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Allicin Against Infection: Evaluating Garlic's Role in UTI Prevention and Treatment

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Abstract: *Urinary tract infections (UTIs) are among the most common microbial diseases worldwide, especially in women. The increasing occurrence of antibiotic-resistant bacteria such as Escherichia coli, Proteus mirabilis, and Klebsiella pneumoniae has made treatment more complicated and created a need to explore natural therapeutic alternatives. Garlic (Allium sativum), a traditional medicinal plant, has been recognized for centuries for its strong antibacterial and healing properties. The major active compound in garlic, allicin, is a sulphur containing molecule that exhibits antibacterial, antifungal, and antiviral effects. Allicin works by inhibiting bacterial enzyme activity, damaging the cell membrane, and inducing oxidative stress, all of which contribute to the destruction of microbial cells. Several in vitro studies have confirmed that garlic extract effectively inhibits major UTI-causing bacteria, even those resistant to conventional antibiotics. Additionally, garlic prevents bacterial adhesion to bladder epithelial cells and inhibits biofilm formation, which helps reduce the recurrence of infections. Moreover, when garlic is used in combination with traditional antibiotics; it enhances their antibacterial effects and reduces the required dosage. Because of its natural origin, safety, affordability, and easy availability, garlic is considered a promising natural alternative for the prevention and treatment of urinary tract infections. Further research, especially clinical studies, is needed to determine the standardized dosage, formulations, and long-term safety of garlic-based therapies. The inclusion of garlic in modern medical treatment could provide an effective and sustainable strategy to combat urinary tract infections and antibiotic resistance*

Keywords: Allicin, Garlic (Allium sativum), Urinary Tract Infection (UTI), Antimicrobial activity, Biofilm inhibition, Antibiotic resistance

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