



Antimicrobial Activity and Phytochemical Analysis of Cassia Glauca Pramod Kumar Singh, Pushkar Pratap Tiwari

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ABSTRACT - This study was performed to evaluate the antimicrobial activity of aerial parts of chloroform extract of *Cassia glauca* L. The chloroform extract of *C. glauca* were shown to possess an antimicrobial activity against two gram positive and two gram negative human pathogenic bacteria, viz. *Bacillus* and *Escherichia coli*. The extract showed antimicrobial activity at all concentrations selected, but only the extract with the concentration of 300 µg/ml showed maximum antimicrobial activity against all the organisms. The comparable with standard control, ketokonazole used. The phytochemical analysis showed the presence of alkaloids, carbohydrates, fixed oils, fats, tannins, gum & mucilage, flavonoids, saponins, terpenoids, lignin and sterols. It is concluded that the antimicrobial activity showed by the plant was due to the presence of these phytochemicals. Further studies are highly needed for future drug development.

Keywords: Mucilage, *Cassia Glauca*, Sterols and Chloroform Extract.

INTRODUCTION

Antibiotics are one of the most important weapons in fighting bacterial infections and have greatly benefited the health-related quality of human life since their introduction. The wide use of antibiotics in the treatment of bacterial infections has led to the emergence and spread of resistant strains (Dogruozet et al., 2008). Increasing development of drug resistance in human pathogens as well as the appearance of side effect of synthetic drugs need to developed new antimicrobial drugs from natural sources. This situation has forced to search new antimicrobial substances in various sources like medicinal plants (Doshi et al., 2011; Tomoko et al., 2000). The medicinal plants are considerably useful and economically essential and it contain rich in a wide variety of secondary metabolites such as tannins, alkaloids and flavonoids, which have been found in vitro to have antimicrobial properties (Khan et al., 2009). The use of plant extract and phytochemical both with known antimicrobial properties are of great significance. In the past few years, a number of investigations have been conducted worldwide to prove antimicrobial activities from medicinal plants. A number of phytotherapy manuals have mentioned various medicinal plants for treating infectious diseases due to their availability, fewer side effects and reduced toxicity.

MATERIALS AND METHODS

Collection and drying of plant materials - Healthy aerial parts of the *C. glauca* (seeds, leaves) were collected from local area adjacent to sultanpur district. collected seed and leave authenticated by national

plant survey of botanical science at Allahabad. The seed and leaves was washed thoroughly three times with purified water and once with distilled water. The plant materials were air shade dried and then powdered using electric blender to get a coarse powder. The powdered samples were kept in sealed containers for extraction purposes.

Antimicrobial Screening- The antimicrobial activity of the *C. glauca* extracts was determined by using disc diffusion method. Two gram positive bacteria and two gram negative bacteria were used for this study. The organisms were sub-cultured on Mueller Hinton Agar medium, incubated at 37 °C for 24 h and stored at 4°C in the refrigerator to maintain stock culture. Petri plates were prepared with 20 ml of sterile Mueller Hinton Agar (MHA) (HIMEDIA, Mumbai, India). The test cultures were swabbed on the top of the solidified media and allowed to dry for 10 min. the tests were conducted at three different concentrations at 80,100 and 1500 µg/ml respectively of the crude extract. The loaded discs were placed on the surface of the medium and left for 30 min at room temperature for compound diffusion. Negative control was prepared using respective solvent.

Table 1: Phytochemical investigation of Aerial parts of the *C. glauca*

Sl.	Constituents	Pet. Ether	Chloro-form	Ethyl acetate	Meth anol
1	Alkaloids	-	-	+	+
2	Carbohydrate	-	-	-	+
3	Fixed oil & fats	+	-	-	-
4	a. Tannins	-	-	+	+
	b. Phenols	-	-	+	-
5	Gum & Mucilage	+	-	-	-
6	Flavonoids	-	-	+	+
7	Saponins	-	-	-	+
8	Terpenoids	-	-	-	-
9	Lignin	-	-	-	-
10	Sterols	+	-	-	-

RESULT AND DISCUSSION

Active compounds obtained from medicinal plants have been used to treat various ailments caused by microorganisms. Chemical process are alkaloids, phenolic compounds, flavanoids and tannins that may be evolved in plants. The Extractive values of aerial parts of *C. glauca* using different solvent showed petroleum ether 0.50, chloroform 1.00, ethyl acetate 2.10, methanol 2.50. It was found that chloroform extract aerial parts of the *C. glauca* contained Alkaloids, carbohydrartes, fixed oils, fats, tannins, gum & mucilage, flavonoids, saponins, terpenoids, lignin and sterols when compared with other three extract viz.,

petroleum ether, ethyl acetate and methanol. The results (table 1) showed that chloroform was the best solvent for extracting the effective antimicrobial substances from the medicinal plant *C. glauca* than the other three solvents. Therefore, the chloroform extract has been selected for investigating antimicrobial activity of *C. glauca* suggests that the extract contains the effective active phytochemical responsible for the elimination of microorganisms.

CONCLUSION

It is concluded based on the findings of the present study that the aerial parts of *C. glauca* shows higher. Phytochemical analysis showed that the antimicrobial activity. *C. glauca* was due to the presence of Phytochemical compounds like alkaloids, carbohydrates, fixed oils & fats, tannins, gum & mucilage, flavonoids, saponins, saponins, terpenoids, lignin and sterols when compared with other three extracts viz., petroleum ether, ethyl acetate and methanol. The extract of *C. glauca* showed maximum zone of inhibition at the concentration of 300 µg/ml for microbial activity against microbial pathogens.

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