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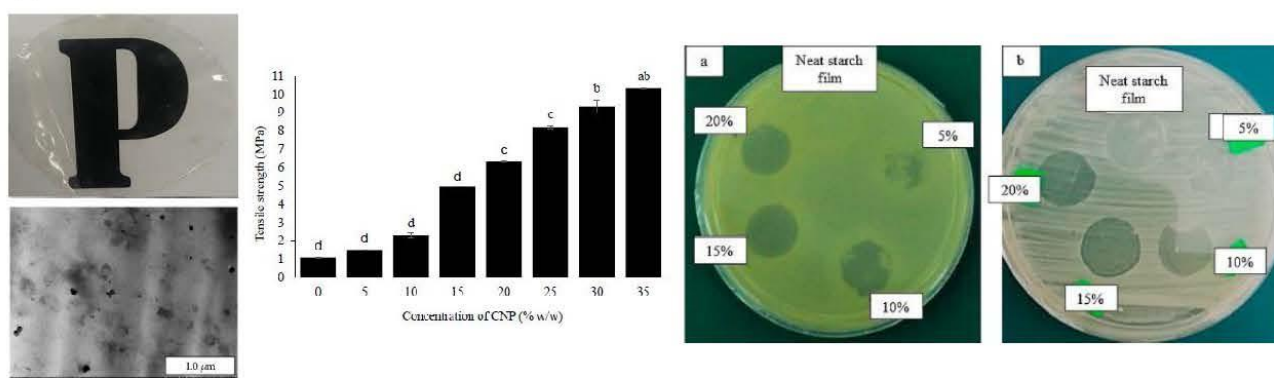


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## RESEARCH HIGHLIGHTS

### 1. Active Starch/CNP Bionanocomposite Films

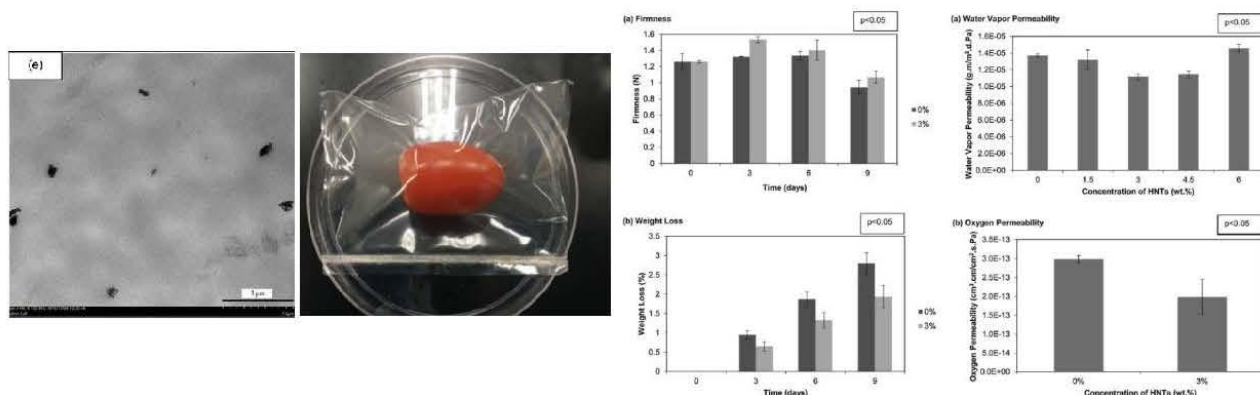
The starch/chitosan nanoparticles (CNP) bionanocomposite films were successfully developed and applied as antimicrobial packaging. The films exhibit improvement in terms of mechanical, thermal, and barrier properties. The mechanical properties of the films were comparable to the commercial packaging material, thus promising for application.



R.A. Shapi'i, \*S.H. Othman, N. Nordin, R.K. Basha, M.N. Naim. Antimicrobial Properties of Starch Films Incorporated with Chitosan Nanoparticles: In Vitro and In Vivo Evaluation, *Carbohydrate Polymers*, 230(115602), 2020.

### 2. PLA/Halloysite Bionanocomposite for Food Packaging

The limited properties of polylactic acid (PLA) biopolymer films were encountered by the incorporation of halloysite nanoclay to produce PLA/halloysite bionanocomposite films. The bionanocomposite films exhibit improvement in terms of mechanical, thermal, and barrier properties apart from able to extend the shelf life of food packaged with the films.



N.P. Risyon, \*S.H. Othman, R.K. Basha, R.A. Talib. Characterization of Polylactic Acid/Halloysite Nanotubes Bionanocomposite Films for Food Packaging Application, *Food Packaging and Shelf Life*, 23(100450), 2020.