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Analysis of Total Phenolic Content, Total Flavonoid Content, Antioxidant and Anti-inflammatory Activities of *Halymenia sp*

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Marine algae have garnered significant interest due to their rich bioactive compound profiles and potential pharmaceutical applications. This study aimed to investigate the total phenolic content (TPC), total flavonoid content (TFC), *in vitro* antioxidant and anti-inflammatory activities of the crude extract of *Halymenia sp.* The crude extract was obtained via ultrasound sonication using a methanol: chloroform mixture (4:6). The TPC, TFC, and antioxidant activity were determined using the Folin-Ciocalteu method, aluminum chloride colorimetric method, 1,1-diphenyl-2-picryl-hydrazyl (DPPH), oxygen radical absorbance capacity (ORAC), and ferric reducing antioxidant power (FRAP) assays, respectively. The anti-inflammatory activity of the crude extract was determined using egg albumin and bovine serum albumin denaturation assays. All the assays were triplicated and the results were expressed as mean ± standard deviation. The TPC and TFC values of the crude extract were 51.70 ± 2.51 mg of Gallic acid equivalent/g of dried extract and 11.65 ± 1.30 mg of Quercetin equivalent/g of dried extract, respectively. The DPPH (IC_{50}), FRAP and ORAC values were 4.301 ± 0.797 µg/mL, 72.71 ± 2.40 mg of Trolox equivalent/g of dried extract, and 17.36 ± 1.09 mg of Trolox equivalent/g of dried extract, respectively. Additionally, the anti-inflammatory activity of the *Halymenia sp.* was 35.47 ± 2.55 mg diclofenac sodium equivalence /g of dried extract in egg albumin denaturation assay and 27.36 ±10.058 mg diclofenac sodium equivalence /g of dried extract in bovine serum albumin denaturation assays. The results indicated that the extract of *Halymenia sp.* is rich in phenolic compounds, flavonoids, antioxidants and compounds with anti-inflammatory properties.

Keywords: *Halymenia sp., antioxidant, anti-inflammatory, flavonoids*