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The GC-MS and antioxidant activity analysis using organic solvent extracts of *Leucas aspera*

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ABSTRACT

Drugs can be generated from many plants. *Leucas aspera* is known as "Thumbai" were taken and 5g of Leaf was treated with 5ml of ethanol and Acetone respectively, and the flowers of *Leucas aspera* were also taken. 1g of flower is treated with the 10ml of Ethanol and Acetone each to get the extract. The Antibacterial activity of the extract was found to be in 100 µg/ml of the flower extract of acetone and the maximum antioxidant activity was also found at 120 µg/ml of flower extract of acetone. The GC-MS analysis were done for the identification of bioactive compounds.

KeyWords : Flower extract, Anti-bacterial activity, Anti-oxidant activity, GC-MS analysis

INTRODUCTION

Nature is a richest source of medicinal plants diversity. Many novel drugs have been isolated from it and most of these novel drugs are based on their use in traditional medicine. In ancient days, the treatment of diseases is done by using medicinal plants, herbs due to their potential to cure diseases[1,2].In developing countries the interest of medicinal plants is increasing as the herbal medicine have been reported as safe and also the adverse effect is low particularly when compared with synthetic drugs[3,4]. Based on folklore medicine, the plants from the genus *Leucas* have different kinds of therapeutic activities. *Leucas aspera* belongs to the family Lamiaceae commonly known as 'Thumbai' (in Tamil) 'Thumbe', 'White dead nettle' (English), 'Dronapushpi', 'Chitrapatrika' (Sanskrit). The whole plant is traditionally important because it has many therapeutic values[5,6].

MATERIALS AND METHODS

Preparation of the Extract

5g of leaf was taken from the plant and 5ml of ethanol was added to it. Another 5g of leaf treated with 5ml of acetone[7]. Both was then grinded well then by using pestle and mortar and the filtrate was extracted as previous procedure. 1g of flower taken from the plant and treated with 10ml of Ethanol and Acetone respectively and the filtrate was obtained[8].

ANTIBACTERIAL ACTIVITY

Nutrient agar was prepared and poured in the sterile Petri dishes and allowed to solidify. The overnight-grown bacterial colony was used for the preparation of the bacterial suspension. A single colony was taken and dissolved in normal saline solution *and* was swabbed on it. Wells were prepared by using a gel puncture of 10 mm diameter on all of the prepared agar plates. Then, the test sample was added over the agar wells. Streptomycin (25µL) was used as positive control (Standard). The plates were then incubated at 37ºC for 24hours[9]. After incubation the inhibition diameter wasmeasured and units are mm.

ANTIOXIDANT ASSAY

DPPH ASSAY

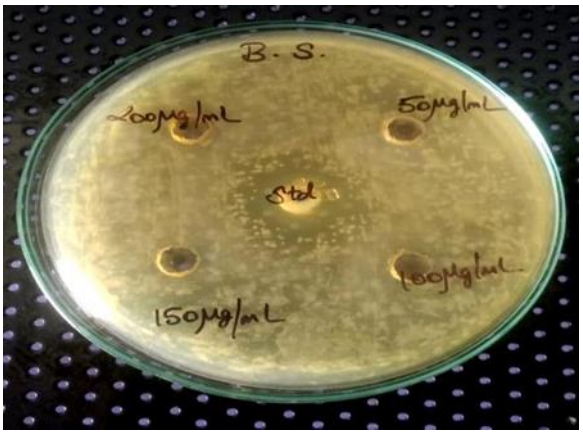
The Radical Scavenging Activity of test sample was determined by using DPPH assay according to Chang et al., (2008)[10] with small modification. The decrease of the absorption at 517nm of the DPPH solution after the addition of the antioxidant was measured in a cuvette containing 2960µl of 0.1mM ethanolic DPPH solution mixed with 20 to 120 µg/ml of test sample and vortexed thoroughly[11]. The setup was left at dark in room temperature and the absorption was monitored after 30minutes. The ability of the plant extract to scavenge DPPH radical was calculated[12] by the following equation:

$$\% \text{ of DPPH Radical Scavenging Activity} = \frac{\text{Abs. control} - \text{Abs. sample}*100}{\text{Abs. control}}$$

Abs. control is the absorbance of DPPH radical + methanol; Abs. sample is the absorbance of DPPH radical + test sample

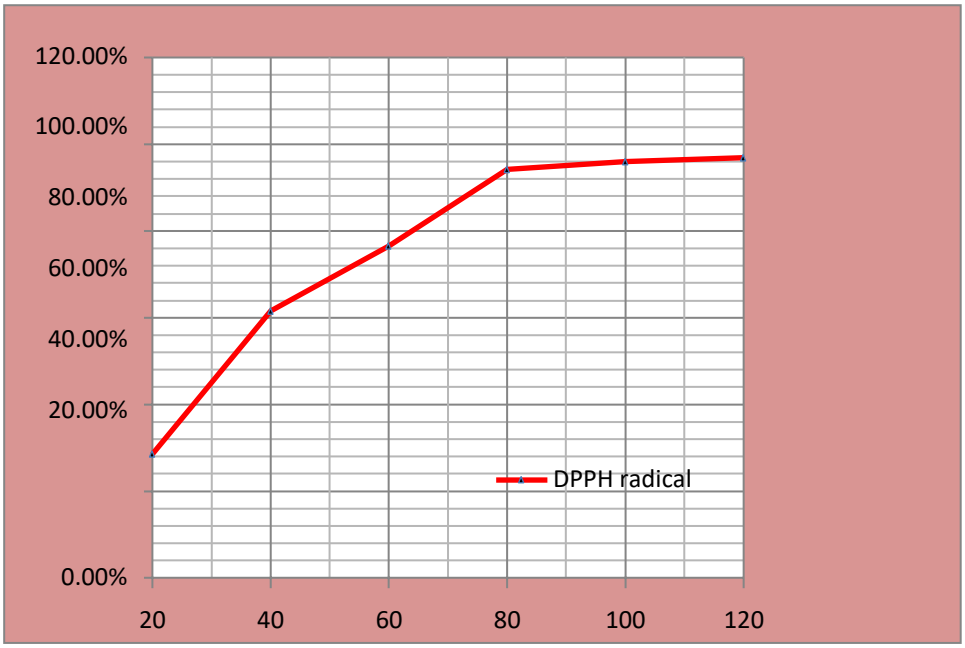
RESULTS AND DISCUSSION

ANTIBACTERIAL ACTIVITY



The agar well diffusion method is the most commonly used method to examine the antimicrobial activity. The anti bacterial activity in plates was observed which was swabbed with *Bacilus sp.,* showed 0.3 mm zone of inhibition to 100µg/ml when used streptomycin as the standard[13]. The zone of inhibition was measured for the standard which is about 0.5mm.

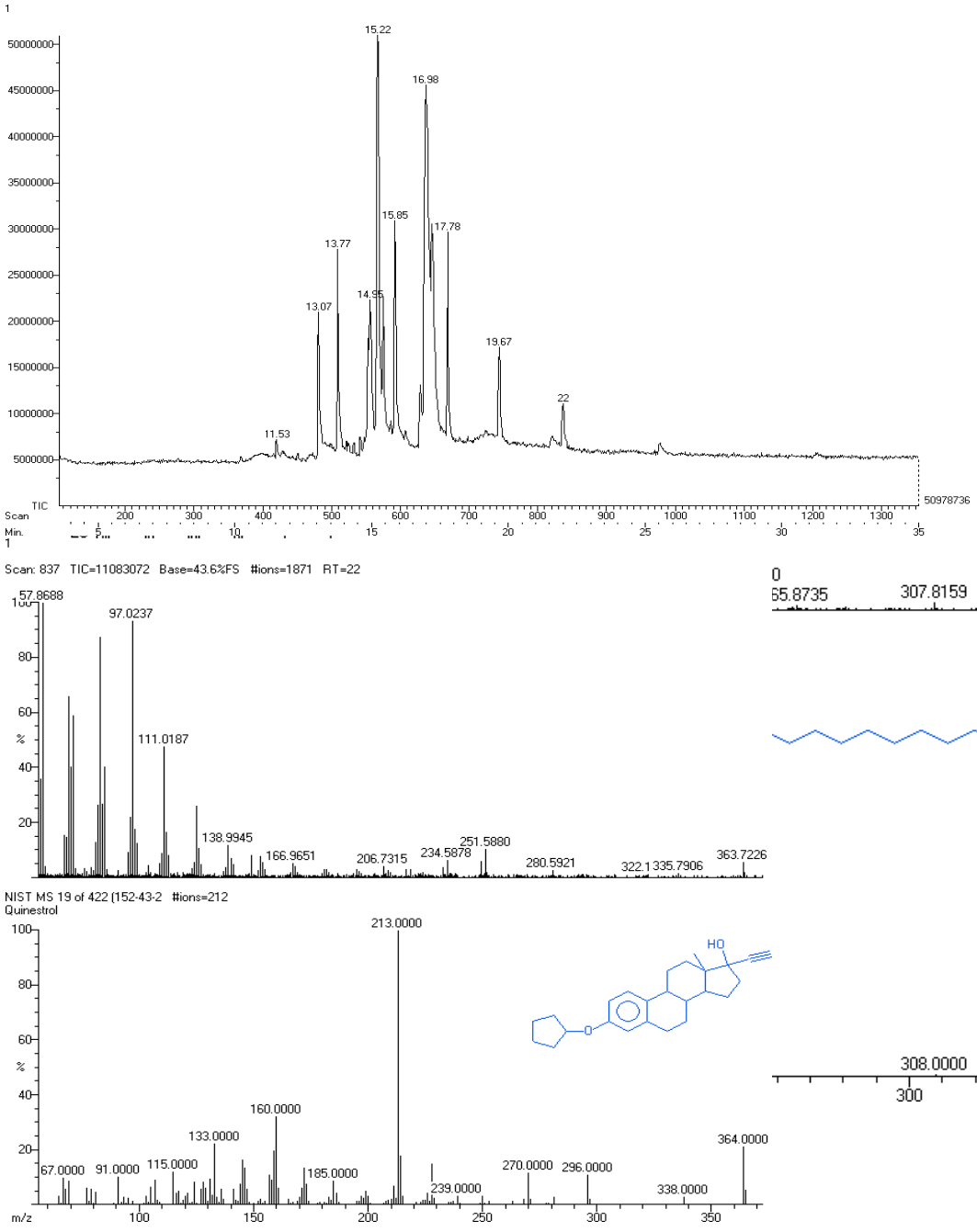
ANTIOXIDANT ACTIVITY



The 2,2-Diphenyl-1-picrylhydrazyl (DPPH) is a popular, quick, easy, and affordable approach for the measurement of antioxidant properties that includes the use of the free radicals used for assessing the potential of substances to serve as hydrogen providers or free-radical scavengers (FRS). The decrease of the absorption at 517nm of the DPPH solution after the addition of the antioxidant was measured in a cuvette containing 2960µl of 0.1mM ethanolic DPPH solution mixed with 20 to 120 µg/ml of test[14]. Anti-scavenging activity was found to be increasing and was found to be 120 µg/ml. Damage caused by ROS may be reduced by using antioxidants, which are chemicals that can stop other molecules from oxidizing. Due to their potential to contribute electrons that may neutralize radical production, antioxidants are useful in lowering and preventing further damage through free-radical responses

GC MS REPORT

A good chromatogram of each standard sample. A mass spectrum of each sample is obtained. Chromatographs and mass spectra of all unknown mixtures has been depicted. The retention time and compound category has been identified [15,16].



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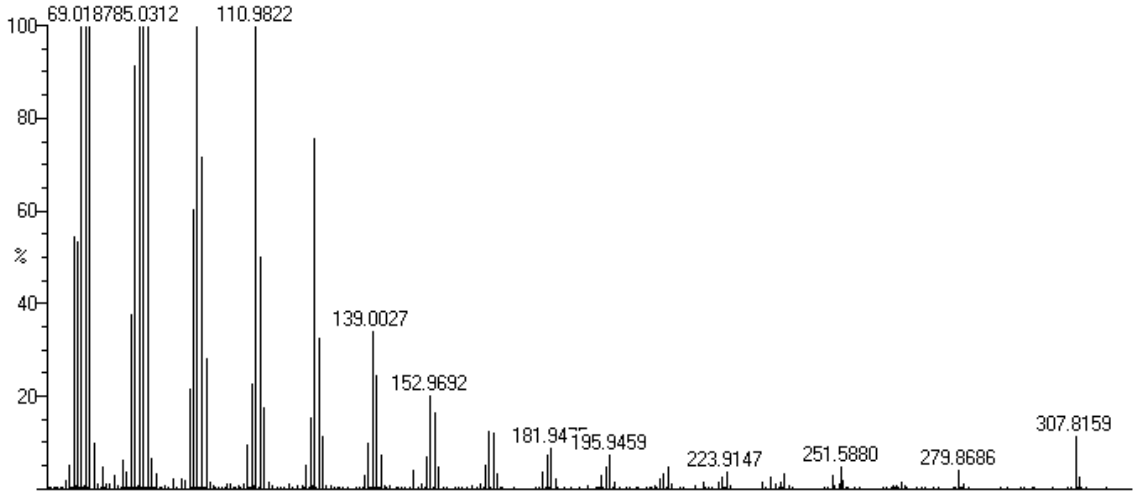

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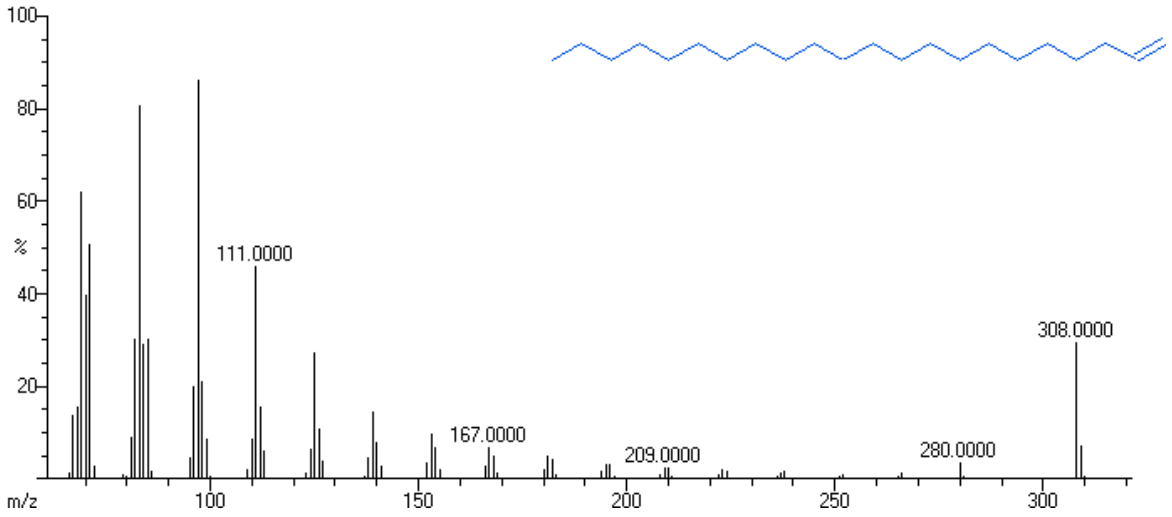
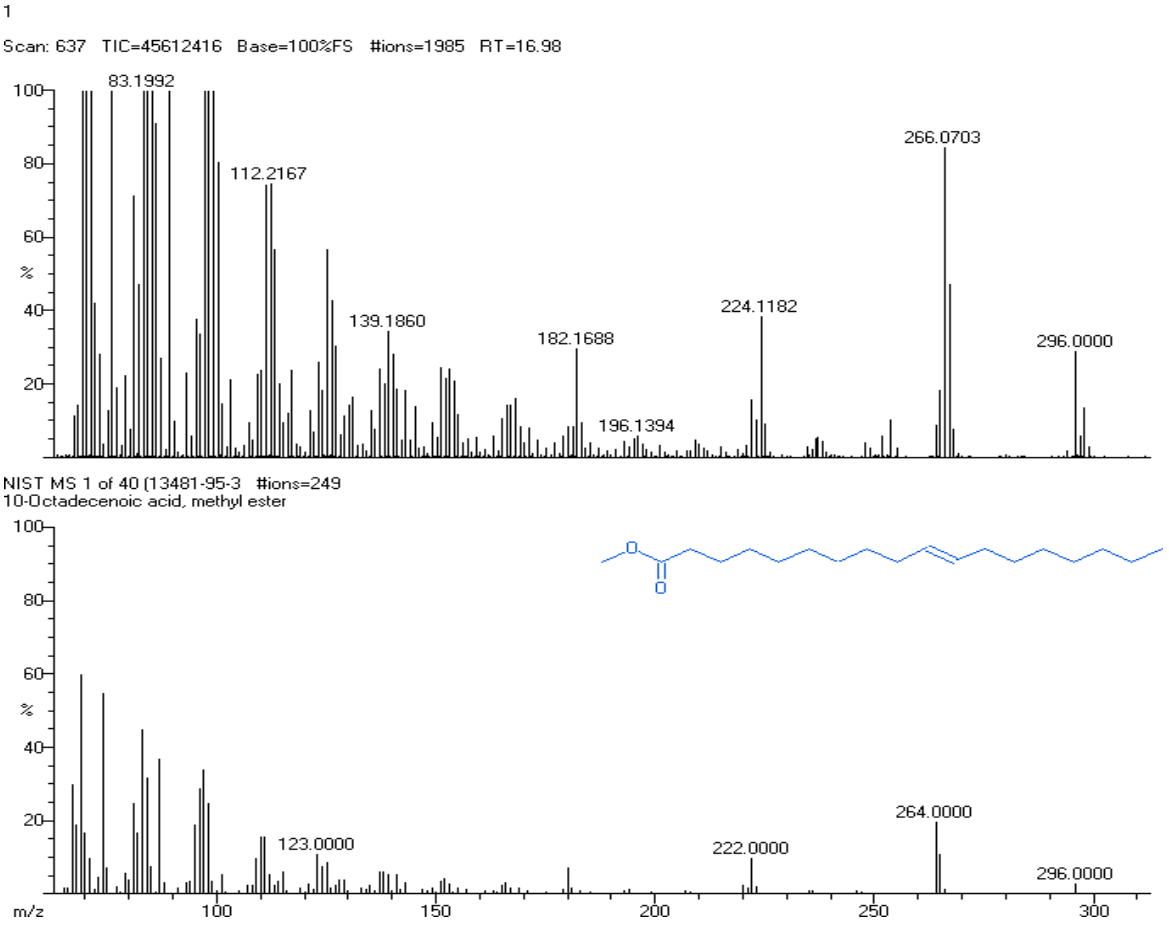
1-Docosene




1
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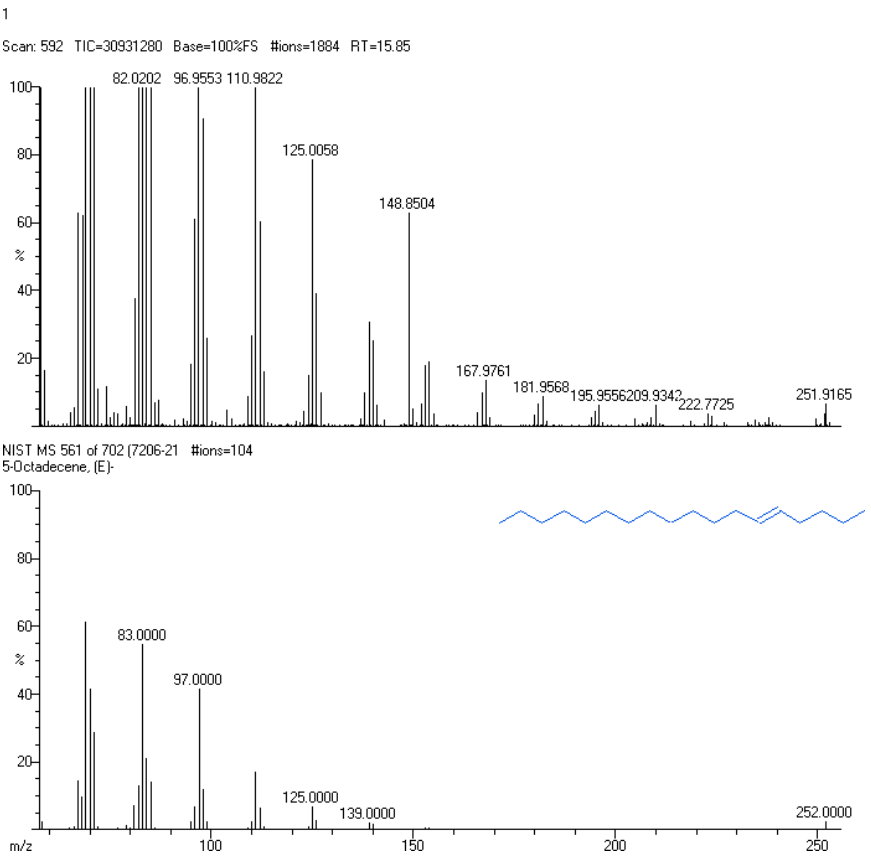
83.1992
112.2167
139.1860
182.1688
196.1394
224.1182
266.0703
296.0000
NIST MS 1 of 40 (13481-95-3 #ions=249
10-Octadecenoic acid, methyl ester
123.0000
222.0000
264.0000
296.0000
%
m/z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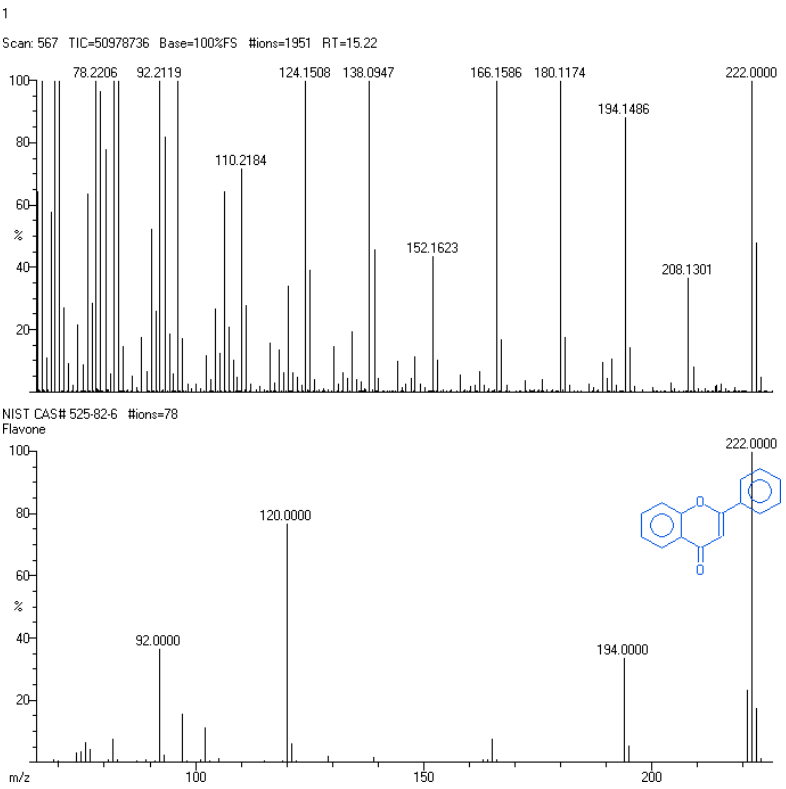
Scan: 592 TIC=30931280 Base=100%FS #ions=1884 RT=15.85
82.0202 96.9553 110.9822
125.0058
148.8504
167.9761
181.9568
195.9556209.9342
222.7725
251.9165
NIST MS 561 of 702 (7206-21 #ions=104
5-Octadecene, (E)-
83.0000
97.0000
125.0000
139.0000
252.0000
m/z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Scan: 567 TIC=50978736 Base=100%FS #ions=1951 RT=15.22
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194.1486
110.2184
152.1623
208.1301
NIST CAS# 525-82-6 #ions=78
Flavone
222.0000
120.0000
92.0000
194.0000
m/z

1

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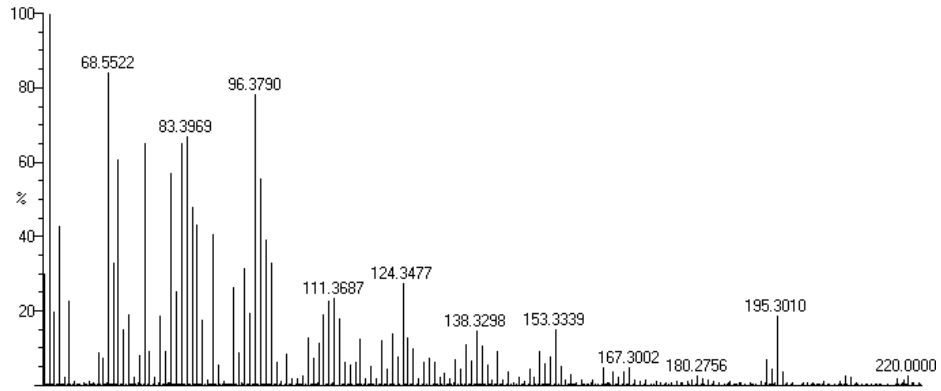

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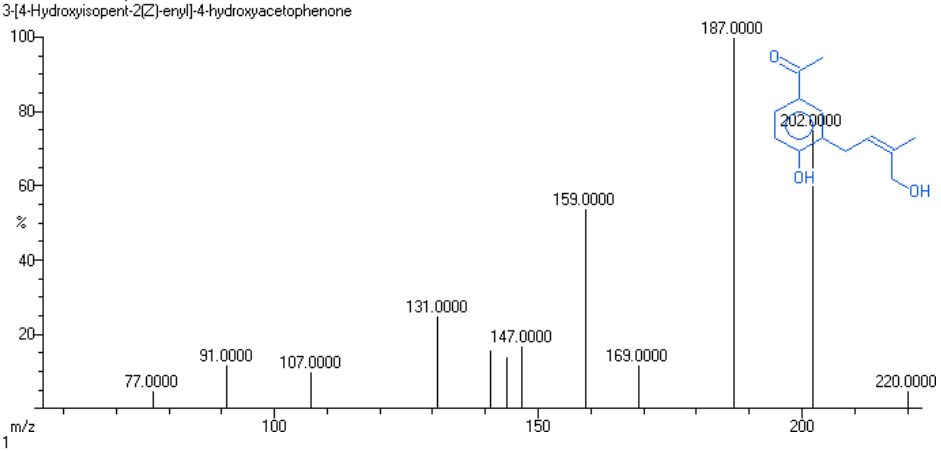
3-[4-Hydroxyisopent-2(Z)-enyl]-4-hydroxyacetophenone



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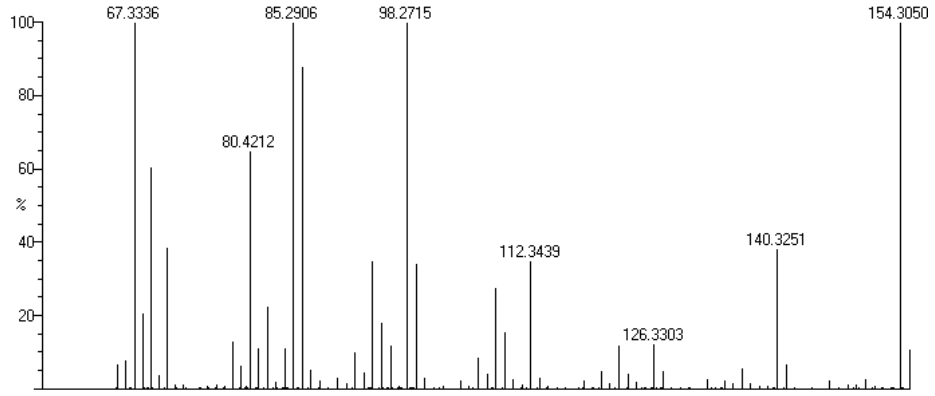
Scan: 481 TIC=21002352 Base=100%FS #ions=1801 RT=13.07



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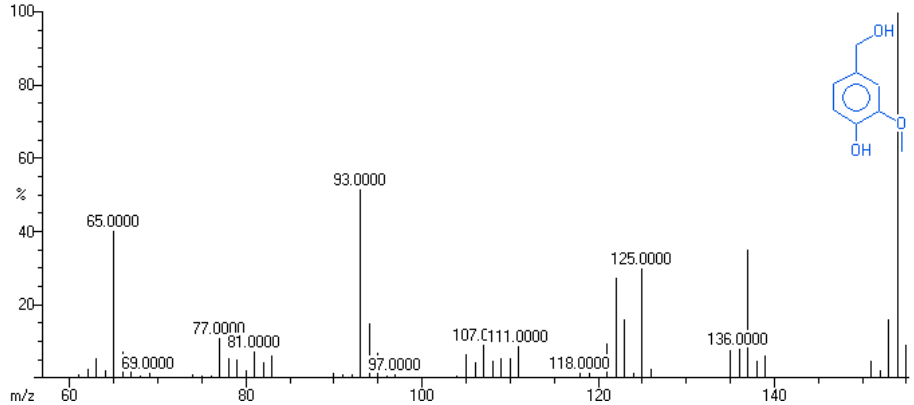
4-Hydroxy-3-methoxybenzyl alcohol



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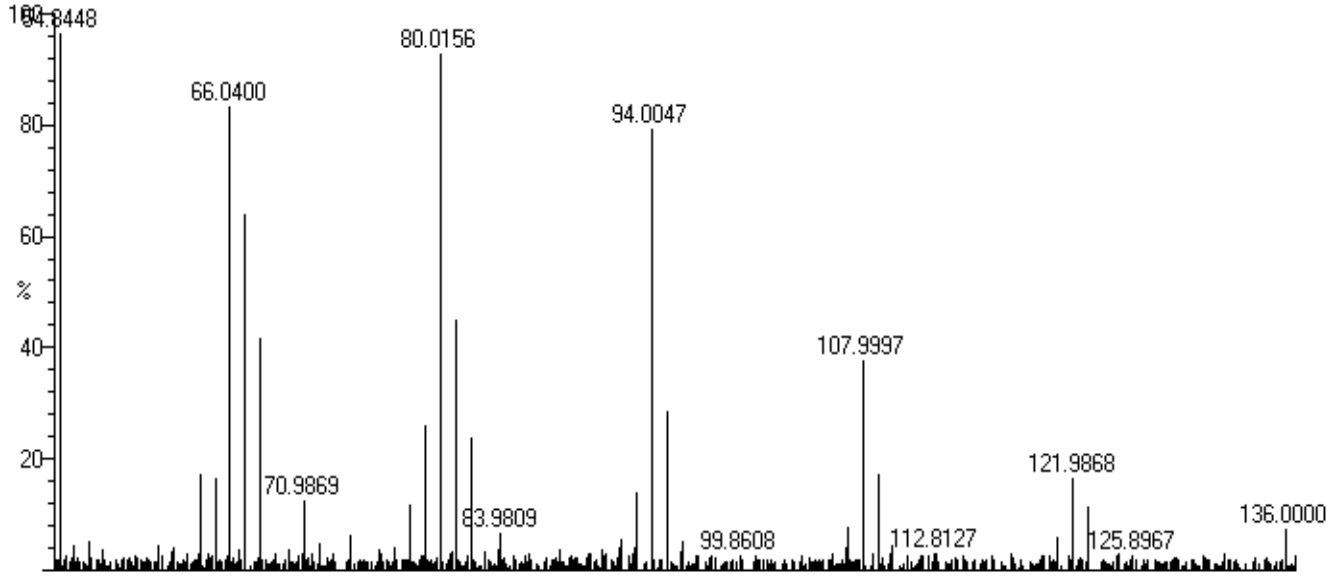
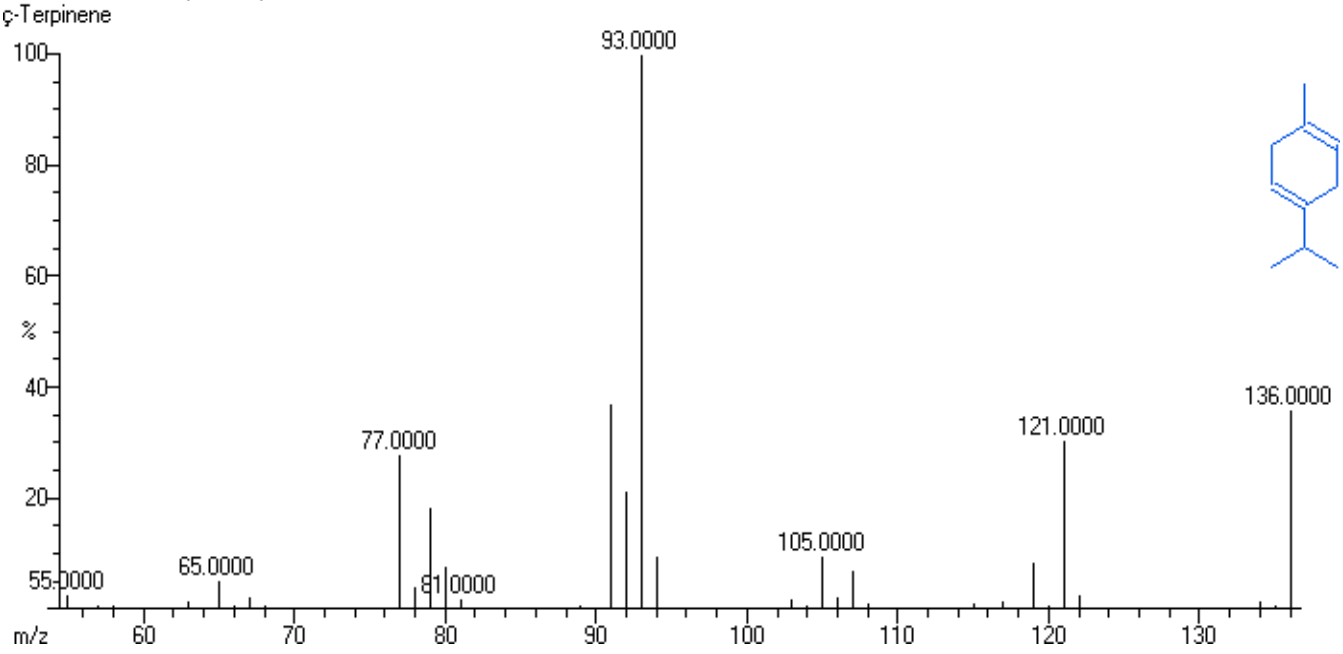


NIST MS 15 of 549 (99-85-4) #ions=71

ç-Terpinene



CONCLUSION

Leucas aspera is a medicinal plant which is traditionally important. *Leucas* genus has many species. The bioactive compounds such as diterpenes, lignans, flavonoids, squalene of this plant has many therapeutic values. *Leucas aspera* extracts have antimicrobial, antioxidant, anticancer, antidiabetic activity. The phytochemical compounds present in *Leucas aspera* can be harnessed for human therapeutic purpose due to its pharmacological activities.

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