ABSTRACT

In this present research *Livistona chinensis* leaf extracts were utilized as reductant to bio-fabricate LC-AgNPs followed by the evaluation of their antioxidant, antibacterial and anticancer potential. Multiple parameters were optimized for formation and constancy of LC-AgNPs. Color shift of the reaction mixture from yellow to dark brown confirmed the LC-AgNPs formation. UV/VIS spectroscopy exhibited surface plasmon resonance (SPR) band at 440 nm. Fourier transform infrared (FTIR) spectroscopy spectrum depicted phytochemicals in plant extract acting as bio-reducer for LC-AgNPs synthesis. XRD pattern confirmed the presence of LC-AgNPs by showing peaks corresponding to 2θ angle at 8.24° (111), 38.16° (200), 44.20° (220), and 64.72° (311). Metallurgical microscopy showed morphology and phase as well as composition analysis of LC-AgNPs at 5, 10 and 20X resolutions. Irregular shape of LC-AgNPs with a mean average of 38.46 ±0.26 nm was found by scanning electron microscopy. Zetasizer showed the zeta potential and size distribution by intensity of LC-AgNPs with mean value of -22.3 mV and 255.7 d. nm, respectively. Furthermore, antioxidant potential of LC-AgNPs was examined by DPPH and ABTS assay and was calculated higher in LC-AgNPs than leaf extracts. Antibacterial activity of LC-AgNPs was investigated against *Escherichia coli, Pseudomonas aeruginosa, Bacillus subtilis* and *Staphylococcus aureus* and maximum potential was observed after 20 and 24 h against *P. aeruginosa*. Moreover, LC-AgNPs exhibited maximum anticancer potential against TPC1 and 8505C cell lines compared to plant extract and free AgNPs. The findings suggested that LC-AgNPs could be practiced as antioxidant, antibacterial and anticancer agents for the cure of free-radical oriented, bacterial and oncogenic diseases.