



# GeoMinE 2025

- XIII SIMPÓSIO SUL-BRASILEIRO DE GEOLOGIA
- IX SIMPÓSIO DE VULCANISMO E AMBIENTES ASSOCIADOS
- I CONFERÊNCIA DE GEOLOGIA E MINERAÇÃO DO MERCOSUL
- II WORKSHOP ARMAZENAMENTO DE CO<sub>2</sub> POR MINERALIZAÇÃO EM BASALTOS
- I EXPOGEOFINE

**2 a 6 de Junho de 2025**

CENTRO DE EVENTOS MABU THERMAS · FOZ DO IGUAÇU/PR



# ANAIIS

2025



Núcleo  
Paraná



Núcleo  
Rio Grande do Sul -  
Santa Catarina

***Dados Internacionais de Catalogação na Publicação (CIP)  
(Câmara Brasileira do Livro, SP, Brasil)***

Simpósio Sul-Brasileiro de Geologia. Simpósio de  
Vulcanismo e Ambientes Associados. Conferência  
de Geologia e Mineração do Mercosul. Workshop  
Armazenamento de Co<sub>2</sub> Mineralização em Basaltos  
(13. : 9. : 1. : 2. : 2025 : Foz do Iguaçu, PR)  
Anais GeoMinE 2025 [livro eletrônico]. --  
1. ed. -- Foz do Iguaçu, PR : Sociedade Brasileira  
de Geologia - SBG, 2025.

PDF

Vários autores.

Vários colaboradores.

bibliografia.

ISBN 978-85-99198-37-7

1. Geologia 2. Minas e mineração 3. Mineração

I. Título.

25-283606

CDD-551

***Índices para catálogo sistemático:***

1. Geologia 551

Aline Grazielle Benitez - Bibliotecária - CRB-1/3129





## **Challenges in geochronological validation of geodynamic mechanisms for silica-undersaturated Cretaceous magmatism in central-southern Brazil: the "Silver Bullet" myth**

Azzone, R.G.<sup>1</sup>; Chmyz, L.<sup>1</sup>; Cetina, L.M.T.<sup>1</sup>; Lima, N.M.<sup>1</sup>; Lino, L.M.<sup>1</sup>

<sup>1</sup> Instituto de Geociências / Universidade de São Paulo, São Paulo, Brasil, email: rgazzone@usp.br

Over the past two and a half decades, discussions on the tectonomagmatic mechanisms responsible for silica-undersaturated Cretaceous magmatism in Central-Southern Brazil have been consistently constrained by the assumption that more precise age determinations were required. In response, a robust and expanding geochronological database has been established, particularly for occurrences in the Alto Paranaíba, Serra do Mar, Cabo Frio Magmatic Lineament, and Ponta Grossa Arch provinces.

Despite these advancements, high-precision geochronological data have been used merely employed in an attempt to validate one of two competing models: one attributing magma generation to mantle plumes (Trindade and Tristan) and the other linking it to stress-field changes and the reactivation of regional structures associated with sedimentary basin development. Rather than fostering new alternatives, these data have primarily been employed to reinforce the existing dichotomy. While these new age constraints provide valuable insights, they do not yield a straightforward resolution; instead, they reveal additional complexities. The challenges are not necessarily related to the precision or accuracy of different analytical methods and isotopic systems but rather to the inherent heterogeneities and limitations of the analyzed geological materials. Consequently, the limitations of geochronological data reinforce that no "silver bullet" solution exists. Here, we critically reassess these issues by comparing age distributions at both the province and individual intrusion scales. Rather than focusing on a linear age progression of magmatic activity, we could discuss in terms of episodic magmatic pulses, each occurring within its own context. Alternative approaches must be explored to develop a more comprehensive geodynamic framework— or multiple working hypotheses — for silica-undersaturated Cretaceous magmatism in the onshore portion of the Brazilian Platform. The discussion of models should not be framed as a strict dichotomy

**Keywords:** geochronological reevaluation; Cretaceous SiO<sub>2</sub>-undersaturated magmatism; plume models; reactivation ancient structures.

*Financial Support:* thematic project FAPESP (Proc. 2019/22084-8); research projects FAPESP (2023/11675-0) and CNPq (404020/2021-6), and research productivity grant CNPq (310055/2021-0).