

# Antibacterial and Antifungal activity from leaves extract of *Corchorus fascicularis* Lam.

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**Abstract:** Since the beginning of modern drug treatments on various diseases, traditional medicine has greatly played important role in societies. Only limited numbers of medicinal plants have received detailed scientific scrutiny. World Health Organization (WHO) recommends that this area can be comprehensively investigated. The aim of present study is to assess the antimicrobial activity and to determine the zone inhibition of extracts on some bacterial and fungal strains. In the present study, the microbial activity of ethanol, n-Hexane, Chloroform and water extracts of leaves of *Corchorus fascicularis* L. were evaluated for potential antimicrobial activity against medically important bacterial and fungal strains. The antimicrobial activity was determined in all extracts by using agar disc diffusion method. Extracts were good effective on tested microorganisms. The antibacterial and antifungal activities of solvent extracts of *Corchorus fascicularis* L. were tested against one gram positive, one gram negative human pathogenic bacteria and one fungi respectively. All the extracts showed broad spectrum of inhibition by showing antibacterial effect of both bacterial strains. The tested bacterial strains were *S. aureus*, *E. coli* and fungal strains was *C. albicans*. The antimicrobial activity of these extracts due to presence of secondary metabolites. Hence these plants can be used to discover bioactive natural products that may serve as leads in development of new pharmaceuticals research.

**Keywords:** - Antibacterial activity Antifungal activity *Corchorus fascicularis* L.

## Introduction

Antibiotics are one of our most important weapons in fighting bacterial infections. However from past few decades these health benefits are under threat. Many antibiotics become less effective against certain illness not only because many of them produce toxic reactions. In many developing countries, traditional medicine is one of the primary health care system<sup>1, 2</sup>. The development of medicinal plant as medicine is good way. In food producing countries to control growth of bacteria in the product is important. The most common bacteria causing food borne illness are *S. aureus*, *E. coli* and others<sup>3, 4</sup>. Natural products of

higher plants may give new source of antimicrobial agents with novel mechanisms of action<sup>5, 6</sup>.

*Corchorus fascicularis* L. commonly called as Hirankhuri is an annual herb found in throughout India and also many tropical countries. The leaves are tasty and sour. It shows activity of laxative, stimulant, tonic and aphrodisiac. The seeds remove tumors, pain stomach troubles, skin diseases and scabies. It is useful in discharging ulcers<sup>7</sup>. Powder of entire plant is used as tonic to anemic patient<sup>8</sup>. *Corchorus fascicularis* L. shows physiological activity<sup>9</sup>. Preliminary phytochemical study of leaves of *Corchorus fascicularis* L. shows that presence of flavonoids, terpenoids, steroids, phenol & tannins, saponins,

glycosides and alkaloids<sup>10</sup>. In Ayurvedic system of medicines this plant has a large demand due to its uses in the treatment of many chronic and acute diseases and disorders. In continuation of work of phytochemical studies of various plants we are presenting of this paper on *Corchorus fascicularis* L.<sup>11, 12</sup>.

## Material and Methods

### Plant Material Collection and Authentication

The leaves of plant *Corchorus fascicularis* L. were collected from village Tande of Shirpur tehsil in Dhule district (MS). The specimens of plants were authenticated by Dr. L.K. Kshirsagar, Department of Botany, S.S.V.P.S's L. K. Dr. Ghogrey Science College, Dhule (MS). The dried uniform leaves powder was used for the extraction of constituents of the plant, determination of ash values, extractive values and phytochemical investigation.

### Drying and Pulverization

Leaves of *Corchorus fascicularis* L. were shade dried and pulverized and stored in an air tight container for future use.

### Extraction of Powdered leaves

The extraction of *Corchorus fascicularis* L. leaves were carried out using known standard procedures<sup>13</sup>. The powdered leaves were successively extracted by cold maceration process using organic solvents like ethanol, n-hexane, chloroform and water. All the extracts were evaporated to dryness and stored for future use.

### Preliminary Phytochemical Screening

The extracts were subjected to preliminary Phytochemical screening for the presence of different chemical groups of compounds. Air dried powdered plant material were screened for the presence of saponins, tannins, flavonoids, steroids, triterpenoids, proteins, glycosides, carbohydrates as described in literatures<sup>14,15,16</sup>.

### Test Microorganisms and Growth Media

*S. aureus* (NCIM 2079), *E. coli* (NCIM 2169) and fungal strain *C. albicans* (NCIM 3471) were chosen based upon their clinical and pharmacological importance<sup>17</sup>. The bacterial strains obtained from NCIM Pune were used for evaluating antimicrobial activity. The bacterial and fungal stock cultures were incubated for 24 Hrs. at 37 °C on Nutrient Agar and MGYT respectively, following refrigeration storage at 4 °C. The bacterial strains were grown in Muller Hinton agar at 37 °C whereas the yeast were grown in MGYT respectively at 28 °C. The stock cultures were maintained at 4 °C.

### Antimicrobial activity

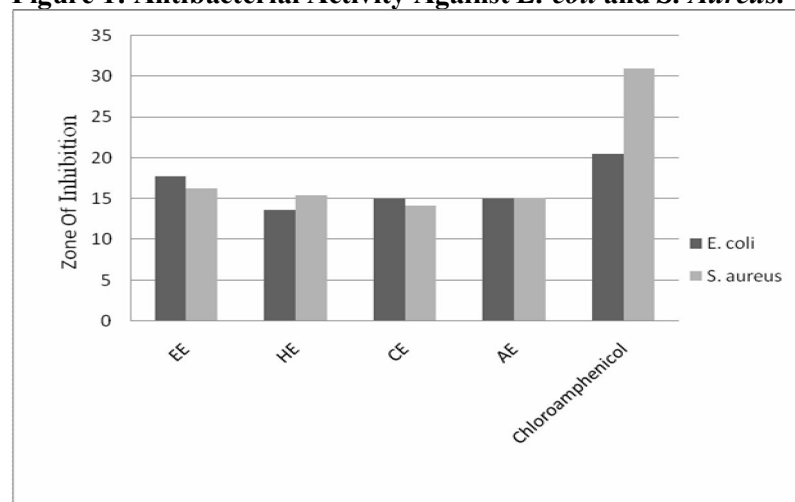
In vitro antibacterial and antifungal activity were examined for ethanol, n-Hexane, chloroform and water extracts. Antibacterial and antifungal activities of these extracts against two pathogenic bacteria and one pathogenic fungi were investigated by the Agar Disk Diffusion method<sup>18, 19, 20</sup>. All the extracts were screened for their antibacterial and antifungal activities against the *S.aureus*, *E. coli* and fungi strain *C. albicans*. The dilutions of *C. fascicularis* L. extracts and standard drugs were prepared in double distilled water using nutrient agar tubes. Muller Hinton sterile agar plates were seeded with bacterial strains ( $1 \times 10^8$  bacteria/ ml) and allowed to stay at 37 °C for 3 hrs. Control experiments were carried out under similar condition by using Chloroamphenicol for antibacterial activity and Nyastatin for antifungal activity as standard drugs. All the plates were incubated at 37°C for 18 to 24 hrs for bacteria and at 28°C for 48 to 96 hrs for fungi. The zones of growth inhibition around the disks were measured after 18 to 24 hrs of incubation at 37°C for bacteria and 48 to 96 h for fungi at 28°C, respectively. The sensitivity of the microorganism species to the plant extracts was determined by measuring the sizes of inhibitory zones (including the diameter of disk) on the agar surface around the disks.

**Table 1: Antibacterial activity of extracts of *C. fascicularis* L. against bacterial test organism.**

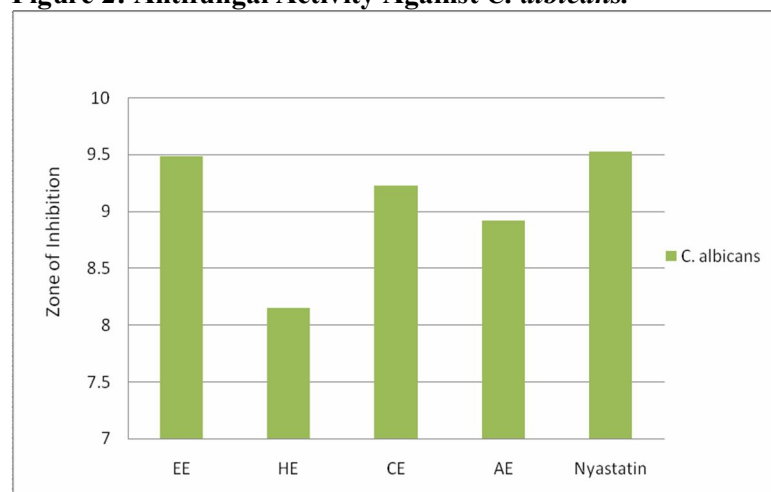
Microorganism	Zone Of Inhibition in mm				
	Concentration in 100 µg/ml				
	Ethanol Extract	n-Hexane Extract	Chloroform Extract	Aqueous Extract	Chloroamphenicol Standard
<i>E. coli</i>	17.76	13.61	15.00	15.01	20.52
<i>S. aureus</i>	16.30	15.41	14.18	15.09	30.94

**Table 2: Antifungal activity of extracts of *C. fascicularis L.* against bacterial test Organism.**

Microorganism	Zone Of Inhibition in mm				Nystatin Standard
	Concentration in 100 µg/ml				
	Ethanol Extract	n-Hexane Extract	Chloroform Extract	Aqueous Extract	
<i>C. albicans</i>	9.80	8.15	9.73	8.92	9.53

**Figure 1: Antibacterial Activity Against *E. coli* and *S. Aureus*.**

(#EE- Ethanol extract, HE- n-Hexane extract, CE- Chloroform extract, AE- Aqueous extract)

**Figure 2: Antifungal Activity Against *C. albicans*.**

(#EE- Ethanol extract, HE- n-Hexane extract, CE- Chloroform extract, AE- Aqueous extract)

## Result and Discussion

The anti microbial activity of all the extracts of *C. fascicularis L.* were studied with concentration 100 µg/ml against two pathogenic bacterial strains and one fungal strain. Antibacterial and antifungal potential of extracts assessed in terms of zone of inhibition of bacterial growth. The results of antimicrobial activities

are presented in Table 1-2. The growth of inhibition zone measured ranged from 15-18 mm for sensitive bacteria and ranged from 08-10 mm for fungal strains. The graphical results are presented in figure 1 and 2. The inhibitory effect of *C. fascicularis L.* leaves ethanol, n-Hexane, chloroform and aqueous extracts showed at 17.76, 13.61, 15.00, 15.01 mm for *E. coli*, 16.30, 15.41, 14.18, 15.09 mm for *S. aureus* and 9.80,

8.15, 9.73, 8.92 for *C. albicans* respectively, The results showed that *C. fascicularis* L. leaves extracts were found to be effective against all the microbes tested.

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