INTERNATIONAL RESEARCH JOURNAL OF PHARMACY
www.irjponline.com ISSN 2230 – 8407
Research Article

GC/MS DETERMINATION OF BIOACTIVE COMPONENTS OF *PLEUROTUS OSTREATUS*

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Article Received on: 11/01/12 Revised on: 19/02/12 Approved for publication: 06/03/12

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ABSTRACT
In this study, the bioactive components of *Pleurotus ostreatus* have been evaluated using GC/MS. The chemical compositions of the hydroalcholic extract of *Pleurotus ostreatus* were investigated using Perkin-Elmer Chromatography–Mass Spectrometry, while the mass spectra of the compounds found in the extract was matched with the National Institute of Standards and Technology (NIST) library. GC/MS analysis of hydroalcholic extract of *Pleurotus ostreatus* revealed the existence of Cholestane-3,7,1,25-tetrol tetraacetate,(3a,5a,7a,12 a)-55.20, 9,12-Octadecadienoic acid,methyl ester(E,E)-18.55,14,17-Octadecadienoic acid,methyl ester(E,E)-5.59,Pentadecanoic acid, ethyl ester-3.84.. The results of this study offer a platform for using *Pleurotus ostreatus* as herbal alternative for the current synthetic antimicrobial agents.
Key words: *Pleurotus ostreatus*, GC/MS, Bioactive components

INTRODUCTION

Edible mushrooms are naturally endowed fungi (Mostly Basidiomycees) that grow naturally on the trunks, leaves and roots of trees as well as decaying woody materials.[1] Mushrooms have been reported to be of therapeutic value, useful in preventing diseases such as hypertension, hypercholesterolemia, cancer and also having antibacterial and antiviral properties. These functional characteristics are mainly due to their chemical composition[2-5] The *Pleurotus ostreatus* is one among the edible mushrooms consumed by the people. Scientific experiments reveals that of shitake mushrooms such as *Lentinus edode*, Maitake mushrooms such as *Grifola froundosa*, white button mushrooms such as *Agaricus bisporus* and Oyster mushrooms have shown serve as respositories of B-vitamins such as niacin, flavin and pyridoxine[6] Organic acids such as the glucons, monoterpenoids and diterpenoids, lipids, protein such as hydrophobins and trace elements such as selenium [7&8]

These substances have been found through several invitro and invivo studies to be responsible for the antimicrobial, antiumours, antihypertensive and antiaging potentials of edible mushrooms These bioactive compounds enhance biological activites like stimulation of interleukins-12 production ,nitric oxide synthase action, free radical scavenging and iron chelating activity[9&10]

MATERIALS AND METHODS

Plant material and extraction procedure

Pleurotus ostreatus were bought fresh from local market, Thanjavur. 10gm powdered material was soaked in 20ml of Absolute alcohol overnight and then filtered through a Whatmann® No.41 filter paper (pore size 20 - 25m) along with 2gm Sodium sulfate to remove the sediments and traces of water in the filtrate. Before filtering, the filter paper along with sodium sulphate was wetted with absolute alcohol. The filtrate was then concentrated by bubbling nitrogen gas into the solution and was concentrated to 1ml. The extract contains both polar and non-polar phytocomponents.

Gas chromatography-mass spectrometry (GC/MS) analysis

GC/MS analysis of this extract was performed using a Perkin Elmer GC Claurus 500 system and GasChromatograph interfaced to a Mass Spectrometer (GC/MS) equipped with a Elite-1 fused silica capillary column (30 m × 0.25 mm ID. ×1 iMdf, composed of 100% Dimethyl poly siloxane). For GC/MS detection, an electron ionization system with ionization energy of70 eV was used. Helium gas (99.999%) was used as the carrier gas at a constant flow rate of 1 ml/min. and an injection volume of 2 ul was employed (split ratio of 10:1). Injector temperature 250°C; Ion-source temperature 280°C. The oven temperature was programmed from 110°C (isothermal for 2 min.), with an increase of 10°C/min, to 200°C, then 5°C/min to 280°C, ending with a 9 min. isothermal at 280°C. Mass spectra were taken at 70 eV; a scan interval of 0.5 seconds and fragments from 45 to 450 Da. Total GC running time was 36 min.The relative percentage of each component was calculated by comparing its average peak area to the total area.

Software adopted to handle mass spectra and chromatograms was TurboMass Ver5.2.0

RESULTS AND DISCUSSION

The extract of *Pleurotus ostreatus* was subjected *GC*/MS analysis. Thirteen compounds were identified in *Pleurotus ostreatus* extract by GC-MS analysis .The active principles with their Retention time (RT), Molecular formula, Molecular weight (MW) , Concentration (%)& their bioactivity are presented in (Fig – 1 and Table - 1) The prevailing compounds were á-Cholestane-3,7,1,25-tetrol tetraacetate,(3a,5a,7a,12 a)-55.20, 9,12-Octadecadienoic acid,methyl ester(E,E)-18.55,14,17- Octadecadienoic acid,methyl ester(E,E)-5.59,Pentadecanoic acid, ethyl ester-3.84.

CONCLUSION

From the above study it may be concluded *Pleurotus ostreatus* contains many important phytochemical like Cholestane-3,7,1,25-tetrol tetraacetate,(3a,5a,7a,12 a)-55.20, 9,12-Octadecadienoic acid,methyl ester(E,E)-18.55,14,17-Octadecadienoic acid,methyl ester(E,E)-5.59,Pentadecanoic acid, ethyl ester-3.84.which may prove to be a potent antimicrobial agent. Further work is being carried out to isolate the same and study its biological activity in an invitro system.

ACKNOWLEDGMENT

I would like to thank wholeheartedly Shri. S.Kumaravel, Scientist, Department of Food Quality and Testing, Indian

Institute of Crop Processing Technology and Dr. K. Alagusundaram, Director, Indian Institute of Crop Processing Technology for guiding and supporting me, throughout.

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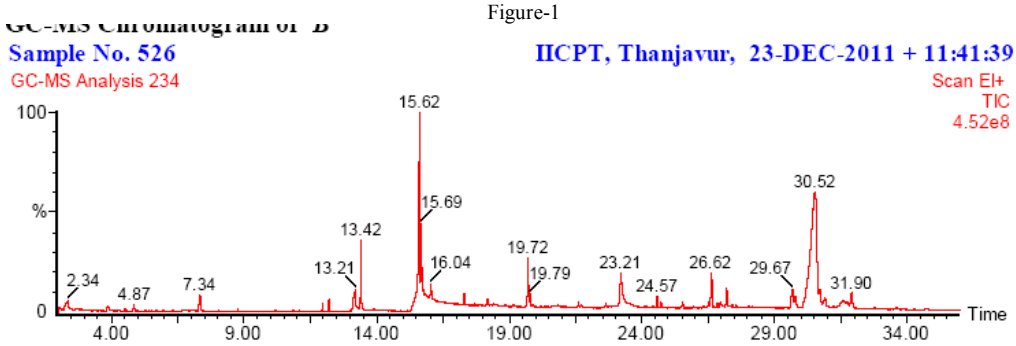
No	RT	Name of the Compound	Molecular formula	MW	Peak Area %
1	2.34	Urea, N-methyl-N-nitroso	C2H5N3O2	103	2.81
2.	3.86	Alpha-amino-gamma -butyrolactone	C4H7NO2	101	0.67
3.	4.87	3-Methyl-2-butenoic acid,2,2-dimethylpropyl ester	C10H1802	170	0.56
4.	7.34	4H-1-2,4-Triazole, 4-methyl	C3H5N3	83	1.45
5.	11.96	D-Lysine	C6H14N2O2	146	0.70
6.	12.22	1-UNDECANOL,11-MERCAPTO-	C11H24OS	204	0.52
7.	13.21	N-8-Guanidino-spermidine	C8H21N5	187	3.42
8.	13.42	Pentadecanoic acid,ethyl ester	C17H34O2	270	3.84
9.	15.62	9,1-Octadecadienoic acid,methyl ester (E,E)	C19H34O2	294	18.55
10.	15.69	14,17-Octadecadienoic acid,methyl ester	C19H34O2	294	5.59
11.	19.72	Methanamine,n-pentylidene	C6H13N	99	3.40
12.	26.62	Dicarbododecaborane-c,c'-bis9propanenitrile)-	C8H18B1ON2	252	3.30
13.	30.52	Cholestane3,7,12,25-tetrol,tetraacetate, (3a,5a,7a,12a)-	C3H56O8	604	55.20

Figure-1



Source of support: Nil, Conflict of interest: None Declared