

# Bare-throated Tiger-Heron (*Tigrisoma mexicanum*) from the Pleistocene of Cuba: a New Subfamily for the West Indies

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**Abstract.**—A complete tarsometatarsus from a small Pleistocene sinkhole in northwest central Cuba is identified as that of a Bare-throated Tiger-Heron *Tigrisoma mexicanum*. This constitutes the first record of any kind of tiger-heron (subfamily Tigrisomatinae) in the West Indies. The extinction of the species in Cuba is perhaps attributable to habitat loss due to climatic change. Received 10 September 2007, accepted 24 November 2007.

**Key words.**—*Tigrisoma mexicanum*, Bare-throated Tiger-Heron, Tigrisomatidae, extinction, fossil, Cuba, Pleistocene.

Waterbirds 31(2): 285-288, 2008

The three species of tiger-herons (*Tigrisoma*), belonging to the subfamily Tigrisomatinae, are endemic to the Neotropics where they range nearly throughout, from Mexico to Argentina, but are absent from the West Indies. Here we report a single well-preserved fossil tarsometatarsus from Cuba that provides the first evidence of this group of herons in the Antilles and the first definite fossil record of the genus anywhere.

## MATERIALS AND METHODS

Comparative skeletal material examined (all National Museum of Natural History, Smithsonian Institution [USNM], unless otherwise specified).—Great Egret *Ardea alba* 500877; Tricolored Heron *Egretta tricolor* 19673; Black-crowned Night-Heron *Nycticorax nycticorax* 500871; Yellow-crowned Night-Heron *Nyctanassa violacea* 610611; Boat-billed Heron *Cochlearius cochlearius* 321490; American Bittern *Botaurus lentiginosus* 500874; Whistling Heron *Syrigma sibilatrix* 614519; Capped Heron *Pilherodias pileatus* 345759; Bare-throated Tiger-Heron *Tigrisoma mexicanum* 12254 (partial, Mexico), 343839-343840 (Panama), Royal Ontario Museum (ROM) 104334 (Belize); Rufescent Tiger-Heron *T. l. lineatum* 18381 (Nicaragua), 562561, 611551, 613350 (Panama), 621936 (Guyana); *T. l. marmoratum* 345752-345757 (Mato Grosso, Brazil), 631043 (Uruguay), 614515 (Entre Rios, Argentina). The fossil material is housed in the collection of Arqueocentro (AC), Sagua La Grande, Villa Clara, Cuba. Measurements were taken with digital calipers and rounded to the nearest 0.1 mm. In addition, the length measurements for the tarsometatarsi of *T. mexicanum* were supplied by the University of Michigan Museum of Zoology (UMMZ): 113610, 113613, 133608-09, 133611 (all Costa Rica), and 219547 (Panama).

## SYSTEMATICS

Family Ardeidae

Subfamily Tigrisomatinae

Genus *Tigrisoma*

The Cuban fossil is proportionately shorter and much too robust for any day heron (e.g., *Ardea*, *Egretta*). It is also more robust than any of the night herons, *Pilherodias*, or *Syrigma*, and in length exceeds the maximum for *Nyctanassa violacea* (Olson and Wingate 2006), in which the tarsometatarsus is considerably longer than in *Nycticorax nycticorax* (Olson and Wingate 2006), *Pilherodias*, or *Syrigma*. The tarsometatarsus in *Botaurus* and *Cochlearius* is proportionately shorter and more robust than in the Cuban fossil. In all the preceding genera the distal foramen is located practically in the space between in the inner and middle trochlea, whereas the fossil agrees with *Tigrisoma* in having this foramen situated higher on the shaft.

Bare-throated Tiger-Heron

*Tigrisoma mexicanum*

**Referred specimen.**—Complete left tarsometatarsus AC 33, collected by members of Arqueocentro, Sagua La Grande, during February-April 2004.

**Locality.**—Cuba, Villa Clara Province, Sagua La Grande, Mal Páez (ca. 22°48'N, 80°04'W), Casimba en Los Buentes. The depositional environment was a casimba, a small water-filled sinkhole with a clay bottom in which fossils accumulated.

**Age.**—Although there are no direct radiometric dates for this site, the nature of the associated fauna and degree of mineralization are similar to deposits elsewhere in Cuba dated as Quaternary, ranging from late Pleistocene to middle Holocene (Jull *et al.* 2004; Steadman *et al.* 2005; MacPhee *et al.* 2007). The associated fauna includes the Cuban Macaw *Ara tricolor* (Olson and Suárez, in press), extinct sloths (*Megalocnus rodens*, *Parocnus browni*, and *Neocnus gliriformis*), the extinct large rodent *Macrocapromys* sp., and the living taxa *Capromys pilorides* and *Solenodon cubanus* (Silva *et al.* 2008).

## RESULTS

On geographical grounds, the Bare-throated Tiger-Heron *Tigrisoma mexicanum*, would be the species of *Tigrisoma* most likely to occur in Cuba because it occurs from Mexico, including the Yucatan Peninsula, the closest point to Cuba, south to Colombia. The Rufescent Tiger-Heron *T. lineatum* extends northward only as far as northeastern Guatemala, and the Fasciated Tiger-Heron *T. fasciatum* only to Costa Rica. No skeletons were available for *T. fasciatum*, but as it is the smallest of the tiger-herons (Kushlan and Hancock 2005) it would be too small for the Cuban fossil. The Cuban fossil is considerably larger than the northern subspecies

of Rufescent Tiger-Heron *T. l. lineatum* (Table 1). The series confirms the larger size of the southern subspecies *T. l. marmoratum* (see Hellmayr and Conover 1948: 222, footnote) but size variation in this species may be clinal, as birds from Mato Grosso, Brazil, are intermediate between the smaller nominate form and a larger bird from Uruguay and a huge individual from Argentina (Table 1). In any case, the Cuban fossil is too large to be referable to any population of *T. lineatum* with any proximity to Cuba.

The Cuban fossil is a close match in size and robustness only with *T. mexicanum* (Table 1). Even in the small series that was examined personally there is a fair amount of variation in size and proportions (Fig. 2). In length, the Cuban fossil is near the minimum for the sample and might possibly represent an endemic subspecies, which could only be determined with more fossils. Because no qualitative differences could be discerned in the tarsometatarsus between the fossil and *T. mexicanum*, it was referred to that species.

## DISCUSSION

The former presence of the Bare-throated Tiger-Heron in Cuba is unexpected as no member of the Tigrisomatidae has been recorded from the West Indies. On the mainland the species occurs in mangroves and salt or brackish areas but is also found inland on rivers or streams or in marshes or swamps with even "quite small water bodies or wet meadows" being "acceptable habitat" (Hancock and Kushlan 1984: 214). It remains

Table 1. Measurements (mm) of the tarsometatarsus of *Tigrisoma*: range (mean).

Taxon	Length	Proximal width	Proximal depth	Shaft width at midpoint	Distal width
Cuban fossil	105.8	12.4	13.9	5.9	12.6
<i>T. mexicanum</i> , N = 4 (length N = 10)	105.0-115.0 (111.4)	12.5-13.7 (12.9)	12.9-14.3 (12.4)	5.1-5.8 (5.5)	12.0-13.2 (12.6)
<i>T. l. lineatum</i> , N = 5	96.5-97.9 (97.1)	10.6-11.4 (11.1)	11.0-12.9 (11.7)	4.6-5.1 (4.9)	10.6-11.3 (10.8)
<i>T. l. marmoratum</i> (Brazil), N = 6	99.0-107.4 (102.4)	11.0-11.9 (11.4)	12.0-13.3 (12.5)	4.6-5.9 (5.2)	10.9-11.9 (11.4)
<i>T. l. "marmoratum"</i> (Uruguay, Argentina) N = 2	111.5-116.7 (114.1)	11.4-13.6 (12.5)	13.4-14.4 (13.9)	5.5-6.8 (6.1)	12.0-13.2 (12.6)



Figure 1. Tarsometatarsi of herons in anterior view: A, Bare-throated Tiger-Heron *Tigrisoma mexicanum* (USNM 343840—image reversed to facilitate comparison); B, Cuban fossil referred to *Tigrisoma mexicanum* (AC 33); C, Rufescent Tiger-Heron *T. lineatum* (USNM 611551); D, Tricolored Heron *Egretta tricolor* (USNM 19673). Scale = 2 cm.

unknown just how widespread the species may have been in Cuba in the past and the reasons for its extinction on the island are obscure. It would be difficult to establish a link to human-caused habitat changes or predation. Possible habitat loss due to climate change at the end of the Pleistocene could be suggested, although seemingly suitable habitat still exists on the island. Nevertheless, extinction has also occurred in other Cuban waterbirds, such as two species of storks (Ciconiidae—see Suárez and Olson 2003) and the huge crane *Grus cubensis* (Olson 1978), although the last may not have been closely tied to water. Not only is the Cuban occurrence the first record of *Tigrisoma* for the Antilles, it appears that this is also the first definite fossil record for the genus anywhere. The only other possible occurrence is single toe bone from the Pliocene of Jalisco, Mexico, that was very tentatively listed under "*Tigrisoma* (?) sp." (Alvarez 1977: 214).



Figure 2. Tarsometatarsi of Bare-throated Tiger-Heron *Tigrisoma mexicanum* to show some of the variation in size and robustness: A, Cuban fossil AC 33; B, USNM 343840—image reversed to facilitate comparison; C, ROM 104334; D, USNM 12254; E, USNM 343839. Scale = 2 cm.

#### ACKNOWLEDGMENTS

We thank the personnel of Arqueocentro, Sagua La Grande, especially Néstor A. Gómez, Lorenzo Morales, and Raul Villavicencio, as well as Carlos Arredondo, Universidad de La Habana, for access to the fossil specimens. We are especially indebted to Kevin Seymour, Brad Millen, and Allan Baker of the Royal Ontario Museum, Toronto, Canada, for providing access to facilities and specimens. The figures are by Brian Schmidt, Division of Birds, National Museum of Natural History, Smithsonian Institution, Washington, D.C. We are extremely grateful to Robert Payne, University of Michigan Museum of Zoology, Ann Arbor, for promptly supplying measurements of specimens.

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