

A NEW GENUS OF FLIGHTLESS IBIS (THRESKIORNITHIDAE)
AND OTHER FOSSIL BIRDS FROM CAVE DEPOSITS IN JAMAICA

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Despite the fact that parts of Jamaica are riddled with caves and sinks (see White and Dunn, 1962), knowledge of Pleistocene faunas from these sites is rather meager, particularly as compared to the remainder of the Greater Antilles. H. E. Anthony (1920a) made collections of fossils from caves in Jamaica in 1919-1920 and briefly reported on some of the mammals contained therein (Anthony, 1920b). Subsequent paleontological studies, based partly or entirely on Anthony's material, include reports on lizards (Hecht, 1951), bats (Koopman and Williams, 1951), and a new endemic genus of ceboid monkey, *Xenothrix* (Williams and Koopman, 1952). Up to the present there has been no published fossil record for the class Aves from Jamaica.

At the American Museum of Natural History (AMNH) we recently examined some of the unsorted and unidentified specimens collected by Anthony, among which there is a fair number of birds. We have made no attempt to identify all of the avian specimens in these collections, as we understand that there is now a great deal of unstudied fossil material from Jamaica at the Florida State Museum that should be consulted by anyone attempting a more comprehensive survey of the fossil avifauna of the island. Instead, we have taken this opportunity to describe as new the single most spectacular of the fossil birds we encountered, to which description we have appended brief observations on a few of the other remains that impressed us as being of interest.

Olson and Wetmore (1976) documented the former existence in Hawaii of a totally flightless ibis, *Apteribis glenos*, based on most elements of the skeleton. Although the type-material of the new Jamaican bird is less complete than that of *Apteribis*, these specimens can only be interpreted as being from a second species of flightless ibis.

Eight of the nine specimens were stored in four different covered boxes, each labelled "Long Mile Cave, Windsor, Trelawny, Jamaica." Three of these specimens (two distal ends of tibiotarsi and a proximal end of a femur) were marked with Anthony's code ("J5") for Long Mile Cave. The size of the specimens and the elements represented strongly suggest that all eight may be from a single individual. The shaft of a humerus, apparently referable to the same species, we discovered in a box labelled "Fowl House Cave," which is also in Windsor, Trelawny. The coloration and preservation of this specimen is so nearly like that of the others (a resemblance heightened by the fact that all nine specimens had at some

time been treated with shellac) that we strongly suspect that this humerus was actually collected in Long Mile Cave, and was erroneously introduced into the container of material from Fowl House Cave during the more than fifty years since its collection.

Anthony's Jamaican fossil sites have been discussed in general by Koopman and Williams (1951) and Long Mile Cave in particular by Williams and Koopman (1952), this being the type-locality of *Xenothrix mcgregori*. Anthony's field notes (Williams and Koopman, 1952) indicate that the deposits in Long Mile Cave consisted of a small Amerindian midden overlying an accumulation of "yellow limestone detritus" that evidently antedated human occupation. Anthony recorded that the primate remains came from this lower layer but unfortunately no such note was made of the ibis bones; therefore, all one can say of their age at this point is that they are late Quaternary.

Each of the specimens of the new ibis was first compared with a synoptic series of skeletal elements containing all modern non-passerine families of birds. The high, pointed intercotylar knob of the tarsometatarsus and the broad, perforate procoracoid process separate the new Jamaican species from most of the families and orders to be expected in the Antilles such as Pelecaniformes, Anseriformes, Falconiformes, Galliformes, Columbiformes and the various orders of small land birds. In the Gruidae and Aramidae (Gruiformes) the shape of the hypotarsus is quite different from that of the fossil and the hypotarsus contains closed canals, which the fossil does not. The same is true for the Ardeidae. In the Phoenicopteridae the intercotylar knob is much wider than in the fossil; in the Ciconiidae it is much narrower and constricted at the base, in addition to which the procoracoid is not perforate. There is no group to which the Jamaican fossils show a greater similarity than the Threskiornithidae.

Material of the following species of Threskiornithidae was used in the comparisons below: complete skeletons of *Threskiornis aethiopicus*, *T. melanocephalus*, *T. ("Carpibis") spinicollis*, *Nipponia nippon*, *Hagedashia hagedash*, *Harpiprion caeruleus*, *Theristicus caudatus*, *T. melanopus*, *Mesembrinibis cayennensis*, *Eudocimus albus*, *E. ruber*, *Plegadis falcinellus*, *P. chihi*, *Platalea leucorodia*, and *P. ("Ajaja") ajaja*; partial skeletons of *Theristicus branickii*, *Platalea minor*, and *P. regia*; tibiotarsi and tarsometatarsi removed from skins of *Cercibis oxycerca* and *Phimosus infuscatus*; all the appropriate fossil elements of *Apteribis glenos*. Descriptive terminology follows that of Howard (1929).

Threskiornithidae

Xenicibis, new genus

Type.—*Xenicibis xympithecus*, new species.

Diagnosis.—A large, heavy-legged ibis with wing and pectoral girdle

proportionately quite small. Differs from the other genera of Threskiornithidae examined as follows: tarsometatarsus with hypotarsus simple, consisting of 2 calcaneal ridges separated by a deep groove, the internal ridge being much shorter than the external one; tibiotarsus with very wide anterior intercondylar fossa, reduced supratendinal bridge, very large outer cnemial crest extending far laterally, inner cnemial crest displaced much farther laterally than in other ibises; femur with head larger and more proximally oriented, antero-proximal portion of shaft greatly excavated and flattened; phalanx 1 of digit IV very stout; coracoid with sternal end thin and weak, area of sterno-coracoidal impression nearly convex and lacking thin diagonal ridges, internal distal angle slender and excavated on ventral surface.

Etymology.—Gr. *xenikos*, strange, and *ibis*, f. a wading bird, an ibis.

Xenicibis xympthecus, new species

Figs. 1-3

Holotype.—Proximal half of left tarsometatarsus, vertebrate paleontological collections AMNH 11006. Collected 16 or 17 January 1920 by H. E. Anthony at Long Mile Cave, Windsor, Trelawny Parish, Jamaica. Late Quaternary.

Measurements of holotype.—Proximal width 18.6 mm, proximal depth through hypotarsus 17.5, width and depth of shaft 30 mm from apex of intercotylar knob 9.6, 6.4.

Paratypes.—Eight other specimens, all of which, with the possible exception of the humerus noted above, have the same data as the holotype and are in the AMNH vertebrate paleontological collections. Nearly complete right coracoid, AMNH 11008; left coracoid lacking sternal end, AMNH 11013; shaft of right humerus, AMNH 11031; proximal end of left femur, AMNH 11005; imperfect proximal end of left tibiotarsus, AMNH 11009; distal $\frac{2}{3}$ of left tibiotarsus, AMNH 11007; distal $\frac{2}{3}$ of right tibiotarsus, AMNH 11004; pedal phalanx 1 of left digit IV, AMNH 11011.

Measurements of paratypes.—Coracoid AMNH 11008—greatest length 50.0 mm, length from internal distal angle 47.8, least width of shaft 7.9, least depth of shaft 3.3; humerus—width and depth of shaft at distal end of attachment of latissimus dorsi posterioris 6.2, 6.4; femur—proximal width 22.6, transverse diameter of head 10.1, proximal depth 17.5, width and depth of shaft 40 mm from proximal end 8.0, 8.7; tibiotarsus AMNH 11004—distal width 15.6, distal depth 15.6, least width of shaft 8.4, least depth of shaft 5.6, length of internal condyle 9.4; tibiotarsus AMNH 11009—proximal width through outer cnemial crest 28.2; phalanx 1 of digit IV—length 21.7, proximal width 7.6, least width 4.2, distal width 5.7.

Diagnosis.—As for the genus.

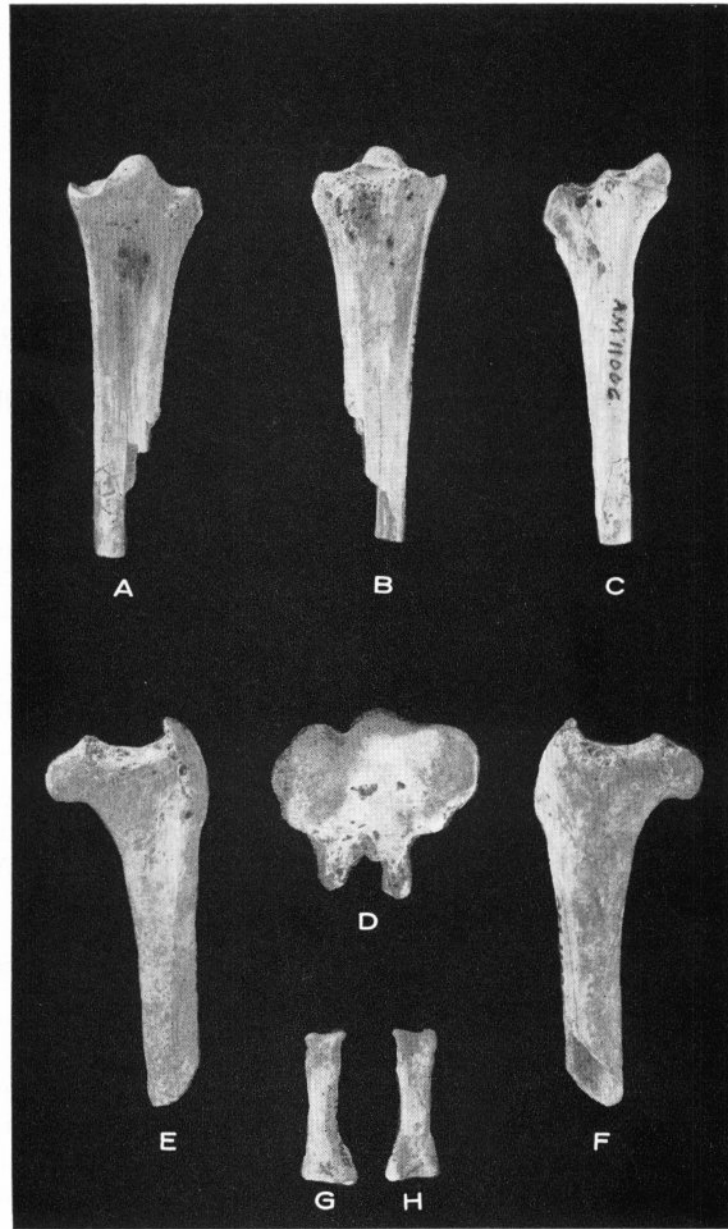


Fig. 1. *Xenicibis xympithecus*, new genus and species. *a*, Holotype proximal end of left tarsometatarsus AMNH 11006, anterior view; *b*, Same, posterior view; *c*, Same, medial view; *d*, Same, proximal view; *e*, Proximal end of left femur AMNH 11005, anterior view; *f*, Same, posterior view; *g*, Pedal phalanx 1 of left digit IV AMNH 11011, dorsal view; *h*, Same, ventral view. All figures natural size except *d* = 1.5 \times .

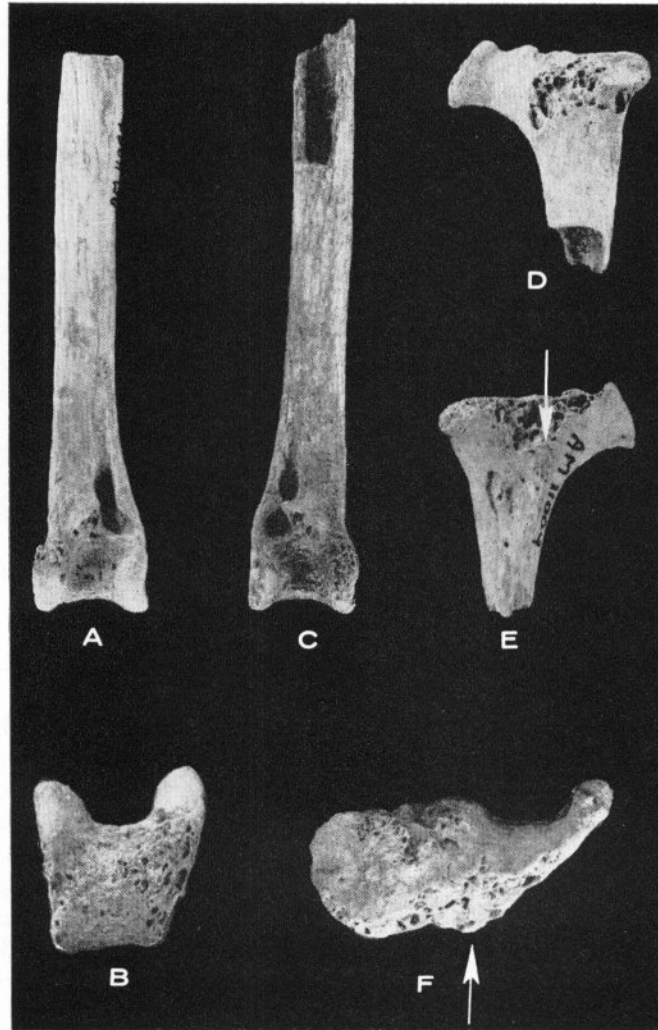


Fig. 2. *Xenicibis xympithecus*, new genus and species. *a*, Distal end of right tibiotarsus AMNH 11004, anterior view; *b*, Same, distal view; *c*, Distal end of left tibiotarsus AMNH 11007, anterior view; *d*, Proximal end of left tibiotarsus AMNH 11009, posterior view; *e*, Same, anterior view; *f*, Same, proximal view. All figures natural size except *b* and *f* = 1.5 \times . Arrows indicate the laterally displaced position of the internal cnemial crest.

Etymology.—Gr. *xyn*, a variant of *kyn* or the more usual *syn* (from which L. *cum*), meaning "with," "along with," or "in company with," and Gr. *pithekos*, monkey. The specific name is a masculine noun in apposition and is an allusion to the possibility that the flightless ibis and *Xeno-*

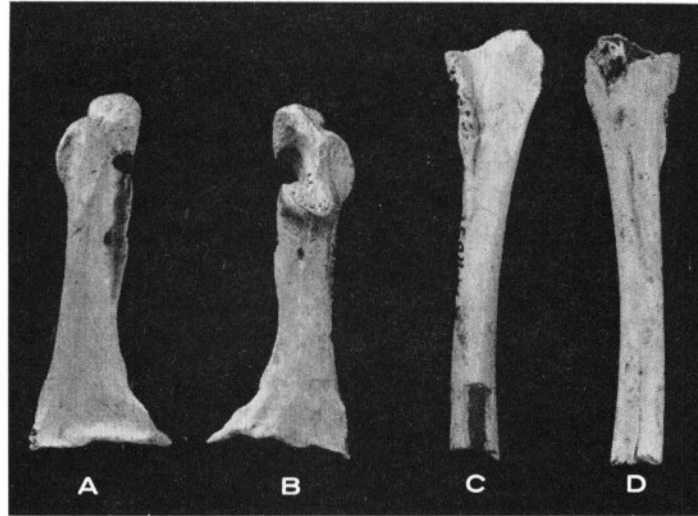


Fig. 3. *Xenicibis xympithecus*, new genus and species. *a*, Right coracoid AMNH 11008, ventral view; *b*, Same, dorsal view; *c*, Shaft of right humerus AMNH 11031, palmar view; *d*, Same, anconal view. All figures natural size.

thrix mcgregori existed as contemporaries in the vicinity of Long Mile Cave, where both were interred.

Description.—Tarsometatarsus with intercotylar knob much higher than in *Theristicus*, *Harpiprion*, *Mesembrinibis*, or *Phimosus*, and more vertically oriented than in *Cercibis*; internal cotyla wider and projecting farther medially than in *Platalea*; prominences at posterior margins of both cotylar surfaces better developed than in other ibises, in some of which these may be lacking; hypotarsus simple, with 2 calcaneal ridges and a deep groove, differing from all other genera examined in having the internal ridge much shorter than the external ridge; external ridge simple and narrow, differing from *Nipponia*, *Harpiprion*, *Theristicus*, and *Cercibis*, in which the external portion of the hypotarsus is wider and bears 2 ridges; antero-lateral surface just distal to external cotyla more deeply excavated than in other ibises examined, although *Eudocimus* and *Threskiornis* approach this condition; proximal portion of postero-medial surface of shaft much less excavated than in *Hagedashia*, *Harpiprion*, *Mesembrinibis*, or *Phimosus*.

Tibiotarsus with outer cnemial crest larger, more thickened, and more laterally protruding than in any other genus of ibises, being approached only by *Apteribis*; inner cnemial crest displaced much farther laterally than in other ibises and more similar to the condition in kiwis (*Apteryx*); supratendinal bridge more reduced than in other genera examined, being composed of two triangular projections of bone whose apexes barely

coincide over the midline of the tendinal canal in AMNH 11007, while in AMNH 11004 the medial side of the canal shows no sign of an excrescence or attachment of bone, the bridge therefore having been incomplete; anterior intercondylar fossa much wider than in other *Threskiornithidae* and internal ligamental prominence more reduced than in other genera except *Hagedashia* and *Apteribis*; resembles typical ibises and differs from spoonbills (*Platalea*) in having distal third of shaft broader and shallower and the distal articulation in distal view deeper and narrower.

Femur with head more protrusive above level of iliac facet, with posterior margin of said facet being more produced over the shaft than in other genera examined; antero-proximal surface of shaft much more deeply excavated than in other ibises, resulting in a very prominent trochanteric ridge; attachment of round ligament much deeper and situated more anteriorly than in other genera examined, being accented by a postero-lateral prominence.

Phalanx 1 of digit IV much stouter than in other ibises, with its length being 2.8 times the proximal width, as opposed, for example, to 3.6 times the width in *Nipponia*.

Coracoid with sterno-coracoidal "impression" nearly convex and without raised striae, rather than deeply concave and with striae, as in all other ibises; sternal end very thin, internal distal angle slender and excavated on ventral surface, unlike other ibises; intermuscular ridge on ventral surface of shaft less distinct than in other forms; area beneath furcular facet not extensively pneumatized, as in the other taxa examined, except *Apteribis*; furcular facet sloping ventro-sternally, as in *Apteribis*, this facet being perpendicular to the axis of the shaft in other genera.

Humerus proportionately small, with deltoid crest thicker and more palmarly rotated than in any ibis except *Apteribis*; shaft at distal end of attachment of *M. latissimus dorsi posterioris* deeper than wide, being approached only by *Apteribis*.

Remarks.—That *Xenicibis xympthecus* was flightless can scarcely be doubted. The elements of the hindlimb indicate a bird larger and heavier than any known ibis except *Thaumatibis gigantea*, while the coracoid is slightly smaller than, for example, in *Threskiornis spinicollis*. Furthermore, the peculiar conformation of the coracoid is indicative of reduced muscular development, and the structure of what remains of the deltoid crest on the one available fragment of humerus is that typical of a variety of flightless birds. The Hawaiian flightless ibis, *Apteribis glenos*, differs markedly from *Xenicibis* and must have evolved independently.

Most of the known elements of *Xenicibis* differ so much from other genera that the relationships of the Jamaican bird are not at all clear. Only the proximal end of the tarsometatarsus seems to afford some clues, being most similar to *Eudocimus* and quite distinct from such endemic South American genera as *Mesembrinibis*, *Phimosus*, and *Harpiprion*.

The tarsometatarsus of *Xenicibis* agrees with that of *Eudocimus* in the shape of the intercotylar knob, in the deep excavation on the antero-lateral surface distal to the external cotyla (greater than in other ibises, including *Plegadis*) and in the greater development of the prominence posterior to the external cotyla. *Xenicibis* differs from *Eudocimus* in the construction of the hypotarsus, in its somewhat deeper anterior groove with more widely spaced proximal foramina, and in the greater excavation of the postero-medial surface of the proximal end of the shaft. In proximal view *Xenicibis* has a distinct anterior projection of the external cotyla and a posterior projection of the internal cotyla, both absent in *Eudocimus*, and the neck of the hypotarsus is less constricted. In the other known elements of the skeleton, *Xenicibis* differs from *Eudocimus* in the characters mentioned in the generic diagnosis.

Eudocimus and *Plegadis* are the only genera of true ibises found in North America and the Antilles. Although *Eudocimus* might possibly have given rise to *Xenicibis*, the nature of the present material of the latter does not afford any reasonable assurance of this.

Accipitridae

Genus and species indeterminate

Also from Long Mile Cave is an ungual phalanx of a large raptor (AMNH 11010). Although the specimen lacks the ventral articular knob (Fig. 4a), enough remains of the articulation to show that this claw is not that of an owl (we compared it specifically with claws of *Tyto ostologa*, a giant extinct barn owl from Hispaniola). Its flattened ventral surface shows that it is not the claw of an osprey, *Pandion haliaetus*. The specimen is too large (dorsal chord 32.6 mm) for *Buteo jamaicensis*, the largest accipitrid known from Jamaica. It is not as heavy as those in most of the New World hawks and eagles with which we compared it, but in size and slenderness it does seem rather similar to the claws of *Spizastur melanoleucus*, a species that now ranges from southern Mexico to Argentina. Even if complete, we would not consider this specimen as being sufficiently diagnostic to allow identification to genus. However, it is an indication of a large raptor now vanished from Jamaica. Large extinct or extirpated species of accipitrids have previously been recorded in the West Indies from the Bahamas (Wetmore, 1937; Brodkorb, 1959) and Cuba (Wetmore, 1928; Arredondo, 1976).

Strigidae

Speotyto cf. cunicularia

Among the material from Dairy Cave, Dry Harbour, St. Ann Parish (see Koopman and Williams [1951] and Hecht [1951] for information on this

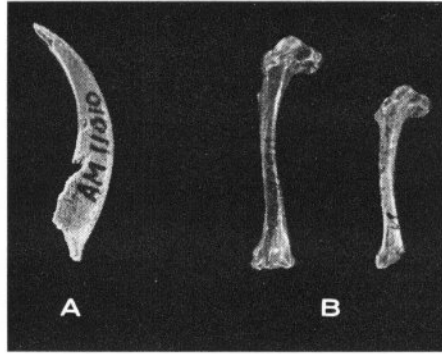


Fig. 4. a, Accipitridae, genus and species indeterminate, unguis phalanx AMNH 11010; b, left humeri of *Siphonorhis americana* (left) and *S. brewsteri* (right) to show difference in size. All figures natural size.

site) we noted two specimens of a strigid owl much smaller than either *Pseudoscops grammicus* or *Tyto alba*, the only two owls now known from Jamaica. The proximal end of a tarsometatarsus (AMNH 11022) and the distal end of a tibiotarsus (AMNH 11033) agree in size and details with the Burrowing Owl, *Speotyto cunicularia*, and differ considerably from *Otus* and greatly from *Glaucidium*, the only other genera of small owls now occurring in the West Indies. *Speotyto* is known historically to have been resident in the Antilles only in the Bahamas, Hispaniola, Antigua, Nevis, St. Christopher, and Marie Galante, all the Lesser Antillean populations having been exterminated within the last century. The former existence of *Speotyto* in Jamaica assumes considerable significance because unpublished paleontological studies by Olson and others indicate that these owls were once present on several other Antillean islands where they no longer are found. Bones of *Speotyto* will probably prove sufficiently abundant in Jamaican deposits to allow a more definitive assessment of the specific or subspecific characters of the Jamaican bird than the fragments we have seen will permit. For this reason we only tentatively refer it to *S. cunicularia*.

Nyctibiidae

Nyctibius griseus

The Common Potoo, *Nyctibius griseus*, occurs from southern Mexico to Argentina and in the West Indies on Jamaica and Hispaniola only. The sole fossil record for the entire family is the occurrence of a *Nyctibius* in a Pleistocene cave deposit in Brazil listed by Brodkorb (1971) under *N. griseus* but only tentatively identified as this species by the original author

(Winge, 1887). It seems worthwhile, therefore, to note a left coracoid of *Nyctibius griseus* (AMNH 11012) among the specimens from Long Mile Cave, the second fossil record for the family and the first for the West Indies.

Caprimulgidae

Siphonorhis americana

This distinctive nightjar, endemic to Jamaica, is now extinct. Greenway (1958) states that only three skins of this species are known, but he evidently did not include the one in the National Museum of Natural History (USNM 22109, collected 'near Spanishtown' by W. T. March). The only other species of *Siphonorhis* is the smaller *S. brewsteri* of Hispaniola. Peters (1940), who perhaps never saw a specimen of the Jamaican bird, listed *S. brewsteri* as a subspecies of *S. americana*. In this judgment he has rightfully been ignored by most subsequent authors, as the two forms differ in coloration and are very different in size.

In the fossil material from Dairy Cave, we found three caprimulgid humeri that most probably pertain to *S. americana*, as they are very different from *Chordeiles minor*, the only other caprimulgid on Jamaica. The most complete of these humeri (AMNH 11020) is 31.5 mm long as compared to 25 mm in a specimen of *S. brewsteri* (USNM uncatalogued) from a cave in Haiti (Fig. 4b).

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