

Preparation of starch-based films from sweet potato starch with the addition of lemon peel pectin

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The use of petroleum-based plastic around the world has increased multiple folds and poses enormous risks to the environment due to its toxicity and non-biodegradability. The possible solution to this problem could be the production of biodegradable materials. Starch is a great polymeric material to be utilized for producing biodegradable films and is abundantly found in plant cells. However, these starch films alone have few mechanical limitations. So, the starch films can be blended with other bio-polymeric materials i.e., pectin to improve its film-forming properties by cross-link structure. In current study, pectin-starch films were extruded by employing pectin and starch extracted from lemons and sweet potatoes, respectively. Eight film combinations were prepared by using three different ratios of starch and pectin with and without ultrasound (US) application to the film forming solution. These films were characterized to obtain the most suitable combination of the film having acceptable physical and mechanical properties. The obtained results showed an insignificant ($P>0.05$) effect of all treatments on the properties of the film. The statistical analysis of films indicated that T5 (1:1+ US) has acceptable mechanical, optical and biodegradable properties. Furthermore, it was also observed that starch films prepared with pectin demonstrated better properties than starch films alone. Also, the application of US appeared as a beneficial approach for improvement in strength, opacity and degradability of films.