عنوان مقاله:

Antibacterial Effects of Spirulina Blue-Green Algae Aqueous and Alcoholic Extracts on Pseudomonas aeruginosa

محل انتشار:

مجله میکروبیولوژی پزشکی و بیماریهای عفونی, دوره 11, شماره 2 (سال: 1402)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

Introduction: Pseudomonas aeruginosa, a Gram-negative bacterium, is the cause of infections in immunocompromised individuals, resulting in various conditions, including pneumonia, and urinary tract, skin, and bloodstream infections. This pathogen produces tissue-destructing toxins, leading to significant morbidity and mortality in affected patients. Conventional antibiotics, including rifampicin and colistin, are often ineffective in treating P. aeruginosa infections due to the emergence of bacterial resistance within affected communities. Alternatively, algae have been explored as a promising source for controlling pathogenic bacteria. In this study, we investigated the antibacterial effects of ethanol and aqueous extracts of Spirulina platensis against P. aeruginosa. Methods: Ethanol and aqueous extracts of S. platensis were prepared at concentrations of ۰.۱۲۵, ۰.۲۵, ۰.۵, and ۱ mg/mL. The antibacterial effect of Spirulina blue-green algae against P. aeruginosa was conducted using a disc diffusion test in an LB medium with ۷-mm wells. We measured the inhibition zone and statistically analyzed the data by comparing the means using the Duncan multiple range test. Results: The ethanol extract of S. platensis significantly inhibited the growth of P. aeruginosa. Furthermore, applying the ethanol extract of S. platensis at a concentration of ۱ mg/mL resulted in the largest inhibition zone (۲۰ mm) compared to the control. In contrast, the S. platensis aqueous extract did not significantly inhibit P. aeruginosa growth. Conclusions: The ethanol extracts of S. platensis algae exhibited a significant antibacterial effect against P. aeruginosa. This alga represents a promising source of antibacterial metabolites, which could be a suitable alternative to common antibiotics. Further investigations are necessary to identify and purify the specific antibacterial substance in S. platensis.

کلمات کلیدی:

Disk diffusion test, Ethanol extraction, Pseudomonas aeruginosa, Secondary metabolites