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A New Species of Fossil Crocodile of the Genus *Leidyosuchus* from the Green River Beds[1]

By Charles C. Mook

In 1936 a skull of a medium-sized crocodilian was collected by L. R. Wilson from the Eocene Green River Formation near Wamsutter, Wyoming. The exact horizon of the specimen is immediately above the Wamsutter Coal Bed.

This specimen has been assigned to me for description. I wish to express my thanks to Professor Wilson for the opportunity to study and describe this form. I also wish to express my appreciation to Mr. Robert Popper for assistance and for information regarding the specimen.

The horizon is somewhat higher in the geological time scale than that of any other species of the genus *Leidyosuchus*, so far as I am aware. Most species of this genus are Cretaceous or Paleocene in age. The characters of the skull resemble those of known leidyosuchine species closely. In fact differences between some of the known species of *Leidyosuchus* are somewhat greater than between any of them and the form herein described. Instead of proposing a new genus of leidyosuchine crocodilian, I ascribe the present form to the genus *Leidyosuchus* in a new species to be named *Leidyosuchus wilsoni*, after the discoverer of the type specimen.

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[1] Contributions to the Osteology, Affinities, and Distribution of the Crocodilia. No. 43.

Leidyosuchus wilsoni, new species

TYPE: An almost complete skull, A.M.N.H. No. 7637.

TYPE LOCALITY AND LEVEL: Middle Eocene, Green River formation, immediately above the Wamsutter Coal Bed, near Wamsutter, Wyoming.

DIAGNOSIS: The characters of the genus *Leidyosuchus.* The nasal bones do not enter the external narial aperture at the surface of the skull. The skull has been crushed from above but probably the major dimensions have not been altered greatly in this process. The surface is largely covered with a crystalline substance that in some places obscures the sutures between the bones. The anterior process of the frontal bone is broad. The posterior end of the external narial aperture is only very slightly anterior to the level of the premaxillary-maxillary notch. The notch is only moderately deep. The anterior processes of the palatine bones together are distinctly wedge-shaped. The palatine fenestrae were narrow anteriorly and broad posteriorly.

DESCRIPTION: The snout is of moderate length, being slightly longer than the portion of the skull posterior to it. The premaxillary region, anterior to the premaxillary-maxillary notch, is much broader than long. The external narial aperture is also broader than it is long. Posterior to the notch the skull expands slightly to the level of the fifth maxillary teeth, then constricts slightly to the level of the seventh maxillary teeth; posterior to this level the skull expands regularly to its posterior end. The orbits are of moderate size and are distinctly pointed anteriorly. The latter character is probably accentuated by the crushing of the specimen. The interorbital plate is very broad, but this breadth again may have been increased by crushing. The supratemporal fenestrae are of moderate size. They are far apart from each other at present, and probably were moderately so, at least, before having been crushed.

The region of the premaxillary foramen is not well preserved, but apparently this aperture was broader than it was long. As noted above, the palatine fenestrae are narrow anteriorly, terminating at the level of the space between the ninth and tenth maxillary teeth. Posteriorly these apertures expand to about the level of the nineteenth (and last) maxillary teeth, and then constrict somewhat to their posterior ends, which are narrow, but are rounded rather than acutely pointed.

The characters and boundaries of the individual bones are difficult to make out, owing to the crushing and to the crystalline covering. It is clear, however, that there is a distinct anterior process to the frontal,

extending considerably anterior to the orbits. It is also clear that the nasal bones do not enter the external narial aperture at the surface of the snout, although they may do so at a slight depth.

The premaxillary-maxillary suture on the palate is W-shaped, but with acute changes of direction, contrasting with the rounded nature of the changes in direction in that of *L. sternbergii*.

The two palatines end anteriorly at the level of the seventh maxillary teeth and the palatine fenestrae at the level of the spaces between the ninth and tenth maxillary teeth.

Each premaxillary appears to have had five dental alveoli, of which the first is not preserved on either side. Of those preserved, the third and fourth are about equal in size and are considerably larger than the approximately equal second and fifth. Each maxillary apparently contained 19 alveoli, of which the fourth and fifth are approximately equal in size and are larger than any of the other alveoli. The range in size from the largest to the smallest alveoli is, however, not great. All the alveoli appear to have complete borders, none being confluent with the preceding or succeeding members of the series.

The measurements (in millimeters) of *Leidyosuchus wilsoni* are as follows:

Length of skull, midline, anterior point preserved to supraoccipital border	270
Length of skull, estimated anterior border to supraoccipital border	275
Length of snout, anterior point preserved to anterior ends of orbits	165
Length of snout, estimated anterior end of snout to anterior ends of orbits	170
Length of skull, anterior ends of orbits to supraoccipital border	100
Breadth of snout across premaxillary expansion, estimated	59
Breadth of snout at premaxillary notch	48
Breadth of snout across anterior ends of orbits	129
Breadth of skull across squamosals (maximum)	138
Breadth of skull across quadrates, estimated	188
Length of tooth row, right side, estimated	203
Length of right orbit	44
Length of right supratemporal fenestra	28
Breadth of right supratemporal fenestra	29
Length of right palatine fenestra	114

Some relative proportions are as follows (all estimated):

Maximum breadth of skull/length of skull, tip of snout to supraoccipital border	696
Length of snout/length of skull, tip of snout to supraoccipital border	629
Breadth of snout/length of snout	700

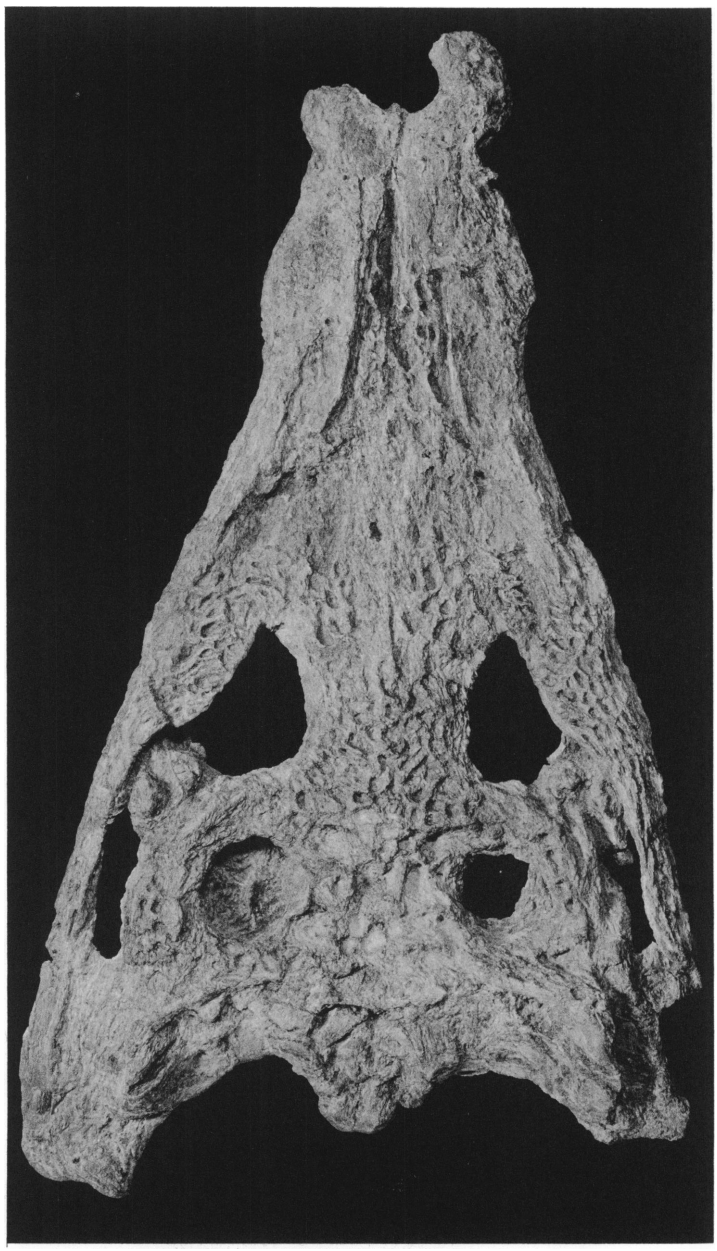

FIG. 1. *Leidyosuchus wilsoni*, new species. Type skull (A.M.N.H. No. 7637). Superior view. Approximately ½ natural size.

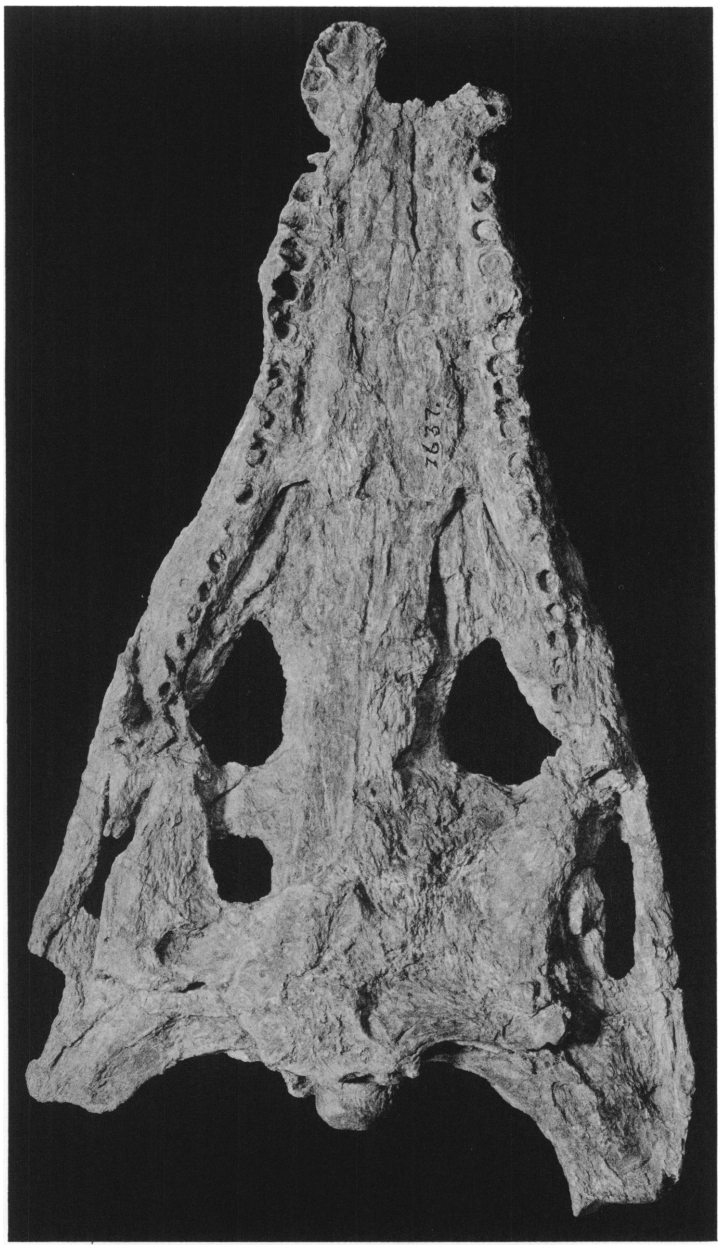

FIG. 2. *Leidyosuchus wilsoni*, new species. Type skull (A.M.N.H. No. 7637). Inferior view. Approximately ½ natural size.

Comparison with Other Species of *Leidyosuchus*

Leidyosuchus acutidentatus Sternberg has egg-shaped orbits and 20 maxillary teeth on each side. Its proportions are (all approximate):

Breadth of skull/length of skull	450
Length of snout/length of skull	571
Breadth of snout/length of snout	557

Leidyosuchus canadensis Lambe has the orbits almost, if not entirely, confluent with the supratemporal fenestrae. The snout is relatively short; the supratemporal fenestrae are moderately large; the teeth vary considerably in size.

Leidyosuchus multidentatus Mook is known from lower jaws only, but the proportions of this structure indicate a skull far longer in proportion to its breadth than in *L. wilsoni;* also the number of lower teeth on each side (28) indicates a larger number in the upper jaw than in the form herein described. The proportions of the lower jaws in *L. multidentatus* are: maximum breadth/length, 296.

Leidyosuchus riggsi Schmidt has the supratemporal fenestrae approximately circular and much smaller than the orbits; the anterior ends of the palatine bones lie opposite the twelfth maxillary teeth. Some proportions are (all approximate):

Breadth of skull/length of skull	398
Length of snout/length of skull	713
Breadth of snout/length of snout	442

Leidyosuchus sternbergii Gilmore has the anterior processes of the palatine bones ending at the level of the tenth maxillary teeth. These processes are broad at their anterior ends. There are five premaxillary, 19 maxillary, and 21 dentary teeth on each side. Some proportions are (all approximate):

Breadth of skull/length of skull	541
Length of snout/length of skull	622
Breadth of snout/length of snout	631