

**BOOSTING PENICILLIN ACTIVITY USING *Coriandrum sativum*
SEED EXTRACTS AGAINST METHICILLIN-RESISTANT
*Staphylococcus aureus***

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The rise of antibiotic resistance, particularly among methicillin-resistant *Staphylococcus aureus* (MRSA), underscores the urgent need for novel strategies to enhance antibiotic efficacy. *Coriandrum sativum* L. is an aromatic herbaceous plant with traditional medicinal uses. This study investigated the ability of *C. sativum* seed extracts to boost penicillin activity against MRSA. The primary objective was to evaluate the antibacterial activity of crude seed extracts of *C. sativum* against pathogenic bacteria and compare their effectiveness alone and in combination with penicillin against MRSA. Dried *C. sativum* seeds were sequentially extracted with hexane, dichloromethane, ethyl acetate, methanol, and water using a Soxhlet apparatus, and their antibacterial activity was determined using the disk diffusion method. Ciprofloxacin (2 mg/mL) and DMSO were used as positive and negative controls, respectively. The interaction between seed extracts and penicillin was tested using MRSA as the model organism. Results showed that hexane, dichloromethane, ethyl acetate, and methanol extracts significantly inhibited the growth of *Staphylococcus aureus* (ATCC 25923), MRSA (clinical isolate) and *Escherichia coli* (ATCC 25922), with inhibition zone diameters (IZD) exceeding 10 mm, while the aqueous extract showed limited activity (IZD > 23 mm), inhibiting only *E. coli*. None of the extracts was effective against *Pseudomonas aeruginosa* (ATCC 27853). Ciprofloxacin inhibited all the tested organisms, showing an IZD >32 mm, while DMSO was inactive against all the tested organisms. Notably, combining half and one-fourth the concentration of penicillin's minimum inhibitory concentration (MIC) with ethyl acetate extract of *C. sativum* also at half MIC demonstrated enhanced inhibition of MRSA (IZD > 7 mm). This interaction suggests that *C. sativum* extracts can potentiate penicillin's efficacy as a promising strategy to counteract antibiotic resistance. The study concludes that seed extracts of *C. sativum* possess notable antibacterial activity and can be used to enhance the efficacy of penicillin against MRSA. Further research should focus on isolating and characterizing the active phytochemicals in *C. sativum*, investigating their interactions with other antibiotics to develop formulations to incorporate *C. sativum* extracts into clinical applications.

Keywords: Antibacterial resistance, *Coriandrum sativum*, Drug interaction, MRSA