



Introduction to the special issue on “Brazilian fossiliferous sites with paleobiological importance”

Invited Editors

Rodrigo Scalise Horodyski^{1,2,3} , Hermínio Ismael de Araújo Júnior^{4,*} 

¹Programa de Pós-Graduação em Geologia, Universidade do Vale do Rio dos Sinos, Av. Unisinos, 950, Bairro Cristo Rei, CEP: 93.022-750, São Leopoldo/RS, Brazil.

²Museu de História Geológica do Rio Grande do Sul, Universidade do Vale do Rio dos Sinos, Av. Unisinos, 950, Bairro Cristo Rei, São Leopoldo-RS, Brazil, CEP: 93.022-750.

³Programa de Pós-Graduação em Geociências, Universidade Federal do Rio Grande do Sul, Prédio 43113/203 – Campus Vale Av. Bento Gonçalves, 9500, Porto Alegre-RS, Brazil, CEP: 91540-000.

⁴Departamento de Estratigrafia e Paleontologia, Faculdade de Geologia, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil.

Abstract

To enhance our understanding of Brazilian paleontological heritage, we have launched the special edition titled “Brazilian Fossiliferous Sites with Paleobiological Importance”. Seven manuscripts have been accepted and published in Vol. 7 SI2 (2024). Recognizing our fossil heritage is essential for the scientific and cultural advancement of Brazil. We strongly encourage paleontologists to continuously publish papers on our rich fossiliferous deposits.

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*Corresponding authors
Rodrigo Scalise Horodyski
E-mail address: horodyski@unisinos.br
Hermínio Ismael de Araújo Júnior
E-mail address: herminio.ismael@yahoo.com.br

1. Introduction

The Brazilian paleontological heritage is a vital component of the scientific and cultural identity of our country. Its preservation and study is not only essential for the advancement of science but also for the development of a culture that values natural history and promotes a harmonious coexistence between humans, their history and the environment.

The scientific importance of this heritage lies in its ability to provide data on deep time, the evolution of life, climate and environmental changes, and the processes that have shaped Brazilian extant ecosystems. Through paleontological research, we can better understand how species have adapted or become extinct in response to climate changes, which is crucial for addressing the

environmental challenges posed by the current climatic crisis and planetary emergence.

The Brazilian basins preserve a wealth of fossil specimens with significant value for science and culture in Brazil. Highlighting them is the first step for decision-making on protection, valorization and utilization. This special volume comes to fill a gap regarding the identification of paleontological sites with paleobiological significance in Brazil, emphasizing their contribution for promoting the paleontological record as a source of scientific and cultural improvement in our country.

2. Content of the Special Issue

For this special volume, seven high-quality contributions were accepted for publication. These articles focused on

paleontological sites dated from different periods of the Phanerozoic and from different regions of the country (Fig. 1).

Carvalho et al. (2024) present notable advancements in understanding the palaeobiodiversity of the Iapó and Vila Maria formations (Rio Ivaí Group) by the Três Barras Farm section with Ordovician-Silurian age. The fossil record is composed of mollusks, brachiopods, ostracods, acritarchs and cryptospores.

Epifânio et al. (2024) highlight the Triassic Passos das Tropas outcrop complex, with exceptional preservation fossil plants of *Dicroidium* Flora, in addition to important evidence of insect-plant interactions. The authors emphasize the significance of preserving and protecting fossil sites, the valorization of the geoh heritage of Santa Maria and the global importance of contributing additional data to understand the biota of the Gondwanan Triassic.

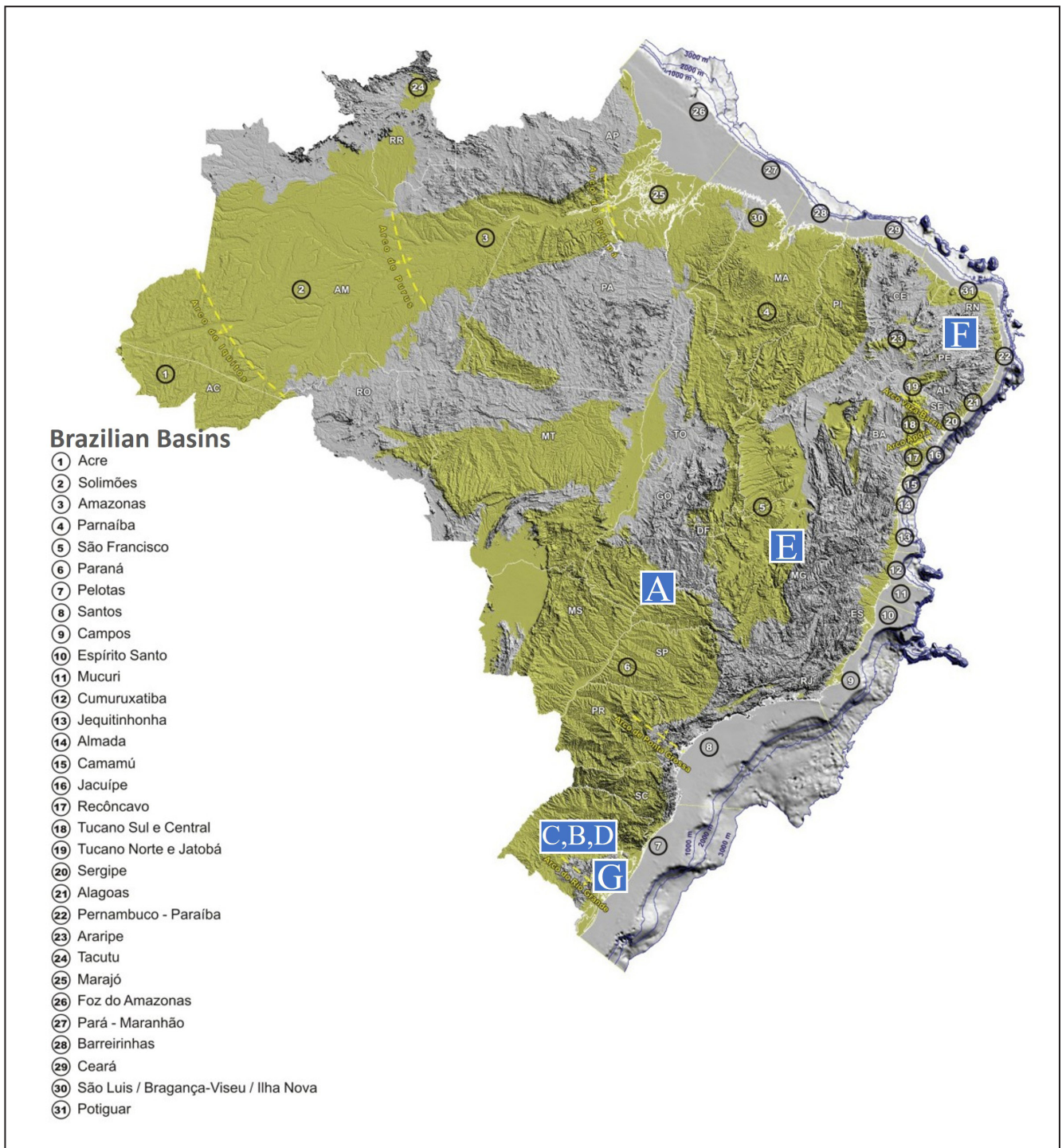


Figure 1. Map of Brazilian sedimentary basins with occurrences of fossiliferous sites (blue squares) with paleobiological importance from the papers published in this special volume (adapted from Milani et al. 2007). (A) Três Barras Farm section (Carvalho et al. 2024); (B) Passo das Tropas site (Epifânio et al. 2024); (C) Bica São Tomé fossil site (Pinheiro and Da-Rosa 2024); (D) Linha São Luiz Geosite (Pretto et al. 2024); (E) Pripiri Geosite (Sanchez et al. 2024); (F) Oligocene-Miocene Boa Vista Basin outcrop in Paraíba State (Silva et al. 2024); (G) Quaternary sites of the southern coast of Rio Grande do Sul state (Lopes et al. 2024).

The Lower Triassic Bica São Tomé site, presented by Pinheiro and Da-Rosa (2024), has become a key-outcrop for understanding the Triassic recovery after the Late Permian Mass Extinction. Notably, recent explorations at the outcrop have yielded more than two hundred specimens, including holotypes and representative samples of significant Early Triassic taxa.

The Mesozoic Linha São Luiz Geosite is one of the richest fossil assemblages known in southern Brazil, whose fossil-bearing strata is composed of micro to macrovertebrates (dinosaurs, pterosauroforms, cynodonts and lepidosauroforms), invertebrates (insects, clam shrimp), plants (primitive conifers and paleosols), and trace fossils. Pretto et al. (2024) discuss the geoconservation strategies being implemented at the site to protect this crucial glimpse into the Brazilian Mesozoic.

Sanchez et al. (2024) analyzed the Quiricó Formation in the Sanfranciscana Basin, revealing a rich paleoasis with diverse vertebrates, microfossils, and paleobotanical content. Recent findings from the Pripiri Geosite in Minas Gerais include potential archosaur fragments and novel microfossil taxa, shedding light on ecological resilience under extreme climatic conditions. The study emphasizes Pripiri's national importance for geodiversity and geoheritage, supporting initiatives for geoconservation and socio-economic development in Coração de Jesus.

Silva et al. (2024) investigate the plant fossil record of the Boa Vista Basin in Paraíba State, Brazil, revealing a volcanic-sedimentary sequence from the Oligocene-Miocene boundary. The Campos Novos Formation contains diverse fossil material, including 200 specimens of leaves and silicified wood, primarily from tropical to subtropical plant families. This assemblage highlights ecological affinities with both humid and dry environments, providing insights into the region's paleoclimate and supporting geological age data.

Finally, Lopes et al. (2024) examine geoheritage records related to Quaternary sea level and environmental changes along the southern coast of Rio Grande do Sul State, Brazil. The region hosts significant fossil records from marine and terrestrial faunas, found in deposits ranging from the continental shelf to coastal lagoons. While most sites remain unthreatened, conservation efforts, including surveys and educational initiatives, aim to enhance public awareness and protect these valuable fossil locations.

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Authorship credits

Author	A	B	C	D	E	F
RSH						
HIAJ						

A - Study design/ Conceptualization B - Investigation/ Data acquisition
 C - Data Interpretation/ Validation D - Writing
 E - Review/Editing F - Supervision/Project administration

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