
OPHIACODON FROM OHIO

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A variety of pelycosaur materials have been reported from the Dunkard beds of eastern Ohio, West Virginia, and western Pennsylvania. The several occurrences and the material itself are discussed by Romer (1952). The identifiable material was referred (Romer, 1952: 93-96) to the genera *Edaphosaurus* and *Baldwinonus?*. Additional undetermined pelycosaur remains suggested the presence of an ophiacodont from the Dunkard series (Romer, 1952: 96). The specimen described in this paper substantiates the presence of *Ophiacodon* in the Dunkard beds.

PAST HISTORY AND ACKNOWLEDGMENTS

Approximately fifty years ago, Fred L. Williams, now of Woodsfield, Ohio, while plowing a field just east of Liangs Post Office, Monroe County, Ohio, struck and split open a large slab of micaceous sandstone. On examining the slab he noted that it contained the bones of some animal. He removed the specimen and placed it in his barn. In September of 1957 he turned over the specimen to Elmer Templeton, a student at Marietta College. Mr. Templeton in turn gave the specimen to George Hayfield, then an instructor of geology at Marietta College. The specimen was sent to the Ohio Geological Survey for identification and then to Professor Claude W. Hibbard, Museum of Paleontology, The University of Michigan. At The University of Michigan the specimen was prepared by Dr. Thomas M. Oelrich but owing to other commitments he did not finish his work on the specimen and it was returned to the Ohio Geological Survey in June of 1959. I uncovered the specimen in March, 1961. Since Mr. Templeton gave the specimen to Marietta College for study, he decided to donate the specimen

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to Princeton University. The specimen is now on display at Princeton and has been assigned Princeton University number 17800.

Dr. Alfred S. Romer, Museum of Comparative Zoology, Harvard University, visited The Ohio State University in the spring of 1961, and examined the specimen, suggesting that it probably belonged to the genus *Ophiacodon*. Further investigation has collaborated this suggestion.

I am indebted to the above mentioned persons for their assistance in all phases of the history of the specimen and again to Dr. Hibbard for loaning specimens of *Ophiacodon uniformis* for comparison. My thanks are also extended to Dr. Donald Baird of Princeton University for his patience and assistance regarding this paper and the specimen.

GENERAL GEOLOGY AND LOCATION

The specimen (PU no. 17800) was collected about 1000 yards east of the crossroads community of Liangs Post Office, Green Township, Monroe County, Ohio. The exact location was on the east side of King's Knob, SW $\frac{1}{4}$, Sec. 27, T. 3N., R. 4 W.

The area of collection lies well within the mapped area of the Dunkard Group in eastern Ohio (Stauffer and Schroyer, 1920). Field examination revealed that the specimen probably came from a sandstone exposed at an elevation of 1100 ft. Comparison of this elevation with the measured section (no. 9908, on file with the Ohio Geological Survey) indicates that the sandstone lies appreciably above the Washington "A" coal and belongs to the Green Formation of Stauffer and Schroyer (1920). Horace Collins, Coal Geologist for the Ohio Geological Survey, confirms the assignment of this sandstone to the Green Formation of Lower Permian (Wichita) age.

SYSTEMATIC DESCRIPTION

Class Reptilia

Order Pelycosauria (Theromorpha)

Suborder Ophiacodontia

Family Ophiacodontidae

Genus *Ophiacodon* Marsh, 1878

Ophiacodon cf. *uniformis* (Cope, 1878)

Figures 1-5

Material

Princeton University no. 17800 is a fossiliferous slab containing parts of ten thoracic vertebrae, partial left humerus, and associate left limb and foot bones (fig. 1).

Description

One of the better preserved bones is the humerus (fig. 3, 4). Following the general terminology of Romer (1940: 137-144; 1956: 350-361), the proximal dorsal surface is almost completely missing. The supinator process is strong and projects at almost a right angle to the axis of the bone. Lying just dorsal of this process is part of the ectepicondylar groove. No evidence that this groove is bridged over is seen. The distal dorsal surface (fig. 3) is largely complete and shows the broad entepicondyle. This surface is pierced by the large entepicondylar foramen. The proximal ventral surface which occupies the underside of the head region is missing. The distal ventral surface (fig. 4) is almost complete and the capitellum, entepicondylar foramen and deltopectoral crest are easily visible. A shallow depression leads distally from the foramen toward a point back of the ulnar articulation. Typical of the primitive reptile humerus, this specimen shows the twisted appearance. The overall length of the humerus is 61 mm, obtained by measuring

from the attachment of the supracoracoideus muscle to the distal edge of the area for the articulation with the radius. Reconstruction of the proximal articulation would give the complete humerus an overall length of approximately 80 mm. The distal width of the humerus is 34 mm.

Elements of the radius and ulna are apparently present, but owing to their

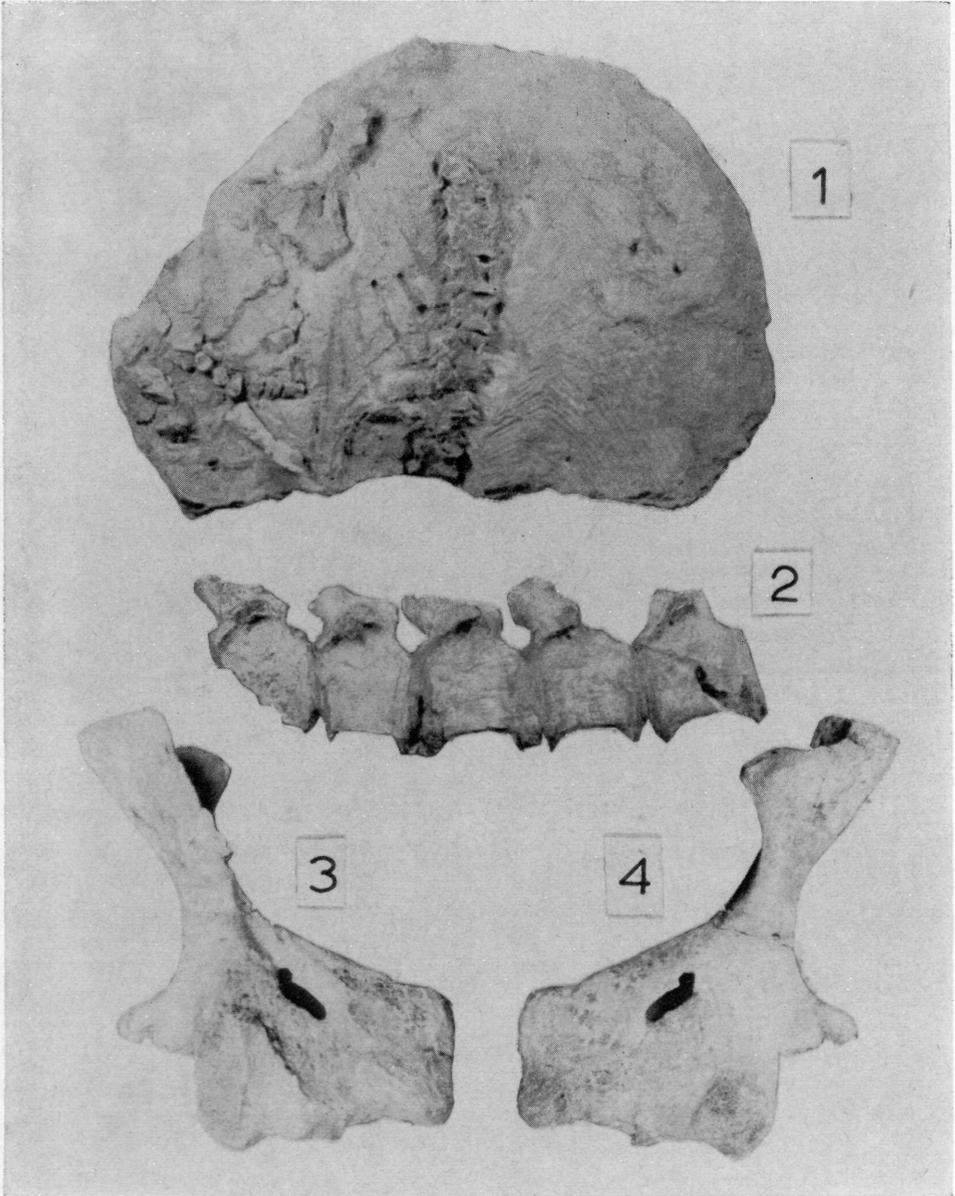


FIGURE 1. Fossil slab with major skeletal elements. $\frac{1}{3}$ natural size.

FIGURE 2. Left side of the first five thoracic vertebrae. Natural size.

FIGURE 3. Distal dorsal surface of left humerus. Natural size.

FIGURE 4. Distal ventral surface of left humerus. Natural size.

fragmentary nature it is impossible to derive any diagnostic information. Certain elements of the left manus are present. All elements of the first digit with the distal carpal are present and measure articulated approximately 30 mm. Distal elements of the second and third digits are also present. The two ungual phalanges (1 and 3) are rather short and blunt. The other elements of the manus are fragmentary.

There are ten dorsal vertebrae represented by fragmental material (fig. 1, 2). The neural arches are missing as are the right sides of the centra. Intercentra are present on two of the vertebrae but presumably were present on all. The average length of the centra is 15 mm. The dorso-ventral diameter of the centra at its end is 13 mm. The centra are subcircular at each end and the middle portion is constricted and flattened with a straight ventral keel present (fig. 5). The centra are all notochordal. The left zygapophyses are present on all vertebrae and tilt inward ventrally.

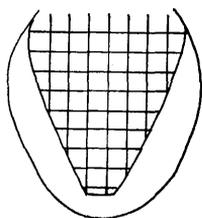


FIGURE 5. Cross-sectional drawing of centrum of thoracic vertebrae. 2×natural size.

Discussion

The described material compares best with the genus *Ophiacodon*. The presence of the broad entepicondyle of the humerus is characteristic of this genus (Romer, 1940: 230). The presence of an ectepicondylar groove, rather than a foramen separates this specimen and genus from *Edaphosaurus*. The reconstructed length of the humerus compares with the length of humeri, (University of Michigan Museum of Paleontology no. 3354) identified by Romer (1940: 456) as *Ophiacodon uniformis*?

The compressed centra of the vertebrae, the flattened ventral keel and cross-section (fig. 5) compare well with the mid-dorsal section of vertebrae as illustrated by Romer (1940: 98, fig. 17).

SUMMARY

The specimen described appears definitely to belong to the genus *Ophiacodon*. The material available indicates the presence of *Ophiacodon* in Ohio during early Permian times. The individual as here represented, appears to have been lighter built and smaller than the majority of forms found in the Lower Permian deposits of the southwest. It seems best to compare this specimen with *Ophiacodon uniformis* but without additional material assignment to this species or the creation of a new species is impossible.

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