

## MEXICO'S FOSSIL VERTEBRATE RECORD: AN ANALYTICAL OVERVIEW

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The published information on this record is scattered in more than 500 papers, registers over 125 years of research, and in spite of its significance to better understand the geologic and faunistic evolution of the country, a modern comprehensive work on it is not available. The present contribution is an effort to fill this gap.

The record consists of about 625 species, that roughly correspond to 500 genera, 200 families and 80 orders; only the Class Agnatha is not represented; it spans from the Permian to the Pleistocene and shows a very uneven taxonomic, geochronologic and environmental distribution, as shown below.

Mammals include 48% of the species, birds, 16%, osteichthyes and reptiles, 11.8% each, chondrichthyes, 10.8% and amphibians, 1.6%. This structure strongly contrasts with that of the extant fauna, one of the most diverse in the world (3276 sp), made up by 12.2% mammals, 31.3% birds, 24.4% osteichthyes, 20.5% reptiles, 3.4% chondrichthyes, 8.2% amphibians and 0.06% agnathans. Within each class, the structure is quite different between the fossil and the recent records, disclosing a significant overrepresentation of the large mammals in the former.

Time-wise, the Cenozoic vertebrates make 83%, the Mesozoic ones 16%, and the Paleozoic (Permian) ones form only 0.2% of the record. Within each era notorious inequalities occur: About 7.5/10 of the Cenozoic vertebrates belong to the Pleistocene, 2/10 to the Pliocene-Miocene, and 0.5/10 to the Oligocene-Eocene; for the Mesozoic, 9/10 are Cretaceous and 1/10, Jurassic. Likewise, the localities are unevenly distributed, most occur in the Central Plateau and the chief sedimentary basins of the Transmexican Volcanic Belt.

Even a cursory comparison of the localities-geologic setting and the make up of the Mexican Territory, exposes that the features of the fossil vertebrate record show marked biases in favor of some geologic features. Sedimentary rock bodies crop out in 50% to 55% of the territory (1.0 to 1.1 mill. sq km); 1/10 of this area corresponds to the Paleozoic bodies, 4/10 to the Mesozoic (mainly marine), and 5/10 to the Cenozoic (largely continental). The localities do not correlate with this geologic make up, since the ones positioned on continental Cenozoic rock bodies constitute 80% of the whole locality set (not 50% as expected) and contribute with over 80% of the fossil species (not 50% as expected); by contrast, the Mesozoic and Paleozoic localities and fossils are vastly underrepresented. The marine localities and fossils are also quite underrepresented. The contribution to the fossil record made by the continental vertebrates from different communities and environments is very uneven too, favoring that of species which lived in environments more likely to be preserved in the sedimentary record, such as those living in and around rivers and lakes.

The discussed biases of Mexico's vertebrate fossil record, reflect not the geologic make up of the territory, but the limited and biased sampling that resulted from the peculiar development of vertebrate paleontology research in this country. In turn, this poses an unavoidable challenge to the interested paleontologic community to augment the known record by several orders of magnitude, which then would transform it in a more efficient tool to unravel the complex geologic and faunistic history of Mexico.