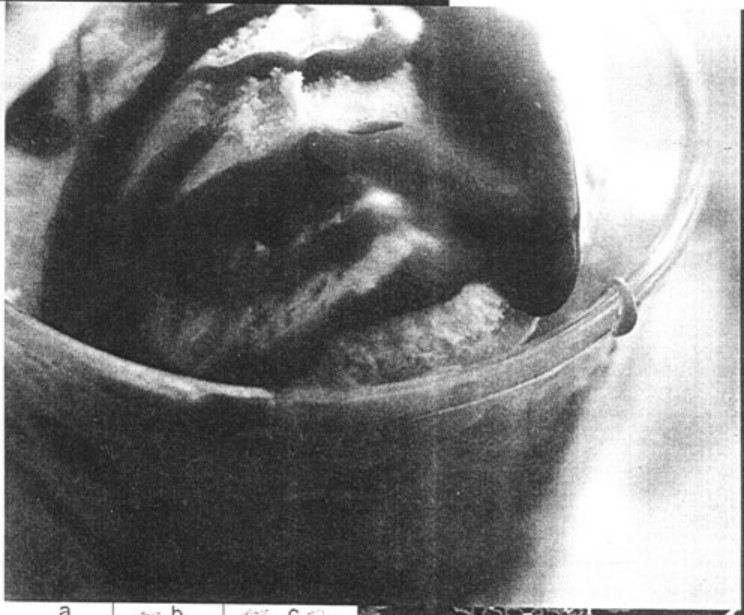
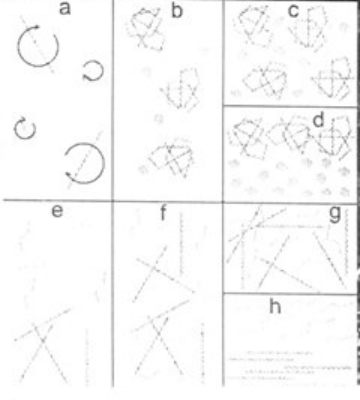
9th International Hydrocolloids Conference 2008

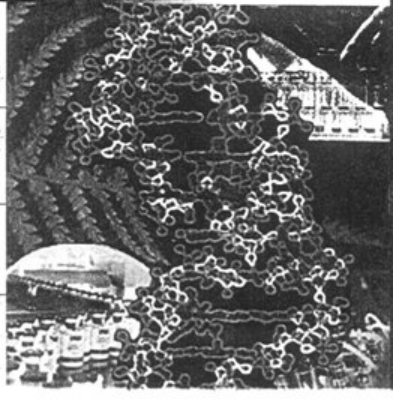
Singapore
June 15-19, 2008

NUS
National University of Singapore

Programme & Abstracts







P-055 – Poster

Effect of Extraction Methods on Yield, Purity and Viscosity of Mucilage Extracted from Qodume Shirazi Seed (*Alyssum Homolocarpum*)

Arash KOOCHEKI, Seyed A. MORTAZAVI, Fakhri SHAHIDI, Seyed M. A. RAZAVI, Rasoul KADKHODAEE and Jafar M. MILANI
Ferdowsi University of Mashhad (FUM), Iran

Alyssum is a genus of about 100-170 species of flowering plants in the family Brassicaceae, native to Egypt, Arabia, Iraq, Iran and Pakistan. The seeds are known to contain a large amount of mucilaginous substance and have been used as a traditional medicine in Iran. In addition, foods fortified with Alyssum homalocarpum seed gum may be well accepted by the consumer since there is well-established knowledge of medicinal uses of these seeds. Effect of different extraction conditions on extraction yield, apparent viscosity and protein content during extraction of Qodume Shirazi seed gum was investigated. Extraction temperature (25–85°C), pH (4-10) and water to seed ratio (20:1-60:1) were the factors investigated with respect to apparent viscosity, extraction yield and protein content. It was found that increase in pH of extraction resulted in reduction of apparent viscosity but increase in water: seed ratio slightly increased the apparent viscosity. As temperature increased, the apparent viscosity increased slightly. Increase in temperature and water: seed ratio caused an increase in the yield wile pH had no significant effect. It was clear that protein content in the gum increased with the increase in temperature and water:seed ratio.

P-056 – Poster

A Comparative Study on Time-independent Rheological Behavior of Saleps, Carboxymethyl Cellulose and Guar Gum as a Function of Concentration and Temperature

Reza FARHOOSH, Seyed M. A. RAZAVI and Alireza RIAZI
Ferdowsi University of Mashhad, Iran

Rheological properties of palmate-tuber salep (PTS) (2, 3, 4, and 5% w/w) and rounded-tuber salep (RTS) (4, 5, 6, and 7% w/w) were compared to carboxymethyl cellulose (CMC) (1, 1.5, 2, and 3% w/w) and guar gum (0.75, 1, 1.5, and 2% w/w) at four temperatures (5, 25, 45, and 65 °C). Samples were subjected to a programmed shear rate increasing from 0 to 300 s^{-1} in 3 min using a rotational viscometer. The power law model well described the rheological behavior of hydrocolloid solutions. At all concentrations and temperatures, the flow curves of all hydrocolloids showed a shear-thinning behavior. The power law model parameters (k and n values) for all hydrocolloids were dependent to changes in concentration and temperature. A power model was used to evaluate the concentration effect on apparent viscosity (50 s^{-1}). The concentration dependency of apparent viscosity for saleps was higher than that of CMC and guar gum, respectively. This dependency increased as temperature increased. Temperature dependency of the apparent viscosity for hydrocolloid solutions was successfully described by the Arrhenius model. The highest and lowest temperature dependencies of apparent viscosity were belong to PTS and CMC, and guar gum, respectively. RTS solutions had an intermediate temperature dependency. This dependency decreased as concentration increased.

P-057 – Poster

Emulsifying Properties of Modified Malva Nut Gum with Different Protein Content

T. SAJJAANANTAKUL and C. LIMPICHUTCHAWAN
Kasetsart University, Thailand

Dry seed of Malva nut (*Scaphium macropodum* Beaum.) can be hydrated in water and readily swell into heat stable gel. The alkaline extracted gum fraction has been characterized[1] to contain about 8.4% protein and 62% carbohydrates which are mainly arabinose, galactose and rhamnose. Our investigations were to evaluate the effect of different treatments of Mulva nut gum on its protein content and emulsifying properties. Comparison of emulsifying properties of different treated Mulva nut gum with gum arabic, guar gum and xanthan gum were made.

Malva nut powder was suspened with water, 0.02 M HCl, 0.1% (w/v) pepsin in 0.02M HCl, 0.01M Phosphate buffer, 0.1% (w/v) bromelain in 0.01 M phosphate buffer at 40°C for various times up to 24 h, neutralized, filtered and dried at 60°C. Malva nut powders and treated samples were separately solubilized with 0.05 M NaOH at 40°C for 16 h, neutralized, vacuum evaporated, freeze-dried and grinded to powder. Total carbohydrate, total phenolics, galacturonic acid content (m-hydroxydiphenyl method), protein content (micro Kjeldahl method) were analyzed. Different Mulva nut gum dispersions in water (0.5% w/v) was evaluated for its emulsifying properties in corn oil emulsion (1:10 oil:water phase). Emulsifying capacity, emulsion heated-stability, and emulsion storage-stability was determined by centrifugation and storage time, surface tension by Du Nouy ring, droplet size by Axiolab Carl Zeiss light microscope, and viscosity by Brookfield. It was found that at 16 h 0.02M HCl, and pepsin treated was equally effective in reduction of about 39.5 % protein content (dry basis) whereas phosphate buffer, bromelain, and water treated were about 28.3% effectiveness. Despite differences in protein content, the emulsifying capacity, emulsion heated-stability of the gum from Malva nut powder (MG), water treated (WMG), and 0.02M HCl treated (AMG) were not significantly differences. However, AMG had significantly ($p<0.05$) higher viscosity which resulted in higher emulsion storage-stability than MG and WMG. At same concentration AMG was about 2.6 times lower in viscosity, but exhibited higher ($p<0.05$) emulsion heated-stability and about the same emulsifying capacity as commercial guar gum. Lower emulsion storage-stability of AMG than guar gum and xanthan gum was primarily due to lower gum viscosity. When compare to gum arabic (similar arabinogalactan-rich with arabinogalactan-protein nature) AMG had about 15.6 times higher in viscosity, 1.5 times higher ($p<0.05$) in emulsion heated-stability, 2 times higher in emulsifying capacity, 3 times higher in emulsion storage-stability than commercial gum arabic.