



*Microbial Communities as growth engines for Greece*

**Book of Abstracts**

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*Citrus medica* and *Cinnamomum zeylanicum* Essential Oil Mixture as Potential Biopreservative Agent Against Low Alcohol Wine Spoilage

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Today, low alcohol wines represent a new steadily rising trend in the global wine market driven mainly by the major awareness about serious long-term effects of alcohol consumption, as well as social and economic reasons. Since low alcohol products are sensitive to spoilage, the use of natural agents with antimicrobial activity is considered a promising alternative to chemical preservatives. Thus, the aim of the present study was to investigate possible antimicrobial action of *Citrus medica* and *Cinnamomum zeylanicum* essential oils (EOs) and assess its commercial potential in the wine industry. The main constituents identified by GC/MS analysis were limonene (38.46 %) and linalool (35.44 %) in *Citrus medica* EO, whereas *trans*-cinnamic-aldehyde (63.58 %) was the dominant compound in *Cinnamomum zeylanicum* EO. The antimicrobial properties were initially verified by the disk diffusion assay and subsequently the minimum inhibitory, non-inhibitory and minimum bactericidal concentration values of an EO mixture against common wine spoilage microbes were determined, applying a previously published model that combined absorbance measurements with the common dilution method and non-linear regression analysis to fit the data. The efficiency of the EO mixture was further validated in low alcohol wine products and in products deliberately spiked with *Gluconobacter cerinus*, *Oenococcus oeni*, *Pediococcus pentosaceus*, *Dekkera bruxellensis*, *Candida zemplinina*, *Hanseniaspora uvarum*, *Pichia guilliermondii* and *Zygosaccharomyces bailii*, separately and stored at room temperature. Wine supplementation with the EO mixture resulted in significant delay of spoilage and extension of the products' shelf-life, as well as in microbial growth inhibition after deliberate inoculation, indicating the potential of the EOs as effective biopreservatives in the wine industry.

**Keywords:** essential oils, low alcohol wines, biopreservatives, *Citrus medica*, *Cinnamomum zeylanicum*, spoilage