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Effect of LAPONITE® Addition on the Mechanical, Barrier and Surface Properties of Novel Biodegradable Kafirin Nanocomposite Films

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1 **Effect of LAPONITE® Addition on the Mechanical, Barrier and Surface Properties of**
2 **Novel Biodegradable Kafirin Nanocomposite Films**

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13 **Abstract**

14 The objective of this research **was** to evaluate the effect of **LAPONITE®** addition on
15 mechanical, surface and barrier properties of kafirin films. Kafirin was extracted using 70%
16 ethanol, sodium metabisulphite and glacial acetic acid at 70 °C, which gave it a less
17 hydrophobic character compared to earlier studies as determined using **water contact angle**
18 **(WCA)** and secondary structure **analysis** through FTIR. Kafirin was then plasticized with
19 equal concentration of lactic acid, glycerol and poly ethylene glycol and then loaded with
20 different concentrations of **LAPONITE® (1, 3, 5 and 10 % by weight)**. Kafirin
21 nanocomposite films were characterized using FTIR, water vapor permeability (WVP), water
22 contact angle (WCA), mechanical properties, optical microscopy and transmission electron
23 microscopy (TEM). Collectively these measurements helped understand the interaction of

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