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PHYTOCHEMICAL ANALYSIS OF METHANOLIC EXTRACT OF *BLUMEA LACERA* (BURM. F.) DC.

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ABSTRACT

Blumea lacera (Burm. F.) DC. is an erect herb belonging to family Asteraceae. Present communication deals with phytochemical, FTIR and GC-MS analysis of the methanolic extract of leaves from this plant. The presence of alkaloids, anthraquinone, coumarins, flavonoids, glycosides, oxalic acid, quinines, saponins, steroids, tannins and phenolic compounds were observed during screening. FTIR analysis confirmed the presence of functional groups such as Free OH, H-bonded H-X, Aliphatic hydrocarbon, Aldehyde, Aromatic, Alkanes, Carboxylic, Aryl-ether, Nitrile and Alkene in the methanol extract. GC-MS analysis showed presence of 9-Octadecanoic acid (Z)-, methyl ester, Hexadecanoic acid, Phytol, n-Hexadecanoic acid, 9-Octadecenal, Octadecanoic acid methyl ester, Stigmasterol, Pentadecane-carboxylic Acid, Nonadecane, 2-methyl- and Eicosane, 2-methyl-.

Key words: *Blumea lacera*, Phytochemical, FTIR, GC-MS

Introduction

The leaves of *Blumea lacera* (Burm. F.) DC. are used to cure boils, wounds, blisters, cold (Sahu, 1984), cuts, burns, leucoderma, skin problems (Upadhyay et al, 2008), and to expel thread worms (Tomar, 2017). During present investigation, attempt was made to standardize the protocol to identify the leaves of *Blumea lacera* (Burm. F.) DC. L. using phytochemical parameters in order to standardize utility of this plant as a source of medicinal drug.

Material and Methods:

Fresh leaves of *Blumea lacera* were collected from Palghar district, Maharashtra, in the year 2017, for which the plant was identified following Naik (1998). The leaves were washed thoroughly under running tap water and air dried at room temperature for about 2-3 days. The dried leaves were ground to a fine powder and passed through 0.5 mm sieve. The powdered leaf sample (10 gm) was extracted with 100 ml methanol by keeping it in dark for 24 hrs with continuous shaking. The extract was filtered through Whatman filter paper, and evaporated using rotary evaporator. The evaporated extract was stored at 4°C for further analysis. During phytochemical analysis, the extract was screened for the presence of alkaloids, anthraquinone, coumarins, flavonoids, glycosides, oxalic acid, quinines, saponins, steroids, tannins and phenolic compounds as described by Sadasivam and Manickam (2008).

FTIR analysis was performed with a mixture of 100 mg powdered potassium bromide (KBr) and methanolic leaf extract (1mg/ml). The molecular functional vibrations of chemical groups present in the sample was recorded with Bruker, Germany, FTIR Spectrophotometer operated at a resolution of 2 cm^{-1} ranging from 4000 to 400 cm^{-1}. The FTIR

analysis was performed at Sophisticated Analytical Instrument Facility (SAIF), Indian Institute of Technology, Powai, Mumbai.

GC-MS analysis was carried out by using a Agilent technologies 7890A Gas Chromatograph, interfaced to a Mass Spectrophotometer (GC-MS), equipped with HP 5 capillary column (30m x 0.25mm x 0.25ᴍm) composed of 5%-Phenyl-methylpolysiloxane. 70eV electron ionization system. The ionizing energy was used for GC-MS detection. Carrier gas used was Helium (99.999%) with constant flow rate of 1 ml/min. Injection volume of 1ᴍl was employed with split ratio of 10:1 and injector temperature 260°C. Mass spectra were taken at 70eV; a scan interval of 25 spectrum/sec. Total GC running time was 36 minutes. The relative % amount was calculated by comparing its peak area to the total areas. The GC-MS analysis was performed at Sophisticated Analytical Instrument Facility (SAIF), Indian Institute of Technology, Powai, Mumbai. Interpretation of mass spectrum GC-MS was conducted using database of National Institute of Standard and technology (NIST), by comparing spectrums of known and unknown compounds. The Name, Molecular weight and structure of the components of the test materials were ascertained.

Results and Discussion :

Preliminary phytochemical screening of crude methanol extract of *Blumea lacera* revealed the presence of Alkaloids, Anthraqinone, Coumarins, Flavonoids, Glycosides, Oxalic acid, Saponins, Steroids, Tannins and phenolic compounds. The Quinines were, however, absent.

Table 1: FTIR analysis of crude methanol extract of *Blumea lacera*.

Frequency (cm^{-1})	Bond/stretching	Functional groups
3423.72	O-H	Free OH group
3130.57	H-O	H-bonded H-X group
3047.92	H-O	H-bonded H-X group
2923.94	C-H asymmetric stretch	Aliphatic hydrocarbon
2853.16	C-H asymmetric stretch	Aliphatic hydrocarbon
1737.96	CHO	Aldehydic group
1587.70	C-C	Aromatic group
1451.33	CH3-CHO bending	Alkanes
1421.92	CH3-CHO bending	Alkanes
1384.05	COOH stretching	Carboxylic group
1260.76	C-O	Aryl-ether
1162.63	C-N	Nitrile
1034.93	C-C-O-C	Alkene

Table 2 : Phytocomponents identified in methanol extract of *Blumea lacera* using GC-MS

SR. No	Name of Compound	R.T	Molecular Weight	Molecular Formula	Area	Peak %
1	9-Octadecenal	4.18	266	$C_{18}H_{34}O$	3071456.40	5.944763
2	Eugenol	7.02	164	$C_{10}H_{12}O_2$	2583078.52	4.999514
3	Phytol	13.15	296	$C_{20}H_{40}O$	2032014.74	3.932938
4	Phytol	14.59	296	$C_{20}H_{40}O$	4199669.79	8.128406
5	n-Hexadecanoic acid	15.35	256	$C_{16}H_{32}O_2$	3287368.80	6.362659
6	9-Octadecenal	15.74	266	$C_{18}H_{34}O$	241541.80	0.467501
7	9-Octadecanoic acid (Z) -, methyl ester	17.07	296	$C_{19}H_{36}O_2$	13200434.84	25.54927
8	Octadecanoic acid, methyl ester	17.38	298	$C_{19}H_{38}O_2$	3206150.50	6.205462
9	Hexadecanoic Acid	17.73	330	$C_{19}H_{38}O_4$	11820218.30	22.87788
10	Stigmasterol	18.11	412	$C_{29}H_{48}O$	1710161.73	3.309995
11	Pentadecane -carboxylic Acid	18.38	256	$C_{16}H_{32}O_2$	364758.22	0.705985
12	Nonadecane, 2methyl-	24.34	282	$C_{20}H_{42}$	2904427.07	5.62148
13	Eicosane, 2methyl-	24.51	296	$C_{21}H_{44}$	3045307.06	5.894152

Figure.1 FTIR Spectrum of Methanolic extracts of *Blumealacera*

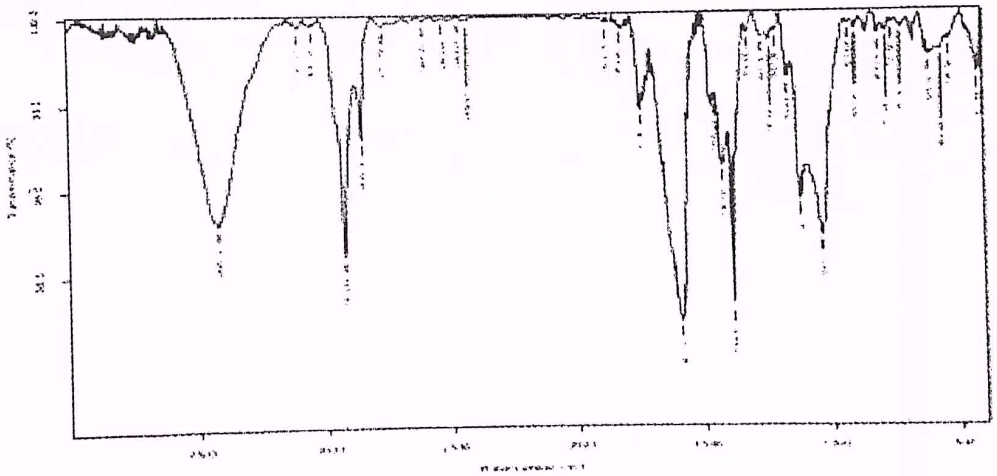
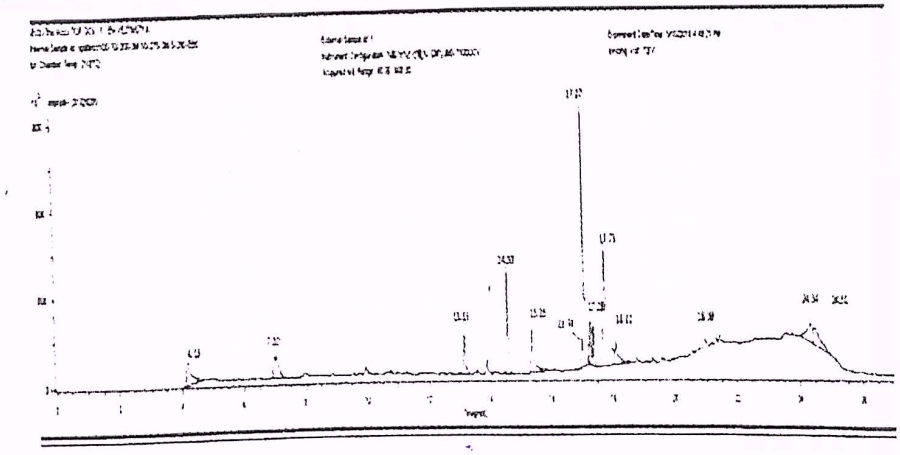


Figure.2 GC-MS chromatogram of methanolic extract of *Blumea lacera*



FTIR analysis confirmed the presence of functional groups such as Free OH, H-bonded H-X, Aliphatic hydrocarbon, Aldehyde, Aromatic, Alkanes, Carboxylic, Aryl-ether, Nitrile and Alkene in the methanol extract (Table 1; Figure1).

GC-MS analysis showed presence of various phytochemicals (Table 2, Figure 2.) Total 13 constituents were identified, out of which 9-Octadecanoic acid (Z)-, methyl ester, Hexadecanoic acid and Phytol were most abundant. Other important compounds were n-Hexadecanoic acid, 9-Octadecenal, Octadecanoic acid methyl ester, Stigmasterol, Pentadecane-carboxylic Acid, Nonadecane, 2-methyl- andEicosane, 2-methyl- etc.

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