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Synthesis and characterization of silver nanobactericides produced by *Aneurinibacillus migulanus* 141, a novel endophyte inhabiting *Mimosa pudica* L.

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Abstract Use of nano-size particles against pathogenic bacteria is a rapidly growing area due to their unique physico-chemical properties. The present investigation reports the synthesis of silver nanobactericides by *Aneurinibacillus migulanus*, a novel endophyte isolated from surface sterilized inner leaf segment of *Mimosa pudica* L. and cultured at large scale to separate cell free extract which was treated with metal salt silver nitrate to synthesize silver nanobactericides. The synthesized nanobactericides were subjected to biophysical characterization using UV–visible spectra with characteristic absorption peaks between 350 and 550 nm. The role of biomolecules mediating the synthesis and stabilizing the nanobactericides was studied with Fourier transform infrared spectroscopy (FTIR) and proton nuclear magnetic resonance (¹H NMR), which suggested the presence of carbonyl, aromatic, amino and secondary aliphatic groups bound to surface of nanobactericides. Bragg's peaks with different intensities exhibited the standard diffraction pattern of the silver plane, corresponding to the crystalline nature of the nanobactericides. The energy dispersive X-ray spectroscopy (EDS) analysis revealed presence of high intense absorption peak at 3 keV is a typical characteristic of nano-crystalline silver which confirmed the presence of elemental silver. Transmission electron microscopy (TEM) showed polydispersity of nanobactericides with size

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