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# Observation on aromatic phyto-constituents from *Pogostemon benghalensis* (Burm.f.)Kuntze

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## Abstract

The family Lamiaceae commonly known as mint family has several plant species which have potential therapeutic activity due to presence of essential oils in them. The family has a cosmopolitan distribution. Lamiaceae contains about 236 genera and 6,900 to 7,200 species. Family Lamiaceae is characterized by plant species endowed with an aromatic phytoconstituents. The members of this family are adapted to low and medium altitude in India. *Pogostemon benghalensis* is one among 70 species belonging to the genus *Pogostemon*. It is native to Southeast Asia and distributed throughout in India, China, Japan and southward from Malayasia to Australia.It is commonly called as Patchouli. It is a herb with strong solid angular stem, leaves opposite, dentate margin, inflorescence is verticillaster. Narrower corolla tube and less crowed inflorescence is a distinctive character of plant. The therapeutic application of this plant is mentioned as antibacterial, antifungal, antitubicular, antirheumatic, skin diseases and liver protectant. The leaves and stem oil is used as a stimulant.

**Keywords:** *Pogostemon,* Lamiaceae , Aromatic phytoconstituents, GC-MS analysis, aromatic oil.

## Introduction

Medicinal and aromatic plants, are known to be used by 70% to 80% of global population for their medicinal-therapeutic effects as estimated by WHO. In India aromatic plants play an important role in the country's agricultural profile due to their application in various fields.[1].

The Lamiaceae (Labiatae) is one of the most important angiospermic aromatic families varying greatly in terms of ethno-medicine [2]. Naturally growing Lamiaceae members have been used as tea, spice and for various medicinal purposes for fever, cough, headaches, wound healing, heart diseases and stomach-aches [3]. *Pogostemon benghalensis* (Burm.F.) Kuntz, is a member of Lamiaceae family and it occurs in open riverine forest and cultivated in almost all parts of India [4].

## Methodology

**Collection of plant material:**

Entire plants of *Pogostemon benghalensis* were collected in month of March2015 from Chikhaladara forest locality, Extraction of stem part done as per Herbone method using solvent acetone [5].

**Extraction Method**

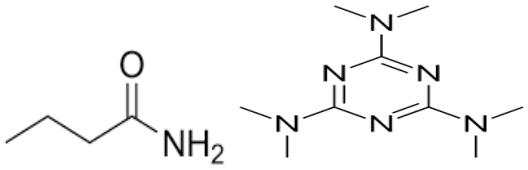
**Gas Chromatography-Mass Spectroscopy (GC-MS) analysis:**

For GC-MS analysis acetone extract was used. The GC-MS analysis of stem extract isolated from *Pogostemon benghalensis* was carried out using gas chromatography – high resolution mass spectrophotometer. 2 µl of sample employed for GC – MS Analysis. Analysis was carried out using Alegent Hp 7880 with coloum 25m. Helium gas was used as carrier gas at constant flow rate and estimation of aromatic phyto-constituents done with the help of NIST online libray.

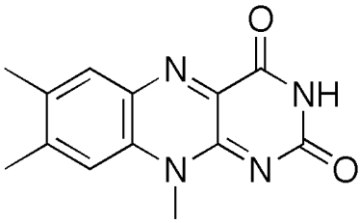
**Observation**

**Table:** Identified compounds in sample of *Pogostemon benghalensis* stem extract in acetone.

| Sr.No. | R.T. | COMPOUND | PEAK AREA | M.W. | M.F. |
|---|---|---|---|---|---|
| 1. | 3.9 | Butanamide | 24.92 % | 87.06 | $C_4H_9NO$ |
| 2. | 13.1 | Cyacetacide | 33.24 % | 99.13 | $C_3H_5N_3O$ |
| 3. | 14.5 | Altretamine | 32.72 % | 210.13 | $C_9H_{18}N_6$ |
| 4. | 18.5 | Lumiflavine | 9.09 % | 256.29 | $C_{13}H_{12}N_4O_2$ |



Butanamide Altretamine



Lumiflavine

**Fig 1 :** Fragmentation patterns of identified compounds correspond shown in table.

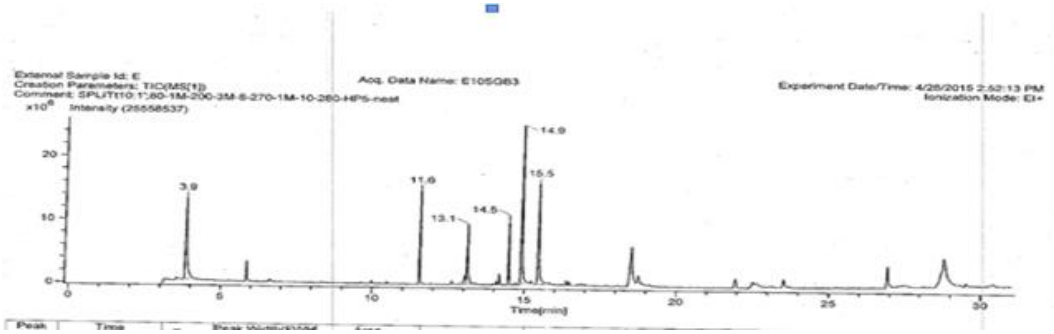
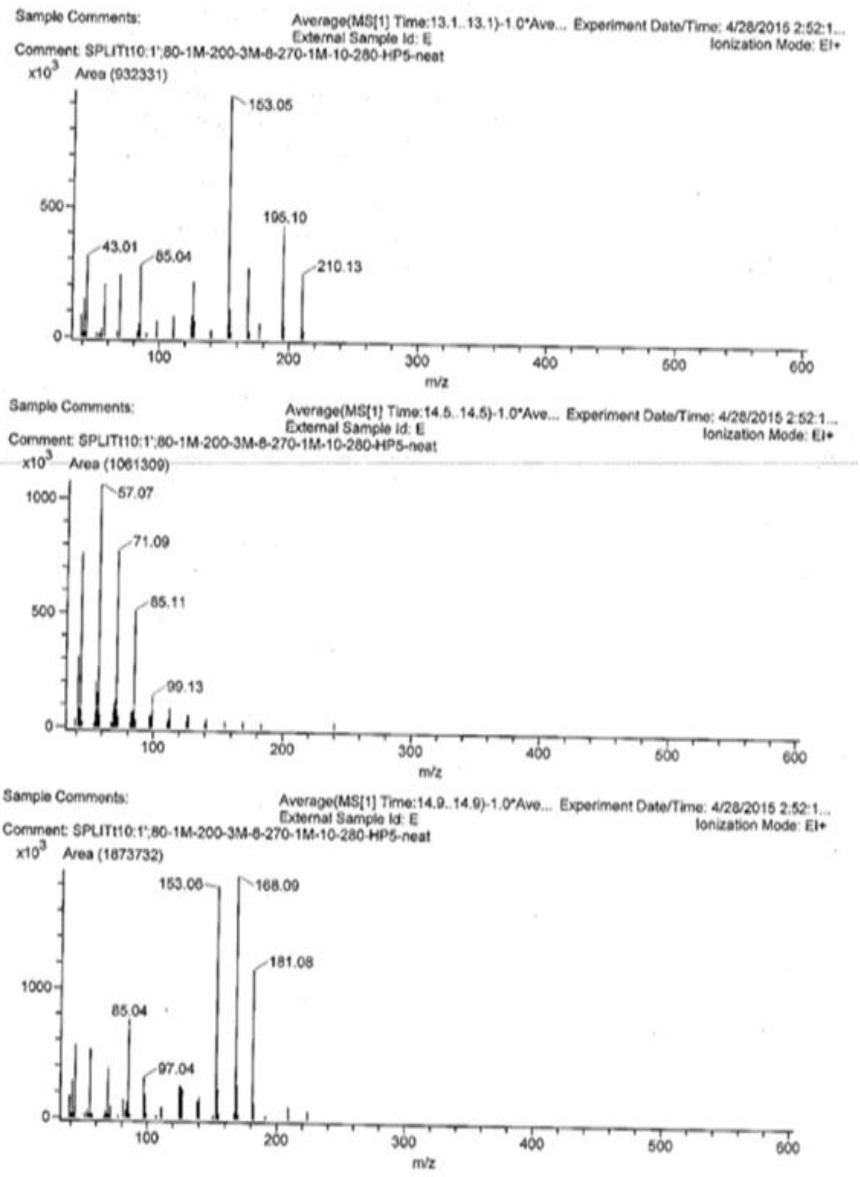



**Fig.2: GC-MS Chromatogram of *Pogostemon benghalensis* stem in acetone extract.**


Sample Comments:
Average(MS[1] Time:13.1..13.1)-1.0*Ave... Experiment Date/Time: 4/28/2015 2:52:1...
External Sample Id: E
Ionization Mode: EI+
Comment: SPLIT10:1',80-1M-200-3M-8-270-1M-10-280-HP5-neat
x10^3 Area (932331)
153.05
195.10
43.01
85.04
210.13
m/z
Sample Comments:
Average(MS[1] Time:14.5..14.5)-1.0*Ave... Experiment Date/Time: 4/28/2015 2:52:1...
External Sample Id: E
Ionization Mode: EI+
Comment: SPLIT10:1',80-1M-200-3M-8-270-1M-10-280-HP5-neat
x10^3 Area (1061309)
57.07
71.09
85.11
99.13
m/z
Sample Comments:
Average(MS[1] Time:14.9..14.9)-1.0*Ave... Experiment Date/Time: 4/28/2015 2:52:1...
External Sample Id: E
Ionization Mode: EI+
Comment: SPLIT10:1',80-1M-200-3M-8-270-1M-10-280-HP5-neat
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168.09
181.08
85.04
97.04
m/z

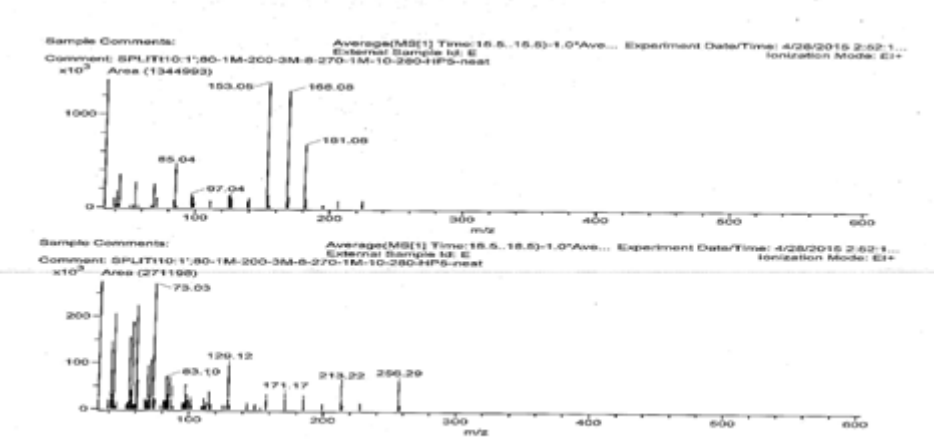

**Fig. 3:** Mass Spectra of *Pogostemon benghalensis* stem in acetone extract.

## Results & Discussions

GC-MS analysis of the *Pogostemonbenghalensis* stemin acetone extract exhibited the presence of cyacetacide (33.24 %) which was characterised on the basis of the base peak 43.01 and mass peak 201.13 which is also true for standard. Evaluation of Altretamine (32.72%) on the basis of the base peak 57.07 and mass peak 99.13 was also confirmed through standard. Altretamine is used for the treatment of ovarian cancerin combination with other cancer drugs [6]. Lumi flavine (9.09 %) confirmed on the basis of the base peak 73.03 and mass peak 256.29 which resembled with Standard. The drug altretamine also called as Hexale shows anti-cancer effect. According to F.D.A. this drug cannot be directly used in cancer treatment but during of chemotherapy when used in combination with another drug it show positive effect on the patients. This drug is approved by the U.S. FDA in 1990, more precisely this drug is very effective in ovarian cancer in female. After treatment patients may suffer from vomiting, anemia [6].

Cyacetacide is a biochemical used in the past as an anti-tuberculosis agent and currently used in Russia for the treatment of various forms of tubercular lesions of the eye: keratitis, scleritis, uveitis, chorioretinitis, tuberculosis-allergic diseases and eye diseases of non-tubercular origin. Cyacetacide has also been used to derive compounds that may have antitumor properties [7].

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**Conflicts of interest:** The authors stated that no conflicts of interest.

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