Unraveling Novel Bioactive Metabolites from 84 Halophytic Island Flora for Marine Biotechnology

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Abstract

Marine and coastal ecosystems are promising sources of bioactive compounds for biotechnological applications. In this study, we investigated the phytochemical diversity of eighty-four wild island plant species by performing ethanol extraction and systematic fractionation with organic solvents. The extraction utilized fifty percent ethanol to obtain crude extracts, followed by solvent partitioning to isolate potentially active constituents.

From *Litsea japonica*, epicatechin was identified, while *Machilus thunbergia* yielded chlorogenic acid, thereby providing two marker compounds. Structural elucidation was conducted through mass spectrometry, confirming their purity and uniqueness. Both compounds exhibited notable biological potential, highlighting prospective uses in pharmaceutical, cosmetic, and nutraceutical fields.

Our findings underscore the importance of conserving island biodiversity, as it can offer valuable leads in the search for novel functional agents. Ongoing research aims to clarify mechanistic pathways and evaluate efficacy under in vivo conditions. This work contributes to sustainable bioprospecting efforts and emphasizes the necessity of expanding exploration of coastal and marine flora as reservoirs of innovative bioactive substances.

Keywords: Island plants, ethanol extraction, organic solvent fractionation, bioactive compounds, phytochemical analysis, biodiversity conservation

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