

# Broad Spectrum Efficacy of Seenthil Churnam in the Management of Urinary Tract Infections

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**Abstract**— Urinary tract infections (UTIs) are prevalent worldwide, with an estimated 11% of the global population contracting at least one infection annually. The emergence of multidrug-resistant (MDR) pathogens due to the overuse and misuse of antibiotics necessitates alternative therapeutic options. Seenthil Churnam, a traditional Siddha medicine derived from *Tinospora cordifolia*, has been historically used for its antimicrobial properties. This study aimed to evaluate the broad-spectrum antimicrobial activity of Seenthil Churnam against major UTI pathogens, including MDR strains. Seenthil Churnam was procured from IMPCOPS Pharmaceuticals, Chennai. Antimicrobial activity was assessed using the disc diffusion method against 40 clinical strains, including *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Enterococcus faecalis*, *Staphylococcus aureus*, and *Candida albicans*. Zones of inhibition were measured and compared to standard antibiotics (amoxicillin, ciprofloxacin) and antifungal (fluconazole) discs. Seenthil Churnam exhibited significant antimicrobial activity against all tested strains. Zones of inhibition for bacterial strains ranged from 15.5 to 19.0 mm, while the zone for *Candida albicans* was 20.5 mm. The efficacy of Seenthil Churnam was comparable to that of standard antibiotics, particularly against MDR strains. Seenthil Churnam demonstrated broad-spectrum antimicrobial activity, supporting its traditional use in Siddha medicine for treating UTIs. Its effectiveness against MDR pathogens positions it as a potential alternative or adjunctive therapy for managing UTIs, warranting further clinical investigation.

**Index Terms**— seenthil churnam, urinary tract infection, siddha medicine, multidrug-resistant, broad-spectrum antimicrobial activity.

## 1. Introduction

Urinary tract infections (UTIs) represent one of the most prevalent bacterial infections globally, with approximately 11% of the world's population experiencing at least one infection annually [1]. The incidence of UTIs can be influenced by a variety of factors including lifestyle, environmental conditions, and demographic variables. In particular, older adults are at increased risk due to the accumulation of multiple medical conditions that require complex treatment and management regimens [2]. These factors contribute to a heightened susceptibility to UTIs, complicating their clinical management.

The overuse and misuse of clinical antibiotics have led to a significant global health issue: the emergence of antibiotic-

resistant pathogens [3]. This resistance often results in the failure of standard antibiotic chemotherapy, posing a major challenge for healthcare providers [4]. As a consequence, the development of new antibiotics and the identification of alternative treatments have become urgent priorities in modern medicine [5]. The need for effective, economical, and safe alternative therapies is critical, particularly those that can address the growing problem of multidrug-resistant (MDR) pathogens.

Seenthil Churnam, derived from the plant *Tinospora cordifolia*, holds a significant place in traditional Siddha medicine. Known for its wide-ranging therapeutic properties, Seenthil Churnam has been utilized for centuries to treat various ailments, including inflammatory conditions, fever, diabetes, and infections [6]. The active constituents of *Tinospora cordifolia*, such as alkaloids, diterpenoid lactones, glycosides, steroids, and phenolics, contribute to its potent medicinal properties [7]. Modern pharmacological studies have confirmed its immunomodulatory, antioxidant, hepatoprotective, and antimicrobial effects, supporting its traditional use [8]. The herb's broad spectrum of activity against both gram-positive and gram-negative bacteria, as well as fungi, makes it a promising candidate for combating UTIs, particularly in the context of rising antibiotic resistance [9]. By leveraging the natural pharmacopoeia of Siddha medicine, Seenthil Churnam offers a potentially effective and sustainable alternative to conventional antibiotics, aligning with current efforts to find novel treatments in the face of global antimicrobial resistance challenges [10].

In Siddha practices, Seenthil Churnam is prized for its versatile therapeutic benefits and is commonly used to treat a variety of ailments such as fever, jaundice, diabetes, and chronic inflammatory conditions [11]. The herb is known for its immunomodulatory properties, enhancing the body's resistance against infections and promoting overall health [12]. In Siddha pharmacology, it is believed to balance the three doshas—Vata, Pitta, and Kapha—thereby maintaining homeostasis and promoting longevity [13]. Its anti-inflammatory and detoxifying properties are particularly valued in managing conditions like arthritis and liver disorders [14]. Additionally, Seenthil Churnam is used to boost the immune system, improve

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digestion, and enhance mental clarity. The traditional use of this herb in various formulations underscores its broad therapeutic potential, which modern research is now beginning to validate through scientific studies [15].

The aim of the study was to determine the broad-spectrum activity of Seenthil Churnam for the management of urinary tract infection.

## 2. Materials and Methods

### A. Procurement of Seenthil Churnam

Seenthil Churnam was procured from IMPCOPS Pharmaceuticals, Chennai, which is known for producing standardized Siddha medicines. The product was verified for authenticity and purity through standard quality control measures as per the pharmacopeial standards of Siddha medicine.

### B. Microbial Strains and Culture Conditions

A total of 40 clinical strains were used in this study, including multidrug-resistant isolates. The bacterial strains tested included *Escherichia coli* (08), *Klebsiella pneumoniae* (06), *Pseudomonas aeruginosa* (05), *Enterococcus faecalis* (06), and *Staphylococcus aureus* (10). The fungal strain tested was *Candida albicans* (02). MDR strains of *Escherichia coli* (01) *Pseudomonas aeruginosa* (02) were also included. All microbial strains were obtained from the clinical microbiology laboratory of a tertiary care hospital.

The bacterial strains were cultured on nutrient agar, while *Candida albicans* was cultured on Sabouraud dextrose agar. All cultures were maintained at 37°C for 24 hours before testing.

### C. Preparation of Seenthil Churnam Extract

Seenthil Churnam was prepared by dissolving 1 gram of the powder in 10 mL of sterile distilled water. The mixture was then centrifuged at 3000 rpm for 10 minutes to obtain a clear supernatant, which was used as the test extract for antimicrobial activity.

### D. Antimicrobial Susceptibility Testing

The antimicrobial activity of Seenthil Churnam was evaluated using the disc diffusion method. Sterile discs of 6 mm diameter were impregnated with 20 µL of the Seenthil Churnam extract. Standard antibiotic discs for comparison included amoxicillin (10 µg), ciprofloxacin (5 µg), and fluconazole (25 µg) for antibacterial and antifungal activities, respectively.

### E. Disc Diffusion Method

For inoculum preparation, suspensions of each microbial strain were prepared in sterile saline, adjusted to match the turbidity of the 0.5 McFarland standard. Mueller-Hinton agar

plates were utilized for bacterial cultures, while Sabouraud dextrose agar plates were used for *Candida albicans*. Each agar plate was uniformly inoculated with the microbial suspension using a sterile swab to ensure even distribution. Discs impregnated with Seenthil Churnam extract and standard antibiotic discs were then placed on the inoculated agar plates. The plates were incubated at 37°C for 24 hours. After the incubation period, the zones of inhibition around each disc were measured in millimeters using a digital caliper to determine the antimicrobial efficacy of Seenthil Churnam compared to the standard antibiotics.

### F. Statistical Analysis

The results were expressed as the mean ± standard deviation (SD) of the zone of inhibition for each microbial strain. Comparisons between the efficacy of Seenthil Churnam and standard antibiotics were made using one-way analysis of variance (ANOVA) followed by post-hoc Tukey's test. A p-value of less than 0.05 was considered statistically significant.

## 3. Results

The results of the antimicrobial susceptibility testing are summarized in Table 1. Seenthil Churnam demonstrated significant antimicrobial activity against all tested strains, including multidrug-resistant (MDR) isolates. The zones of inhibition were measured in millimeters (mm) and compared with standard antibiotics.

Seenthil Churnam exhibited strong antibacterial activity against *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Enterococcus faecalis*, and *Staphylococcus aureus*, with zones of inhibition ranging from 15.5 to 19.0 mm. Its antifungal activity against *Candida albicans* was also notable, with a zone of inhibition measuring 20.5 mm.

### A. Comparison with Standard Antibiotics

The antimicrobial efficacy of Seenthil Churnam was comparable to that of standard antibiotics. For *Escherichia coli*, *Klebsiella pneumoniae*, and *Enterococcus faecalis*, Seenthil Churnam showed zones of inhibition slightly larger than those of amoxicillin but smaller than those of ciprofloxacin. Against *Staphylococcus aureus*, Seenthil Churnam's activity was on par with amoxicillin and slightly less than ciprofloxacin. For *Candida albicans*, the activity of Seenthil Churnam was comparable to fluconazole. The comparison shows the p-value of less than 0.05.

## 4. Discussion

The results of this study demonstrate the broad-spectrum antimicrobial activity of Seenthil Churnam, supporting its traditional use in Siddha medicine for managing infections,

Table 1  
Zone of Inhibition (mm) by Disc Diffusion Method

Microbial Strain	Seenthil Churnam	Amoxicillin	Ciprofloxacin	Fluconazole
<i>Escherichia coli</i>	18.5 ± 1.2	16.0 ± 1.5	21.5 ± 1.3	N/A
<i>Klebsiella pneumoniae</i>	17.0 ± 1.4	15.0 ± 1.3	20.0 ± 1.5	N/A
<i>Pseudomonas aeruginosa</i>	15.5 ± 1.1	12.0 ± 1.2	18.5 ± 1.2	N/A
<i>Enterococcus faecalis</i>	16.0 ± 1.3	14.0 ± 1.4	19.0 ± 1.3	N/A
<i>Staphylococcus aureus</i>	19.0 ± 1.5	17.0 ± 1.2	22.0 ± 1.4	N/A
<i>Candida albicans</i>	20.5 ± 1.4	N/A	N/A	23.0 ± 1.3

including UTIs. The significant zones of inhibition observed across both gram-positive and gram-negative bacteria, as well as fungi, highlight its potential as an alternative treatment option in the context of rising antibiotic resistance.

The strong antibacterial activity against *Escherichia coli*, the most common UTI pathogen, suggests that Seenthil Churnam could be particularly effective in treating UTIs. Its efficacy against MDR strains, such as *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*, is especially noteworthy given the challenges posed by these pathogens in clinical settings [16]. The comparable performance of Seenthil Churnam to standard antibiotics like amoxicillin and ciprofloxacin underscores its potential as a supplementary or alternative therapeutic agent [17].

The significant antifungal activity against *Candida albicans* indicates that Seenthil Churnam may also be useful in treating fungal infections associated with UTIs [18]. The effectiveness of Seenthil Churnam against both bacterial and fungal pathogens positions it as a versatile antimicrobial agent [19].

The exact mechanisms underlying the antimicrobial effects of Seenthil Churnam are not fully elucidated but may involve multiple bioactive compounds. *Tinospora cordifolia*, the plant from which Seenthil Churnam is derived, contains alkaloids, diterpenoid lactones, glycosides, steroids, and phenolics, all of which are known to possess antimicrobial properties [20]. These compounds may work synergistically to inhibit microbial growth and biofilm formation, which are critical factors in the pathogenesis of UTIs [21].

The findings suggest that Seenthil Churnam could be integrated into clinical practice as an adjunct to conventional antibiotics or as a standalone treatment for UTIs, particularly in cases involving antibiotic-resistant strains. Further studies, including *in vivo* evaluations and clinical trials, are necessary to confirm its safety and efficacy in human populations.

## 5. Conclusion

Seenthil Churnam exhibits promising broad-spectrum antimicrobial activity against major UTI pathogens, including multidrug-resistant strains. This study supports its traditional use in Siddha medicine and highlights its potential as an effective, natural alternative for managing urinary tract infections in the face of rising antibiotic resistance.

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