

Antimicrobial potential of *Argemone mexicana* L. derived Chelerythrine and its copper and silver nanoconjugates

Tanmay S. Bachhav^a, Satish V. Patil^a, Bhavana V. Mohite^b, Sunil H. Koli^c,
Vikas S. Patil^d and Abdel Rahman Tawaha^e

^aSchool of Life Sciences, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon, Maharashtra, India; ^bDepartment of Microbiology, Bajaj College of Science, Wardha, Maharashtra, India; ^cDepartment of Microbiology, Yashwantrao Chavan College of Science, Karad, Maharashtra, India; ^dUniversity Institute of Chemical Technology, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon, Maharashtra, India; ^eDepartment of Biological Sciences, Al-Hussein bin Talal University, Maan, Jordan

ABSTRACT

The antimicrobial and anti-acanthamoebal activity of chelerythrine isolated from *Argemone mexicana* L. (Papaveraceae), along with its synthesised silver (AgNPs) and copper nanoparticles (CuNPs) was evaluated. Chelerythrine was purified by chromatographic methods and identified using spectrophotometric analysis and structurally characterised using ¹H and ¹³C NMR. Purified chelerythrine and its nanoconjugates showed significant antimicrobial activity against bacteria, fungi and amoebae. Chelerythrine showed a zone of inhibition ranging from 8 to 12 mm against tested bacteria and fungi, with the MIC in the range of 150–250 mg/L for bacterial strains. The biosynthesised AgNPs and CuNPs showed enhanced antimicrobial potential with the zone of inhibition in the range of 14 to 16 and 14 to 15 mm, respectively with MIC in the range of 62.5–31.25 mg/L with MBC concentration range 62.5–>500 mg/L. Moreover, significant reduction of LC₅₀ values by 53.39 to 58.34% against *Acanthamoeba* was determined. These results indicate that chelerythrine has potential antimicrobial and anti-acanthamoebal activity along with nanoconjugate formulation for enhance bioactivities which suggest effectiveness in the antimicrobial drug development.

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