



48ª
Reunião Anual da
Sociedade
Brasileira de
Química

Emergências Climáticas?
A Química Age e Reage!

ANAIS

08 a 11 de junho de 2025, Campinas, Expo Dom Pedro

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

Reunião Anual da SBQ (48. : 2025 : Campinas, SP)
Anais da 48ª Reunião Anual da SBQ [livro
eletrônico] / Sociedade Brasileira de Química. --
1. ed. -- Campinas, SP : Aptor Software, 2025.
PDF

Vários autores.
Vários colaboradores.
Bibliografia.
ISBN 978-85-63273-70-3

1. Química I. Sociedade Brasileira de Química.
II. Título.

25-282696

CDD-540

Índices para catálogo sistemático:

1. Química 540

Eliete Marques da Silva - Bibliotecária - CRB-8/9380

Exploring the Biotechnological Potential and Chemical Environment of a *Komarekiella* isolated from Atlantic Forest

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Key words: *Cyanobacteria; Metabolomics; Natural product chemistry; Secondary metabolites; Bioactive compounds; Dereplication.*

Highlights

Komarekiella is an underexplored cyanobacterium. This study revealed its bioactivity and unique chlorophyll derivatives, showing potential against various organisms and highlighting its drug discovery relevance.

Resumo/Abstract

Natural products have significant therapeutic potential and are crucial for drug development and human health. A promising strategy for discovering new bioactive compounds involves exploring understudied organisms, such as the cyanobacteria. The genus *Komarekiella* is a cyanobacterial genus, which thrives in tropical and subtropical regions. This study identified a strain of *Komarekiella* isolated from the Atlantic Forest (SisGen number A531C68) through a polyphasic approach. The strain was cultured, extracted, and analyzed using mass spectrometry and molecular networking to prioritize samples and enable preliminary analysis. The strain exhibited inhibitory effects against specific pathogens and cytotoxicity towards a cancer cell line. Preliminary metabolomic analysis revealed unique features with unusual chlorophyll derivatives, indicating potential novel molecules. The DAF discovery tool aided to localize the bioactive compounds, which are in identification process. This research has improved our understanding of *Komarekiella* genus and the Nostocaceae family, aiming to identify new bioactive compounds that could serve as frameworks for drug design. Furthermore, reinforces the effectiveness of our strategy and the potential of Brazilian cyanobacteria as source of chemical novelty.

Agradecimentos/Acknowledgments

Pró Reitoria de Inclusão e Pertencimento da Universidade de São Paulo (PRIP/USP) and Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP).