

# Investigation of Aloe Vera gel and biofilm effect on methicillin-resistant *Staphylococcus aureus* isolates

Hannaneh Mahboob Rabbani\*,

**Title Abstract:** Investigation of Aloe Vera gel and biofilm effect on methicillin-resistant *Staphylococcus aureus* isolates **Background and Purpose:** *Staphylococcus aureus* is a potentially pathogenic agent and often produces asymptomatic diseases. Patients with methicillin-resistant hospitals are dangerous pathogens that are often resistant to commonly used antibiotics and can challenge patient-specific therapies. Medicinal plants are rich in antimicrobial properties, so they can be used to delay or inhibit the growth of pathogenic microorganisms. The aim of this study was to determine the strains of methicillin-resistant *Staphylococcus aureus* bacteria clinical and standard isolates and to investigate the antimicrobial and anti-biofilm effects of gel and aqueous extract of Aloe Vera leaves on this bacterium. **methods:** In this experimental study, a standard strain strain and 20 clinical strains were isolated pus, ulcers, blood and urine infections. Methicillin-resistant strains were studied in these isolates using disk diffusion method. Antibacterial and anti-biofilm effect of gel and aqueous extract of Aloe Vera leaf were investigated by disc diffusion method and microplate of 96 houses, minimum inhibitory concentration (MIC) and minimum microbial concentration (MBC) by micro dilution method. **findings:** Of the 20 clinical and standard strains Seven strains were methicillin resistant. In order to investigate the antibacterial effect of the gel and aqueous extract of the two-sided Aloe vera strain 57 and 6 on the diffusion of a gel disk and aqueous extract, they exhibited a good inhibition pattern and showed good antimicrobial properties. The highest non-growth halo showed the aqueous extract of Aloe Vera leaves in a clinical strain of 23 years. Also, the minimum concentration of germicidal bacteria for gel and aqueous extract of Aloe Vera leaves is between 250-500 and 500-500 milligrams per ml, respectively. In the case of anti-biofilm effect, the effect of different concentrations of gel and aloe vera extract on biofilm formation of 3 clinical isolates (3 strains

resistant to methicillin) and standard strain of Staphylococcus aureus were investigated. The results of this study showed that none of the strains had the ability to form biofilms at SubMIC concentration, and the optical absorption of all strains after treatment with the extract was greatly reduced, indicating that the bacterial cells had the ability to form biofilms. Thereby reducing the ability to connect to the floor, their optical absorption has decreased. Conclusion: The findings of this study showed that gel and extract of aloe vera against resistant bacteria have antimicrobial properties and can be used as a method to treat Staphylococcus aureus infections caused by Staphylococcus aureus.

**Keywords :** Staphylococcus aureus, anti-biofilm, fecundity, methacillin

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