

Original Paper

# Effect of methanolic extract of *Nasturtium officinale* on growth and biofilm formation of *Pseudomonas aeruginosa*

Aryan Omidi (M.Sc), Asghar Sharifi (Ph.D)\*<sup>2</sup>

<sup>1</sup>M.Sc in Microbiology, Young Researchers and Elite Club, Yasooj Branch, Islamic Azad University, Yasooj, Iran.

<sup>2</sup>Associate Professor, Cellular and Molecular Research Center, Yasuj University of Medical Sciences, Yasuj, Iran.

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## Abstract

**Background and Objective:** Biofilms caused by pathogenic microorganisms that plays an important role against human health. Due to their resistance to detergents and antimicrobial agent, treatment response of affected patients with these bacteria is difficult. This study was done to evaluate the effect of methanol extract of *Nasturtium officinale* plant on growth and biofilm formation of *Pseudomonas aeruginosa*.

**Methods:** In this descriptive - laboratory study, the extraction was done by Maceration in 80% methanol and by rotary evaporator. The minimum inhibitory concentration (MIC) of *Nasturtium officinale* extracts were determined by broth microdilution method. Biofilm formation was investigated using the microtiter plate and stained with crystal violet.

**Results:** The minimum inhibitory concentration of *Nasturtium officinale* against *Pseudomonas aeruginosa* was 0.625 mg/ml and the Minimum bactericidal concentration of this extract was 1.25 mg/ml. PAO1 strain and 5 clinical strains were able to biofilm formation. Inhibition of biofilm formation by extract of *Nasturtium officinale* plant was dependent to concentration. The highest percentage of inhibition of biofilm formation was in the concentration of 7.5 mg/ml and the lowest percentage of inhibition of biofilm formation was in the concentration of 0.11 mg/ml. The mean of *Pseudomonas aeruginosa* biofilm inhibition by *Nasturtium officinale* extracts was  $72.69 \pm 22.27$  %. In the concentrations of 7.5, 0.93, 0.46, 0.23 and 0.11 mg/ml, there was a significant difference between clinical strains and PAO1 strain ( $P < 0.05$ ).

**Conclusion:** Methanolic extracts of *Nasturtium officinale* plant has anti-bacterial and anti-biofilm effect against *Pseudomonas aeruginosa*.

**Keywords:** *Nasturtium officinale*, *Pseudomonas aeruginosa*, Biofilm, MIC

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\* Corresponding Author: Sharifi A (Ph.D), E-mail: [asgharsharifi@yahoo.com](mailto:asgharsharifi@yahoo.com)

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Aryan Omidi (<https://orcid.org/0000-0002-6824-3776>), Asghar Sharifi (<https://orcid.org/0000-0001-7856-0313>)