

## **Effect of sugar palm-derived cellulose reinforcement on the mechanical and water barrier properties of sugar palm starch biocomposite films**

### **Abstract**

In this study, sugar palm-derived cellulose (SPC) composites were prepared and utilized as reinforcement material to improve the mechanical and water vapor barrier properties of sugar palm starch (SPS)-based films. Cellulose-reinforced SPS composite films (SPS-C) were prepared with different SPC loadings (1 to 10 wt.%) using a solution casting method. The mechanical properties of the composite films showed increased tensile strength and modulus, while the elongation at break decreased with SPC loading. Adding 1 wt. % SPC loading significantly improved the water vapor permeability (WVP) of the composite film by 63.53% compared with the neat SPS film. This was ascribed to the high compatibility between the SPC and SPS matrices, which was supported by the field emission scanning electron microscopy (FESEM) and Fourier transform infrared spectroscopy (FTIR) results.