Abstract

Hybrid materials which are combination of nanostructure cellulose and metal oxide gaining lot of attention due to their application in packaging and nanomedicine. In this work, we repurpose animal waste, especially cow dung, to fabricate CuO/ CNC hybrids. Firstly, extraction of cellulose nanocrystal from cellulose of cow dung through acid hydrolysis takes place. Subsequently, hybrids of CNC and CuO were fabricated using *in-situ* approach. Several analytical methods, including Ultraviolet visible spectroscopy (UV-VIS), Fourier-Transform Infrared spectroscopy (FTIR) and Scanning Electron Microscope (SEM) were used to study properties of sample. Furthermore, CuO/ CNC hybrids were checked against three human pathogenic bacteria *Bacillus cereus Staphylococcus aureus, Escherichia coli* and one fungus *Aspergillus niger* at different concentration. The outcomes revealed that fabricated hybrids show affective potential against all microorganisms. These findings suggest that hybrid material made of biodegradable reagent have protentional applications in antimicrobial pharmaceutical and packaging material to control growth of bacteria.