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Inhibitory Effects of *Enteromorpha prolifera* on the Production of Nitric Oxide, Prostaglandin E_2, and Pro-inflammatory Cytokines in RAW 264.7 Cells

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SUMMARY. Inducible nitric oxide synthase (iNOS) and cyclooxygenase (COX)-2 have been used as tools for the screening of anti-inflammatory agents. In a search for inhibitors of COX-2 and iNOS, we found that extracts of *Enteromorpha prolifera* inhibit the production of nitric oxide (NO) and prostaglandin (PG)E_2 in LPS-stimulated RAW 264.7 macrophage cells. We first extracted *E. prolifera* with 80% ethanol and the extract was partitioned with hexane, dichloromethane, ethyl acetate, butanol, and water, successively. The results indicate that the hexane and ethyl acetate fractions effective inhibited LPS-induced NO and PGE_2 production in RAW 264.7 cells. To test the inhibition effects of the *E. prolifera* fractions on other cytokines, we also performed an ELISA assay on tumor necrosis factor (TNF)-α, IL-1β, and IL-6 in LPS-stimulated RAW 264.7 macrophage cells. The expression of TNF-α, IL-1β, and IL-6 was also decreased following treatment with the hexane and ethyl acetate fractions. To test the potential application of the *E. prolifera* extract as a cosmetic material, we also performed MTT assays on keratinocyte HaCaT cells as well as primary skin irritation tests. In these assays, the *E. prolifera* extracts did not induce any adverse reactions. Based on these results, we suggest that *E. prolifera* extracts may be considered potential anti-inflammatory candidates for skin health.

KEY WORDS: Cytokine, *Enteromorpha prolifera,* inflammation, iNOS, PGE_2

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