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Carrageenan and Seaweed Powder Anticytotoxicity and Antioral Bacterial Activity

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Carrageenan is a sulphated polysaccharide derived from red seaweed from the class Rhodophyceae. *Kappaphycus alvarezii* and *Eucheuma spinosum* which yield *kappa(k-)* and *iota(i-)* carrageenan, respectively function as natural thickener or emulsifier in food products. Carrageenan is labelled as Generally Recognized As Safe by FDA. However, it is also used by scientist to induce gastrointestinal inflammation in animal where degraded carrageenan was proven to cause ulcerative colitis in animal model. In this study, anticytotoxicity and antioral bacterial activity of *k*-carrageenan, *i*-carrageenan and *kappa* seaweed crude powder were determined. Human hepatocellular carcinoma (HepG2) and human epithelial colorectal adenocarcinoma cells (Caco-2), as well as oral bacteria (3 gram positive and 3 gram negative) were treated with different concentration of carrageenan range from 0.005%-3% (w/v). *k*-carrageenan, *i*-carrageenan and *kappa* seaweed powder were supplied by Tacara Sdn Bhd, Sabah. Disc diffusion and broth dilution method were performed to test the antibacteria activity of carrageenan. The three carrageenan did not show IC_{50} value on HepG2 and Caco-2 cells with the concentration tested range from 31.25-2000 µg/mL when screening by MTT assay. Meanwhile, carrageenan cannot inhibit the growing of oral bacteria. So we concluded that *i*-carrageenan, *k*-carrageenan and *kappa* seaweed crude powder were not toxic to HepG2 and Caco-2 cells, and they could not function as antioral bacteria agent. Biochemical and molecular analysis of effect of carrageenan on HepG2 and Caco-2 cells will be further investigated.

Keywords: Anticytotoxicity, antioral bacteria, carrageenan, HepG2, Caco-2.