ISOLATION AND IDENTIFICATION OF BIOACTIVE COMPOUNDS FROM SEAWEED *Sargassum ilicifolium*

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Three species of *Sargassum* sp. (*S. ilicifolium, S. polycystum* and *S. oligocystum*) have been screened for antioxidant (DPPH method), cytotoxicity (MTT Assay), anti-microbial (Disc Diffusion Method) and anti-amoebic bioactivities. All methanol crude extracts showed DPPH free radical scavenging, cytotoxic to several cell lines which include HL-60 (leukemic) and MCF-7 (breast cancer), anti-bacterial and anti-amoebic activity. However methanol extract of *S. oligocystum* is inactive against all microbes tested. Only *S. ilicifolium* selected to be investigate further, based on their promising bioactivity results and the availability of the sample.

C39 isolated through silica gel column chromatography, eluted with ethyl acetate:methanol (1:1) and identified as mannitol elucidated by ^{1}H NMR, ^{13}C NMR, HMBC, HMQC, COSY, NOESY and mass spectrometry spectral data. Mannitol exhibited low DPPH free radical scavenging activity (10% inhibition activity at the concentration of 10 mg/mL) and anti-bacterial properties (8 - 12 mm inhibition zone at 0.02mg/disk); however it showed very high bioactivity against HL-60 and MCF-7 cells with the IC_{50} of 0.8± 0.76 µg/mL and 3.2 ± 0.66 µg/mL respectively.

Abstrak tesis yang di kemukakan kepada Senat Universiti Malaysia Terengganu sebagai memenuhi keperluan untuk Ijazah Sarjana Sains

PEMENCILAN DAN PENENTUAN SEBATIAN-SEBATIAN BIOAKTIF DARIPADA RUMPAI LAUT *Sargassum ilicifolium*

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Tiga spesis *Sargassum* sp. (*S. ilicifolium, S. polycystum* dan *S. oligocystum*) telah dikaji untuk menentukan aktiviti antioksidan (kaedah DPPH), ketoksikan sel (kaedah penyerapan cakera) dan asai anti-amoeba. Kesemua ekstrak metanol mentah menunjukkan aktiviti ke atas pemerangkapan radikal bebas DPPH, sel-sel kanser, bakteria dan amoeba. Walaubagaimanapun ekstrak metanol mentah *S. oligocystum* tidak aktif ke atas semua mikrob yang diuji. Hanya *S. ilicifolium* dipilih untuk kajian selanjutnya berdasarkan kepada keputusan ujian saringan yang baik dan ketersediaan sampel.

Sebatian C39 berjaya dipencilkan melalui kromatografi kolum yang dilalukan dengan campuran etil acetat: methanol (1:1) dan ditentukan sebagai mannitol hasil

daripada analisis data-data ^{1}H NMR, ^{13}C NMR, HMBC, HMQC, COSY, NOESY dan spectrofotometri jisim. Mannitol menunjukkan kadar pemerangkapan radikal bebas DPPH yang rendah (10% pemerencatan aktiviti pada kepekatan 10 mg/mL) dan mempamerkan kebolehan anti-bakteria (8 - 12 mm zon perencatan pada 0.02mg/cakera), namun ia menunjukkan aktiviti perencatan yang sangat tinggi ke atas sel HL-60 berbanding sel MCF-7 iaitu masing-masing pada IC_{50} 0.8±0.76 μg/mL dan IC_{50} 3.2±0.66 μg/mL.