Formulation and Physical Properties Characterization of Galactomannan and Xyloglucan Films

Mendes, F.R.S.[1]; Oliveira-Filho, R.D. [1]; Portela, J.G.[2], Ferreira, M.K.A.[2]; Bastos, M.S.R.[3], Monteiro-Moreira, A.C.O.[2], Moreira, R.A.[2]

[1]Dep. de Bioquímica e Biologia Molecular, UFC, CE; [2]Centro de Ciências da Saúde, UNIFOR, CE; [3]Laboratório de Tecnologia de Embalagens em Alimentos, Embrapa Agroindústria Tropica, CE, Brazil

INTRODUCTION: The films can be produced using a variety of products such as, proteins, lipids, polysaccharides with the addition of plasticizers and surfactants. Films based on polysaccharides are an alternative for the application of food packaging. Galactomannans (GAL) and xyloglucans (XYL) are neutral polysaccharides, classified as hemicelluloses, found mainly in cell walls of some legumes seeds. **OBJECTIVES:** This study aimed to evaluate the physical properties of the films that comprise blends of hemicelluloses extracted from *Caesalpinia pulcherrima* and *Tamarindus indica* seeds. **MATERIAL AND METHODS:** The hemicelluloses were obtained by boiling the seeds in water followed by homogenization, ethanol precipitation and drying. The films were prepared with experimental desing F0 (GAL 1%), F1 (GAL, 0.8%; XYL 0, 2%), F2 (GAL 0.6%, 0.4% XYL), F3 (GAL 0.5%, 0.5% XYL), F4 (GAL 0.4%, 0.6% XYL), F5 (GAL 0.2%, 0.8% XYL) and F6 (XYL 1%) film formulations using glycerol 0.5% as plasticizer; all formulations were homogenized in TE-102 TURRATEC shaker (10 min, 25x10^3 rpm). The films thicknesses were measured with a manual digital micrometer. The water vapour permeability (WVP) was determined gravimetrically at 25ºC based on the ASTM E96-00 method. The films opacity was determined with a colorimeter; the measurement scale ranges from 0% (fully transparent) to 100% (full opaque). **RESULTS AND DISCUSSION:** The F0 film showed higher WVP and was significantly different to the others films, while there was no difference among the other six film formulations. Thus, GAL is more permeable to than XYL; the opacity for all films was below 20% indicating that the films are relatively transparent. The thicknesses values were between 0.061 and 0.077 mm with no significant difference ($p<0.05\%$). **CONCLUSION:** All the films showed low opacity, uniform thickness and the GAL films has potential for applications requiring higher permeability to the food industry.

Key words: films, physical properties, polysaccharides.
Acknowledgements: FUNCAP, CNPq, CAPES, UFC, EMBRAPA and UNIFOR