

## The Comparative Study of Antimicrobial Effects of Semi Purified Cyclotides from Iranian *Viola Odorata* with Commercial Antibiotics Against *E.coli*

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**Background & Objectives:** The cyclotides are mini proteins that are synthesized via the ribosomal pathway. They have a structural motif that has been named a Cyclic Cystine Knot (CCK). The motif is responsible for their remarkable thermal, chemical and enzymatic stability. The cyclotides have a variety of biological activities such as antimicrobial, anti-tumor, anti-HIV activity and etc. Because of their various bioactivities and their unique stability, they are suitable candidate in drug design applications. The main aim of this study was to determine new antimicrobial agents which can use instead of chemical antibiotics. In this reason, we compared antimicrobial effects of cyclotides with commercial antibiotics such as Gentamicin, Penicillin G, Amikacin, and Piperacillin.

**Methods:** In the current study, the cyclotides have been isolated from the Iranian plant *Viola odorata* by fractionation and solid phase extraction Methods and were semi purified on a SPE-C18 column chromatography. Antimicrobial activities of cyclotides were examined against *E.coli* ATCC25922, human pathogenic bacteria, by radial diffusion assays (RDAs), minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC).

**Results:** The results and statistical analysis show that the antimicrobial effects of cyclotides are as potent as antimicrobial effects of gentamicin and are more than antimicrobial effects of penicillin G.

**Conclusion:** Because of the broad spectrum of antimicrobial activity of Gentamicin that include gram negative and positive bacteria, cyclotides seem to be able to replace with it.

**Keywords:** New Antimicrobial Agents; Cyclotides; *Viola odorata*; *E.coli*; Chemical Antibiotics