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SPECIALTY SECTION
This article was submitted to
Paleoecology,
a section of the journal
Frontiers in Ecology and Evolution

RECEIVED 08 February 2023
ACCEPTED 20 February 2023
PUBLISHED 01 March 2023

CITATION
Araújo-Júnior Hld, Dantas MAT, Porpino KdO,
Santos ACd and Barbosa FHdS (2023) Editorial:
Formation and taphonomy of Quaternary fossil
accumulations: Advances and new
perspectives. *Front. Ecol. Evol.* 11:1161889.
doi: 10.3389/fevo.2023.1161889

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Editorial: Formation and taphonomy of Quaternary fossil accumulations: Advances and new perspectives

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KEYWORDS

Ichnology, Isotopic Paleoecology, geochronology, biostratigraphy, fossil-diagenesis

Editorial on the Research Topic

Formation and taphonomy of Quaternary fossil accumulations: Advances and new perspectives

Quaternary fossil accumulations furnish pivotal clues in assessing timely scientific questions, such as climate change, human migrations and colonization, species extinction and life and death scenarios for vertebrates, invertebrates, and plants. Furthermore, these fossil assemblages can provide useful information for decision-making in the conservation of extant species. Researchers worldwide had explored Quaternary accumulations in their most diverse aspects, generating advances in the areas of Taphonomy, Isotopic Paleoecology, Ichnology, Speleology, and Conservation Paleobiology. The articles in this Research Topic testify to the advances that have emerged from the exploration of fossil accumulations around the world, including transdisciplinary investigations involving Quaternary Paleontology.

In the first contribution entitled “*The Technological Advance and Application of Coprolite Analysis*,” by [Yang et al.](#), the role of coprolites—“fossilized feces of animals”—in several areas of geosciences is highlighted. The authors provide an in-depth exploration of the application of these trace fossils to: (i) describe taphonomic features and sedimentological properties; (ii) disclose the dietary, sanitary culture, and husbandry development; (iii) trace the evolutionary history of producers; and (iv) infer the palaeoenvironment. In addition, technological advances in the research of coprolites are shown in terms of their morphological study, isotopic and biomarker analyses, paleomicrobiology, paleoparasitology, and ancient DNA.

“*Mammal Taphonomy in a Cave Deposit From Quaternary of Brazil*”—the article by [Trifilio et al.](#)—is focused on vertebrate taphonomy in cave environments. Caves are archetypal Quaternary deposits, and preserve some of the most abundant fossiliferous concentrations of terrestrial vertebrates for this period. Therefore, understanding how

biostratigraphic and fossil-diagenetic processes affected the formation and preservation of these fossil assemblages is crucial for Quaternary Paleontology. In this paper, Trifilio et al., based on macroscopic and microscopic features of vertebrate remains from a cave deposit in northeastern Brazil, conclude that the taphonomic history was governed by alternating dry and wet cycles, culminating in the formation of four distinct taphonomic modes.

The paper by Assumpção et al. is entitled “*The Tricky Task of Fisher-Gardener Research in Conservation Paleobiology*.” “Sambaquis”—ancient shell mounds—are widely distributed along the Brazilian coast and were built by indigenous groups of fishermen-gardeners between 10,000 and 1,000 years ago, formed mostly by accumulations of mollusk shells. The authors’ results help with understanding the practices of fishermen-gardeners during the prehistory of southern Brazil. In addition to the preference for collecting larger individuals, the occurrence of distinct collection strategies in different seasons of the year is another finding of this paper.

“*Human Occupation of the North American Colorado Plateau ~37,000 Years Ago*” is authored by Rowe et al. and provides an important contribution to understand the dispersal of human populations across Earth’s surface. Its main results are related to rates and timing of anthropogenic impacts in the late Quaternary. Hartley mammoth locality—a relevant paleontological site in the United States of America—was reassessed by applying modern techniques and was reinterpreted as a cultural site, because two mammoths were butchered using expedient lithic and bone technology. Besides, the authors present diagnostic evidence of controlled (domestic) fire. It is noteworthy that this locality was dated to 38,900–36,250 cal BP by AMS ^{14}C analysis of hydroxyproline from bone collagen, raising the possibility of a

dispersal into the Americas by people of East Asian ancestry that preceded the Native American groups by millennia.

These four papers could pave the way for new research to be developed in the future. Above all, they are key studies for the consolidation of several research areas in the realm of Taphonomy, Archaeology, Paleoecology, and Conservation Biology.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

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