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# Bioactive Compounds Identification of *Pleurotus platypus* and *Pleurotus eous by GC-MS*

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## ABSTRACT

*In this study, Pleurotus platypus and Pleurotus eous was subjected to identification of bioactive compounds by using Gas chromatography – Mass spectrum technique. These two organisms were extracted with 99% of ethanol. Extracted sample was injected, according to the retention time and peak formation the bioactive compounds are screened. In Pleurotus platypus Pyridine-3-carboxamide, 4-dimethylamino-N-(2, 4-difluorophenyl), Piperidin-4-carboxylic acid, Aspidofractinine-3-methanol, (2à, 3á, 5à), Indolizine, and 2-(4-methylphenyl)-. Pleurotus eous shows that Imidazolidine, 1, 3-dinitro, Phenol, 2-methyl-4-(1, 1, 3, 3-tetramethylbutyl), Aspidofractinine-3-methanol, (2à, 3á, 5à) and Squalene.*

**Key Words:** Bioactive compounds, GC-MS, *Pleurotus eous* and *Pleurotus platypus.*

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## INTRODUCTION

Today, with the development of better technologies and greater realization of their nutrient values, mushrooms have occupied an important place in food in several parts of the world [1]. Researches on the nutritive value of edible mushrooms indicate that they may be regarded as healthy foods, even though they are deficient in calories and fat and consist of about 90% water [2, 3, and 4]. 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 [5, 6, 7 and 8].

The fruiting body of the mushroom is also a potential source of lignin and phenol degrading enzymes [9]. While from clinical viewpoint, [10] showed that *P. ostreatus* elicited hypocholesterolemic and antherogenesis inhibition functions in rabbits and rat coutesy of its mycelial secretory products. However, unlike the fruiting bodies of few other edible mushrooms such as *L. edodes*, *G. fondosa* and *G. lucidium* known for exhibiting antibacterial and antifungal activity *in vitro*, there is lack of information on the microbicidal properties of *P. ostreatus* coupled with inadequate data on its phytochemistry. It is hypothesized that knowledge of the phytoconsitituents of *P. ostreatus* would provide an insight into its biological functions beyond nutrition when consumed.

## MATERIALS AND METHODS

25gm of smashed fresh *Pleurotus eous and Pleurotus platypus* sample was taken in a conical flask with 30ml of distilled alcohol and keep it for overnight soaking then filter the sample and concentrated the sample with help of nitrogen flushing. Filter the filtrate with sodium sulphate. 2ul of purely prepared sample was injected into the programme GC-MS instrument.

### GC Programme

Column: Elite-5MS (5% Diphenyl / 95% Dimethyl poly siloxane), 30 x 0.25mm x 0.25µm df
Equipment: GC Clarus 500 Perkin Elmer, Carrier gas: 1ml per min, Split: 10:1, Detector: Mass detector Turbo mass gold-Perkin Elmer,Software: Turbomass 5.2,Sample injected: 2µl

### Oven temperature Programme

110° C -2 min hold ,Up to 200° C at the rate of 10 ° C/min-No hold,Up to 280 ° C at the rate of 5° C / min-9 min hold,Injector temperature 250° C,Total GC running time 36 min

### MS Programme

Library used NIST Version-Year 2005, Inlet line temperature 200°C, Source temperature 200°C Electron energy:70 eV, Mass scan (m/z): 45-450,Solvent Delay: 0-2 min, Total MS running time: 36 min

## RESULTS AND DISCUSSION

### Identification of Components

Interpretation on mass spectrum GC-MS was conducted using the database of National Institute Standard and Technology (NIST) having more than 62,000 patterns. The spectrum of the unknown component was compared with the spectrum of the known components stored in the NIST library. The name, molecular weight and structure of the components of the test materials were ascertained. Table 1 & 2.

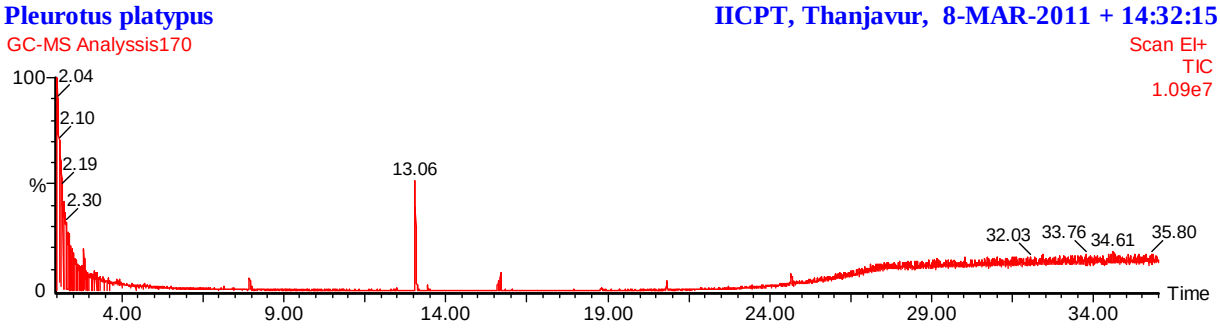
*P.platypus* and *P.eous* was subjected to GC-MS study for identification of medicinal properties, According to the results, the Phytocomponents are screened, and most of the medicinal properties are Pyridine-3-carboxamide, 4-dimethylamino-N-(2,4-difluorophenyl)-, Piperidin-4-carboxylic acid, Aspidofractinine-3-methanol, (2à,3á,5à)-, 1H)Pyrrole-2-carboxaldehyde, 4-(trichloroacetyl)-, Indolizine, 2-(4-methylphenyl)- are present in *P.platypus*. In *P.eous* Imidazolidine, 1,3-dinitro, Phenol, 2-methyl-4-(1,1,3,3-tetramethylbutyl),Aspidofractinine-3-

methanol, (2à,3á,5à)- and Squalene are presented. The anticancer properties contain Phytochemical compounds were screened in the GC-MS which was shows the high activity, other Phytocomponents were showed in the chromatogram.

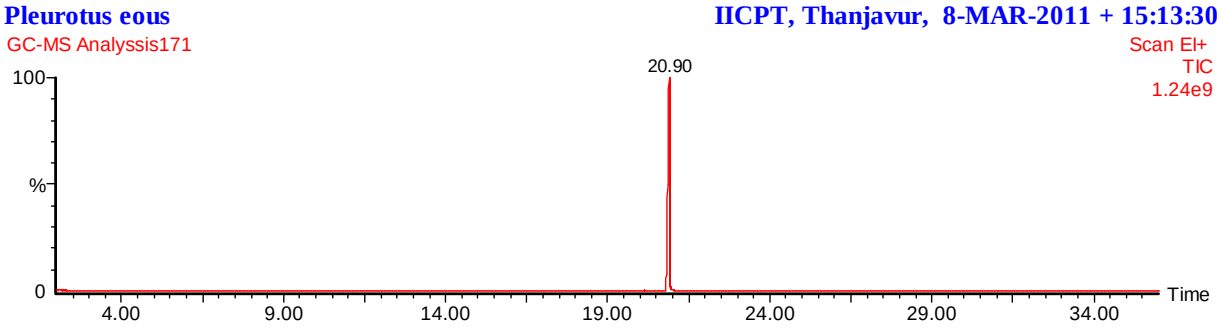
**Table: 1 Components identified in the *Pleurotus platypus Sample* [GC-MS Study]**

| No. | RT | Name of the compound | Molecular Formula | MW | Peak Area % |
|---|---|---|---|---|---|
| 1. | 7.17 | DL-Alanine, N-benzoyl-N-(3-chloro-4-fluorophenyl)-, methyl ester | $C_{17}H_{15}ClFNO_3$ | 335 | 0.76 |
| 2. | 7.44 | (1H)Pyrrole-2-carboxaldehyde, 4-(trichloroacetyl)- | $C_7H_4Cl_3NO_2$ | 239 | 0.76 |
| 3. | 7.96 | 2-Amino-4-hydroxy-6,7,8-trimethylpteridine | $C_9H_{11}N_5O$ | 205 | 3.80 |
| 4. | 12.49 | Benzoic acid 1-methoxy-1H-tetrazol-5-ylmethyl ester | $C_{10}H_{10}N_4O_3$ | 234 | 0.76 |
| 5. | 13.06 | Pyridine-3-carboxamide, 4-dimethylamino-N-(2,4-difluorophenyl)- | $C_{14}H_{13}F_2N_3O$ | 277 | 74.14 |
| 6. | 13.45 | à-Ethyl aspartate | $C_6H_{11}NO_4$ | 161 | 2.28 |
| 7. | 18.80 | Piperidin-4-carboxylic acid | $C_6H_{11}NO_2$ | 129 | 1.52 |
| 8. | 20.82 | Aspidofractinine-3-methanol, (2à,3á,5à)- | $C_{20}H_{26}N_2O$ | 310 | 4.94 |
| 9. | 24.67 | Indolizine, 2-(4-methylphenyl)- | $C_{15}H_{13}N$ | 207 | 11.03 |

**GC-MS Chromatogram of *Pleurotus platypus***




**GC-MS Chromatogram of *Pleurotus eous***




## CONCLUSION

In this study, *Pleurotus platypus* and *Pleurotus eous* were extracted with pure ethanol and subjected to screening of bioactive compounds by Gas Chromatography-Mass Spectrum technique, according to the results various active compounds are presented in Pleurotus platypus when compared with Pleurotus eous. The active compounds are Pyridine-3-carboxamide, 4-dimethylamino-N-(2, 4-difluorophenyl)-, Piperidin-4-carboxylic acid, Aspidofractinine-3-

methanol, (2à, 3á, 5à)-, 1H) Pyrrole-2-carboxaldehyde, 4-(trichloroacetyl)-, Indolizine, 2-(4-methylphenyl)- are present in *P.platypus*. In *P.eous* Imidazolidine, 1, 3-dinitro, Phenol, 2-methyl-4-(1, 1, 3, 3-tetramethylbutyl), Aspidofractinine-3-methanol, (2à, 3á, 5à) - and Squalene

**Table: 2 Components identified in the *Pleurotus eous Sample* [GC-MS Study]**

| No. | RT | Name of the compound | Molecular Formula | MW | Peak Area % |
|---|---|---|---|---|---|
| 1. | 7.96 | 5-(4-Hexyloxybenzoyloxy)-2-(4-nitrophenyl) pyrimidine | $C_{23}H_{23}N_3O_5$ | 421 | 0.01 |
| 2. | 10.15 | Imidazolidine, 1,3-dinitro- | $C_3H_6N_4O_4$ | 162 | 0.02 |
| 3. | 12.64 | dl-Alanine | $C_3H_7NO_2$ | 89 | 0.01 |
| 4. | 16.89 | Phenol, 2-methyl-4-(1,1,3,3-tetramethylbutyl)- | $C_{15}H_{24}O$ | 220 | 0.07 |
| 5. | 17.51 | 1H-Tetrazol-5-amine | $CH_3N_5$ | 85 | 0.02 |
| 6. | 20.90 | Aspidofractinine-3-methanol, (2à,3á,5à)- | $C_{20}H_{26}N_2O$ | 310 | 99.83 |
| 7. | 24.66 | Squalene | $C_{30}H_{50}$ | 410 | 0.05 |

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