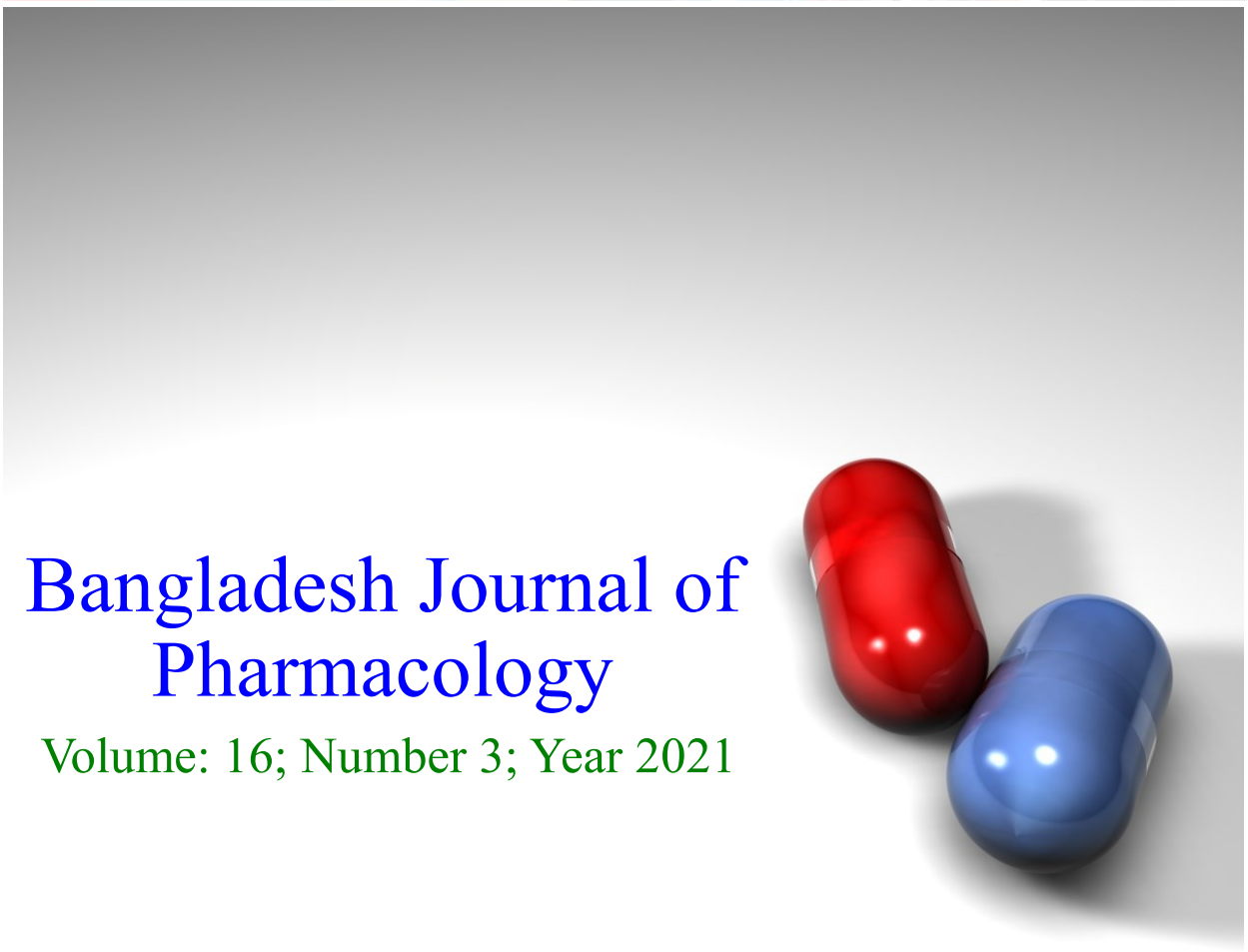
Bangladesh Pharmacological Society



Bangladesh Journal of Pharmacology

Volume: 16; Number 3; Year 2021

Cite this article as: Shankar S, Sathiavelu M. Antibacterial activity of *Dracaena lisa.* Bangladesh J Pharmacol. 2021; 16: 84-86.

A Journal of the Bangladesh Pharmacological Society (BDPS)
Journal homepage: www.banglajol.info; www.bdpsjournal.org
Abstracted/indexed in Academic Search Complete, Agroforestry Abstracts, Asia Journals Online, Bangladesh Journals Online, Biological Abstracts, BIOSIS Previews, CAB Abstracts, Current Abstracts, Directory of Open Access Journals, EMBASE/Excerpta Medica, Global Health, Google Scholar, HINARI (WHO), International Pharmaceutical Abstracts, Open J-gate, Science Citation Index Expanded, SCOPUS and Social Sciences Citation Index
ISSN: 1991-0088; DOI: 10.3329/bjp.v16i3.53018

Letter to the Editor

Antibacterial activity of *Dracaena lisa*

Sir,

Dracaena is a genus of about 120 species that belongs to the family Asparagaceae and subfamily Nolinoideae. At moderate temperature, humidity and moisture conditions the leaf of Dracaena remains more attractive and colorful at a huge duration of time (Shankar et al., 2018). The plant *Dracaena draco* stem contains red resin called Dragon's blood that was used as traditional medicine. An effective saponin compound known as spirocanozole-A was extracted from the plant *D. arborea* and *D. mannini* showed various pharmacological activities such as molluscicidal, fungicidal, bacterio-static, antileishmanial and antimalarial activities (Aslam et al., 2013). Some of the species of this genus, *D. victoria* (Sundar et al., 2019), *D. cinnabari* (Altwair and Edrah, 2015) and *D. mahatma* (Shankar et al., 2018) exhibited significant antibacterial activity. Based on these literature reviews, the plant *D. lisa* was chosen to evaluate the phytochemical screening and *in vitro* antibacterial activity against bacterial pathogens using the agar well diffusion method.

Fresh leaves of the plant *D. lisa* were collected from the VIT, Vellore, Tamil Nadu, India. The leaves were washed with double distilled water to remove dust particles and shade dried for 3-4 days. After drying, the leaves were ground into a fine powder using an electric blender. Based on polarity the solvents such as methanol, ethyl acetate and dichloromethane were used for leaf extracts preparation. The leaf powder of about 1 g was dissolved in 100 mL of different solvents in 250 mL of Erlenmeyer flask. Then the flask was sealed with parafilm and placed in a shaker for 48 hours at 120 rpm. After 48 hours the content was filtered using a Whatman filter paper No. 1 and evaporated by using a rotary vacuum evaporator. The crude extract becomes concentrated and further studies have been carried out using these extracts.

Phytochemical assessment was done for *D. lisa* leaf using standard qualitative methods (Papitha et al., 2017). Agar well diffusion method was carried out to determine the antibacterial activity of leaf crude extracts. The stock culture was prepared using nutrient broth and inoculated with different bacteria's such as *Staphylococcus aureus, Pseudomonas fluorescence, Bacillus subtilis, Klebsiella pneumonia, Enterococcus fecalis* and *Escherichia coli* then it was incubated at 37°C for 24 hours. Further, the bacterial culture was streaked over the surface of the freshly prepared Muller-Hinton agar plate. Using cork borer the wells were made on the plates and filled with 100 µL of leaf extract at different concentrations (25, 50 and 100 µg/mL). Ciprofloxacin disc was used as positive control and these plates were kept for incubation at 37°C for 24 hours. After the incubation period, the zone of inhibition was measured (Goyal et al., 2008)

Qualitative phytochemical analysis of leaf extracts of *D. lisa* indicates the presence of phenol, tannins and flavonoids. Whereas *D. mahatma* revealed the presence of tannins, phenols, alkaloids, sterols, triterpenes and anthraquinone glycosides (Shankar et al., 2018).

Antibacterial activity was performed for three different leaf extracts of the plant *D. lisa*. The result revealed that all three extracts showed significant antibacterial

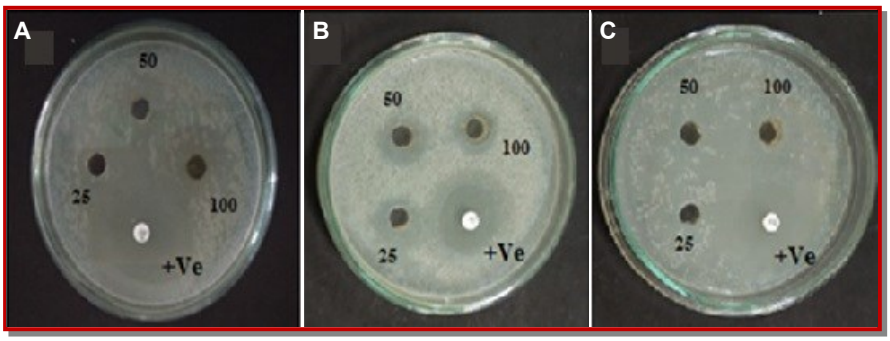


Figure 1: Antibacterial activity of the plant *Dracaena lisa* against test strain (*Bacillus subtilis*). Ethyl acetate extract (A), dichloro-methane extract (B), and methanol extract (C)

Table I

Antibacterial properties of *Dracaena lisa* leaf extracts using agar well diffusion method

Extract	Concentration (µg/mL)	Zone of inhibition (mm)					
		S. aureus	*P. fluorescence*	*B. subtilis*	*K. pneumonia*	*E. fecalis*	*E. coli*
Methanol	25	-	-	11		-	-
	50	-	5	14	-	-	-
	100	7	8	16	9	-	7
Ethyl acetate	25	16	-	7	-	-	8
	50	17	-	13	12	11	15
	100	19	-	28	17	14	25
Dichloromethane	25	-	-	12	11	10	-
	50	-	-	20	13	11	10
	100	-	10	24	15	14	12
Standard (ciprofloxacin in mg)	10	32	28	43	33	35	32

activity against Gram positive bacteria such as *S. aureus, B. subtilis* and *E. fecalis* and also Gram negative bacteria like *K. pneumonia, P. fluorescence* and *E. coli*. Among all test organisms, *B. subtilis* exhibited maximum zone of inhibition in all leaf extracts as shown in Figure 1. In ethyl acetate leaf extract the highest zone of inhibition was observed in *B. subtilis* with 28 mm at 100 µg/mL followed by *E. coli* of about 25 mm inhibition at 100 µg/mL as tabulated in Table I. *P. fluorescence* did not show any zone of inhibition. In dichloromethane leaf extract, *B. subtilis* showed strong antibacterial activity of about 24 mm zone of inhibition at 100 µg/mL followed by *K. pneumonia* with 15 mm inhibition at 100 µg/mL. In methanol leaf extract, *B. subtilis* exhibited good antibacterial activity of about 16 mm at 100 µg/mL. *E. fecalis* did not show any zone of inhibition for this extract. This is the first report on the antibacterial activity of *D. lisa*.

The ethyl acetate leaf extract of the plant *D. colorama* exhibited strong antibacterial activity against *P. aeruginosa* of about 16 mm at 100 µg/mL (Sundar et al., 2020). The plant *D. mahatma* methanolic leaf extract showed significant antibacterial activity against various pathogens such as *S. aureus, Proteus mirabilis, B. cereus* and *K. pneumoniae* respectively. The methanolic extract of *D. afromontana* leaves exhibited prominent antibacterial activity against *E.* with 1.6 cm zone of inhibition at 0.1 mg/mL (Jean et al., 2020). The ethyl acetate extract of the stem of *D. manni* showed maximum inhibition of about 24 mm against *E. coli* at 200 mg/mL. whereas, in methanolic stem extract, *S. aureus* exhibited good antibacterial activity of about 20 mm at 200 mg/mL (Ameen et al., 2015). The ethyl acetate and aqueous extract of the plant *D. cinnabari* had significant antibacterial activity against different pathogenic microorganisms that includes *E. coli*, *P. vulgaris*, *P. aeruginosa*, *K. pneumonia* and *S. saprophyticus* (Altwair and Edrah, 2015).

In conclusion, the present study justifies that the *D. lisa* leaf extracts possess significant antibacterial activity against tested organisms.

The authors thank Vellore Institute of Technology for providing lab facilities to carry out this research work.

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