



Characterization of keratin microparticles from feather biomass with potent antioxidant and anticancer activities



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ABSTRACT

In the present study chicken feathers were hydrolyzed by chemical treatment in alkaline conditions. The pH value of feather hydrolyzed solution was amended accordingly the iso-electric precipitation. Two types of keratin microparticles KM1, KM2 were synthesized under acidic conditions at 3.5 and 5.5 pH respectively. The synthesized keratin microparticles possessed uniform and round surface by scanning electron microscopy (SEM). The thermal degradation of microparticles were examined by thermogravimetry (TGA). Fourier transform infrared spectroscopy (FTIR) revealed that the extracted keratin retained the most of protein backbone. The microparticles were screened for their *in vitro* anticancer activities by SRB bioassay towards HeLa, SK-OV-3 and A549 cancer cell lines. Furthermore, their cytotoxicity towards healthy cell lines was analyzed having Malin Darby canine kidney (MDCK) cell lines along with *in vitro* antioxidant activity using DPPH and ABTS methods KM1 and KM2 showed 200.31 ± 1.01 and 139.73 ± 0.94 , 214.16 ± 0.29 and 153.92 ± 0.61 , 328.92 ± 3.46 and 200.33 ± 2.48 $\mu\text{g/mL}$ of IC_{50} levels against HeLa, SK-OV-3, and A549 cell lines, respectively. Moreover, KM1 and KM2 demonstrated significant antioxidant potency with IC_{50} levels 13.15 and 9.02 $\mu\text{g/mL}$ as well as 8.96 and 5.60 $\mu\text{g/mL}$ in DPPH and ABTS radical scavenging bioassay, respectively.

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