

Wednesday 4:00

REFINED AGE OF THE LATE NEOGENE TERROR BIRD (*TITANIS*) FROM FLORIDA AND TEXAS USING RARE EARTH ELEMENTS

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The giant flightless bird *Titanis walleri* (†Phorusrhacidae) is known from three localities in Florida and one in Texas. At two FL sites (Port Charlotte and Inglis) the age of *Titanis* is constrained by associated late Blancan mammals. The age of *Titanis* at the other two sites, however, is problematical because this taxon co-occurs with temporally mixed faunas. Thus, prior to the current study, *T. walleri* from the Santa Fe River, FL (type locality) was either as old as late Blancan (~2.4 to 2.0 Ma) or as young as latest Rancholabrean (RLB, ~15 ka). Likewise, *Titanis* from a gravel pit along the Nueces River, TX was either as old as late Hemphillian (~5 Ma) or as young as latest RLB (~15 ka). This study uses Rare Earth Elements (“REEs”) to refine the age of *Titanis* from the two problematic sites.

REEs occur in low abundances in living vertebrate skeletons, but are rapidly taken up during early diagenesis. Thereafter, REEs in fossil bones and teeth are characteristically “locked in” As such, REEs preserve a distinctive signature of local geochemistry and environmental conditions for a short period of geological time. The REEs of *Titanis* [N = 6] from the Santa Fe River, FL were compared to two biochronologically unambiguous groups (Blancan [N = 17] versus RLB [N = 12]) of fossil mammals from the same locality. Similarly, the REEs of *Titanis* (N = 1, only specimen known) from the Nueces River, TX were compared to two groups (Hemphillian [N = 9] versus RLB [N = 10]) of fossil mammals from the same locality. The REE signatures of *Titanis* from FL are indistinguishable from those of the Blancan mammals of FL. Likewise, the REE signature of *Titanis* from TX is indistinguishable from those of the Hemphillian mammals from TX.

Given these REE constraints, the refined age of *Titanis* is late Hemphillian in Texas (~5 Ma) and late Blancan (~2.4 to 2.0 Ma) in Florida. No evidence currently exists for latest RLB *Titanis* in North America. As such, *Titanis* was an early immigrant during the Great American Interchange. Analyses of REEs preserved in vertebrate fossils have the potential to elucidate a broad range of aged-related questions in Deep Time.

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