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Short Communication

Antimicrobial activity of *n*-hexane and Ethyl acetate extracts of *Erythrina stricta* Roxb

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The crude *n*-hexane and ethyl acetate extract of the stem bark of *E. stricta* were subjected to microbiological investigation and were found to be significantly inhibitory to microbial growth, with the average zone of inhibition 12–17 and 10–16 mm, respectively. In the cytotoxic observation, the *n*-hexane and ethyl acetate extracts were found to show LC_{50} of 2.1 and 0.316 mg/ml respectively.

Key words: *Erythrina stricta,* Fabaceae, Antimicrobial activities and Cytotoxicity observation.

Nature has been a source of medicinal agents for thousand years in the use of medicinal plants especially in traditional medicines is currently well acknowledged and established[4]. Antimicrobial activity of pathogens to different drugs is very common, which is a very concern in the treatment of various diseases. The use of plant extracts and phytochemicals, both with known antimicrobial properties can be of great significance in therapeutic treatments[6, 7].

Plant material

Plant sample of *Erythrina stricta* was collected from Brahramanbaria in April 2008. A voucher specimen has been deposited in University of Dhaka Herbarium (Herbarium No : 20250). The stem bark of this plant usually collected in fresh condition Therefore it should be washed well. It was cut in small pieces and then sun dried followed oven dried at reduced temperature (25^0c) and powdered after drying.

Antimicrobial Screening

Antimicrobial screening performed according to published principle of single-disk method[1]. Standard antibiotic (kanamycin) discs and blank discs were used as positive and negative control. The antimicrobial activity of the test agent was then determined by measuring the diameter of zone of inhibition expressed in millimetre[1,2,10]. The crude extracts (*n*–hexane and ethyl acetate) were tested for antimicrobial activity by disc diffusion method. The average zones of inhibition produced by *n*–hexane and ethyl acetate extract were found to be 12-17 mm and 10-16 mm, respectively at a concentration of 400 mg/disc. The *n*–hexane extract of the bark strongly inhibited the growth of *B. cereus* (16 mm), *S. aureus* (16 mm), *E. coli* (16 mm), *V. mimicus* (17 mm), and *V. parahemolyticus* (16 mm). Moderate inhibitory activity was found against *S. lutea* (14 mm), *P. aeruginosa* (15 mm), *S. paratyphi* (14 mm), *S. typhi* (14 mm). At the same time mild activity was found against *B. megaterium* (12 mm), *B. subtilis* (13 mm), *S. boydii*(12 mm) and *S. dysenteriae* (12 mm). In case of fungi it showed mild inhibitory activity (12 mm) against the tested microorganisms. On the other hand, the ethyl acetate extract strongly inhibited the growth of *B. subtilis* (15 mm), *E. coli* (16 mm), *S. typhi* (15 mm), *V. parahemolyticus* (15 mm). The extract also showed moderate activity against the growth of *B. cereus* (14 mm), *S. aureus* (14 mm), *P. aeruginosa* (14 mm), *S. paratyphi* (14 mm), *S. boydii* (14 mm) *and S. dysenteriae* (14 mm). At the same time, the growth of *B. megaterium* (11 mm), and *V. mimicus* (10 mm), was mildly inhibited. In case of fungi the growth of *C. albicans* was strongly inhibited and moderate activity was noticed against *S. cerevacae* (12 mm). Amtimicrobial activities of test samples of Erythrine stricta are given in Table-1.

Table 1: *Antimicrobial activity of test samples of Erythrina stricta*

Test microorganisms	Diameter of zone of inhibition (mm)		
	Standard Disc (Kanamycin)	n-hexane Extract	Ethyl Acetate Extract
Bacteria			
Bacillus cereus	17	16	14
Bacillus megaterium	17	12	11
Bacillus subtilis	18	13	15
Staphylococcus aureus	20	16	14
Sarcina lutea	18	14	13
Escherichia coli	40	16	16
Pseudomonas aeruginosa	15	15	14
Salmonella paratyphi	15	14	14
Salmonella typhi	17	14	15
Shigella boydii	-	12	14
Shigella dysenteriae	20	12	14
Vibrio mimicus	22	17	10
Vibrio parahemolyticus	23	16	15
Fungi			
Candida albicans	12	12	14
Aspergillus niger	35	-	-
Sacharomyces cerevacae	12	12	12

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Table 2: *Effect of HX and EA on brine shrimp nauplii.*

Conc (C) (µg/ml)	Log C	% Mortality		LC_{50} (µg/ml)		Vincristine Sulfate			
						Conc (C)	Log C	%	LC_{50}
		HX	EA	HX	EA	(µg/ml)		Mortality	(µg/ml)
400	2.602	100	100	2.1	0.316	40	1.602	100	0.812
200	2.301	100	100			20	1.301	100	
100	2.000	100	100			10	1.000	90	
50	1.699	90	100			5	0.698	80	
25	1.398	80	80			2.5	0.397	70	
12.5	1.097	70	70			1.25	0.096	50	
6.25	0.796	60	70			0.625	-0.204	40	
3.125	0.495	60	70			0.3125	-0.505	30	
1.563	0.194	40	60			0.15625	-0.806	30	
0.781	-0.107	40	60			0.078125	-1.107	20	

Cytotoxic activities

The brine shrimp lethality bioassay has been used for screening cytotoxic activities in plant extracts and natural marine products. Following the procedure of Meyer[3, 5, 8, 9] the lethality of the *n*–hexane extract (HX) and ethyl acetate extract (EA) of the bark to brine shrimp were determined. LC_{50} were obtained 2.1 and 0.316 µg/ml for HX and EA respectively. The degree of lethality was directly proportional to the concentration of the extract ranging from significant with the lowest concentration (0.78125 µg/ml) to highly significant with the highest concentration (400 µg/ml). Maximum mortalities took place at a concentration of 400 µg/ml, whereas least mortalities were at 0.78125 µg/ml concentration. Effect of HX and EA on brine shrimp nauplii are given in Table 2.

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