Antioxidant and Antiproliferative Activities of Malaysian Sea Cucumber, (*Holothuria edulis* Lesson), Extracts

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Sea cucumber is a marine invertebrate of the phylum Echinodermata and the class Holothuroidea that found on the sea floor worldwide. In Asia, many of sea cucumber species are considered as traditional food items and have been used in treatment of numerous diseases such as eczema, arthritis and hypertension. Previous scientific studies have shown multiple biological activities of sea cucumber species as antinociceptive, antimicrobial and antifungal properties.
This study was conducted to investigate the antioxidant and antiproliferative activities of aqueous and organic extracts from sea cucumber, *Holothuria edulis*. Two different free radical systems were used to evaluate antioxidant activity of *H. edulis*, stable radical 1,1-diphenyl-2-picrylhydrazyl (DPPH•) and linoleic acid free radical mediated β-carotene bleaching. In addition, Folin–Ciocalteau reagent was used to determine the total phenolic content of the extracts. The inhibitory effect of the extracts on proliferation of MCF-7 (human breast adenocarcinoma) and TE1 (Human esophageal squamous cell carcinoma) human cancer cell lines were demonstrated by 3-(4,5- dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay.
Our data showed that the gallic acid equivalent (GAE) of the total phenolic content in aqueous extract (GAE = 7.33 mg/g) is higher than an organic extract (GAE = 2.17 mg/g). An aqueous extract also exhibited higher antioxidant capacity by using DPPH assay (IC_{50} = 2.04 mg/mL vs. 8.73 mg/mL in organic extract), as well as by using β-carotene bleaching assay (Antioxidant Activity = 42.69 % vs. 28.52 % in organic extract). On the other hand, an organic extract showed higher antiproliferative effect against MCF-7 and TE1 cancer cells, giving IC_{50} = 28.0 and 17.5 µg/mL, respectively than aqueous extract, that gave IC_{50} = 133.0 µg/mL against MCF-7 and 76.0 µg/mL against TE1. In conclusion, findings of this study revealed that *H. edulis* as a promising source of natural antioxidants and anticancer products.