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Bioactive potential of phlorotannins from *Sargassum turbinatifolium* Tseng et. Lu and the effect of encapsulation on its bioactivity

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Phlorotannins in brown algae have proven to be a group of excellent bioactive agents for functional foods and nutraceuticals. Less effectiveness and stability of phenolics in their free form have led to their microencapsulation. Phlorotannins are metabolized and absorbed predominantly in the large intestine of human while chitosan is a vehicle for the colon targeted delivery of active compounds. The study was carried out to evaluate the brown algae *Sargassum turbinatifolium* from Thalpe beach, Sri Lanka for the presence of phlorotannins, their bioactivities and the potential to be microencapsulated in chitosan. Phlorotannin fraction was extracted, semi- purified, quantified and analyzed for the DPPH scavenging ability, reducing power, α-amylase inhibitory activity and antibacterial activity. Phlorotannins were encapsulated with chitosan extracted from crab shells. The results showed that the phlorotannin content was highest in the ethyl acetate extract of semi purification, 854.4+_ 68.5mg PGEs/g of extract. The IC_{50} value was 989.27+_ 12.45 g/mL in the DPPH assay. Ferric reducing power and α-amylase inhibition values were 680.2+_ 24.4mg of AAE/g and 76.3+_ 3.5% respectively. The inhibition zone diameter of 7mm against *E.coli* was observed. The yield of encapsulated phlorotannin was 30.6+_ 3.1 %. These results highlighted higher bioactive properties of phlorotannin extract from *S. turbinatifolium* and its encapsulation efficacy.

Keywords: *Phlorotannins, Sargassum turbinatifolium, encapsulation, α-amylase inhibition, antioxidation properties*

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