

Determining the Applicability of *Caesalpinia pulcherrima* Seed Gum in the Edible Film Forming for Food Packaging

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Researching novel biopolymer sources of biodegradable and edible films has become a recent trend as a potential alternative for plastic packaging films which highly cause environmental pollution. Among the biopolymers used in edible film making, galactomannan is identified as a good film-forming agent. *Caesalpinia pulcherrima* seed gum is a rich source of galactomannan which can be suggested to use as an edible film making material. The main objectives of this study are to identify the ability of *Caesalpinia pulcherrima* seed gum in making food packaging film and assessing its performance. In this study, *Caesalpinia pulcherrima* seed gum was extracted from seeds using ethanol. The film-forming solution was prepared by dissolving *Caesalpinia pulcherrima* seed gum in distilled water along with glycerol. The appropriate seed gum and the range of plasticizer contents were determined based on the preliminary experiments. This study was carried out to find out the optimum plasticizer concentration of the *Caesalpinia pulcherrima* seed gum in edible film making while measuring its physical and mechanical properties. According to the study, the film which did not incorporate glycerol was brittle, not flexible and had a strong film matrix. With the increase of glycerol content, the film was more flexible, sticky and weak. Further, the physical properties namely thickness, moisture content, swelling index, the water solubility of *Caesalpinia pulcherrima* seed gum-based films were increased from 0.039 ± 0.001 to 0.076 ± 0.001 mm, from 62.92 ± 0.51 to $69.40 \pm 0.15\%$, from 5.39 ± 0.17 to 8.45 ± 0.17 , from 55.69 ± 0.51 to $66.66 \pm 0.45\%$, respectively with the increase of glycerol content from 0.0 to 1.5%. Concerning the mechanical properties, the tensile strength and Young's module were decreased from 10.90 ± 0.08 to 2.11 ± 0.05 MPa and from 48.46 ± 0.24 to 3.47 ± 0.09 MPa, respectively and the elongation was increased from 22.50 ± 0.05 to $60.84 \pm 0.04\%$ with increasing the glycerol content from 0.0 to 1.5%. The analysis of physical and mechanical properties reveals that *Caesalpinia pulcherrima* seed gum is a potential source for edible packaging films.

Keywords: Food packaging; Edible film, *Caesalpinia pulcherrima*