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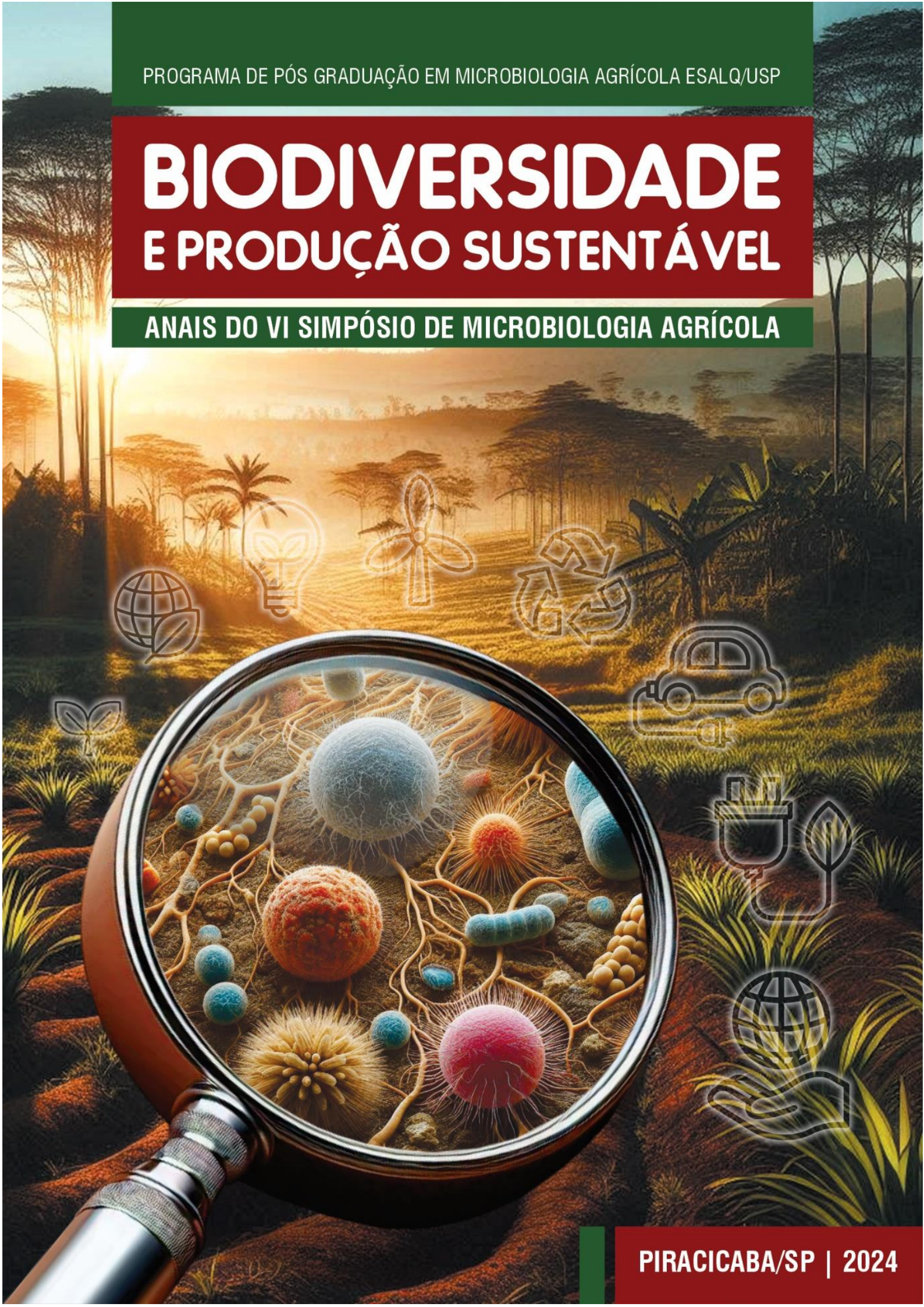

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Metabolomics guided discovery of specialized metabolites from *Streptomyces lunalinharesii* A54A, a promising biological control agent of crop phytopathogens

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The assault from fungal and bacterial pathogens on crops causes great losses on food production worldwide. Traditional methods have heavily relied on chemical pesticides for their control, with detrimental effects on environment and human health as well as creating pest resistance. In this regard, biological sources have emerged as an alternative for crop pest management, particularly actinobacteria because of their capacities for the biosynthesis of specialized metabolites with antimicrobial properties. This study investigates the use of the endophytic actinobacterium *Streptomyces lunalinharesii* A54A, obtained from the leaves of the plant *Anthurium urvilleanum* from São Paulo Coast, as a biological control strain against various phytopathogenic bacteria and fungi. In vitro bioassay-guided fractionation revealed the potent growing inhibiting fractions, demonstrating its broad antimicrobial spectrum against both bacterial and fungal phytopathogens. Furthermore, a high-resolution tandem mass spectrometry (HRMSMS) untargeted metabolomics approach was implemented in order to investigate chemical space produced by *S. lunalinharesii* A54A. Statistical multivariate analysis and molecular networking (GNPS) analysis showed diverse chemical compound classes such as nonribosomal peptides and polyketides in the bioactive fractions. This approach made possible to target the potentially new antimicrobial compounds for their isolation in further stages. Hence, these results indicate the potential of *S. lunalinharesii* A54A as a biological control agent of a wide range of microbial pythopathogens. Finally, the merged activity-metabolomics approach proves to be a powerful tool to accelerate the bioprospection of microorganisms for their subsequent application for crop protection.

KEYWORDS: Actinobacteria, untargeted metabolomics, specialized metabolites, biological control, phytopathogens, crop protection

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