

PHYTOCHEMICAL SCREENING AND ANTIBACTERIAL ACTIVITY OF *Nigella sativa* L. AND *Cuminum cyminum* (IRUSEERAGAM)

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Abstract

Iruseeragam is a compound drug consisting of *Nigella sativa* L. and *Cuminum cyminum* L. Microbial infections and antibiotic resistance pose significant global health challenges, necessitating the discovery of novel effective, and affordable antimicrobial agents. This study aims to screen the preliminary phytochemicals and antibacterial activity and determine the minimum inhibitory concentration (MIC) of *N. sativa* and *C. cyminum*. Aqueous and methanolic extracts of both plants were screened for phytochemicals and antibacterial activity against *Staphylococcus aureus* (NCTC 6571) and *Pseudomonas aeruginosa* (NCTC 10662) using an agar cut well diffusion method and MIC was determined using an agar dilution method. Alkaloids, tannins, flavonoids, and saponins are present in both extracts of both plants. Additionally, terpenoids are found in both extracts of *C. cyminum* and glycoside is in the methanolic extract. The antibacterial activity revealed that both extracts of both plants showed antibacterial activity against *S. aureus* (Gram-positive) and *P. aeruginosa* (Gram-negative). The mean diameter of zone of inhibition (ZOI) of aqueous extract of *N. sativa* and *C. cyminum* was 13.67 ± 0.58 and 12.67 ± 0.58 mm for *S. aureus* and 14.67 ± 0.58 and 15.67 ± 0.58 mm for *P. aeruginosa* respectively while methanolic extract of *N. sativa* and *C. cyminum* showed inhibitory activity against *S. aureus* 14.67 ± 0.76 and 16.67 ± 0.58 mm and *P. aeruginosa* 18.50 ± 0.50 and 17.67 ± 0.58 mm respectively. The MIC of methanolic extract of *N. sativa* was 2.5 mg/mL for *S. aureus* and 5 mg/mL for *P. aeruginosa* whereas MIC of methanolic extract *C. cyminum* was 5 mg/mL for both *S. aureus* and *P. aeruginosa*. Moreover, the presence of tannins, saponins, and flavonoids in these plants plays a crucial role in their antibacterial activity. These findings suggest that iruseeragam could be a potential source of novel antimicrobial agents. Further studies are needed to identify and characterize the bioactive compounds responsible for the antibacterial activity in individual plants and compound drug.

Keywords: Antibacterial activity, *C. cyminum*, Minimum inhibitory concentration, *N. sativa*

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