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Editorial: Celebration of the natural products division of the Brazilian chemical society

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Editorial on the Research Topic
Celebration of the natural products division of the Brazilian chemical society

Introduction

Natural Products Chemistry is a part of the research lines of the Brazilian Chemical Society (SBQ), an institution created in 1977 by chemists, namely, Simão Mathias, Jacques Danon, and Ricardo Ferreira. Nowadays, SBQ has 13 research areas of chemistry, and its main goal is to develop and consolidate the Brazilian chemistry community. After the establishment of the SBQ scientific divisions in 1994, the Natural Products Division quickly emerged as a remarkable community, representing the largest division for many years. National meetings and regional conferences are annually organized during which new scientific results, ideas, opinions, and perspectives are shared. It is also an opportunity for the participants to build new national and international collaborations.

The meaningful performance of Natural Products research all over the country inspired this special edition "*Celebration of the Natural Products Division of the Brazilian Chemical Society*." Two research articles and two reviews that reported physical, biological, and chemical natural product properties were published, representing research groups from the North, Midwest, and Southeast of Brazil. Among the published works, the representation of women researchers as authors is also notable, comprising 61% of the authors in this edition. This scenario reflects the growing presence of women in Natural Products research groups in the country. According to data publicized by the CNPq foundation (National Council for Scientific and Technological Development), for example, 143 Brazilian women researchers whose primary research area is related to Natural Products Chemistry can be mapped. This data depicts female leadership in the field, emphasizing the essential participation and contribution of women to Brazilian Natural Products Chemistry.

The first original article whose studies were performed by Santos et al., focuses on the search from the leaf aqueous extract of *Strychnos peckii* of new compounds by using high-performance liquid chromatography coupled with mass spectrometry (HPLC-MS) analysis. HPLC-MS analyses led to the characterization of eleven compounds which were further purified by successive chromatographic techniques. Their chemical structures were established as harman-3-carboxylic acid (5) and *N*,*β*-glucopyranosyl vincosamide (6), and the flavonoids

quercetin 3-*O*-rhamnopyranoside (9) and kaempferol 3-*O*-rhamnopyranoside (10) by using NMR data. These secondary metabolites were obtained together with strictosidine (3), 5-carboxystrictosidine (7), and desoxycordifoline (8). Compounds (5), (6), (9), and (10) are reported for the first time in the Loganiaceae family. According to the results, the untargeted HPLC-MS analysis and dereplication of *S. peckii* chemical components proved to be a simple and effective strategy to guide the isolation of substances not yet identified in the Loganiaceae family.

The second original article by Simão et al. reported on the potential of ethanolic extracts of leaves and flowers from *Banisteriopsis laevifolia*, a native Brazilian plant, and their antifungal activity against the rice blast fungus *Magnaporthe oryzae*. During biological assays, the mycelium growth reduction, conidial germination, and appressorium formation of *M. oryzae* were evaluated. In addition, these ethanolic extracts were tested *in vivo* for the suppression of leaf blasts. The chemical profiles of ethanolic extracts of leaves and flowers were established by high-performance liquid chromatography coupled with high-resolution mass spectrometry (HPLC-HRMS). Both leaf and flower extracts reduced mycelial growth by 21.72% and 30.49%, respectively, by inhibiting ergosterol production. Additionally, both extracts inhibited melanin production in the mycelium of *M. oryzae* by attenuating tyrosine production. Leaf and flower extracts showed significant inhibition of the conidia germination and appressorium formation. Furthermore, rice leaves treated with the extracts suppressed 18.17% and 18.97% leaf blast severity, at concentrations of 1.00 mg/mL and 0. 75 mg/mL for flower and leaf extract, respectively. The dereplication technique revealed the presence in extracts of phenolic compounds, including 2,3,7,8-tetrahydroxy-chromeno-(5,4,3)-chromene-5,10-dione, 3-(4-hydroxyphenyl)prop-2-enoic acid, 2-(3,4-dihydroxyphenyl)-3,4-dihydro-2*H*-chromen-3,5,7-triol, 3,4′,5,7-tetrahydroxyflavone, 3′,4′,5,7-tetrahydroxyflavone, 4′,5,7-trihydroxyflavanone, 3,3′,4′,5,7-pentahydroxyflavone, 3,3′,4′,5,7-pentahydroxyflavone-3-*O*-glucoside, and 3,3′,4′,5,7-pentahydroxyflavone-3-*O*-rutinoside. Part of these secondary metabolites are well-documented for their antifungal activity and are likely responsible for the obtained activity of the extracts. Based on the aforementioned data, medicinal plant extracts could be a sustainable alternative for crop protection. The results also showed that *B. laevifolia* has a strong potential to manage rice blasts.

The third document, a review article from Batista et al., covers the challenge faced by chemists in Brazil to completely assign the absolute configuration of stereogenic carbons in the structure of marine natural products (MNP). After consulting 250 reports on MNP containing chiral carbons, it turned out that 70% of these articles showed no data on the absolute configuration. Those with full structural assignments belong to sesquiterpenoids, diterpenoids, triterpenoids, alkaloids, polyketides, macrolides, and peptides. Techniques such as X-ray crystallography, electronic circular dichroism (ECD), vibrational circular dichroism (VCD), and comparison of the optical rotation. Moreover, the authors also found that chiroptical methods associated with quantum chemical calculations and vibrational methods are reliable tools for the determination of the absolute configuration.

The last report, a review article by Mannochio-Russo et al., described the 25th year of the contribution of the Nucleus of Bioassays, Biosynthesis, and Ecophysiology of Natural Products known as NuBBE, in natural product chemistry. Over 25 years, their main goals fell within the scope of medicinal plant studies, investigations of endophytic fungi and marine organisms, biosynthetic studies, medicinal chemistry, and the development of innovative methodologies. Their contributions led to over a thousand identified natural products bearing numerous skeletal hydrocarbons. These substances belong to diterpenoids, cyclopeptides, macrolides, triterpenoids, benzofurans, alkamides, lignans, and chromenes with weak to significant biological activities. Endophytic fungi-derived natural products were phenolics, diketopiperazines, isocoumarins, depsicyclopeptides, sesquiterpenic triquinane, alkaloids, and polyketides. Part of the achievement was the biotransformation of labdane diterpenes into oxidized derivatives. The substantiality of their production led to the development of a database and software known as Label Using Machine In Organic Samples (LUMIOS) to assist LCMS dereplication through molecular analysis and harnessing molecular information.

Conclusion

Over the years of its existence, the Natural Products Division of SBQ has developed a central role in organizing the actions of the community of scientists in the area of natural products in Brazil. Its continuity and strengthening are fundamental for the evolution and strengthening of this area of research. This editorial celebrates the 30th anniversary of the Natural Products Division, as well as the launch of the journal Frontiers in Natural Products, a new and important vehicle for disseminating research in the area.

Author contributions

LS: Writing–review and editing, Writing–original draft, Validation, Supervision, Conceptualization. LdM: Writing–review and editing, Writing–original draft, Data curation, Conceptualization. HK: Writing–review and editing, Writing–original draft, Data curation, Conceptualization. VS: Writing–review and editing, Writing–original draft, Data curation, Conceptualization.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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