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BOOK OF ABSTRACTS

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Natural Solutions for Grape Pathogen Control: Chemical Analysis and Bioactivity Evaluation of Plant Extracts

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Peels from orange (*Citrus sinensis* L.) are often considered processing waste. Citrus peels contain bioactive compounds such as organic acids that have important biological properties [1]. In addition, fennel (*Foeniculum vulgare* Mill.) and sage (*Salvia officinalis* L.) are widely used herbs that have been used for medicinal purposes and human consumption for centuries. The leaves of these herbs contain polyphenols, which are antioxidant and antifungal compounds such as flavonoids [2,3]. To explore the potential of these plants as natural antifungals, this study aimed to analyze the phenolic compounds in extracts of fennel and sage leaves using HPLC-DAD/ESI-MS, after a maceration process. The study also evaluated the organic acids present in orange peels using HPLC-DAD. Finally, the antimicrobial potential of the plant extracts against food contaminants, including grapevine pathogens such as *Botrytis cinerea*, was tested using the microdilution method. This study found that the highest concentration of polyphenols in the leaves of sage and fennel were the flavonoids luteolin-7-O-glucuronide and quercetin-3-O-glucuronide, respectively. Sage leaves extract contained 69% of flavonoids and 31% of phenolic acids, while fennel leaves extract was richer in phenolic acids, corresponding to 61%, and the flavonoids were found in lower concentrations, corresponding to 39% of total phenolic composition. The concentration of organic acids in orange peels was 8±0.1g/100g dw, with citric acid being the main compound found, corresponding to 75%, while ascorbic acid corresponding to 18% of total organic acids determined. In this study, oxalic and quinic acids were also found in orange peels extract. All plant extracts demonstrated the ability to inhibit the growth of *B. cinerea* at a concentration of 10 mg/mL, indicating their potential as natural antifungals against this grapevine pathogen. Thus, these plant extracts have the potential to act as natural antimicrobials, showing promising results for disease control in grapevines. In this sense, the valorization of these plant extracts could generate significant economic benefits for the wine industry.

Keywords: *Polyphenols; Citrus sinensis* L.*; Foeniculum vulgare* Mill.; Salvia officinalis L.*; antimicrobial activity; Botrytis cinerea*

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