



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



Swati Sharma<sup>a</sup>, Arun Gupta<sup>a,\*</sup>, Syed Mohd S.T. Chik<sup>a</sup>, Chua Geek Kee<sup>a</sup>,  
Bhupendra M. Mistry<sup>b</sup>, Doo H. Kim<sup>c</sup>, Gaurav Sharma<sup>d</sup>

<sup>a</sup> Faculty of Chemical Engineering and Natural Resources, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Pahang, Malaysia

<sup>b</sup> Department of Food Science and Biotechnology, Dongguk University-Seoul, Ilsandong-gu, Goyang-si, Gyeonggi-do 410-820, Republic of Korea

<sup>c</sup> Department of Bioresources and Food Science, College of Life and Environmental Sciences, Konkuk University, Seoul, Republic of Korea

<sup>d</sup> School of Chemistry, Shoolini University, Solan 173212, Himachal Pradesh, India

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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  $200.31 \pm 1.01$  and  $139.73 \pm 0.94$ ,  $214.16 \pm 0.29$  and  $153.92 \pm 0.61$ ,  $328.92 \pm 3.46$  and  $200.33 \pm 2.48$   $\mu\text{g/mL}$  of  $\text{IC}_{50}$  levels against HeLa, SK-OV-3, and A549 cell lines, respectively. Moreover, KM1 and KM2 demonstrated significant antioxidant potency with  $\text{IC}_{50}$  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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\* Corresponding author.

E-mail address: [arungupta10@gmail.com](mailto:arungupta10@gmail.com) (A. Gupta).