

Acylphloroglucinols from *Callistemon lanceolatus* DC.

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Diverse phloroglucinols with *hAChE* inhibitory and anti-VRE effects from *Rhodomyrtus tomentosa* fruits

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ORIGINAL ARTICLE

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Diverse phloroglucinols with *hAChE* inhibitory and anti-VRE effects from *Rhodomyrtus tomentosa* fruits

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Abstract

Rhodomyrtus tomentosa fruits serve as both functional food and medicinal resources due to their rich bioactive constituents and manifold pharmacological effects. Phytochemical exploration of the *R. tomentosa* fruits led to the identification of eight new polymethylated phloroglucinols, designated as rhodotomentodione F (**1**) and rhodotomentodimers H–N (**2–8**), along with six previously described congeners (**9–14**). Based on the detailed inspection of comprehensive spectroscopic data, electronic circular dichroism (ECD) simulations, and nuclear magnetic resonance (NMR) calculations, and DP4+ analyses, the structures of phloroglucinols **1–8** were determined. Heterodimeric phloroglucinols **3–14** exhibited human acetylcholinesterase (*hAChE*) inhibitory activities, with **13** exhibiting the highest potency (IC₅₀ = 1.04 μM). Moreover, molecular docking analysis clarified the potential binding interactions between the most active phloroglucinol **13** with *hAChE*. In addition, phloroglucinols **11** and **12** displayed significant anti-VRE (vancomycin-resistant *Enterococci*) activities, with MIC values reaching as low as 1 μg/mL.

Keywords *Rhodomyrtus tomentosa* fruits, Phloroglucinols, *hAChE* inhibitory activity, Anti-VRE activity, Molecular docking

[†]Ling-Yun Chen, Mu-Yuan Yu and E-E. Luo contributed equally.

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Author contributions

Ling-Yun Chen carried out the experiments and prepared the original draft; Mu-Yuan Yu participated in the main experiments and revised the manuscript; E-E Luo and Wen-Ying Zong performed the ECD calculations; Shu-Mei Lei and Yu Pan performed the NMR calculations; Ai-Chun Lu and Cheng-Qin Liang revised the manuscript; Xu-Jie Qin conceived and supervised the study, revised the manuscript, and secured project funding. All authors reviewed and approved the final version of the manuscript.

Data availability

The datasets used or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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