

Effect of plant phenolics on physicochemical properties of gelatin films

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This study is an experimental investigation of adding liquefied *pinus radiata* bark extract to gelatin and the development of a new series of biobased polymeric films. A 10 %wt. gelatin filmogenic solution was prepared by adding 2 %wt. glycerol as plasticizer, without and with the addition of *pinus radiata* bark extracts at 5 to 10 %wt. based on dry gelatin mass content. The films were prepared by the casting technique, at room temperature. All the films were smooth and homogeneous. Neat gelatin films were clear transparent, whereas incorporation of bark extract has changed the colour of films from light yellow to dark brown. Properties of this series of films were characterized using different physicochemical techniques (barrier, thickness swell, water solubility, color, FTIR spectroscopically and morphologically). With the increase in bark extract concentration from 5 to 10 %wt. a gradual increase in the thickness, decremental trend in physicomechanical properties such as swelling, dissolution of films, were observed with compared to neat gelatin films. Further increase in addition of bark extracts has improved higher resistance to water, high relative humidity conditions and lower swelling characteristics. Successful biodegradation of films was further confirmed their potential suitability to be used as alternative to non-biodegradable polymeric materials, for their application in packaging fields. Elimination of traditional non-biodegradable raw materials and value addition to waste are novel concepts.

Keywords: Plant phenolics, films, gelatin and physicochemical properties

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