



Multi-perspective CuO@C nanocomposites: Synthesis using drumstick peel as carbon source and its optimization using response surface methodology

T.V. Surendra, S.M. Roopan, D. Devipriya, M.M. Rahman Khan, R. Hassanien

Abstract:

Recent finding on the *Moringa oleifera* (*M. oleifera*) species evidenced the significant pharmacological activities which comply with the claims made in the folk medicine. However there is no conclusive pharmacognostic, nutritional value, phytochemical investigations on the dry peel of *M. oleifera* till date. The current work discuss on the nutritional value, minerals, vitamins content, amino acids, bioactive compounds and quantitative phytochemical analysis of *M. oleifera* dry vegetable peel. The result obtained from the above study confirms the presence of carbohydrates, protein, and fat as 7.15 ± 0.15 mg/100 g, 2.5 ± 0.85 mg/100 g and 0.2 ± 0.08 mg/ 100 g respectively. The dry peel powder of *M. oleifera* showed high content of potassium with 12.48 ± 0.85 and promising amount of vitamins, amino acids and bioactive compound composition. From the preliminary phytochemical analysis, it was found that the dry vegetable peel contains high content total glycosides, falvonoids and phenolic contents. The preparations of CuO@C nanocomposites were optimized using RSM (Response surface methodology). The synthesized CuO@C nanocomposites were analyzed using various characterization techniques and size and shape of CuO@C nanocomposites determined as 20 nm with cubic shape. The synthesized CuO@C nanocomposites are showed nontoxic on the human erythrocytes and act as a good antibacterial agent on gram negative bacterial strain.

Keywords:

Composites CuO@C Nano-engineered materials Natural carbon RSM

Published In:

Composites Part B: Engineering , 172 , 690-703.