

## ANTIMICROBIAL ACTIVITIES OF *CASSIA ITALICA* (MILL.) SPRENG. AND *PLUCHEA WALLICHIANA* DC.

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### ABSTRACT

Methanolic extract of *Cassia italica* and *Pluchea wallichiana* have shown antimicrobial activity against ten different species of microorganisms.

**Keywords:** Antimicrobial activity, *Cassia italica*, *Pluchea wallichiana*

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### INTRODUCTION

Since time immemorial, indigenous plant materials have been explored, processed and utilized for medicinal purposes. The use of medicinal plants can be traced back to the beginning of mankind. The available historical references show that the art of healing was known to mankind even 5000 years ago. People in China (Ledderhose, 1876) and Egypt (Horton, 1969) were well aware of a large number of poisons and drugs, some of which like opium, aconite and croton are still in use both in modern and traditional system of medicine. The plants contain compounds which have potential to be used in modern medicine for treatment of many diseases. Currently many people in the developed countries have begun to turn to alternative or complementary therapies, including medicine herbs.

*Cassia italica* is one of the most important genera of Caesalpiniaceae. It consists of 600 species mostly distributed in tropic and subtropics. In Pakistan 24 species are found. Most of the species are cultivated in Sindh, Balochistan and Punjab (Ali and Nasir 1977; Baquer, 1889). It is used in indigenous system of medicine for the treatment of constipation, biliousness, gout and ring worm and other parasites of skin disease (Perry and Metzgar, 1980; Krishna and Murhi, 1969).

The *Pluchea wallichiana* belongs to the Family Compositae which is widely distributed in Pakistan. The family composite contains sesquiterpene, chlorogenic acid, lactones, orange yellow pigment, sitosterol glycoside which are known to possess cytotoxic, antitumor and mutagenic properties (Therdore, 1908; Jafri., 1966; Krishna and Murhi, 2003; Jayawera, 1980). Several species have shown antifungal, antibacterial and anti inflammatory activities against number of microorganisms (Perry and Metzgar, 1980; Jayawera, 1980). The plant is traditionally used in the treatment of peptic, Ulcer burns, abdominal pain and bacterial diseases (Mhaskar *et al.*, 2002).

### MATERIALS AND METHOD

The plant material *Cassia italica* and *Pluchea wallichiana* (25kg) of each collected from Karachi region and were identified by plant Taxonomist Prof. Dr. Surriya Khatoon, Department of Botany, University of Karachi. A voucher specimen have been deposited in the Herbarium of the department of Botany university of Karachi

The whole plant material (25kg) was dried under shade; the material was chopped in small pieces and soaked in methanol for two weeks. The combined methanolic extract of each plant was evaporated under reduced pressure at room temperature to obtain the (200g) of each plant concentrated extract.

### ANTIBACTERIAL ASSAY

The antibacterial activity of both plant extracts was determined by agar well diffusion method proposed by (Jaffer *et al.*, 1988), one loop full of 24h- old culture of selected bacteria was spread on the surface of Mueller Hinton agar plates wells were dug in the medium with the help of sterile borer. A stock solution of extract 2mg/ml was prepared in DMSO and dilution of the stock solution containing hundred micro liter of each dilution was added to their respective wells and after 24h-growth inhibition of bacteria was observed.

### RESULT AND DISCUSSION

The extract of *Cassia italica* and *Pluchea wallichiana* was tested against number of organisms (Table 1). It was found to be active against *Bacillus anthracis*, *Coryne bacterium*, *Pseudo diphthericum*, *Salmonella.typhi*, *Shigella*

*dysenteriae*, zone of inhibition also increased with the concentration of the extract. *Aspergillus flavus* was only active against *Pluchea wallichiana*. On the other hand *Alternaria. alternata*, *Curvilaria.lunata*, *Aspergillus niger* and *Shigella somnei* were not active in both plant extracts.

*Cassia italica* and *Pluchea wallichiana* showed significant antibacterial activity and thus they are capable to be used in cure of infectious diseases caused by *Bacillus anthracis*, *Coryne bacterium*, *Pseudo diphthericum*, *Salmonella.typhi* and *Shigella dysenteriae*. The presence of phytochemical constituents, like steroids, terpenoids and flavonoids were likely to be responsible for the observed antimicrobial activity.

The present antibacterial studies were in accordance with the finding of Fransworth (1961).

Table 1. Antimicrobial activity of *Cassia italica* and *Pluchea Wallichiana*.

Name of Organism	Zone of inhibition (mm)									
	<i>Cassia italica</i> Extract					<i>Pluchea wallichiana</i> Extract				
	50	100	150	200	Control DMSO	50	100	150	200	Control DMSO
<i>Bacillus anthracis</i>	+	8	10	12	+	+	6	7	10	+
<i>Coryne bacterium</i>	+	6	8	9	+	+	3	4	7	+
<i>Pseudodiphthericum</i>	+	2	3	6	+	+	2	5	7	+
<i>Alternaria alterata</i>	-	-	-	-	-	-	-	-	-	+
<i>Curvilaria lunata</i>	-	-	-	-	-	-	-	-	-	-
<i>Aspergillus niger</i>	-	-	-	-	-	-	-	-	-	-
<i>Aspergillus flavous</i>	-	-	-	-	-	+	2	3	5	+
<i>Salmonella tyhpi</i>	+	4	7	10	+	+	3	5	7	+
<i>Shigella dysenteriae</i>	+	2	5	8	+	+	4	6	9	+
<i>Shigella somnei</i>	-	-	-	-	-	-	-	-	-	-

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