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ANTI BACTERIAL ACTIVITY OF *COMMELINA BENGHALENSIS*

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Abstract: 95% ethanolic extract of the herb *Commelina benghalensis* and its three fractions (carbon tetrachloride, *n*-hexane, and chloroform soluble fractions) exhibited significant cytotoxic activity in brine shrimp lethality bioassay. Whereas, two compounds ß-Amyrin and Baeurenol were isolated from the ethyl acetate extract. The extracts, fractions and isolated compounds were checked for their antibacterial activity.

Keywords: Antibacterial activity; *Commelina benghalensis*

Introduction

Commelina benghalensis Linn. (Family-*Commelinaceae*), local name-Kanshira, is a small herb, which is used as a traditional medicine in the Indian subcontinent for centuries in the treatment of a variety of diseases, e.g. leprosy, headache, fever, constipation and jaundice (*Yusuf et al., 1994* and *Kirtikar et al., 1980*). Some phytochemical works have previously been carried out on *Commelina communis* and *Commelina undulata* and some anthocyanins and a dammarane type compound were isolated from these plants respectively (*Tang et al., 1994, Itaka et al., 1986, Sharma et al. 1982, Hayashi et al., 1958*). But no biological investigation has been carried out on *Commelina* genus. The ethanolic and ethyl acetate extract of the whole plant demonstrated significant cytotoxicity in brine shrimp lethality bioassay (*Rahman, G.M.S., 1994*). In present study, the extracts, fractions and isolated compounds were subjected to antibacterial screening.

Materials and Method

Measured amount of the test samples were dissolved in definite volume of solvent (95% ethanol, ethyl acetate, carbon tetrachloride, *n*-hexane, and chloroform) to give solutions of known concentrations (μg/ml). Then sterile Matricel (BBL, Cocksville, USA) filter paper discs were impregnated with known amounts of test substances (μg/disc) using micropipette and dried. Standard antibiotic discs (positive control) and discs treated with the solvents (negative control) were used for the purpose of comparison. The discs were then aseptically placed in petridishes (120 mm in diameter) containing nutrient agar medium seeded with the test organisms for antibacterial screening. The plates were then kept at 4^0C up side down for 12 hours facilitating maximum diffusion. The test material gradually diffuses from the discs to the surrounding medium. The plates were then kept in an incubator (37^0C) for 12-18 hours to allow the growth of the organisms. If the test material has any antibacterial activity, it will inhibit the growth of microorganism giving a clear, distinct zone called "Zone of inhibition". The antibacterial activity of the test agent is determined by measuring the diameter of the zone of inhibition in term of mm. The experiments were carried out more than triplicate and the mean of the readings are recorded (Bauer *et al.* 1966).

Selection of microorganisms

Selected strains of gram-positive and gram-negative bacteria were collected from International Center for Diarrhoeal Disease Research, Bangladesh. (ICDDRB). The selection criteria were based on their established potential in causing infectious diseases in human. The list of bacteria is given in Table 1.

Table 1. List of test bacteria

Gram Positive	Gram Negative	
Bacillus subtilis	*Salmonella typhi*	*Shigella flexneri*
Bacillus cereus	*Salmonella paratyphi A*	*Escherichia coli*
Bacillus megaterium	*Shigella sonnei*	*Pseudomonas aeruginosa*
Staphylococcus aureus	*Shigella boydii*	*Klebsiella sp.*
Sarcinae lutea	*Shigella dysenteriae*	*Vibrio colerae*

Results and Discussion:

The average diameter of the discs was 5-6 mm. The diameter for the zone of inhibition of the discs

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impregnated with extracts (500 µg/disc) and mixture of β-Amyrin and Baeurenol (100 µg/disc) aremore or less same.

Table 2. *In vitro* antibacterial activity of the isolated compounds of *C. benghalensis*.

Type of Bacteria	Diameter of zone of Inhibition (in mm)					
	500 µg/disc				100 µg/disc	30 µg/disc
	Ethanol extract	Hexane fraction	CCl_4 fraction	$CHCl_3$ fraction	Mixture of ß-amyrin and Baeurenol *	Kanamycin
Gram positive						
1. *Bacillus subitilis*	8	9	7	9	8	27
2. *Bacillus cereus*	7	9	8	11	7	22
3. *Staphylococcus aureus*	8	7	10	11	-	28
4. *Sarcina lutea*	7	-	7	10	8	24
Gram negative						
1. *Salmonella typhi*	8	6	7	8	8	32
2. *Salmonella paratyphi A*	-	-	-	-	-	29
3. *Shigella sonnei*	7	8	8	12	9	28
4. *Shigella boydii*	-	-	-	7	8	26
5. *Shigella dysenteriae*	-	8	8	9	9	23
6. *Shigella flexneri*	-	6	7	8	7	22
7. *Escherichia coli*	9	7	7	9	7	21
8. *Pseudomonas aeruginosa*	8	8	9	13	9	29
9. *Klebsiella sp.*	7	9	8	11	-	31
10. *Vibrio colerae*	7	7	7	9	8	25

* Isomeric Mixture.

Conclusion

The reputation of *Commelina benghalensis* as a traditional remedy for different microbial diseases is not supported by the antibacterial screening tests. Inference can be drawn that either the antibacterial constituents are present in the extract in low concentration or they may be chemically or thermally unstable and hence destroyed during chemical and thermal treatment.

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