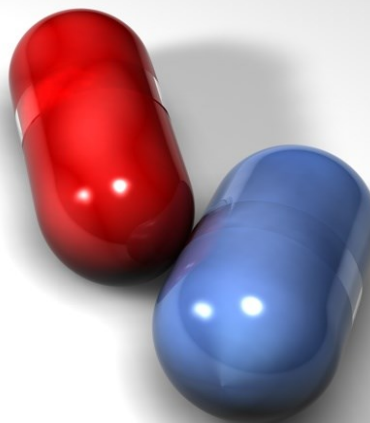


# Bangladesh Journal of Pharmacology

Volume: 14; Number 4; Year 2019



Cite this article as: Sundar RDV, Srikanth L, Manogna PS, Yuvaraja S, Arunachalam S. *In vitro* antibacterial activity of *Dracaena victoria* leaf extract. Bangladesh J Pharmacol. 2019; 14: 202-203.



## Letter to the Editor

### **In vitro antibacterial activity of *Dracaena victoria* leaf extract**

Sir,

Among the plants of the genus *Dracaena*, only *Dracaena spicata* (Nazneen, 2013), *Dracaena cinnabari* (Altwair and Edrah, 2015), *Dracaena deisteliana* (Roger et al., 2015) and *Dracaena mahatma* (Saranya et al., 2018) show antibacterial effects. In the present study, we have examined the antibacterial effect of *Dracaena victoria*.

Fresh, healthy leaves of *D. victoria* were collected locally and transferred to the laboratory. They were washed thoroughly under running tap water and double distilled water and were allowed to dry under shade for 2-3 weeks. The leaves were made into a fine powder by mortar and pestle. To 15 g of the powdered leaves, 150 mL of ethyl acetate and petroleum ether solvents were added separately and kept in shaker for 2 days at 120 rpm. The mixture was filtered (Whatman paper No. 1) and air-dried to obtain the crude extract. About 2-3 g of crude were obtained from each solvent (Papitha et al., 2016).

The qualitative phytochemical screening was carried out using a standard protocol. It is done to determine the presence and absence of alkaloid, anthraquinone glycosides, tannins, phenols, saponins and flavonoids in the leaf powder (Saranya et al., 2018; Ranjitha et al., 2017).

The antibacterial activity of the leaf extracts was checked using the agar well diffusion method. Muller-Hinton agar medium was prepared, sterilized and poured into petri plates. The media were allowed to

solidify and the bacterial strains were spread uniformly using sterile cotton swabs. The five different bacterial strains used were *Salmonella typhi*, *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Listeria monocytogenes*. Then the wells of 6 mm were made using a sterile cork borer. To the wells, 100  $\mu$ l of different concentrations (2.5, 5, 10 mg/mL) of the extracts were added and incubated at 37°C for 24 hours. The plates were observed for a zone of inhibition around each well. Streptomycin was used as positive control (Mahalingam et al., 2011; Ravi et al., 2016).

To determine the presence of bioactive compounds, the crude extract obtained from leaves were subjected to GC-MS analysis (Perkin Elmer Clarus 680 with mass spectrometer Clarus 600 equipped with Elite-5MS capillary medium 30, 0.55 mm ID, 250  $\mu$ m df). The initial temperature of the oven was 55°C for 3 min and a ramp program 10 min to 300°C hold 6 min. Helium was used as a carrier gas with a constant rate flow of 1 mL/min. Mass transfer line and source temperature were set at 240°C. The software used for analysis is Turbo version 5.4.2. By comparing the retention time of chromatographic peaks in the chromatogram with the National Institute of Standards and Technology (NIST-LIB 0.5) Library which is inbuilt in the instrument, the compounds present in the plant extracts were identified. By relating respective peak areas to total ion chromatogram areas, quantitative determination of the compounds can be made (Papitha et al., 2016).

The antioxidant activity of the extract was determined by DPPH assay. From 1 mg/mL, different concentrations (50, 100, 150  $\mu$ L) of both extracts along with gallic acid as standard. 2 mL of DPPH was added and incubated in dark for 45 min and absorbance was

Table I

#### Antibacterial activity of the leaf extracts

Extract	Concentration ( $\mu$ g/mL)	Zone of inhibition (mm)				
		<i>L. monocytogenes</i>	<i>E. coli</i>	<i>S. aureus</i>	<i>S. typhii</i>	<i>P. aeruginosa</i>
Ethyl acetate	50	1.0	-	-	1.3	-
	75	1.0	-	-	1.1	-
	100	1.1	-	-	1.4	-
Petroleum ether	50	1.3	-	-	-	-
	75	1.1	-	-	-	-
	100	1.4	1.4	-	1.3	0.9



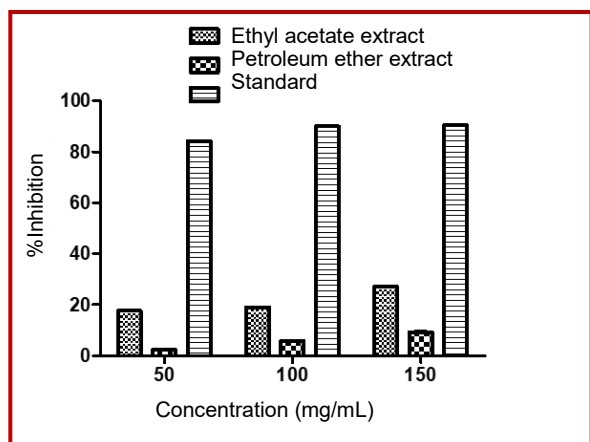


Figure 1: DPPH free radical scavenging activity of ethyl acetate and petroleum ether extract

measured at 517 nm in a UV-visible spectrophotometer. The free radical scavenging activity was calculated by the equation:  $\text{DPPH radical scavenging effect\%} = [A_0 - A_1/A_0]$  where,  $A_0$  is the absorbance of the control and  $A_1$  is the absorbance of the sample (Papitha et al., 2016; Sahu et al., 2013).

The phytochemical analysis of the leaf powder revealed the presence of all the tested phytochemicals. It contains phenols, tannins, saponins, flavonoids, alkaloids, sterols, triterpenes, anthraquinone glycosides

Both extracts showed significant antibacterial activity against *L. monocytogenes*. In ethyl acetate extract, the maximum inhibition about 1.1 cm was observed in 100 mg/mL concentration whereas in petroleum ether 1.4 cm for 100 mg/mL was found (Table I).

The GC-MS analysis of petroleum ether revealed the presence of 10 compounds and ethyl acetate revealed 6 known compounds. The compounds and the retention time (within bracket in min) present in petroleum ether extracts were methylene chloride (2.86), 1,2-benzenedicarboxylic acid, diisooctyl ester (22.94), hexatriacontane (25.70), palmitic acid vinyl ester (26.80, 28.13), myristic acid vinyl ester (28.72), octadecanoic acid, 3-[(1-oxohexadecyl)oxy]-2-[(1-ox (29.42), 2-isopropyl-5-methylcyclohexyl 3-(1-(4-chlorophe (29.77), hexadecanoic acid, 2-oxo-methyl ester (30.45), 1-naphthalenepropanol, alpha-ethenyldecahydr (31.04). Ethyl acetate (2.87), docosane, 11-decyl- (25.82), octadecanoic acid, 2-OXO-,methyl ester (27.60), hexadecanoic acid,(3-bromoprop-2-ynyl)ester (28.32), eicosanoic acid,2-[(1-oxohexadecyl)OXY]-1-[[1-(1-OXOH (30.69), oxalic acid, hexylneopentyl ester (31.70) were compounds present in ethyl acetate extract.

All the crude extract demonstrated antioxidant activity, on comparing both the crude extract, ethyl acetate extract showed a high scavenging activity. Ascorbic

acid was taken as standard showing  $95.1 \pm 0.9\%$  antioxidant activity at 150  $\mu\text{g/mL}$  concentration (Figure 1).

It can be concluded that leaves of *D. victoria* have potential antibacterial activity. This is the first report on the antibacterial, antioxidant and phytochemical analysis of *D. victoria* leaves extract. Both ethyl acetate extract and petroleum ether extract has significant bioactivity.

The authors thank VIT for providing the lab facility to carry out this study.

**Ranjitha Dhevi V. Sundar, Lavanya Srikanth, P. Swethana Manognya, Sreenidhi Yuvaraja and Sathiavelu Arunachalam**

School of Biosciences and Technology, Vellore Institute of Technology, Vellore 14, India.

Corresponding author:  
email: asathiavelu@vit.ac.in

#### References

- Altwaitr K, Edrah S. Phytochemical screening and antimicrobial activity for plants *Dracaena cinnabari*, *Verbena officinalis*, *Polygala tenuifolia* and *Linux usitatissimum*. J Curr Chem Pharm Sci. 2015; 5: 47-55.
- Papitha R, Lokesh R, Kaviyarasi R, Selvaraj CI. Phytochemical screening, FT-IR and gas chromatography-mass spectrometry analysis of *Tinospora cordifolia* (Thunb.) Miers. Int J Pharmacogn Phytoch Res. 2016; 8: 2020-24.
- Mahalingam R, Bharathidasan R, Ambikapathy V, Panneerselvam A. Studies on antibacterial activity of some medicinal plant against human pathogenic microorganism. Asian J Plant Sci Res. 2011; 1: 86-90.
- Nazneen S. Antimicrobial and cytotoxic investigations of petroleum ether extract of *Dracaena spicata*. East West University, Bachelor of Pharmacy dissertation, Bangladesh, 2013.
- Ranjitha DVS, Gayathri S, Saranya S, Sugashini S, Lokesh R. Bioactivity of *Phoenix dactylifera* seed and its phytochemical analysis. Int J Green Pharm. 2017; 11: S1-S6.
- Ravi L, Manasvi V, Lakshmi BP. Antibacterial and antioxidant activity of saponin from *Abutilon indicum* leaves. Asian J Pharm Clin Res. 2016; 9: 344-47.
- Roger T, Pierre-Marie M, Igor VK, Patrick VD. Phytochemical screening and antibacterial activity of medicinal plants used to treat typhoid fever in Bamboutos division, West Cameroon. J Appl Pharm Sci. 2015; 5: 34-49.
- Saranya S Sugashini S, Gayathri S, Ranjitha DVS, Lokesh R. Phytochemical constituents of *Dracaena mahatma* leaves and their anti-bacterial, anti-oxidant and anti-inflammatory significance. Biotechnol Res Innovation. 2018; 2: 1-8.
- Sahu RK, Kar M, Routray R. DPPH free radical scavenging activity of some leafy vegetables used by tribals of Odisha, India. J Med Plant Stu. 2013; 1: 21-27.