## Abstract

The present study was conducted to evaluate the biopesticidal and antibacterial potential of sericin (reducing/stabilizing/capping agent) based Silver nanoparticles (Se-AgNPs). Se-AgNPs were synthesized using heat, sonication and natural light and characterized using particle size analyzer, UV spectrometry, SEM, EDX and FTIR. Size of sonication assisted SE-AgNPs was found to be smallest (7.49nm) followed by heat assisted (53.6nm) and natural light assisted NPs (78.60nm). Being smallest in size, sonication assisted Se-AgNPs revealed the highest biopesticidal activity against 4$^{th}$ instar lab and field/resistant larvae of *Ae. Aegypti.* Findings of biochemical assays (esterase & glutathione-S transferase) showed the presence of resistance in field strain while results of acetylcholine esterase unveiled the possible mode of action of Se-AgNPs. Similarly, sonication assisted Se-AgNPs exhibited the unparalleled antibacterial results against ten bacterial pathogens as compared to heat and natural light assisted Se-AgNPs. However, concentration based antibacterial bioassay expressed the significant bactericidal activity at lower concentration of Se-AgNPs. Moreover, statistically significant antibacterial activities were observed for the Se-AgNPs prepared at neutral (7) and basic (12) pH while the different temperature (5, 37 & 60°C) assisted Se-AgNPs showed non-significant results. Above mentioned findings of the study suggests the sonication as the best method for synthesis of Se-AgNPs while the biopesticidal and antibacterial potentials are inversely proportional to the size of Se-AgNPs i.e. smallest the size, highest the activities.