

Effects of food matrix on the bioactivity properties of malaysian brown seaweed, *sargassum polycystum*

ABSTRACT

The objective of the study is to evaluate the effects of food matrix on the bioactivity properties of Malaysian brown seaweed, *Sargassum polycystum*. Antioxidant activities were employed using ferric reducing ability power, beta-carotene bleaching assay and 2,2-diphenyl-1-picrylhydrazyl-hydrate free radical scavenging activity. *S. polycystum* powder was subjected to a simulated gastrointestinal model to mimic digestion at different phases (oral, gastric and post gastric) to investigate the bioavailability of antioxidant activities. The food matrix effects were studied using 17 different types of common foodstuffs cooking oil, sodium chloride, sugar, honey, vinegar, 95% protein isolate, skim milk, full cream milk, soy milk, bread, rice, meat, vitamin C, broccoli, apple, lemon juice, and apple juice were used as food models. The antioxidant activity has shown the highest recovery in the post gastric section. Food matrix results suggested seaweed was best to be taken with a combination of high-fat content food where full cream milk and oil showed promoting effects on the release of fucoxanthin and beta-carotene by increasing 12-18% of fucoxanthin and 17-26% of beta-carotene content. Bread, salt, and vinegar showed promoting effect in recovery by 4-7%. Fat's products were able to increase the bio-accessibility of fucoxanthin by 12-15% and beta-carotene by 15-20%. Protein and dietary fibre products have shown inhibiting effects on the recovery of fucoxanthin and beta-carotene content, wherein a decrease in bio-accessibility of fucoxanthin by 22-40% and beta-carotene by 8-23% respectively. In conclusion, fucoxanthin and beta-carotene recovery and bio-accessibility were affected by types of food matrix mainly fat and fibre content.