Extraction and Characterization of Green Algae *Cladophora* sp. Polysaccharide and use it in Beef Patties

By

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Summary

The study included extraction of polysaccharides from algae. The green algae was collected from Shatt Alarab water in Karmat Ali in Basrah, the green algae was purified and it is *Cladophora* sp. Polysaccharides was extracted by sodium carbonate Na_2CO_3. Its chemical composition including moisture, ash, protein, fat , carbohydrate and total saccharides was studied and it was moisture 4.16%, ash 29.78%, protein 16.10% at 1.25%, carbohydrate 48.71% and total sharrides 78.4%. The effect of extract conditions on polysaccharides yield were also studied included mixing percentage 1:7, 1:9, 1:12 and 1:15 and 1:9 exhibited the highest yield (7.48%) and the lowest yield (3.2%) when we use 1:15. The extraction was carried on different temperature 60°C, 80°C and100°C the highest yield was 7.53% when extraction on 80°C .The effect of the time of extraction in 2 hrs, 4hrs so the yield was 6.95% and 7.60% for 2 and 4 hrs respectively, the highest yield was 7.49% when extraction on pH 2. The results showed that the best yield was when the extraction on 1:9 and 80 °C for 4hrs and pH 2.

The physiochemical properties for polysaccharides wer studied and the result showed the relative viscosity was increased with the increase of concentration and decrease with the increase of temperature the highest viscosity was 11.0020 in 30°C and the lowest was 8.0576 in 50 °C.

The ability of polysaccharides for water absorbtion and fat binding was noticed that it was increased with the increased of concentration, the percentage of polysaccharides solubility was 69.72%, and it was higher than sodium alginate

(65.68%). The results also showed decrease of foaming of polysaccharides because of its high viscosity. The molecular weight of polysaccharides was 875.26 Kdal, the Thermo Gravimetric Analysis (TGA) was 7% for loss and the residue was 93%.

The test of cytotoxicity was appaired that the polysaccharides was no toxic in all concentration and for all incubation periods 10, 30 and 60 min.

The extracted polysaccharides and sodium alginate were used in beef patties for 0.2%, 0.4% and 0.6% and storage for 1, 4 and 7 days, the results showed that there were significant increased ($p<0.05$) in water holding capacity in all treatments comparing with control and pH increased during storage periode and also noticed that cooking loss was decreased and increased in cooking yield for beef patties treated with polysaccharides and sodium alginate comparing with control.

The results showed that addition of extracted polysaccharides and sodium alginate to beef patties improved sensory properties (color, falvor, tenderness, juicness and overal acceptability) during storage periode compared with control.