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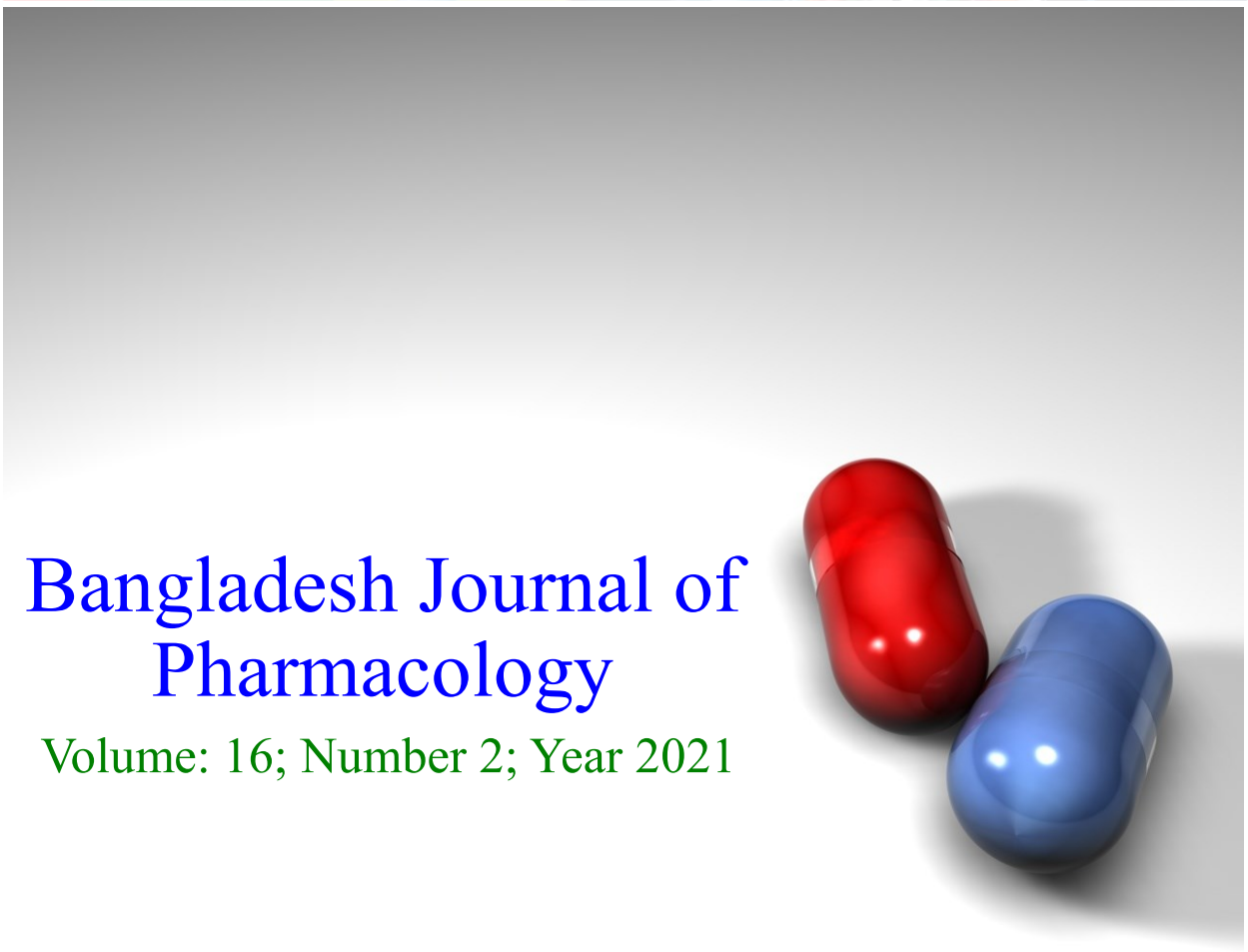

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Letter to the Editor

Antibacterial activity of an ornamental plant *Hippeastrum fosteri*

Sir,

The genera Hippeastrum Herb. is native to South American and belongs to the family Amaryllidaceae with about 60 species. This genus has long been used to treat tumor, hemorrhoid and bronchial asthma (Tallini et al., 2017). One of the species *Hippeastrum elegans* shows anticholinesterase activity due to the presence of galantamine to treat Alzheimer's disease. Other bioactive alkaloids are narciclasine, sanguinine and pseudolycorine (de Paiva et al., 2021). 3-*O*-acetyl-narcissidine (bioactive alkaloid) was isolated from *H. puniceum* and showed antifeedant against the poly-phagous insect *Spodoptera littoralis*. *H. fosteri* is an ornamental plant used for decorative purposes. This study aimed to conduct the antibacterial activity of *H. fosteri* leaves.

The fresh and healthy leaves from the study plant were collected from the Ranipet, Tamilnadu, India. Leaves were washed twice with tap water to remove dust particles and air-dried for 2 weeks. Then, the dried leaves were grounded to fine powder with a blender machine. Water, methanol, ethyl acetate and dichloromethane were the solvents with four different polarities used. About one gram of dry leaf powder was soaked in 100 mL of each solvent and Milli-Q water in a 250 mL conical flask and kept in a shaker of 120 rpm at 37°C overnight. Solvent and aqueous extracts were separated from the solid residue by filtration using Whatman No. 1 filter paper and evaporated for one week to obtain the leaf crude extracts.

Phytochemical constituents of the leaf were analyzed by the method described previously (Shankar et al., 2018). Antibacterial properties of leaf crude extracts were screened by the agar well diffusion method (Atef et al., 2019). The antimicrobial properties of crude extracts were tested against *Bacillus subtilis, Enterococcus fecalis, Staphylococcus aureus* (Gram positive) and *Escherichia coli, Pseudomonas fluorescence, Klebsiella pneumoniae* (Gram negative bacteria). The test pathogens were pre-cultured in nutrient broth and used for this study. Fresh Muller Hinton agar plates were prepared and streaked with test pathogen. A sterile cork borer was used to make wells in agar plates containing inoculums. Three different concentrations (25, 50, 100 µg/mL) of crude extracts were subjected for analysis. Further, 100 µL of each extracts were added to their appropriate wells. The

Table I

Antibacterial activity of different extracts of *H. fosteri* against bacterial pathogenic strains

Extract	Concentration (µg/mL)	Zone of inhibition (mm)					
		Gram positive			Gram negative		
		Bacillus subtilis	*Enterococcus fecalis*	*Staphylococcus aureus*	*Escherichia coli*	*Pseudomonas fluorescence*	*Klebsiella pneumoniae*
Aqueous	25	-	-	-	16	-	-
	50	12			20	13	
	100	14			31	20	
Methanol	25	14	-	-	-	-	1
	50	21					12
	100	24			13		15
Ethyl acetate	25	-	-	7	16	-	8
	50		8	8	2		8
	100	20	8	9	31	17	8
Dichloromethane	25	11	-	12	-	-	11
	50	12		14			13
	100	17		15			16
Standard (mg)	10	35	46	35	40	33	25

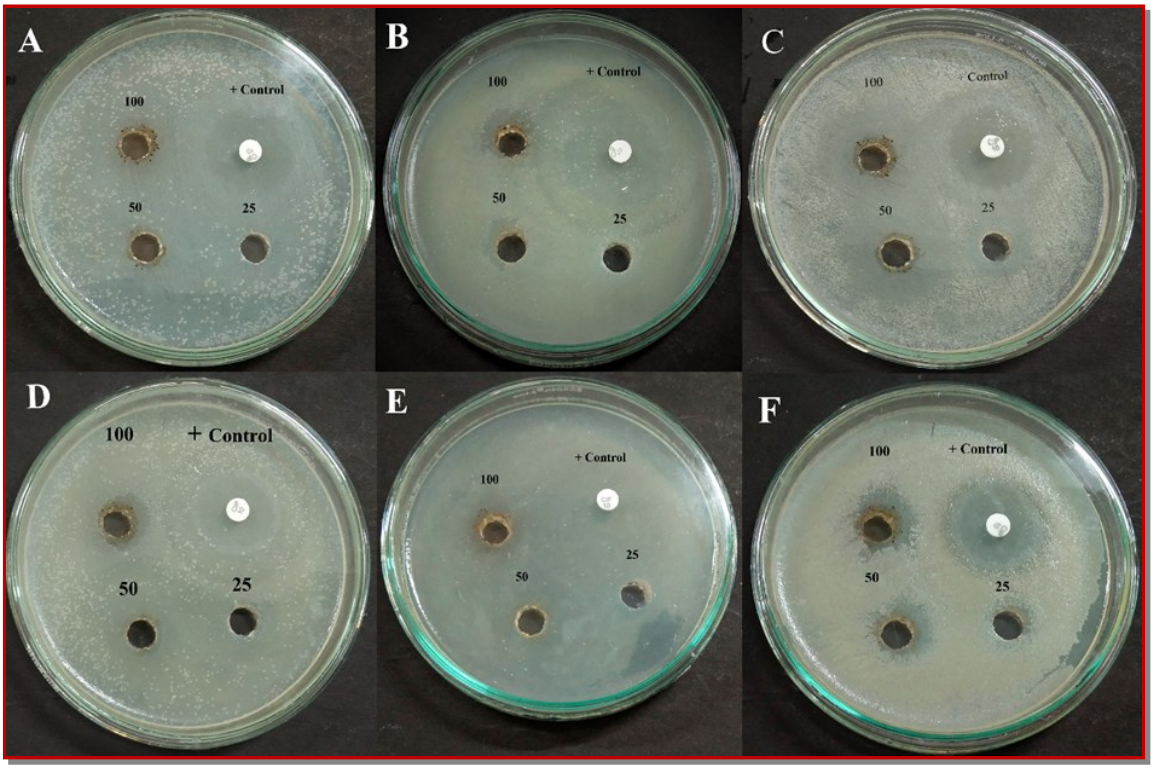

Figure 1: Antibacterial activity of ethyl acetate extract of *H. fosteri* leaves against bacterial pathogens

plates were incubated at 37°C for 18 hours. After the incubation period, the zone of inhibition was measured in diameter to determine the antimicrobial activity. Ciprofloxacin is used as the positive control (standard).

Phytochemical screening of the leaf extracts of *H. fosteri* revealed the presence of phenol, flavonoids, tannins and anthraquinone glycosides (data are not shown).

The resulting outcome of agar well diffusion assay showed the plant extract had antibacterial property. The highest zone of inhibition was observed on *E. coli* for aqueous extract with 32 mm inhibition at 100 µg/mL (Table I). The ethyl acetate extract of *H. fosteri* leaves showed antibacterial activity (Figure 1). It had prominent antibacterial properties against *E. fecalis, S. aureus, E. coli, P. fluorescence* and *K. pneumoniae.* When compared with the other three extracts, methanol exhibited lower antibacterial activity against tested strains. This is the first report on the antibacterial activity of *H. fosteri.*

The methanol extract showed inhibition against only two pathogenic microbes *B. subtilis* and *K. pneumoniae* and exhibited lower antibacterial activity. Whereas, the other three extracts exhibited significant antibacterial activity against most of the test pathogens.

A study demonstrated the cytotoxic activity of fresh bulbs of *H. vittatum* against five human cell lines OVCAR3 epithelial ovarian cancer, RXF393 renal cell carcinoma, H460 non-small cell lung carcinoma, MCF7 breast cancer and HT29 colon adenocarcinoma (Silva et al., 2008). Both *n*-butanol and dichloromethane extracts and alkaloids of *H. vittatum* demonstrated strong activity against the cell lines (Silva et al., 2008). When compared to untreated diabetic rats, the oral administration of mucilage of *H. vittatum* bulbs at 150 mg/kg reduced induced hyperglycemia by 45.4% and 62.0% after 2 and 4 hours. At the concentration of 250 mg/kg, elevated blood glucose levels were reduced by 57.4% and 65.7% after 2 and 3 hours (Attia et al., 2021).

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