

## GC/MS Based Phytochemical Analysis of Lichen Species of Acetone extract *Pseudevernia furfuraceae* (L) Zopf.

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### ABSTRACT

*Pseudevernia furfuraceae* (L) Zopf (Parmeliaceae) is a common epiphytic lichens in the forest of Navegaon forest of Maharashtra India. The sepsis used as traditionally as a treatment of wounds and eczema. The major component of *Pseudevernia furfuraceae* (L) Zopf after GCMS analysis is 1,3-Dioxolone-4-methanol 2,2dimethyl,, Azaridine-1-(2-methyl-1-propenyl) -(S)- Azaridine-1-(2-methyl-1-propenyl)- E-2-Hexenyl E-2-Octenoate.

**Abreversion** –*Pseudevernia furfuraceae* L Zopf. P.F., Retention time R.T.

### I. INTRODUCTION

Natural products hold a specific significance for microbiological research. They have largely acquired traits related to biological processes in animal or plant organisms during their lengthy history and selection. The extraordinarily complex molecular architectures of natural products are also well known, and they exhibit extraordinary functional group configurations, strained ring systems, and other alluring structural characteristics.

There are numerous causes for people's interest in natural product chemistry. First, natural products may be used as lead compounds in the development of

novel medications. Second, they teach us about potential bio mechanisms, and hence the molecular source and basis of disorders. Thirdly, because of their isolation, cutting-edge analytical and spectroscopic tools and methods, like HPTLC, NMR, and mass spectrometry, have been developed. Fourth, natural products offer a constant challenge in total synthesis, stimulating the discovery of new reagents and reactions. (Mulzer & Bohlmann, 2000)

Gas Chromatography: Culberson (1972) investigated gas-liquid chromatography as a quick technique for separating typical lichen products from small amounts of lichen material. However, lichen depsides have little volatility and are damaged by the high

temperatures required to convert them to a gaseous state. Depsides and many other secondary chemicals can thus only be detected once they have been rendered more volatile, which is accomplished by converting them to trimethylsilyl derivatives. Usnic acid is less labile and doesn't need to be derivative

### Material and Methods of Lichens species

*Pseudevernia furfuraceae* (L)Zopf

## II. AUTHENTICATION

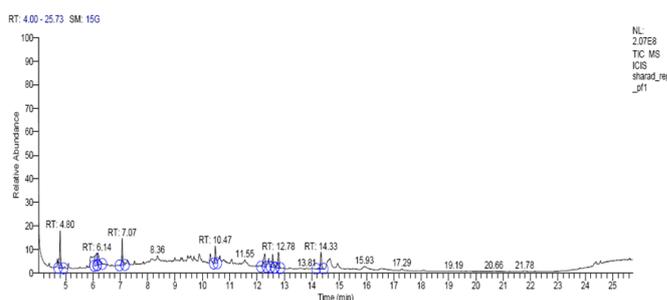
Lichen thallus was collected from Nagzira wildlife sanctuary, Maharashtra in the month of February 2023 in India. Then sample was send for authentication in CSIR -National Botanical research Institute Lucknow (Council of Scientific and industrial Research) Rana Pratap Marg P.B. 436, Lucknow Uttar-Pradesh. The voucher specimen number PDSH/LWG/Authentication /2023-24/03 date 29/05/2023 And PDSH/LWG/Authentication /2023-24/14 dt 29/05/2023 was deposited in CSIR -National Botanical research Institute Lucknow (Council of Scientific and industrial Research) Rana Pratap Marg P.B. 436, Lucknow Uttar-Pradesh.

## III. EXTRACTION METHOD

Lichens *Pseudevernia furfuraceae* (L)Zopf sixteen grams of air-dried thallus (vegetative as well as fruiting) was washed thoroughly using tap water followed by distilled water and pat-dried. Then, thalli *Pseudevernia furfuraceae* (L)Zopf were subjected to successive extraction of *Pseudevernia furfuraceae* (L)Zopf 16.04 gm. in 500 mL of Pet ether 60-80° C for soxhlations for twenty five to twenty six cycle after drying extract using solvent chloroform extraction was performed then solvent acetone was used after that solvent methanol was used after that adding water and macerate for three days then extract was Subsequently, the solvent was filtered by Whatman No. 1 filter paper after 48 h. The weight of crude extract obtained was 15.04 g after vacuum

drying the filtrate via rotary evaporator. Per cent yield of crude extract was calculated according to the equation below: Per cent yield (%) = (Dry weight of extract/Dry weight 100. = 15.04/16.04 =93.76.

**GCMS Spectroscopy**-(GCMS) Thermo Scientific TSQ 8000. Due to the Triple Quadruple nature of the MS component, MS/MS research is possible. It is possible to use Selected Reaction Monitoring (SRM) to achieve the lower detection limits. The TRACE 1300 GC and Auto-sampler have been connected with this mass spectrometer to handle samples automatically. Additionally, the instrument's versatility is enhanced with the addition of Head Space. Because of the Direct Insertion Probe, we are able to directly evaluate materials on MS. It is possible to program EI sources up to 350 degrees Celsius. The range of mass is 2.1100 amu. Modes: SIM, full scan, timed-SIM, timed-SRM, timed-SRM, timed-SRM, combined SRM/full scan.



**Fig.1** GCMS Chromatogram of acetone extracts *Pseudevernia furfuraceae* (L)Zopf

SR.NO.	RT	Peak area	% AREA	Peak high
1	4.80	93315999.21	17.02	32966032.00
2	6.14	66075886.56	12.05	10856067.84
3	6.18	56208471.47	10.25	10776428.23
4	7.07	66586661.00	12.14	23880502.15
5	10.47	47426275.61	8.65	15358777.00
6	12.28	65973496.57	12.03	11635883.28
7	12.57	36361799.47	6.63	11507054.80
8	12.78	65013960.14	11.86	13894740.67
9	14.33	51398390.57	9.37	14913914.52

**Table.- 1** GCMS Chromatogram of acetone extracts *Pseudevernia furfuraceae* (L)Zopf

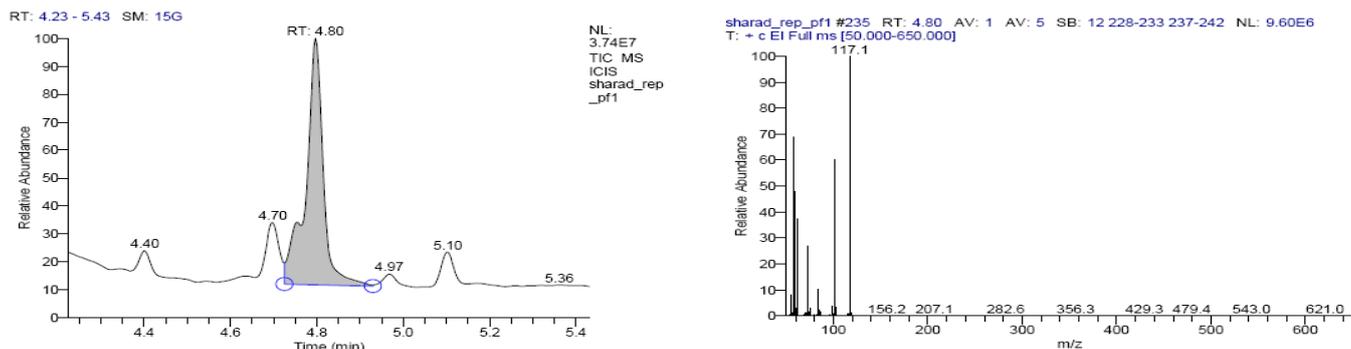


Table 2.

SR.NO	RT	COMPUND NAME	Molecular formula	% AREA	CAS#
1	4.80	1,3-Dioxolane-4-methanol, 2,2-dimethyl, (S)	C6H12O3	17.02	22323•82•6
2	4.80	(R)-2,2-Dimethyl-1,3-dioxolane-4-methanol	C6H12O3	17.02	14347•78•5
3	4.80	1,3-Dioxolane-4-methanol, 2,2-dimethyl.	C6H12O3	17.02	100-79-8
4	4.80	Pentatonic acid, 3•hydroxy•, ethyl ester	C7H14O3	17.02	54074•85•0
5	4.80	Propionic acid, 3•ethoxy•, ethyl ester	C7H14O3	17.02	763•69•9

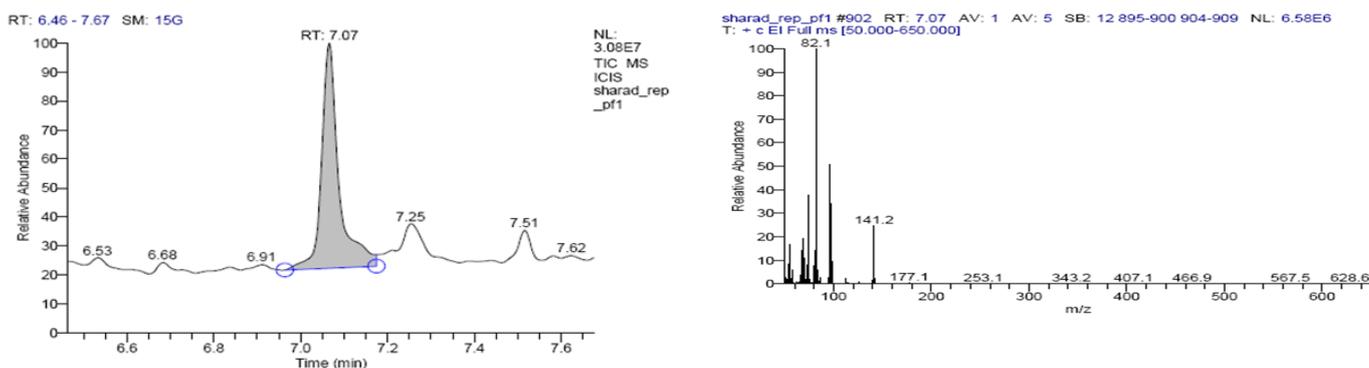
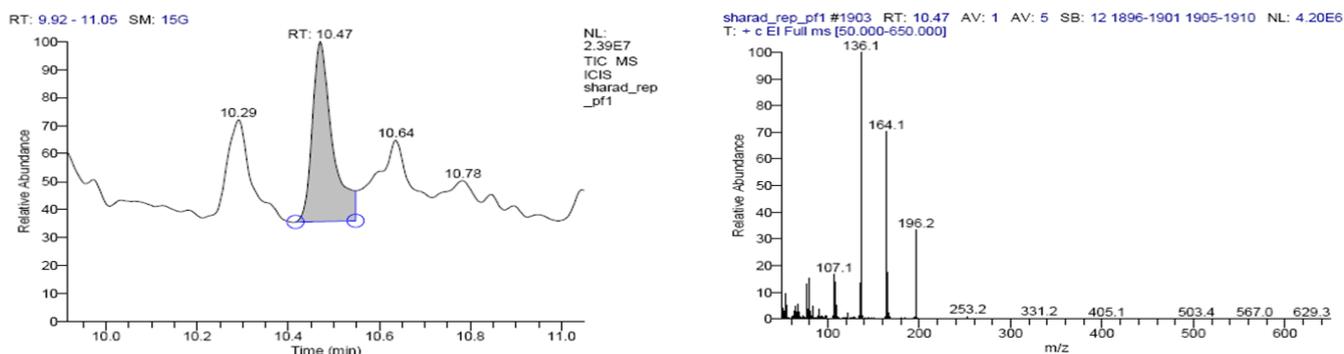


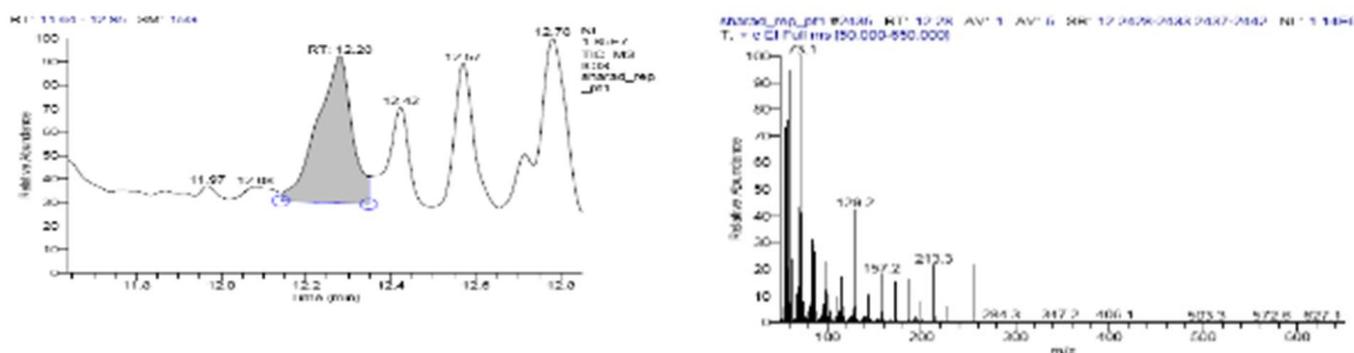
Table 3.

SR.NO	RT	COMPUND NAME	Molecular formula	%AREA	CAS#
1	7.07	Aziridine,1-2-methyl-1-propenyl)-	C6H11N	12.14	80839-93-6
2	7.07	1-But-1-enylaziridine	C6H11N	12.14	NA
3	7.07	Methenamine-[3-methylbutenylidene]	C6H11N	12.14	NA
4	7.07	1-2-Methylallyl)-aziridine	C6H11N	12.14	6498•86•8
5	7.07	8-Azabicyclo [3.2.1] octan-3-ol,8-methylendo	C8H15NO	12.14	120•29•6



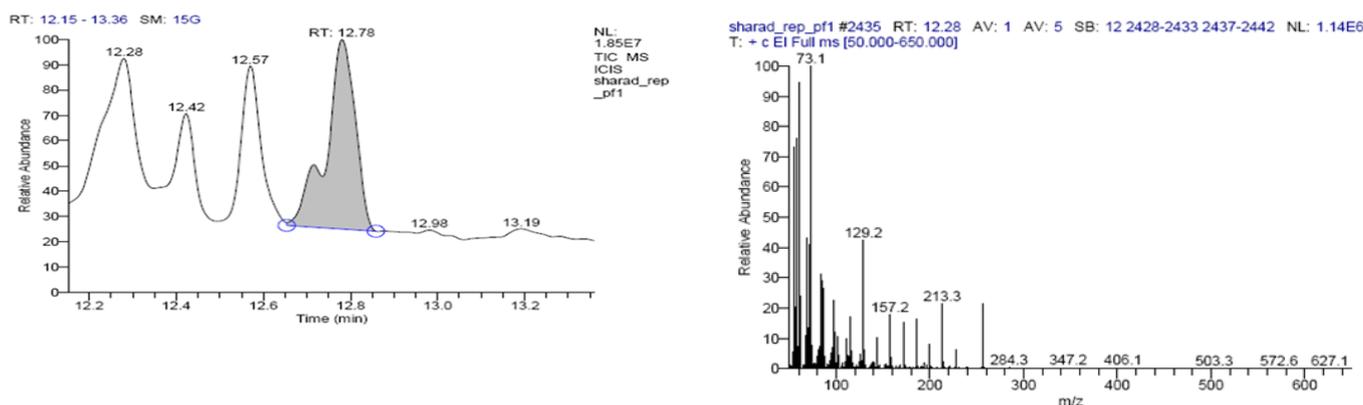
Sr.No	Rt	Compound Name	Molecular Formula	% Area	Cas#
1	10.47	Benzoic acid, 2,4-dihydroxy-3,6-dimethyl-, methyl ester	C10H12O4	8.65	4707-47-5
2	10.47	Benzoic acid, 2-hydroxy-4-methoxy-6-methyl-, methyl ester.	C10H12O4	8.65	520-43-4
3	10.47	3-hydroxy-4-(methoxycarbonyl)-2,5-dimethylphenyl ester	C19H17ClO8	8.65	479-16-3
4	10.47	Atranorin	C19H18O8	8.65	479-20-9
5	10.47	2-Hydroxy-5-methylisophthalaldehyde	C19H18O2	8.65	7310-95-4

Table.4



SR.NO	RT	COMPUND NAME	Molecular	% AREA	CAS#
1	12.78	3-Cyclopentylpropionic acid, 2-tetradecyl ester	C22H42O2	11.86	NA
2	12.78	3-Cyclopentylpropionic acid, nonyl ester	C17H32O2	11.86	NA
3	12.78	3-Cyclopentylpropionic acid, undecyl ester	C19H36O2	11.86	NA
4	12.78	<b>E-2-Hexenyl E-2-octenoate</b>	<b>C14H24O2</b>	<b>11.86</b>	<b>153367-22-7</b>
5	12.78	3-Cyclopentylpropionic acid, cyclohexyl ester	C14H24O2	11.86	NA

Table.4



SR.NO	RT	COMPUND NAME	Molecular formula	% AREA	CAS#
1	12.28	n-Hexadecenoic acid	C16H32O2	12.03	57-10-3
2	12.28	<b>l-(+)-Ascorbic acid 2,6-dihexadecanoate</b>	<b>C38H68O8</b>	<b>12.03</b>	<b>28474-90-0</b>
3	12.28	Pentadecanoic acid	C15H30O2	12.03	1002-84-2
4	12.28	Tetra decanoic acid	C14H28O2	12.03	544-63-8
5	12.28	Octadecanoic acid	C18H36O2	12.03	57-11-4

Table 5

TABLE - GCMS Analysis Interpretation *Pseudevernia furfuraceae* (L) Zopf

#### IV. DISCUSSION

Potential compounds from *Pseudevernia furfuracea* L. Zopf were identified using the GCMS profile, which showed the existence of chemicals in acetone extract. The GCMS chromatogram of the identified compounds' peaks showed the relative amounts of the various compounds isolated from the lichen extracts that eluted as a function of retention time. The peak area displayed the relative concentration of the compounds eluted at different intervals, which allowed for the determination of the nature and structure of the compounds present in the acetone extracts namely 1-(+)-Ascorbic acid 2,6-dihexadecanoate, Atranorin, E-2-Hexenyl E-2-octenoate, Aziridine, 1-2-methyl-1-propenyl).

#### V. CONCLUSION

The acetone extracts utilizing the GCMS profile, which revealed the presence of compounds in acetone extract, *Pseudevernia furfuracea* {L.} Zopf was discovered. The relative amounts of the different compounds from the lichen extracts that eluted as a function of retention time were displayed in the GCMS chromatogram of the identified compounds' peaks. The nature and structure of the compounds present in the acetone extracts, specifically 1-(+)-Ascorbic acid 2,6-dihexadecanoate, Atranorin, E-2-Hexenyl E-2-octenoate, Aziridine, 1-2-methyl-1-propenyl, were determined in part by the peak area, which showed the relative concentration of the compounds eluted at various intervals.

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