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Extracellular synthesis of silver nanoparticles by novel *Pseudomonas veronii* AS41G inhabiting *Annona squamosa* L. and their bactericidal activity

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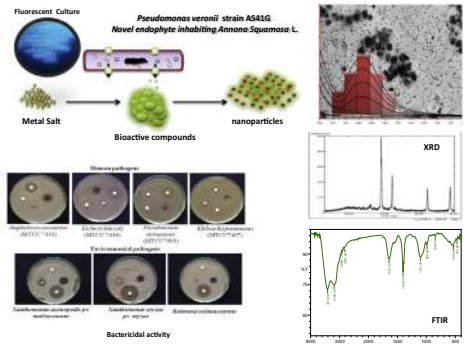
HIGHLIGHTS

- First report of *Pseudomonas veronii* AS 41G as an endophyte.
- First report of *Pseudomonas veronii* AS 41G for synthesis of silver nanoparticles.
- Biosynthesized silver nanoparticles bactericidal activity.
- Emerging role of endophyte for the synthesis of nanoparticles.

GRAPHICAL ABSTRACT



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ABSTRACT

In present investigation extracellular synthesis of silver nanoparticles were synthesized using cell free supernatant of *Pseudomonas veronii* AS41G isolated from *Annona squamosa* L. The bacterium significantly reduced silver nitrate to generate silver nanoparticles which was characterized with hyphenated techniques. Synthesis of silver nanoparticles preliminary confirmed by UV–Visible spectrophotometry with the intense peak at 410 nm, Further FTIR analysis revealed the possible role of biomolecules in the supernatant responsible for mediating the nanoparticles formation. The XRD spectra exhibited the characteristic Bragg peaks of 100, 111, 200, and 220 facets of the face centred cubic symmetry of nanoparticles suggesting that these nanoparticles were crystalline in nature. TEM microgram showed polydispersity of nanoparticles with size ranging from 5 to 50 nm. Synthesized silver nanoparticles showed antibacterial activity against human and environmental pathogens including MRSA. The study enlightens the role of biosynthesized silver nanoparticles as an emerging alternative for drug resistant microorganisms. The obtained results are promising enough to pave the environmentally benign nanoparticle synthesis processes without use of any toxic chemicals and also envision the emerging role of endophytes towards synthesis of nanoparticles. With scanty reports available on *P. veronii* species, a new role has been reported in this study which will be very valuable for future researchers working on it.

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