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Sulfated polysaccharide from *Sargassum* spp. in Bolinao, Pangasinan, Philippines

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The Philippines is rich in brown macroalgae that are widely distributed across the country. Studies on macroalgal chemical composition and biological activity have not yet been established in the country. Thus, this study aims to utilize *Sargassum* species collected from Bolinao, Pangasinan as source of known sulfated polysaccharide, fucoidan. The study specifically aims to characterize and screen the potential antioxidant activity of fucoidan isolated from *Sargassum* species. Fucoidan isolation was carried out using salt-assisted extraction and anion exchange purification. Qualitative and quantitative characterization of fucoidan were conducted through turbidimetric sulfate determination, total carbohydrate content, glycosyl monosaccharide analysis, fourier transform infrared spectroscopy (FT-IR) and gas chromatography tandem with mass spectrometry (GC-MS). Biological activity screening of the compound includes DPPH radical and site specific hydroxyl radical scavenging. Results from the quantitative analyses indicated that fucoidan was composed of approximately 53% sulfates and its monosaccharide units were mainly comprised of 29% fucose and galactose. Size exclusion chromatography showed that the compound has a molecular weight of 7 kDa indicating that it was a low molecular weight fucoidan. Structural analysis in FT-IR indicated the presence of significant functional units in the polysaccharide chain. Sulfate groups were described in the 1210-1220 cm^{-1} and 800-840 cm^{-1} region. The hydroxyl groups, on the other hand were indicated in the FT-IR through the broad peak at regions 3330-3430 cm^{-1}. The fucose unit was described by the presence of a small peak at 2920-2960 cm^{-1} in the FT-IR region. Acetyl groups were also indicated in the regions 1600-1660 cm^{-1}. Bioactivity screening of fucoidan indicated that it does not have the capability to inhibit bacterial and fungal growth. Antioxidant assays demonstrated that the compound has a strong antioxidant activity against DPPH but not with hydroxyl radicals. In summary, fucoidan from *Sargassum* species was a highly sulfated and heteropolymeric fucan chain that has a potential to be an antioxidant. To further improve the study, additional compositional, structural and bioactivity tests should be done in fucoidan. Furthermore, other bioactivities of fucoidan should also be explored.

Biography

Nieva J A is currently working on Seaweed Chemistry in The Marine Science Institute, University of Philippines, Philippines.

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