

REVISION OF *REDONDASUCHUS* (ARCHOSAURIA: AETOSAURIA) FROM THE UPPER TRIASSIC REDONDA FORMATION, NEW MEXICO, WITH DESCRIPTION OF A NEW SPECIES

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Abstract—We describe a new species of aetosaur, *Redondasuchus rineharti*, based on isolated scutes and an incomplete femur from a single locality in the Upper Triassic Redonda Formation of east-central New Mexico. *R. rineharti* is distinguished from *R. reseri*, the only other species of *Redondasuchus*, by its scute morphology, specifically by its large size, presence of a boss at the point of flexure and mediolaterally-oriented row of pits immediately posterior to the anterior bar. Various workers have proposed that *Redondasuchus* should be synonymized with *Typothorax coccinarum*, but we review their arguments and find no justification for this synonymy.

INTRODUCTION

Aetosaurus are a suborder of archosaurs known from Upper Triassic strata of North and South America, Greenland, Europe, India, North Africa and Madagascar (Heckert and Lucas, 2000). Aetosaurus are principally known from armor scutes that form a carapace around their neck, trunk and tail. Associated and articulated specimens are rare, but individual scutes have taxonomic utility, allowing identification to genus or species level (Long and Ballew, 1985; Long and Murry, 1995; Heckert and Lucas, 2000).

The aetosaur genus *Redondasuchus* was named by Hunt and Lucas (1991) based on isolated scutes from two collecting areas, Apache Canyon and Shark Tooth Hill, both in the Upper Triassic Redonda Formation of east-central New Mexico. Recently, new material of a second species of *Redondasuchus* has been recognized from the Redonda Formation. Here, we rediagnose the genus, describe the new species and address issues concerning the taxonomic validity of *Redondasuchus* presented by Long and Murry (1995) and Martz (2002). In this paper, NMMNH = New Mexico Museum of Natural History and Science, Albuquerque, and UCMP = University of California Museum of Paleontology, Berkeley.

SYSTEMATIC PALEONTOLOGY

ARCHOSAURIA

AETOSAURIA

STAGONOLEPIDIDAE

Redondasuchus

Type Species: *Redondasuchus reseri* Hunt and Lucas.

Revised Diagnosis: *Redondasuchus* is differentiated from all other aetosaurus by the strong flexure (approximately 45°) of its dorsal paramedian scutes one-third of the distance from the medial to the lateral edge of the scute, and external ornamentation of the scutes, consisting solely of densely packed pits that lack a radial pattern.

Discussion: The interpretation of the orientation of flexure in the diagnosis of the genus *Redondasuchus* presented here (Fig. 1) differs from that of previous studies (Hunt and Lucas, 1991; Heckert et al., 1996). These studies suggested that, for the mid-dorsal paramedian scutes, the point of flexure was “two-thirds of the lateral distance from the medial to lateral edge of the scute” (Heckert et al., 1996, p. 620). However, we believe that this is incorrect and that the point of flexure instead lies one-third of the lateral distance from the medial to lateral edge of the scute (Fig. 1). This changes the conception of how the scutes are flexed; previous interpretations had the point of flexure between the medial two-thirds of the scute and the lateral third, while our interpretation has the point of flexure between the medial third of the scute and the lateral two-thirds.

The confusion is due to the holotype of *Redondasuchus reseri*, and thus of the genus *Redondasuchus*, being identified as a left dorsal paramedian scute. Although both Hunt and Lucas (1991) and Heckert et al. (1996) acknowledge an anterior bar, this is not congruent with the holotype scute being a left dorsal paramedian. In addition, Heckert et al. (1996) mislabeled their figure 5b as a posterior view, even though it is an anterior view of the holotype scute. This confusion is exacerbated by the scute always being figured, in dorsal view, with its anterior margin oriented toward the bottom of the page; this runs counter to typical protocol, which has the anterior margin facing the top of the page in dorsal view. Thus, we revise the orientation of the holotype scute of *R. reseri* and interpret it as a right dorsal paramedian, which makes the point of flexure one-third of the lateral distance along the scute. Although this is a change in the way *Redondasuchus* scutes are interpreted, it does little to fundamentally change the reconstruction of *Redondasuchus* as illustrated by Heckert et al. (1996, fig. 5). In the cross-sections of Heckert et al. (1996, fig. 5), it is clear that all of the dorsal and caudal paramedians are flexed one-third of the way from their medial margin, except for the holotype (Heckert et al., 1996, fig. 5c). This reevaluation of the holotype actually makes the scute flexure more consistent throughout the carapace (Fig. 1).

Redondasuchus reseri Hunt and Lucas, 1991

Figure 1

- 1985 *Typothorax* sp.: Lucas et al., p. 199, fig. 3f-g.
 1991 *Redondasuchus reseri*: Hunt and Lucas, p. 728, figs. 2-3.
 1996 *Redondasuchus reseri*: Heckert et al., p. 619, figs. 3-6.
 2000 *Redondasuchus reseri*: Heckert and Lucas, p. 1558, fig. 5d-e.

Revised Diagnosis: A species of *Redondasuchus* that is distinguished from *R. rineharti* by the small size (width <10 cm) of its dorsal paramedians, with possession of a ventral keel that extends laterally from the point of flexure and a lack of any raised bosses on the dorsal scute surface.

Redondasuchus rineharti, sp. nov.

Figures 2-4

Holotype: NMMNH P-43312, an incomplete right dorsal paramedian scute (Fig. 2).

Type Locality and Horizon: Redonda Formation (Chinle Group) at NMMNH locality 2671 in Apache Canyon, Quay County, New Mexico.

Paratypes: All paratypes are also from NMMNH locality 2671: NMMNH P-25770, an incomplete left paramedian scute (Fig. 3A-C); NMMNH P-43311, an incomplete left paramedian (Fig. 3D-F); NMMNH P-50745, a proximal right femur (Fig. 4).