

**CHARACTERISATION OF THE POLYSACCHARIDE MATERIAL ISOLATED FROM THE
FRUIT OF *CORDIA ABYSSINICA***

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ABSTRACT

Treatment of aqueous extracts of the fruit of *C. abyssinica*, containing 0.25% sodium chloride with three volumes of ethanol produced an acidic polysaccharide with a 2% yield, on a fresh weight basis. With a protein content between 2.6% and 4.6%, the polymer contained 0.29% hydroxyproline. Uronic acid content, determined using the m-hydroxydiphenyl method was 9%. Some uronic acid residues along the polymer chain were methyl esterified, with the methoxyl content being 38%. With an ash content of 17% the polymer had a mineral ion content of Ca, 0.3%, Mg, 0.3%, Na, 0.2% and K, 4.8%. The optical rotation of a 0.25% solution was -50° . The molecular weight of the polysaccharide crudely estimated by viscometry was approximately 1 800 000 daltons. Acid and enzymatic hydrolysis, followed by HPLC and TLC analysis, revealed that the polysaccharide consisted of glucose, galactose, mannose, arabinose, xylose, rhamnose, fucose, galacturonic acid and an unidentified sugar. Solutions of the polysaccharide showed pseudoplastic flow behaviour. When suspended in water, the polysaccharide that was precipitated with salt and ethanol formed gels at a concentration of 2% at room temperature and at 4°C . Emulsions formed by the polysaccharide at neutral and alkaline pH were less stable than those formed by gum arabic. Emulsion formation was enhanced by increasing the concentration of polysaccharide and the emulsions formed remained stable even under conditions of high salt concentration. On its own, the polymer formed brittle films but flexible films were formed in the presence of 1% glycerol. Apples coated with films based on the polysaccharide lost 33% less moisture than uncoated apples after 30 days of storage at room temperature. Composite films, prepared in the presence of up to 1.5% starch, had improved elastic properties.

*“Trust in the Lord with all thine heart, and lean not unto thine understanding. In all thy ways
acknowledge him and he shall direct thy paths.” Proverbs 3 vs 4*

DEDICATIONS

This thesis is dedicated to:

my husband TERRENCE,

my children PATIENCE and XAVIER

my late mother Ms P. Katsidzira and my father S. Katayi

and my brothers and sisters.

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