

Abstract

Novel approaches are obligatory to treat chronic intracellular bacterial infectious diseases like Brucellosis specifically, are very complicated to deal with. The aim of the study to take upon nanotechnology approach to exploit the efficacy of the synthesized nanoparticles, to overcome barriers for treatment of *Brucella* species and other pathogens. Present study used *Rivina humilis* extract as reductant of silver ions for synthesis of silver nanoparticles for the first time. Rh-AgNP's was characterized by UV-visible spectroscopy, DLS, FT-IR, SEM, EDS, TEM and XRD. Radical scavenging, antibrucellosis, bactericidal activity was evaluated. Clinical application was assessed by Rate of haemolysis, fibrinolytic and Hemagglutination activity. UV-visible spectrum of synthesized Rh-AgNP's showed maximum peak at 440 nm indicating the formation of nanoparticles. TEM showed that the average particle size of nanoparticles 51 nm with spherical shape, DLS depicted monodisperse state in water; EDS confirmed the presence of silver metal. Rh-AgNP's exhibited potential antibrucellosis activity against *B. abortus*, *B. melitensis* and *B. suis* effective inhibition at 800 µg/mL. The bio-compatibility of Rh-AgNP's was established by rate of haemolysis, hemagglutination and fibrinolytic activity. For the first time it has been proved that Rh-AgNP's have efficacy as antimicrobial agent with potential application in the biological domain.