



BIOACTIVITY SCREENING OF BRAZILIAN AND AMERICAN CULTIVARS OF HOPS (*Humulus lupulus* L.): COMPARATIVE ANALYSIS OF ANTI-INFLAMMATORY, NEUROPROTECTIVE, ANTIBIOFILM, AND ANTIBIOTIC PROFILES

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Hops (*Humulus lupulus* L.) are well known for their role in the brewing industry but have gained increasing attention due to their pharmacological potential, driven by various bioactive compounds¹. This study aims to systematically screen the biological activities of extracts from different American hop cultivars grown in Brazil, comparing them to the same cultivars grown in their original regions in the United States.

Four primary biological activities were evaluated: anti-inflammatory activity via PGE₂ inhibition, neuroprotective effects, antibiofilm action, and antibiotic activity. Preliminary analyses showed that extracts BR5, BR6, US2, and US5 significantly inhibited PGE₂ production, suggesting their potential as anti-inflammatory candidates.

In parallel with the biological assays, a metabolomics approach using LC-MS/MS will be conducted to identify potential chemical biomarkers associated with each biological activity. Statistical analysis will be performed using multivariate techniques and machine learning methods, enabling robust correlations between chemical profiles and observed bioactivities.

This study not only contributes to the discovery of pharmacologically relevant bioactive compounds but also provides a comparative insight into the chemical and biological differences between cultivars grown under different environmental conditions. The integrated approach strengthens strategies for selecting and valorizing the most promising genotypes for pharmaceutical and functional ingredient applications.

Keywords: *Humulus Lupulus*, chemometrics approach, LC-MS-based metabolomics,

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