

Decoding myrtle activity against Alzheimer's disease: characterization of metabolic composition and anti-amyloidogenic activity of myrtle leaves extracts

Linda Molteni¹, Luca Moretti¹, Maura Brioschi¹, Diletta Ami^{1,2}, Antonino Natalello^{1,2}, Valeria Cassina³,
Alessandro Palmioli^{1,2}, Cristina Airoidi^{1,2}.

¹Department of Biotechnology and Biosciences, University of Milano-Bicocca, P.zza della Scienza 2, 20126 Milan, Italy;

²NeuroMI, Milan Center for Neuroscience, University of Milano-Bicocca, 20126 Milano, Italy ;

³School of Medicine and Surgery, University of Milano-Bicocca, 20854 Veduggio al Lambro (MB), Italy.

The primary challenge in addressing Alzheimer's disease (AD) is the significant lag between the molecular onset and the appearance of clinical symptoms. Consequently, prioritizing primary prevention strategies is imperative^[1]. In this context, diet is a promising preventive tool in addressing AD pathogenesis^[2]. Myrtle (*Myrtus communis*) is an evergreen aromatic plant historically employed in cooking and liqueur production; while the leaves are often considered a waste product, they could represent a rich source of bioactive compounds^[3].

Here we investigated the anti-amyloidogenic activity of the hydro-alcoholic extracts of myrtle leaves against A β 1-42 aggregation, one of the main hallmarks of AD [4]. By combining advanced analytical techniques (including STD NMR to probe molecular interactions and FT-IR/AFM to assess structural and morphological changes) we demonstrated that myrtle extracts significantly modulate A β 1-42 aggregation. Moreover, we employed a combined NMR and LC-MS metabolomic approach to identify the compounds responsible for the biological activity of myrtle extracts, revealing the presence of glycosylated flavonoids, hydrolysable tannins and myrtucommulones. These compounds were isolated and further tested for their anti-amyloidogenic properties.

Overall, our findings suggest that myrtle bioactive compounds are promising nutraceutical candidates for the safe and sustainable prevention of neurodegeneration. Their synergistic antioxidant, anti-inflammatory, and anti-amyloidogenic properties allow for the effective modulation of early-stage molecular events.

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