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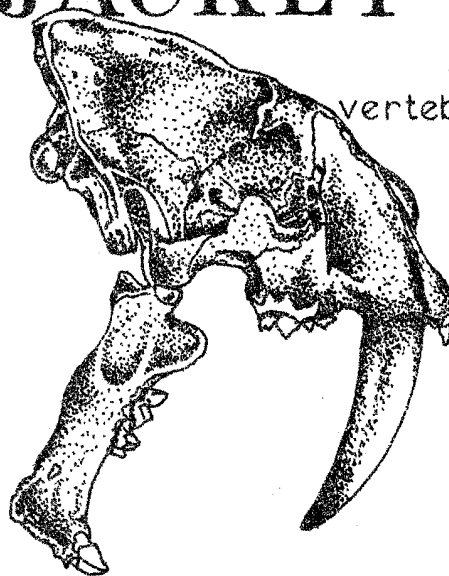
The PLASTER JACKET is a newsletter about fossil vertebrate animals of Florida. Its purpose is to circulate authoritative material on vertebrate paleontology and to foster communication among the growing number of enthusiasts of this subject.

Questions, announcements and other communications are solicited from all readers. Information of general interest will be included in future issues.

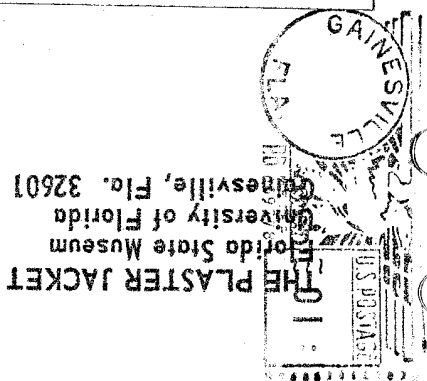
It is our intent to produce this series at the rate of about one issue per quarter year. We hope to add as many genuinely interested paleontologists as possible to our mailing list. If you are interested please send your name and address to the PLASTER JACKET. These issues are distributed free of charge to all interested people.

# The PLASTER JACKET

-- about fossil  
vertebrates of Florida



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## FOSSIL CROCODYLIANS OF FLORIDA

W. Auffenberg

Other than the turtles, the only ancient reptiles that survived beyond the Mesozoic are the crocodylians of the order Crocodylia, containing the crocodiles, alligators, caimans, and their relatives. The crocodylians evolved in the late Triassic and have undergone comparatively little modification in later times. In general body form and in many structural features they resemble the early Mesozoic ancestors of the dinosaurs; they are obviously very primitive.

The skull (Fig. 2) is always rather elongate; extremely so in such fish-eating types as the living Indian gaviel. The external nostrils are at the tip of the snout, which enables the animal to breathe with only this part of the body out of the water. The roof of the mouth is also modified for life in the water. An air channel leading from the nostrils to the throat obviates the danger of water escaping from the mouth into the air supply. Below the original inner opening of the nostrils the bones of the roof of the mouth have formed a secondary shelf which extends backward. Inhaled air passes back above this shelf to the posteriorly situated narial openings. Thus the air does not enter the mouth proper at all, but passes back separately into the throat, which can be closed off from the water in the mouth by a flap of skin. A similar secondary palate has developed in some mammals, but almost never to the extent seen in the crocodylians.

The general body shape is rather lizard-like. The long, flattened tail is used mainly for swimming. In modern forms the vertebrae are cupped in front and ball-shaped behind. A well-developed series of armor plates are always present down the back, and sometimes down the ventral side as well - - a feature inherited from their primitive ancestors.

The crocodylians may be grouped into four suborders: Protosuchia, very primitive Triassic forms; Mesosuchia, the typical Mesozoic families; Eusuchia, more progressive families, particularly of the Cenozoic; and Sebecosuchia, established for a peculiar South American fossil group. Except for a few Eocene forms, all crocodylians living after the Cre-

aceous belong to the Eusuchia.

Apart from some early specialized genera of the Late Cretaceous, all the eusuchians may be arranged in three groups, usually considered as families - - Crocodylidae, Alligatoridae, and Gavialidae. The distinction between the first two is none too sharp, and family assignments, particularly of some of the fossil forms, are often uncertain. The family Gavialidae is today represented by only one living species, restricted to the Ganges River in India. However, fossil species had a wide distribution in the Tertiary. All the gavials have a very slender snout, sharply marked off from the rest of the skull (Fig. 2). Most crocodiles also have an elongate snout, but it always blends smoothly into the back of the skull. In the alligators and caimans the snout is always broad. In addition, the first tooth of the lower jaw (and often the fourth as well) fits into a deep pit in the palate of the upper jaw; in the crocodiles these pits are absent, and the upper jaw is usually notched for these long lower teeth.

True gavials have not yet been reported from Tertiary deposits of North America, though they are known from South America and many parts of the Old World. Both crocodiles and alligators were abundant and varied in the New World throughout the Tertiary; species of both families still occur here, but only in tropical and subtropical regions. Of the family Alligatoridae, caimans are found from Mexico to Argentina, alligators only in southern United States and northeastern Mexico (with

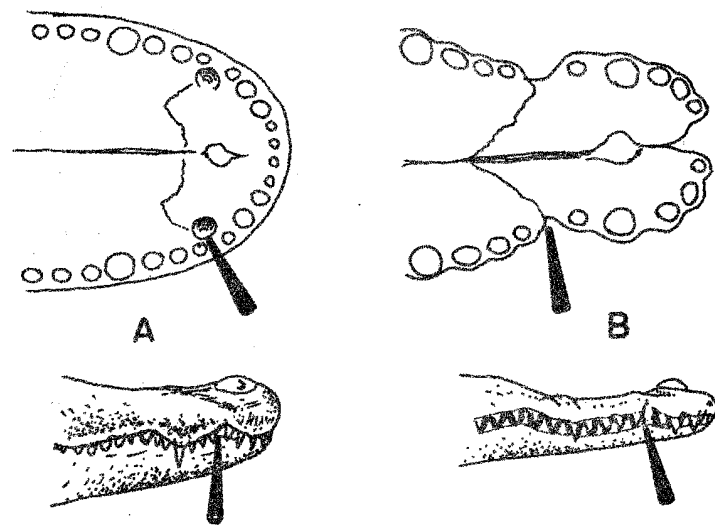


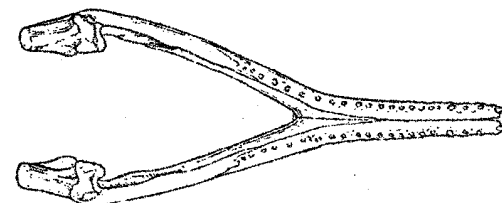
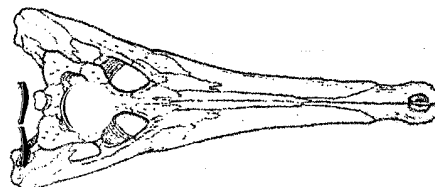
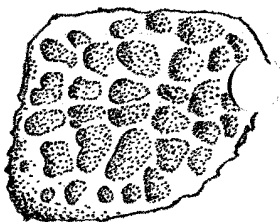
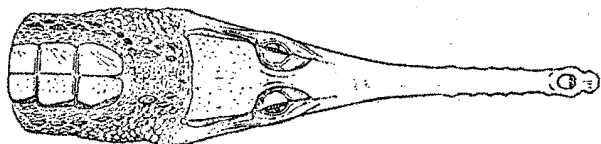
Figure 1. Upper jaws and side views of A, alligator and B, crocodile, showing position of fourth lower tooth on both types.

HEAD FROM TOP

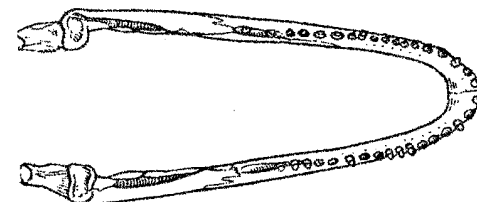
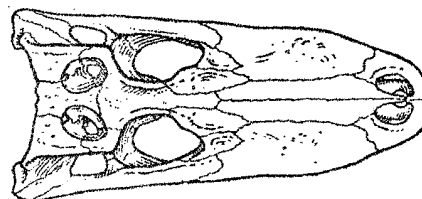
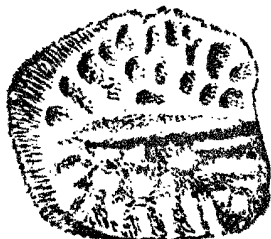
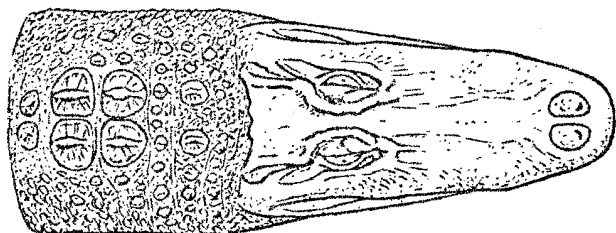
ARMOR - PLATE

( SKULL FROM TOP

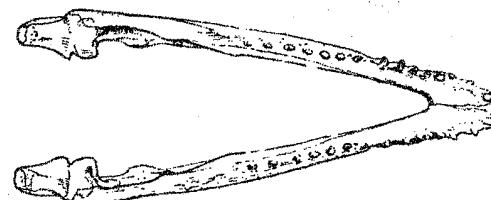
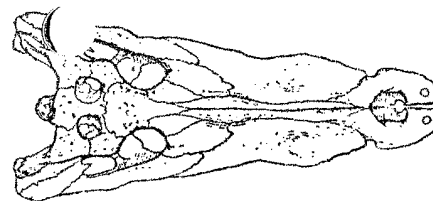
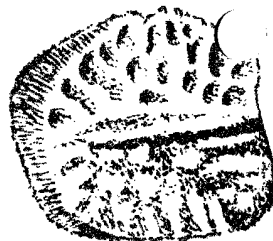
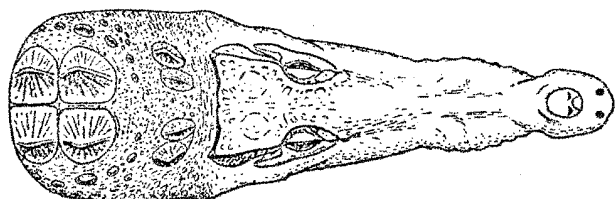
LOWER JAW FROM TOP



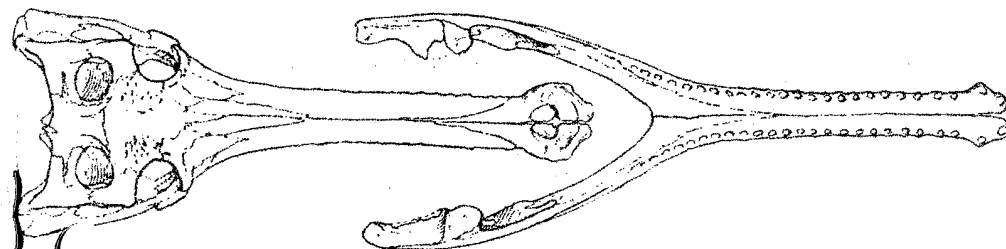
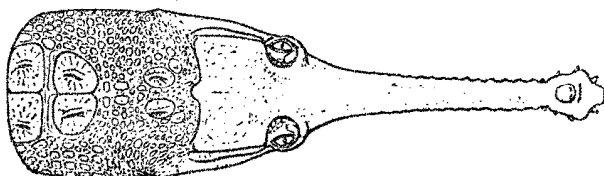
*Gavialosuchus americanus* (Pliocene)



*Alligator mississippiensis* (Pleistocene and Recent)



*Crocodylus acutus* (Recent)



*Gavialis gangeticus* (Recent of Asia)

Figure 2. Illustrations of some of the crocodylians mentioned in the text.

## FOSSIL CROCODILES OF FLORIDA

The earliest fossils of true crocodiles from Florida are also Miocene in age. These represent long-snouted fish-eating types, apparently closely related to a species now living in the islands of the southwestern Pacific. So far remains of these animals have been found only in deposits laid down in shallow marine bays and estuaries at the mouths of large rivers. The material is not yet sufficiently plentiful to identify the species, but it seems closely related to similar, better known types from the Pliocene of Florida. That is, it is probably a species of the genus *Gavialosuchus*.

In the Pliocene estuarine deposits of Florida is a long-snouted crocodile called *Gavialosuchus americanus* known from several deposits in Alachua, Marion, Citrus, Polk, and Hardee Counties. This species attained lengths up to 40 feet, and was probably most common in situations similar to those presently found at the mouths of Homosassa and Weekiwachee Springs, where fresh and salt waters meet and where fish are particularly abundant.

Ribbed crocodilian teeth are occasionally found in Pliocene deposits of Florida. On the basis of a South Carolina fossil, it seems to have been a long-snouted crocodilian similar to *Gavialosuchus*. The genus *Charactosuchus* from the Miocene of South America has similar teeth, but whether the Florida teeth should be assigned to this genus is not yet certain. More material of this interesting crocodile from our state is sorely needed to solve the problem.

Alligators and crocodiles rarely live side by side in Florida today, and captive specimens have been known to fight to the death. However, *Gavialosuchus americanus* and *Alligator mississippiensis* occur together in several Pliocene deposits in Florida, though it is not known whether they occupied the same areas at the same time.

The American crocodile, *Crocodylus acutus*, is found in Florida today only in the mangrove forests at the southern tip of the peninsula. However, its range extends southward throughout the mangrove forests as far as southern South America. It has not yet been found as a fossil in Florida, though it should be present in Pleistocene coastal deposits. The largest specimens known reach lengths of about 18 feet.

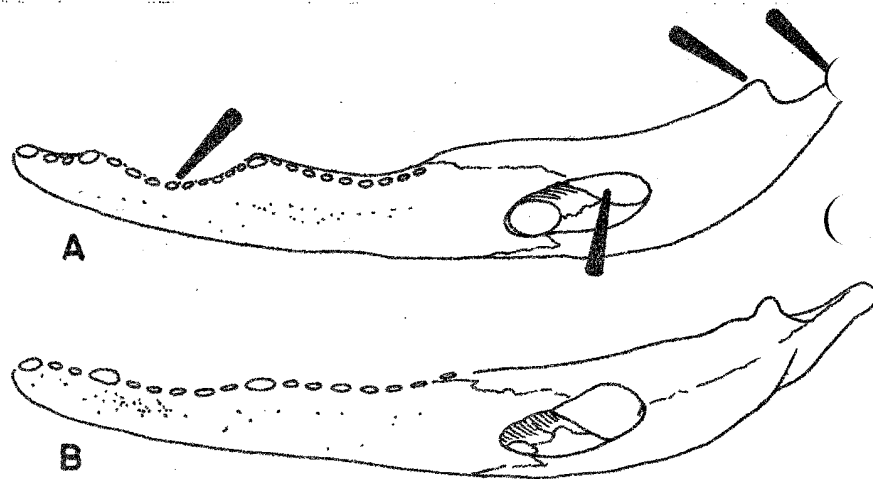


Figure 3. Lower jaws of A, *Alligator olseni* and B, *Alligator mississippiensis*. Note slight differences at places indicated.

a close relative in China). Members of the family Crocodylidae are found throughout both fresh and salt water habitats in central and northern South America. The single species of crocodile in North America is limited to the mangrove forests of the southern tip of Florida.

## FOSSIL ALLIGATORS OF FLORIDA

The earliest member of this family known from Florida is *Alligator olseni* of the Miocene. Originally described from the Thomas Farm in Gilchrist County, it has since been found in several other Florida fresh water deposits of about the same age. In size it seems to have been considerably smaller than the living alligator; the largest fossils obtained so far suggest that 8 foot specimens were very large. This species is probably ancestral to the living species in Florida.

Remains of the genus *Alligator* are quite plentiful in Pliocene deposits from Alachua County south to and including the pebble phosphate area. Though these fossils have not yet been thoroughly studied, they seem to represent the living species, *Alligator mississippiensis*. In Florida Pleistocene deposits *Alligator mississippiensis* is an extremely common fossil. Though modern specimens rarely attain lengths greater than 15 feet, this species may have reached as much as 20 feet in the Pleistocene.