

**Alpha-amylase, antioxidant, and anti-inflammatory activities of *Eucheuma denticulatum*  
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ABSTRACT

*Eucheuma denticulatum* is a red edible seaweed that grows in the East Malaysia coastal region. The objective of this study was to investigate the  $\alpha$ -amylase, antioxidant and anti-inflammatory activities of *E. denticulatum* ethanol extract and its three fractions (n-hexane, ethyl acetate and acetone).  $\alpha$ -Amylase activity was assessed by dinitrosalicylic acid (DNS) assay, while the antioxidant property was determined by oxygen radical absorbance capacity (ORAC) analysis. The anti-inflammatory effects of the seaweed samples were evaluated by nitric oxide (NO), interleukin-6 (IL-6), interleukin-1 (IL-1), tumor necrosis factor-alpha (TNF- $\alpha$ ), and monocyte chemoattractant protein-1 (MCP-1) activities on the interferongamma/ lipopolysaccharide (IFN- $\gamma$ /LPS)-stimulated murine macrophage cell line (RAW 264.7) using Griess reaction and immunoassays, respectively. At 10 mg mL<sup>-1</sup>, *E. denticulatum* ethanol extract and three fractions inhibited  $\alpha$ -amylase activities at variable levels. The highest (67 %) inhibition of  $\alpha$ -amylase enzyme was by the ethanol crude extract. The three fractions showed inhibition with a mean of 42 %. Crude ethanol extracts also exhibited higher antioxidant capacity (36,400  $\pm$  23.5 mol Trolox equivalent (TE) (100 g)<sup>-1</sup>) when compared to the fractions. Crude extract and fractions (1–100  $\mu$ g mL<sup>-1</sup>), also exhibited anti-inflammatory activity without showing any cytotoxic effect to RAW 264.7 cells. The present study suggests that *E. denticulatum* has the potential to be a promising source of effective functional metabolite. An extensive research on the edible varieties would contribute to a better understanding of their importance as functional food.

**Keyword:**  $\alpha$ -Amylase; Anti-inflammatory; Antioxidant; Rhodophyta; *Eucheuma denticulatum*; Seaweed