A NEW ?ORNITHISCHIAN DINOSAUR FROM THE BULL CANYON FORMATION (UPPER TRIASSIC) OF EAST-CENTRAL NEW MEXICO

ADRIAN P. HUNT
New Mexico Museum of Natural History, P.O. Box 7010, Albuquerque, New Mexico 87194

Abstract - Revueltosaurus callenderi is a new ?ornithischian dinosaur from the Bull Canyon Formation (Upper Triassic) of eastern New Mexico. It is distinguished by having denticulated premaxillary teeth twice the size of dentary/maxillary teeth and in having incisiform (?anterior) teeth. Anterior teeth are lacking in all ornithischians.

INTRODUCTION

Ornithischian dinosaurs were the most abundant and diverse group of large terrestrial vertebrates during the late Mesozoic, yet the origin and early diversification of this group are poorly understood. Undoubtedly, the Ornithischia evolved during the Late Triassic, but the dinosaur record for this time interval is poor (Chatterjee, 1984; Galton, 1986). In the extensive and well-studied faunas of the Late Triassic of the American Southwest, only one ornithischian dinosaur has been described (Chatterjee, 1984). However, there are also reports of unpublished material (Murry, 1986, 1989). This paper presents a brief description of a new dinosaur taxon which may possibly represent a sister group to the Ornithischia. NMMNH refers to the New Mexico Museum of Natural History, Albuquerque.

SYSTEMATIC PALEONTOLOGY

Class Reptilia
Order ?Ornithischia Seeley, 1887
Genus Revueltosaurus, new genus

Type Species: Revueltosaurus callenderi.

Derivation of Name: From Revuelto Creek, Quay County, New Mexico where the specimen was collected. Revuelto is Spanish for "revolution" (revolt) which is appropriate for an animal from the Late Triassic during which there was a revolution in terrestrial vertebrate evolution.

Distribution: Bull Canyon Formation (Late Triassic, Norian) of Quay County, New Mexico.

Diagnosis: Herbivorous dinosaur of small size which shares with the Ornithischia teeth that are low and triangular-shaped in lateral view, no recurvature in maxilla/dentary teeth and the fact that teeth have well-developed necks separating the crown from the roots (Sereno, 1986). Revueltosaurus differs from most ornithischians, except advanced heterodontosaurs, in having premaxillary teeth twice as tall as maxillary/dentary teeth

(Sereno, 1986). Revueltosaurus differs from heterodontosaurs in that all teeth have denticulated margins (Sereno, 1986). Teeth of Revueltosaurus have no cingula, unlike "fabrosaur" taxa (Galton, 1986). Revueltosaurus differs from Technosaurus in not having accessory cusps. Revueltosaurus apparently differs from Ornithischia in having incisiform teeth on the ?premaxilla (Sereno, 1986).

Revueltosaurus callenderi, new species

Holotype: NMMNH P 4957, incisiform tooth (Plate 9E-H).

Paratypes: NMMHH P 4958, dentary/maxillary tooth (Plate 9A-D); NMMNH P 4959, premaxillary tooth (Plate 8E-H).

Derivation of Name: To honor Jonathan F. Callender, Director of NMMNH for his enthusiastic and substantive support of paleontology in New Mexico.

Distribution: Same as for genus.

Referred Specimens: NMMNH P 4960, 28 premaxillary and dentary/maxillary teeth.

Diagnosis: Same as for genus.

Description and Discussion: Revueltosaurus is represented by 27 isolated teeth from NMMNH Locality 001. Most teeth are represented only by the crowns, but two have long roots. Three distinct tooth morphologies are present.

The first tooth form (Plate 9A-D) is a typical "fabrosaur"-like maxillary/dentary morphology (e.g., Ginsburg, 1964, unnumbered fig.; Thulborn, 1971, fig 3). These teeth are leaf-shaped in lateral view and laterally compressed with a crown expanded above the root. The teeth have a coarsely denticulated margin with the denticles oriented nearly vertical. They are slightly incurved in lateral view. However, they differ from other "fabrosaurs" (e.g., Lesothosaurus) in having no cingula (Galton, 1986). Enamel is equally thick on both sides of the teeth. On the lateral faces of the crown, medial ridges extend to the apices, and grooves extend vertically down from the denticles.

The second tooth form is more elongate (Plate 8E-H), slightly recurved and with a more ovoid cross section. These teeth resemble the posterior premaxillary teeth of Lesothosaurus (Thulborn, 1970, fig. 6B) in lateral view, in outline and in the presence of a furrow just inside the denticulated margin on the exterior face.

The third form of tooth (Plate 9E-H) is the most interesting and is represented by only one specimen. The tooth is not recurved, but instead is inwardly curved and has a symmetrical spoon-like morphology, highly reminiscent of a mammalian incisor tooth. Except for the denticles this tooth is similar to a human incisor (Sobotta and Uhlenhuth, 1957, fig. 128). The tooth could represent an anterior premaxillary tooth of an animal like Lesothosaurus (Thulborn, 1970, fig. 6), but it differs in being asymmetrical in cross section, in not having a strongly inflated crown, and in not having a thin, elongate distal crown. The symmetry of this tooth strongly suggests that it did not lie in the lateral position in the jaw, but at the anterior end. If

this tooth does represent an anterior incisiform, then Revueltosaurus is a sister taxon to Ornithischia, as no ornithischians have anterior teeth (Sereno, 1986; contra Thulborn, 1970).

ACKNOWLEDGMENTS

I would like to thank the many people who have helped me collect in Revuelto Creek, including Dan D'Andrea, Phil Birchoff, Jack Clift, Bill Cotton, Jim Linke, Roger Mongold and Paul Sealey; Spencer Lucas for constant support and inspiration; and my wife Kathleen and children, Charles and Mary, for tolerating my long absences.

REFERENCES

Chatterjee, S., 1984, A new ornithischian dinosaur from the Triassic of North America: Naturwissenschaften, v. 71, p. 630-631.

Galton, P. M., 1986, Herbivorous adaptations of Late Triassic and Early Jurassic dinosaurs; in Padian, K., ed., The beginning of the age of dinosaurs: faunal change across the Triassic/Jurassic boundary: New York, Cambridge University Press, p. 203-221.

Ginsburg, L., 1964 , Decouverte d'un scelidosaurien (dinosaure ornithischien) dans le Trias superieur du Basutuland: Compte Rendus Academie Sciences, v. 258, p. 2366-2368.

Murry, P. A., 1987, Notes on the stratigraphy and paleontology of the Upper Triassic Dockum Group: Journal of the Arizona-Nevada Academy of Science, v. 22, p. 73-84.

Murry, P. A., 1989, Geology and paleontology of the Dockum Formation (Upper Triassic), West Texas and eastern New Mexico; in Lucas, S. G. and Hunt, A. P., eds., Dawn of the age of dinosaurs in the American Southwest: stratigraphy, paleontology and biochronology: Albuquerque, New Mexico Museum of Natural History.

Sereno, P. C., 1986, Phylogeny of the bird-hipped dinosaurs (Order Ornithischia): National Geographic Research, v. 2, p. 234-256.

Sobotta, J. and Uhlenhuth, 1957, Atlas of descriptive human anatomy. Volume 1. Regions-skeleton-ligaments-joints and muscles : New York, Hafner, 321 p.

Thulborn, R. A., 1970, The skull of Fabrosaurus australis, a Triassic ornithischian dinosaur: Palaeontology, v. 13, p. 414-432.

Thulborn, R. A., 1971, Tooth wear and jaw action in the Triassic ornithischian dinosaur Fabrosaurus: Journal of Zoology, v. 164, p. 165-179.

PLATE CAPTIONS

PLATE 8. Paratype premaxillary tooth of Revueltosaurus callenderi (NMMNH P 4959). E, Internal view, x 8. F, External view, x 8. G,

Occlusal view, x 11. H, ?Anterior view, x 7.

PLATE 9. A-D, Paratype dentary/maxillary tooth of Revueltosaurus callenderi (NMMNH P 4958). A, External view, x 10. B, Internal view, x 10. C, Occlusal view, x 13. D, ?Anterior view, x 10. E-H, Holotype incisiform tooth of Revueltosaurus callenderi (NMMNH P 4957). E, Internal view, x 11. F, External view, x 11. G, Lateral view, x 11. H, Occlusal view, x 10.