

AN OXFORDIAN ICHTHYOSAURIA (REPTILIA) FROM VIÑALES, WESTERN CUBA: PALEOBIOGEOGRAPHIC SIGNIFICANCE

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Western Cuba has yielded significant material of Jurassic marine reptiles since very early in this century, when the Cuban naturalist Don Carlos de la Torre y Huerta discovered the first specimens from the area of Viñales (Alvarez Conde, 1957) (Fig. 1). It was some time before the fossil reptiles were partially described (R. De la Torre and Cuervo, 1939; R. De la Torre and Rojas, 1949; A. De la Torre, 1949; Colbert, 1969). The presence of “ichthyosaur remains” within this assemblage was first reported by R. De la Torre and Cuervo (1939) who described two new taxa: *Sphaerodontes caroli* and *Ichthyosaurus torrei*, but neither are now considered valid as the first was based on a fish, and the second has been reidentified as a plesiosaur (Iturralde-Vinent and Norell, 1996). In a later paper, R. De la Torre and Rojas (1949) described one species and two subspecies of “ichthyosaurs” but they referred the taxa to *Cryptocleidus*, a plesiosauroid genus. In fact, none of these species or subspecies are referable to Ichthyosauria (Iturralde-Vinent and Norell, 1996). Recently, a synopsis of the provenance and identity of Jurassic marine reptiles from Cuba has been published by Iturralde-Vinent and Norell (1996). In this paper, many of the early taxonomic designations have been revised, but no ichthyosaur remains could be identified.

Some of the Jurassic fossil remains of marine reptiles from Cuba have been sent on loan to the Departamento de Paleontología de Vertebrados of the Museo de la Plata (Argentina), as part of a joint research project between the Argentinian institution and the Cuban Museo Nacional de Historia Natural in Havana. Among these materials there is a specimen (MNHNH-P 3068) embedded in black limestone which, before preparation, was characterized by Iturralde-Vinent and Norell (1996) as a skull fragment of a large marine reptile composed of a few bone fragments surrounding extremely large scleral ossicles. According to these authors it represented the largest saurian specimen yet recovered from the Jurassic of Cuba. Further preparation of MNHNH-P 3068 at the Museo de la Plata allowed the identification of the skull bones preserved, among which there is the basioccipital that is of important taxonomic interest. With these elements the specimen can now be identified as an ichthyosaurian of the Ophthalmosauria (sensu Motani, 1999). This is the first Ichthyosaur properly identified from Cuba. The scope of the present paper is to describe the new specimen and analyze its paleobiogeographical significance.

Abbreviations—MNHNH-P, Paleontological Collection of the Cuban Museo Nacional de Historia Natural.

SYSTEMATIC PALEONTOLOGY

ICHTHYOSAURIA Blainville, 1835
OPHTHALMOSAURIA Appelby, 1956 (sensu Motani, 1999)
OPHTHALMOSAURIA indet.
(Figs. 2, 3)

Referred Specimen—MNHNH-P 3068. Elements of one skull partially disarticulated.

Occurrence—The only information available states that the MNHNH P 3068 was collected “near Viñales.” Iturralde-Vinent and Norell (1996:7) pointed out that this locality probably is located on “... the southern slope of Sierra de Guasasa, on the northern flank of the Viñales valley, northeast of the town of Viñales.” The fossil-bearing middle to early late Oxfordian Jagua Formation (Fig. 1), outcrops along this slope and “... has been the source of many important Jurassic fossil collections, including fishes, ammonites, and reptile bones.”

Description—MNHNH-P 3068 consists of the following skull elements: both pterygoids, the basisphenoid, the basioccipital, part of the sclerotic ring and two other skull elements one of which is tentatively identified as a postorbital. Excepting the sclerotic plates all the remaining elements are disarticulated (Fig. 3).

The basisphenoid can be seen in its ventral, dorsal and lateral views. Its width in ventral view equals 65 mm. In ventral view the basisphenoid is completely fused with the parasphenoid so that the contact between these two elements cannot be distinguished. On this surface the carotid foramen, partially covered by sediment, is set well back (Fig. 3A).

The basioccipital is strongly compressed antero-posteriorly and it is rotated from its original position in such a way that its anterior surface is pointed backward (Fig. 3A). As this surface is eroded, the presence of a basioccipital peg can not be checked. In posterior view, there are two different areas well defined: the condyle, and the extracondylar area. This latter area is reduced (Fig. 3B). In dorsal view it can be identified as the neural canal and, on both sides, the facets for the occipital are present. In this view, the most conspicuous feature is the lateral expansion of this bone (Fig. 3A). The palatal ramus of both pterygoids are broken. The left one is more complete and the triangular quadrate ramus of the pterygoid can be seen dorsally (Fig. 3A).

Remarks—In the Cuban specimen, although incomplete, the most striking feature is the relatively large orbit. Orbit size is inferred based on the large size of the sclerotic rings (estimated diameter=15 cm; Iturralde-Vinent and Norell, 1996) in comparison with the remaining elements of the skull (pterygoids, basisphenoid and basioccipital, Figs. 2, 3). Another element to note, although damaged, is the basioccipital. In posterior view, the extracondylar area can be identified and it is reduced as in *Ophthalmosaurus* Seeley, 1874. It is different from the basioccipital of *Brachypterygius* Huene, 1922 from the Kimmeridgian of England, in which this bone is a stout element, and the extracondylar area is even more reduced than in *Ophthalmosaurus* and the condyle occupied most of the posterior face of the bone (see McGowan, 1976,

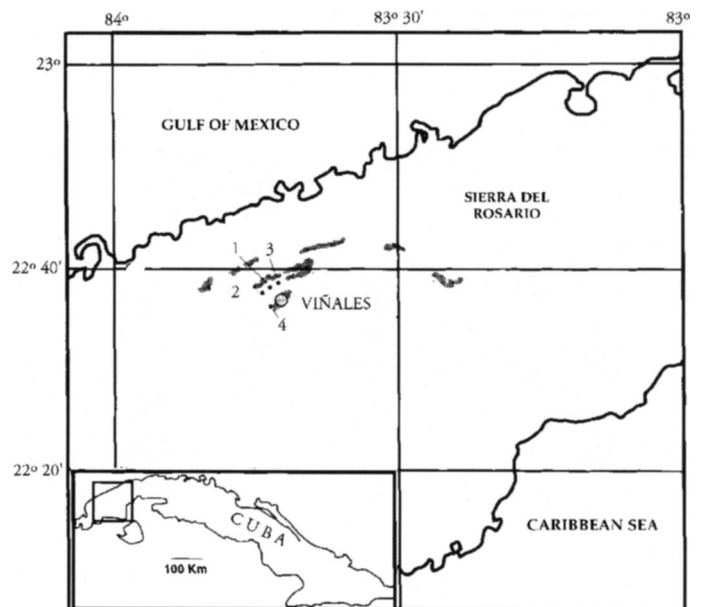


FIGURE 1. Map showing localities near Viñales (Western Cuba) where Jurassic marine reptiles were found (simplified after Iturralde-Vinent and Norell, 1996). Black strips: main outcrops of the middle-late Oxfordian Jagua Formation. 1, “near Viñales”; 2, Puerta del Ancón; 3, Laguna de Piedra; 4, Viñales town.



FIGURE 2. *Ophthalmosauria* indet. (MNHNH-P 3068). Lateral view. Scale bar=5 cm.

Figs. 2A–C). Based on the characteristics of the basioccipital, the MNHNH-P 3068 can now be referred to the *Ophthalmosauria*.

DISCUSSION AND CONCLUSIONS

We can conclude from this study that the *Ophthalmosauria* is represented in western Cuba, in the middle to early late Oxfordian Jagua Formation, within the so called Guaniguanico terrane (Iturralde-Vinent, 1994). *Ophthalmosaurians* are well known in the Callovian Oxford Clay of England (i.e., Martill, 1991) and from the Oxfordian of the USA (i.e., McGowan, 1991) and recently *Ophthalmosaurus* has been reported from the Tithonian of Boulogne, France (Bardet et al., 1997) and from the Tithonian of Argentina (Fernández, in press). This distribution agrees with the idea proposed by McGowan (1978) that ichthyosaurs were spatially and temporally widespread rather than restricted.

In the early 1970s Gasparini, based on systematic studies of Jurassic marine reptiles from the Pacific Margin of South America, pointed out the close affinities between the Jurassic marine herpetofauna of the Neuquén Basin (Western Argentina) with those of the Western Tethys

(Chong and Gasparini, 1972, 1976; Gasparini, 1978; Gasparini and Chong, 1977). Based on the paleoposition of the continents during the Late Jurassic, Gasparini (1977) proposed that the most important seaways linking both marine reptile faunas was the early Caribbean seaway (Bartok et al., 1985). Other evidence, such as the affinities of the invertebrate faunas from west-central South America and the West Tethys (Damborenea and Manceñido, 1979; Manceñido and Dagys, 1992; Riccardi, 1991), and further works on South American herpetofaunas (i.e., Gasparini, 1980, 1985, 1992; Gasparini and Fernández, 1996, 1997), reinforced the hypothesis. Excepting for the material cited by Iturralde-Vinent and Norell, 1996, direct evidence of marine reptiles using the Caribbean seaway during the Late Jurassic is scarce. In this context, the description and identification of ichthyosaur remains from the Oxfordian of the Guaniguanico terrane in Cuba is of particular interest and fills a paleobiogeographic gap, as the Guaniguanico terrane originated at the Caribbean borderland of the Maya block (Yucatan peninsula) (Iturralde-Vinent, 1994).

Further studies are now under way on Argentinian and Cuban Jurassic marine reptile faunas. We hope that these studies will bring new clues to improve our understanding of diversity and biogeography of the Mesozoic marine herpetofauna.

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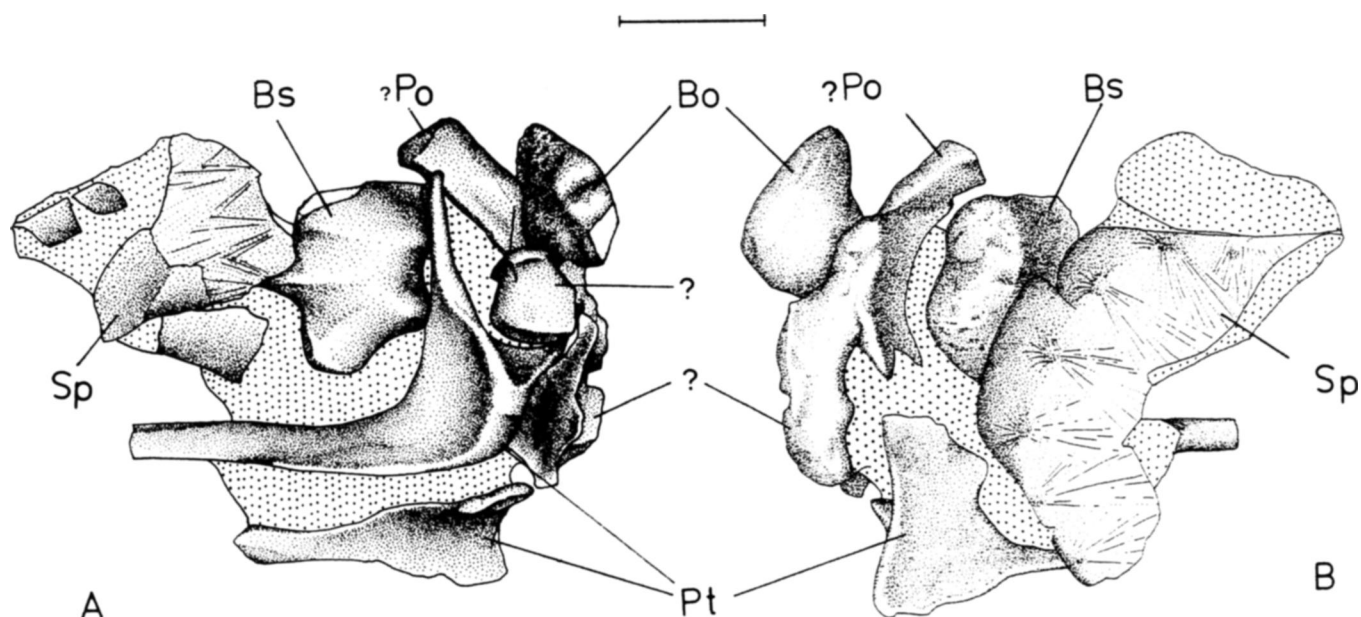


FIGURE 3. *Ophthalmosauria* indet. (MNHNH-P 3068). A, ventral view; B, lateral view. **Abbreviations:** Bo, basioccipital; Bs, basisphenoid; Po, postorbital; Sp, sclerotic plates. Scale bar=5 cm.

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