

THE ABANICO FORMATION OF THE CHILEAN ANDES: AN EXCEPTIONAL EOCENE-MIOCENE RECORD OF SOUTH AMERICAN MAMMAL EVOLUTION

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Since our initial discovery of fossil mammals in volcanoclastic sediments of east central Chile, we have recovered more than 1,000 specimens from at least 12 new assemblages, spanning the Eocene to mid-Miocene and ~ 4° of latitude, in the Andean Main Range. Fossils are so ubiquitous in this unit (the Abanico Fm.) that it now represents a premiere archive of mammal evolution in South America. The unusual depositional setting of these faunas accounts for their remarkably high proportion of well-preserved specimens, and permits the first precise radioisotopic dates for many Land Mammal "Ages".

The earliest Oligocene (to late Eocene?) Tinguiririca and ?middle Eocene Tapado faunas along the upper Río Tinguiririca were our first two finds in the region. At least three late Oligocene (to early Miocene) assemblages (Boca Toma, Los Sapos, Estero San Francisco) in the upper Río Maipo drainage ~100 km N of Tinguiririca represent our northernmost localities within the formation. Slightly further south (~60 km N of Tinguiririca) at least three new earliest Oligocene to earliest Miocene faunal assemblages were discovered along the upper Cachapoal and Las Leñas rivers. The latter is noteworthy for producing the earliest well-preserved New World anthropoid primate skull. Sparse Eocene? fossils have been recovered along the Río Azufre, just N of the Tinguiririca valley. To the south, important assemblages have been discovered at Laguna de Teno, Río Vergara, and Río Upeo (all ~15-25 km S of Tinguiririca; late Oligocene to early Miocene) and, in strata correlative to the Abanico Formation, new fossiliferous mid-late Miocene sites at Laguna del Laja (~300 km S of Tinguiririca).

The ~ 31.5 Ma Tinguiririca Fauna is remarkable for: a) the completeness of its >400 specimens; b) its diversity (>25 taxa, most new); c) representing a new South American Land Mammal "Age"; d) containing the oldest known caviomorph rodents; e) providing evidence (hypsodonty, cenogram, macroniche) of the earliest open grassland habitats known globally; and f) clarifying events near the Eocene/Oligocene boundary and its associated climatic, paleoenvironmental and biotic changes.