

The Cuban Crocodile, *Crocodylus rhombifer*, from Late Quaternary Fossil Deposits on Grand Cayman

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ABSTRACT. – Fossil remains of crocodiles have been recovered from six sites on Grand Cayman, a small island in the northwestern Caribbean Sea about 250 km south of Cuba. The three most productive fossil faunas (Chisholm Cow Well, Crocodile Canal, and Furtherland Farms Cow Well) were deposited in aquatic depositional environments, based on the presence of dark organic sediments and the predominance of freshwater and estuarine vertebrates. Radiocarbon dates of 860 ± 50 yBP and 375 ± 60 yBP obtained on peat samples from the Crocodile Canal site confirm that crocodiles inhabited Grand Cayman until the late Holocene, although they are no longer found there. The Grand Cayman fossil sample contains four nearly complete skulls that closely resemble modern specimens of the Cuban crocodile, *Crocodylus rhombifer* Cuvier. The diagnostic cranial features they share include: comparatively short, broad, and deep rostrum; large orbits; strongly concave cranial roof and interorbital region; prominent ridges on dorsal margin of orbits and lateral edge of postorbital and squamosals, terminating in a rounded protuberance on posterolateral corner of squamosals; premaxillary/maxillary suture on palate transverse at level of first maxillary tooth; and 13 maxillary teeth. Most of the fossils in the extensive sample of *C. rhombifer* from Grand Cayman represent juvenile and subadult individuals. The name of the Cayman Islands is probably derived from the abundance of crocodiles prior to their local extinction during the last century.

INTRODUCTION

Morgan and Patton (1979) first reported fossil crocodiles in the Cayman Islands based on a single tooth collected in 1976 from a small cave at the eastern end of Grand Cayman. In the past ten years, crocodile fossils have been collected from five additional sites on Grand Cayman. The three sites containing the richest samples of crocodile bones, Chisholm Cow Well, Crocodile Canal, and Furtherland Farms Cow Well, are composed of dark, peaty, organic sediments that probably formed in a quiet estuarine or brackish depositional environment such as a mangrove swamp or coastal lagoon. The abundance of crocodiles and the presence of several species of wading birds in the Grand Cayman sites is unusual, as the vast majority of West Indian vertebrate fossil deposits occur in caves and are dominated by terrestrial taxa (Morgan and Woods, 1986; Morgan, in press).

At the invitation of the Mosquito Research and Control Unit and Natural Re-

sources Study (MRCU) of the Cayman Islands government, Gary Morgan and Richard Franz conducted a paleontological survey of the Cayman Islands in January and February of 1986. Excavations at the Chisholm Cow Well and Furtherland Farms Cow Well sites produced abundant fossils of crocodiles and other vertebrates. The crocodile bones recovered from these two deposits, as well as material from three additional sites, Crocodile Canal, Connally Cow Well, and Prospect, form the basis for the present report.

The Cayman Islands, including Grand Cayman, Little Cayman, and Cayman Brat, are three small, low limestone islands located in the northwestern Caribbean Sea between 19°15'N and 19°45'N latitude and 79°42'W and 81°26'W longitude. They are situated slightly more than 200 km from both Cuba to the north and Jamaica to the southeast, and about 500 km from the closest point in Central America.

Grand Cayman is the largest of the islands, with an area of 197 km². Its maximum elevation is about 20 m and more

than half the island's area is under 5 m. Low-lying areas are characterized by brackish lagoons, mangrove swamps, and other swamp vegetative formations.

Although they are low and flat, the Cayman Islands represent the projecting peaks of high submarine mountains located along the Cayman Ridge on the southern edge of the North American plate. The Cayman Islands are surrounded by deep water in all directions. Depths of 1000 m or more occur between the Cayman Islands and both the Greater Antilles and Middle America. Depths of nearly 2000 m have been recorded between Grand Cayman and Little Cayman, and the narrow channel between Cayman Brat and Little Cayman is almost 1000 m deep. These depths preclude land connections during Pleistocene low sea levels, either within the Cayman Islands or between the Caymans and other land masses.

The following museums and institutions possess specimens of fossil or extant crocodiles from the West Indies that we examined during this study. The standard abbreviation follows the name in parentheses.

American Museum of Natural History (AMNH)
Cayman Islands National Museum (CINM)
Florida Museum of Natural History—formerly the Florida State Museum (UF)
Mosquito Research and Control Unit and Natural Resources Study (MRCU)
Museum of Comparative Zoology, Harvard University (MCZ)
United States National Museum of Natural History (USNM)

DESCRIPTION OF FOSSIL DEPOSITS

Fossil deposits in the Cayman Islands that have yielded remains of crocodiles are restricted to Grand Cayman. With the exception of one tooth from Crab Cave at the eastern end of the island (Morgan and Patton, 1979), the fossils are preserved in dark brown to black, highly organic, peaty sediments. The most abundant species preserved in these organic sediments is the Cuban crocodile, *Crocodylus rhombifer* Cuvier, which is now extinct in the Cayman

Islands. In two deposits, the Chisholm Cow Well and the Furtherland Farms Cow Well, the fossiliferous organic sediments were deposited in small depressions or sinkholes in the limestone. These depressions are called "cow wells" by residents because they are used as a source of drinking water for cattle, especially after the organic sediments are removed to deepen the holes. It is during the removal of these sediments that fossils have been discovered.

The third major locality for fossil crocodiles on Grand Cayman, Crocodile Canal, is different from the other two sites, since it did not form in a limestone depression. This site consists of a mangrove peat deposit uncovered during the excavation of a mosquito control canal. Although the cow well deposits and the mangrove peat formed under different depositional conditions, they are similar in the high organic content of the sediments and the abundance of *C. rhombifer* bones. These sites also contain bones of many other vertebrates, including freshwater and terrestrial forms. No strictly marine vertebrates have been identified from either deposit.

Brief descriptions of the fossil deposits on Grand Cayman that have produced fossil crocodiles are provided below. The latitude and longitude are given for each of the fossil sites, along with the six-digit coordinates based on the 1000 meter Universal Transverse Mercator Grid (Grid Zone Designation 17Q) taken from the 1:25,000 topographic map series for the Cayman Islands, published in 1978 by the British Directorate of Overseas Surveys. The first three digits are east coordinates and the last three are north coordinates. The six-digit number is preceded by two letters corresponding to the 100,000 m² identification (MM is the designation for Grand Cayman). More detailed locality data, field notes, and photographs for these sites are available in the vertebrate paleontology locality files of the Florida Museum of Natural History. A map showing the location of all vertebrate fossil sites on Grand Cayman can be found in Morgan (in press).

Chisholm Cow Well (19°21'N, 81°13'W; MM765391). — The Chisholm Cow Well is located about 0.3 km south of Grape Tree

Point and 1.8 km southwest of North Side. This site is only a few meters above sea level and consists of a small depression or sinkhole in the limestone about 5 m long, 3 m wide, and 1-2 m deep. The bones are preserved in a dark, organic sediment at the bottom of the sinkhole. The bones from the Chisholm Cow Well are predominantly those of the Cuban crocodile, *Crocodylus rhombifer*, along with much smaller samples of the capromyid rodents *Capromys* and *Geocapromys*, the rock iguana *Cyclura nubila* Gray, and snakes. Bones were originally discovered at this site when sediments were removed from the cow well during the dry season. The largest sample of bones from the Chisholm Cow Well was collected by Rolin Chisholm and the late Ira Thompson in the late 1970's. One of us (GSM) examined Thompson's sample of fossils in April 1980, which included several skulls and mandibles of *C. rhombifer* and a complete skull of *Capromys*. After Thompson's death, his collection was obtained by the government of the Cayman Islands, and has been transferred to the Cayman Islands National Museum. Rolin Chisholm generously donated a representative sample of his collection from the site to the UF vertebrate paleontology collection. Rolin Chisholm, R. Franz, and G. S. Morgan conducted further excavations at the Chisholm Cow Well in February 1986.

Connally Cow Well (19°21'N, 81°13'W; MM773391). — A single well preserved skull of *Crocodylus rhombifer* was found in the Connally Cow Well, located a few meters above sea level 0.5 km southwest of Hutland. No other fossils are known from this site. This skull was obtained by the MRCU.

Crab Cave (19°18'N, 81°06'W; MM889338). — Crab Cave is located in East End on the north side of the main island road about 0.7 km west of the Gorling Bluff Light-house. The small opening to the cave is at the base of a 7-8 m high limestone ridge parallel to and about 200 m inland from the south shore of the island. Crab Cave is small and linear, barely 50 m in length with no side passageways. The only productive sediment accumulation was located underneath a ledge about 4 m inside

the cave entrance. A test pit 2 m long, 1 m wide, and 0.5 m deep was dug under this ledge. Besides the single tooth of a crocodile (Morgan and Patton, 1979), Crab Cave produced fossils of *Cyclura nubila*, smaller lizards, two species of snakes, birds, bats, and rich samples of capromyid rodents (Morgan, in press). Crab Cave was excavated by H. G. McDonald, G. S. Morgan, and N. R. Thanz in March 1976 and by M. K. Langworthy and G. S. Morgan in April 1980.

Crocodile Canal (19°19'N, 81°23'W; MM603363). — The Crocodile Canal site was discovered in a mosquito control canal about 3 km north of George Town. The canal was dug through a mangrove swamp and is only slightly above sea level. The bones were derived from a dark, highly organic peat deposit exposed in the sides and bottom of the canal. Most of the bones were obtained by soaking the peat and washing the sediment through a window screen. The great majority of bones from this site are from small individuals of the Cuban crocodile. Also present are *Cyclura nubila*, the snakes *Alsophis cantherigerus* Bibron and *Tretanorhinus variabilis* Duméril and Bibron, the clapper rail *Rallus longirostris* Boddaert, and *Capromys*. The Crocodile Canal Site was originally discovered by Edward and Robert Materne in 1979. Further excavations were conducted in April 1980 by J. J. Belwood, M. K. Langworthy and G. S. Morgan.

Furtherland Farms Cow Well (19°19'N, 81°08'W; MM853364). — The Furtherland Farms Cow Well is located in a banana plantation at the eastern end of the island, about 3 km north of Half Moon Bay and about 10 m above sea level. This cow well is actually a small water-filled cave about 5 m across and 2-3 m deep. The sediments were removed so the cave could function as a well, filling with rainwater which is pumped to irrigate the banana plants. As with the Crocodile Canal and Chisholm Cow Well sites, the Furtherland Farms sediments are composed of dark brown to blackish organic peat containing numerous bones of *Crocodylus rhombifer*. The Furtherland Farms Cow Well has a more diverse terrestrial vertebrate fauna than the

other two aquatically-derived organic fossil deposits. In addition to *C. rhombifer*, the vertebrate fauna is composed of *Cyclura nubiola*, the lizard *Anolis conspersus*, the small insectivore *Nesophontes*, the capromyid rodents *Capromys* and *Geocapromys*; and the richest fossil avifauna recorded from Grand Cayman, including the lizard cuckoo *Saurothera merlini* d'Orbigny, the Cuban crow *Corvus nasicus* Temminck, and a large sample of the ibis *Eudocimus* sp. Although radiocarbon dates have not been obtained from this site, the presence of several specimens of the introduced black rat *Rattus rattus* indicates that at least a portion of the deposit is post-Columbian (<500 yBP). A small sample of bones from this site was brought to the MRCU by Mr. Reginald Koster, a science teacher at the Cayman Islands High School, who obtained them from a student named Blair Smith. The site was rediscovered in February 1986 by G. S. Morgan, R. Franz, and J. Andresen, who removed a sizeable sample of bones. In August 1987, R. Franz and S. Franz screened more bones from the Furtherland Farms sediments.

Prospect (19°16'N, 81°20'W; MM645314).—A nearly complete skull with mandibles and a partial postcranial skeleton of a single *Crocodylus rhombifer* were found in a mangrove swamp just north of Prospect. The specimen was collected on the surface and appears to be quite recent, because the bones are white and unmineralized. This skeleton was found about 1980 by a Mrs. Pierce who gave it to Lear Grimmer. Mr. Grimmer subsequently donated the specimen to the UF vertebrate paleontology collection.

Age of Fossil Deposits.—Two radiocarbon (¹⁴C) dates were obtained from samples of mangrove peat from the Crocodile Canal site (Morgan and Woods, 1986). One of the peat samples contained crocodile bones and the other was collected in direct association with crocodile remains. Both dates were analyzed by the Smithsonian Institution (SI) Radiocarbon Laboratory. The dates are presented with a \pm factor of one standard deviation and the SI lab numbers in parentheses. The first sample (SI-5068), containing a tooth and an osteoderm of

Crocodylus rhombifer, was dated at 860 ± 50 yBP. The second sample (SI-5069), containing a femur of an undescribed extinct species of the capromyid rodent *Capromys* (Morgan, in press), yielded a date of 375 ± 60 yBP. Both peat samples were subject to minor contamination from modern mangrove roots but there is no doubt that this deposit is late Holocene, almost certainly younger than 1000 yBP. The younger date suggests a post-Columbian age, although there are no human artifacts or bones of *Rattus* present to confirm this. A similar but undated site on Grand Cayman, the Furtherland Farms Cow Well, contains *C. rhombifer* along with extinct species of *Nesophontes*, *Capromys*, and *Geocapromys*, in association with *Rattus rattus*. The close association of *C. rhombifer* with the introduced *Rattus* in the Furtherland Farms Cow Well establishes a post-Columbian (<500 yBP) age for this site.

SYSTEMATIC PALEONTOLOGY

Crocodylus rhombifer Cuvier, 1807

Specimens Examined.—Only cranial and mandibular elements are listed separately here. More detailed information on the postcranial material is available in the vertebrate paleontology collection of the Florida Museum of Natural History.

Chisholm Cow Well: nearly complete skull (UF 80000), associated premaxilla and maxilla (UF 128085), associated frontals (UF 128086), 2 ectopterygoids (UF 128069, 128087), prefrontal (UF 128070), complete mandible (UF 128065), associated angular and surangular (UF 128066), angular (UF 128088), surangular (UF 128067), articular (UF 128068), 35 isolated teeth (UF 128089), 43 assorted postcranial elements (UF 128071-128084, 128090-128098). Minimum number of individuals represented in sample is 5.

Connally Cow Well: nearly complete skull (original in MRCU; cast-UF 128064).

Crab Cave: 1 tooth (UF 22739).

Crocodile Canal: nearly complete skull (USNM 216197), 2 premaxillae (UF 61101-61102), 2 maxillae (UF 61103-61104), 1 frontal (UF 61 162), associated jugal and lacrimar (UF 61105), associated jugal and qua-

dratojugal (UF 61106), 2 pterygoids (UF 61107-61108), 3 ectopterygoids (UF 61109-61111), 3 dentaries (UF 61112-61114), 2 angulars (UF 61115-61116), 4 surangulars (UF 61117-61119, 61163), 7 articulars (UF 61120-61126); 69 isolated teeth (UF 61142, 61164, 61165), 81 assorted postcranial elements (UF 61127-61145, 61166-61171). Minimum number of individuals represented in sample is 6.

Furtherland Farms Cow Well: partial cranial roof (UF 128128), 2 maxillae (UF 128134, 128135), 3 lacrimals (UF 128101, 128136, 128137), squamosal (UF 128138), dentary (UF 128139), 2 splenials (UF 128102, 128129), articular (UF 128140), 12 isolated teeth (UF 128111, 128141), 80 assorted postcranial elements (UF 128102-128110, 128109-128127, 128130-128133, 128142-128159). Minimum number of individuals represented in sample is 3.

Prospect: nearly complete skull, right and left mandibles, humerus, femur, and about ten vertebrae, all from a single individual (UF 65800).

Modern Distribution. — The Cuban crocodile, *Crocodylus rhombifer*, is restricted to Cuba, Isla de Pines, and the Archipiélago de los Canarreos (Varona, 1966; Schwartz and Henderson, 1991). Historical evidence and fossils confirm that *C. rhombifer* was once more widely distributed in Cuba (Varona, 1966, 1984).

Fossil Record. — Varona (1984) reported fossils of *Crocodylus rhombifer* from three localities in central Cuba: the springs at Ciego Montero, a fissure in the Sierra de Jatibonico, and the caves of Cueiba in the Sierra de Remedios. The fossil species *C. pristinus*, described by Leidy (1868) based on a single damaged vertebra from Ciego Montero, was considered a synonym of *C. rhombifer* by Varona (1984). Varona (1966) described a second extinct species from Cuba, *C. antillensis*, from a fossil deposit in Cueva Lamas near Santa Fe on the northern coast of the island just west of Havana. Morgan and Patton (1979) reported a single tooth of *Crocodylus* sp. from Crab Cave on Grand Cayman.

Description and Comparisons. — The impressive sample of crocodile fossils now available from Grand Cayman includes four

nearly complete skulls along with many isolated cranial elements, mandibles, and postcranial bones (Figs. 1-3). The excellent preservation of the Grand Cayman fossils permits detailed comparisons of these skulls with those of the two species of *Crocodylus* now found in the West Indies, *C. acutus* and *C. rhombifer*, as well as the Middle American species, *C. moreletii*. To eliminate morphological differences related to ontogenetic factors, only skulls of approximately the same size as the Grand Cayman fossils were used for comparisons. *Crocodylus acutus* is a widespread species occurring in southernmost Florida, throughout most of the Greater Antilles, and from both coasts of Mexico south to northern South America. *Crocodylus moreletii* is restricted to the Gulf and Caribbean drainages of Middle America from central Tamaulipas Province in Mexico south to Belize and Guatemala.

Varona (1966) compared the skulls of *Crocodylus acutus* and *C. rhombifer*, noting a number of characters that readily separate the two species. We compared these same features in two skulls of *C. moreletii*. The Grand Cayman fossils closely resemble *C. rhombifer*. Unless otherwise noted, all characters discussed here for modern Cuban specimens of *C. rhombifer* pertain to the Grand Cayman fossils as well. *Crocodylus rhombifer* skulls have a comparatively shorter, broader, and deeper snout than *C. acutus*, which has a narrower and more flattened rostrum. The rostrum of *C. rhombifer* is particularly deep just anterior to the orbits. *C. moreletii* is somewhat intermediate between these two species in the length of the snout, but the depth of the rostrum is more like that of *C. acutus*. The premaxilla of the Cuban crocodile also is broader, shorter, and deeper than that of *C. acutus*. In *C. rhombifer* and *C. moreletii*, the dorsal surface of the premaxilla along the midline bears a short, blunt process that extends no farther posteriorly than the second maxillary tooth. The premaxilla of *C. acutus* has a narrow, elongated, triangular-shaped process extending posteriorly to the level of the third or fourth maxillary tooth. These three species also differ in the shape of the premaxillary/maxillary suture on the pal-

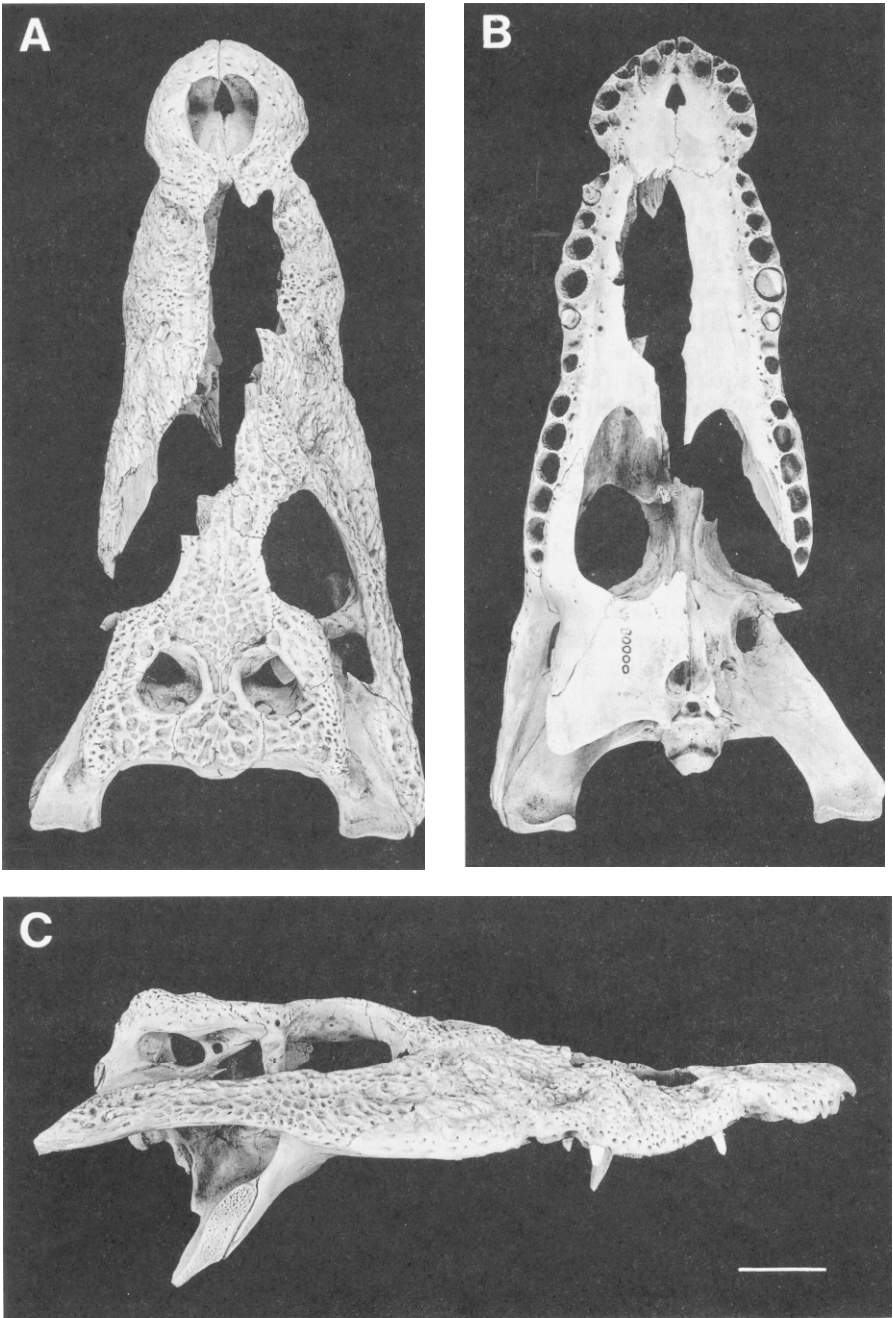


FIG. 1. Fossil skull of *Crocodylus rhombifer* (UF 80000) from Chisholm Cow Well, Grand Cayman, in dorsal (A), ventral (B), and right lateral (C) views. Scale bar equals 25 mm.

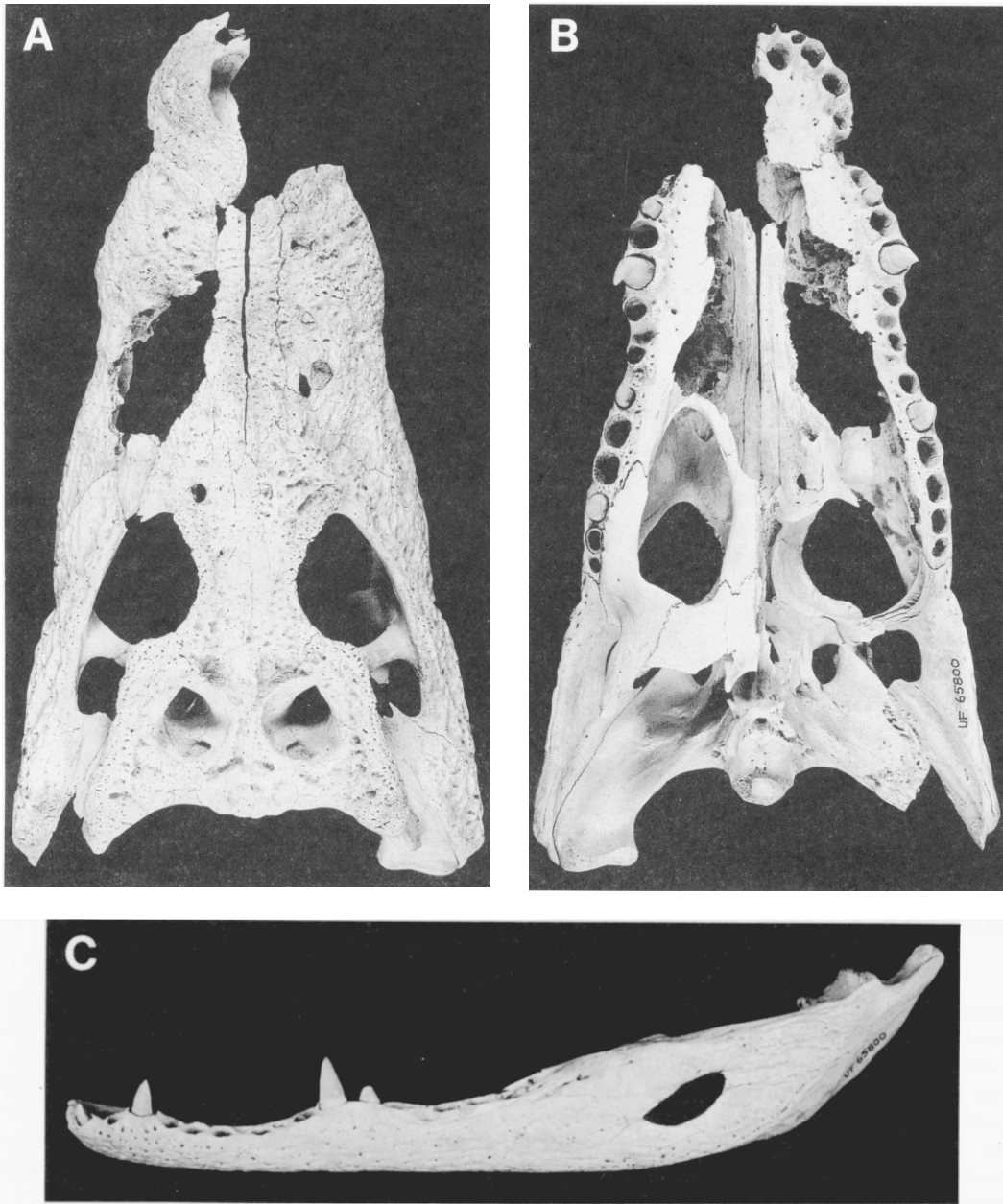


FIG. 2. Fossil skull and left mandible of *Crocodylus rhombifer* (UF 65800) from Prospect, Grand Cayman. Dorsal (A) and ventral (B) views of skull and lateral view of mandible (C). For scale see Fig. 1.

atal surface. The suture is transverse at the level of the first maxillary tooth in *C. rhombifer* and *C. moreletii*, while in *C. acutus* it is W-shaped and extends posteriorly to the third maxillary tooth. Compared to *C. acutus*, the distance between the tip of the

snout and the anterior edge of the external narial opening is reduced in *C. rhombifer* and *C. moreletii*. In *C. acutus*, the anterior portion of the premaxilla is longer and the narial opening begins farther posteriorly,

In *C. rhombifer* and the Grand Cayman

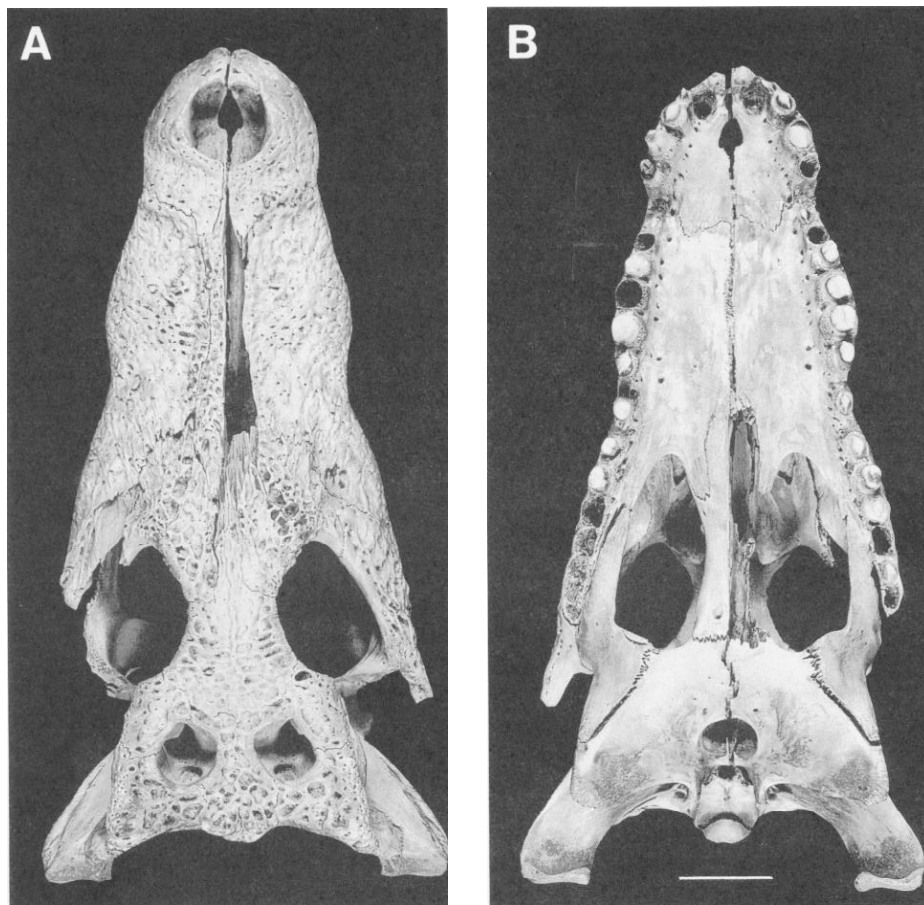


FIG. 3. Fossil skull of *Crocodylus rhombifer* (MRCU/CINM uncat., cast-UF 128064) from Connally Cow Well, Grand Cayman, in dorsal (A) and ventral (B) views. Scale bar equals 25 mm.

fossils, the cranial roof, composed of the frontals, postorbital, squamosals, and parietals, is markedly concave along the midline in the region of the dorsal temporal openings (Figs. 1–3). The lateral edges of the cranial roof are strongly upraised, forming prominent ridges on the postorbital and squamosals. There is a strong rounded protuberance on the posterolateral corner of the squamosal. *Crocodylus acutus* and *C. moreletii* have a flat cranial roof and the squamosal protuberances are absent. The region between the orbits, principally the frontals, is deeply concave in the Cuban crocodile and the lateral edges form a strong raised ridge on the internal margin of the orbits. The interorbital

region in *C. acutus* and *C. moreletii* is only slightly concave and the ridges on the inner margin of the orbits are weakly developed. The combination of a deeper snout, elevated cranial roof, and more constricted interorbital region gives *C. rhombifer* a noticeably larger orbit than *C. acutus* or *C. moreletii*.

Modern skulls of *C. rhombifer* have 13 (sometimes 12) maxillary teeth. Seven fossils from Grand Cayman have the complete maxilla preserved on at least one side, all with 13 teeth. All specimens of *C. acutus* and *C. moreletii* examined have 14 maxillary teeth. The third largest tooth in the dentary (after the 4th and 1st) is the 10th tooth in *C. rhombifer*, but is the 11th in *C. acutus*

TABLE 1. Measurements (in mm) of fossil *Crocodylus rhombifer* skulls from Grand Cayman.

	Prospect UF 65800	Chisholm Cow Well UF 80000	Connally Cow Well MRCU/CINM UF 128064 (CAST)	Crocodile Canal USNM 216197
Total length of skull (premaxilla-quadrato)	305	255	247	251
Length of skull (premaxilla-squamosal)	283	236	230	233
Length of snout (premaxilla- anterior edge of orbits)	175	147	144	139
Length of premaxilla	58	47	49	48
Length of maxilla	156	133	128	129
Length of maxillary toothrow	148	127	121	125
Breadth of premaxilla	— ¹	53	53	— ¹
Breadth of snout (at 5th maxillary tooth)	100	71	73	72
Breadth of snout (at anterior edge of orbits)	127	88	96	90
Interorbital breadth	31	22	23	22
Breadth of cranial roof (at anterior edge)	76	59	56	57
Breadth of cranial roof (at posterior edge)	104	79	75	75
Breadth of skull (at quadrate- quadratejugal suture)	163	119	— ¹	117

¹Measurements not taken because of damage to the fossils.

and *C. moreletii*. In summary, no characters readily distinguish the Cayman crocodiles from Cuban *C. rhombifer* of similar size.

Measurements. — Although large individuals of *Crocodylus rhombifer* are now rare in Cuba due to overhunting, historical evidence and the fossil record demonstrate that this species can reach a very large size. Gundlach (1880) mentioned a specimen 17.5 feet (5.3 m) long. Adults of this species now are generally less than 3.5 m. We measured several fossils of *C. rhombifer* in the AMNH from Ciego Montero in Cuba that must have come from enormous individuals, including a skull 677 mm long and a mandible 818 mm in length. Comparisons with modern crocodilian skulls (Thorbjarnson and McIntosh, 1987) suggest that these fossils came from animals over 5 m in length.

Comparative measurements of the four most complete skulls of *C. rhombifer* from Grand Cayman are presented in Table 1. The largest skull (Prospect specimen) is 305

mm long. The skulls from the Chisholm Cow Well, Connally Cow Well, and Crocodile Canal sites are smaller, ranging from 247–255 mm. Most of the skulls and postcranial elements of *C. rhombifer* from Grand Cayman appear to represent juvenile or subadult individuals (C. Brochu, pers. comm.).

Comparative Material Examined. — All comparative specimens consisted of modern skulls, with the exception of several fossil skulls from Cuba. The country of origin, number of specimens examined, and the museum collection abbreviation are provided for the comparative material representing each of the three species. *Crocodylus rhombifer*: Cuba (1 AMNH, 1 MCZ, 1 UF); fossil skulls, Ciego Montero, Cuba (4 AMNH); *C. acutus*: Florida (6 UF), Dominican Republic (1 UF), Haiti (2 UF), Cayman Islands, Little Cayman (1 MCZ), Jamaica (1 AMNH), Mexico (1 MCZ, 1 USNM); *C. moreletii*: Mexico (1 UF, 1 USNM).

DISCUSSION

Grant (1940) and Morgan and Patton (1979) summarized the historical literature on the occurrence of crocodiles in the Cayman Islands. Several quotations cited by them are repeated here. The earliest known reference to crocodiles in the Cayman Islands was in Walter Bigges' 1589 narrative on one of Sir Frances Drake's Caribbean voyages. According to Bigges, on the 20th day of April 1586, Sir Frances Drake's fleet, ". . . fell with two islands called Caimanes, where we refreshed ourselves with many allagartas and greate turtoises, being very ugly and fearefull beasts to behold, but were made good meate to eate . . ." Bigges' term *allagartas* (also *alagarto*) is an earlier English spelling of alligator and is derived from the Spanish *el lagarto*. In the early English historical literature from the West Indies, alligator or its prior equivalent was often used as a general term for crocodilians. Bigges' references to two islands indicates that Drake visited Little Cayman and Cayman Brat.

The next reference to crocodiles in the Cayman Islands was in 1642 or 1643 by a Captain William Jackson (from Grant 1940: 3) who stated, ". . . ye island of Chimanos [apparently Grand Cayman] . . . this place is low land and all rockye, and there bee other two Islands of ye same name and Quallitie [Little Cayman and Cayman Brat], being by ye Spanyards called Chimanos, from ye multitude of Alligators here found which are Serpents, if not resembling ye Crocodiles of Egypt." In his history of Jamaica, Edward Long (1774:875) noted that, ". . . the crocodile . . . is found at Grand Caymanas . . .".

According to Grant (1940), the first herpetological collection from the Cayman Islands was made on Grand Cayman in 1886 by W. B. Richardson and reported by Garman (1887). In discussing the occurrence of crocodiles on Grand Cayman, Garman stated (1887:276), "Mr. Richardson states that the natives reported a crocodile in the swamps." The following year Garman (1888) reported on a collection made by C. J. Maynard on Little Cayman and Cayman Brat. Garman quoted from Maynard's field

notes (1888:101), "Two species of crocodiles have been taken on this island [Little Cayman] and one on Cayman Brat. I [Maynard] saw but a portion of one specimen. The natives assured me the species were similar to those found in Cuba." In reference to Garman's records, Barbour (1914: 345) stated, "The species referred to are doubtless *C. rhombifer* and *C. americanus* [= *C. acutus*]. Whether they are resident on the Cayman Group or whether they only reach the islands occasionally by swimming would be well worth ascertaining definitely." Crocodiles apparently inhabited the three Cayman Islands until at least the late nineteenth century. Individual crocodiles have been reported sporadically within the last 50 years, including a specimen of *Crocodylus acutus* captured along the southern coast of Little Cayman in 1939 (Grant, 1940) and an unknown species of crocodile captured on Cayman Brat in the 1950's (Seidel and Franz, in press).

A radiocarbon date of 860 yBP from the Crocodile Canal Site establishes the presence of *Crocodylus rhombifer* on Grand Cayman in pre-Columbian times. The second radiocarbon date of 375 yBP from the Crocodile Canal Site and the presence of *Rattus rattus* in association with *C. rhombifer* in the Furtherland Farms Cow Well, clearly indicate that Cuban crocodiles inhabited Grand Cayman when the Cayman Islands were discovered by Columbus in 1503.

The discovery of fossil crocodile bones from Grand Cayman may have some bearing on how the Cayman Islands were named. These islands are called *Islas Caimán* in Spanish. The Amerindian word *caiman* has been incorporated into the Spanish language as a general term for all crocodilians, and is the local Cuban name for *Crocodylus acutus* (DeSola, 1930; Varona, 1966). The prior abundance of *Crocodylus rhombifer* on Grand Cayman strongly suggests that the Cayman Islands were named for their formerly resident crocodiles.

The occurrence on Grand Cayman of *Crocodylus rhombifer* rather than the more widespread *C. acutus* is puzzling, particularly considering that *C. acutus* prefers coastal marine and brackish-water habitats, while *C. rhombifer* inhabits freshwater

marshes and swamps in Cuba (DeSola, 1930; Varona, 1966). Large portions of Grand Cayman are below 5 m in elevation and are characterized by mangrove swamps, brackish lagoons, and other habitats favored by *C. acutus*. The occurrence of *C. rhombifer* fossils in mangrove swamps in two localities on Grand Cayman suggests that this species may have occupied a wider variety of habitats than it does presently. Furthermore, to reach Grand Cayman from southern Cuba, individuals of *C. rhombifer* would have to cross 250 km of open ocean, a difficult feat for an animal supposedly restricted to freshwater.

There is little doubt that *Crocodylus rhombifer* was a breeding resident on Grand Cayman, based on the large sample sizes of fossils in the Chisholm Cow Well, Crocodile Canal, and Furtherland Farms Cow Well sites, as well as the presence of numerous bones belonging to hatchlings or very small individuals. The evidence for *C. rhombifer* on Little Cayman and Cayman Brat is much less convincing. Except for one museum specimen of *C. acutus* from Little Cayman, the occurrence of crocodiles on these two islands is based on inconclusive sight records.

The disappearance of crocodiles and many other species of vertebrates from the Cayman Islands during the last 500 years probably resulted from a combination of human-caused habitat destruction and predation (Morgan and Woods, 1986; Morgan, in press). Among the many extinct and extirpated vertebrates from the Cayman Islands, only the crocodile is mentioned in the historical literature. Numerous references from the sixteenth century onward confirm that crocodiles inhabited the Cayman Islands until at least the late nineteenth century.

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