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## FIRST USE OF ORNITHISCHIAN DINOSAURS FOR BIOSTRATIGRAPHIC ZONATION OF THE UPPER TRIASSIC

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The recently recognized ornithischian dinosaurs *Tecovasaurus murreyi* and *Revueltosaurus callenderi* occur stratigraphically superposed at several localities in the Chinle Group in Texas, New Mexico, and Arizona, U.S.A. *Tecovasaurus* occurs at the type locality in the Tecovas Formation in Crosby County, Texas, at the *Placencias* quarry in the Bluewater Creek Formation of eastern Arizona, and from low in the Bluewater Creek Formation near Fort Wingate, New Mexico. These localities are in strata that produce a vertebrate fossil assemblage typical of the Adamanian (latest Carnian) land vertebrate faunachron (M). *Revueltosaurus* is known from its type locality in the Bull Canyon Formation of eastern New Mexico and from the Painted Desert Member of the Petrified Forest Formation in the Petrified Forest National Park in eastern Arizona. These strata have been assigned to the Revueltian M of early-mid Norian age on the basis of tetrapod fossils, including phytosaurs and aetosaurs. Because the biostratigraphic zonation of *Tecovasaurus* and *Revueltosaurus* independently support other biostratigraphic correlations, particularly those of tetrapods, we suggest that the dinosaur *Tecovasaurus* is an additional index taxon of the Adamanian M, which is generally characterized by the aetosaur *Stagonolepis* and the phytosaur *Rutiodon*. Similarly, *Revueltosaurus* is an index taxon of the Revueltian M, in addition to the aetosaur *Typothorax* and the phytosaur *Pseudopalatus*. To date, *Tecovasaurus* and *Revueltosaurus* are the only Triassic ornithischians identified from multiple localities. This is the first use of dinosaur genera as biostratigraphic indicators in the Upper Triassic and should be useful in future studies of microvertebrates in the Chinle Group.

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### Introduction

In spite of many recent discoveries of new Triassic dinosaurs, particularly in the Western Hemisphere (e.g., Hunt, 1989; Sereno et al., 1993) and continued work on older, better-known forms (Colbert, 1989; Hunt and Lucas, 1991; Sereno and Novas, 1992; Novas, 1993; Sereno, 1993; Sereno and Novas, 1993), dinosaurs remain poor biostratigraphic indicators of Upper Triassic strata. This is largely due to the endemism of most Triassic dinosaur taxa, which are often limited to a single locality. Consequently, tetrapod-based correlations of Upper Triassic sediments have remained tied to phytosaurs, aetosaurs, and metoposaurs (e.g., Gregory, 1957; Colbert, 1972; Lucas and Hunt, 1993; Lucas, 1997). Although many recent advances in the temporal and spatial distribution of these large tetrapod taxa have greatly improved these correlations (Lucas and Huber, 1998), two facts are readily apparent. First, dinosaurs are conspicuously absent from the present correlation schemes, and second, the bulk of the taxa used for correlation, such as phytosaurs and aetosaurs, are all relatively large (often >2 m). Here, we document the first use of Triassic microvertebrate fossils to correlate two superposed zones in nonmarine Upper Triassic strata. Interestingly, the fossils themselves are teeth of the ornithischian dinosaurs *Tecovasaurus murreyi* (of latest Carnian age) and *Revueltosaurus callenderi* (of early-mid Norian age). Here, MNA refers to the Museum of Northern Arizona, Flagstaff, Arizona, and NMMNH refers to the New Mexico Museum of Natural History, Albuquerque, New Mexico.