indios.

**13. Isla de La Juventud [= Isla de Pinos]**
Isla de la Juventud (*sm*). Sierra de Caballos (*l*): **ISC**.—Cueva en Sierra de Caballos. Punta del Este (*l*): **IPE**.—Cueva de Isla (or 'Cueva de las Pictografías').


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