

# GC-MS Analysis of *Leucas aspera*, a Medicinal Plant of Nagpur District

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## Abstract –

The current piece of work is a focus on micro level study and is purely based on contents in leaf of *L. aspera* in Nagpur region which is use in medicine as well as cosmetics. Basically Aromatic plants of family Lamiaceae that is *L. aspera* have aromatic smell and its aroma which is a characteristic feature of family Lamiaceae. *L. aspera* is commonly known as **Dronapushpi**. In this work I got six compounds in leaves of *L. aspera* which is use as medicine as well as cosmetics industry. These are **9,9 trimethyloctahydrbenzo(d) cycloprop(c) oxepin-2,4-dione,3-Buten-2-one,3-methyl-4-(1,3,3-trimethyl-7-Oxabicyclo[4.1.0]heptan-1y, Tetratriacontane ,Hexacosane, Heptacosane, Tetratetracontane**. Also I got 1.33 % gm of aroma oil found in 100 gm leaves of *L. aspera*. *L. aspera* is a wild herb or shrub which is having medicinal value to a great extent and is available abundantly in field of India **Conclusion-** Natural herbs help in preserving and enhancing the beauty and personality of human beings. Natural Cosmetics and personal-care products may contain ingredients whose safety is unknown or which are known to create health risks. The present review focuses on the potential of herbal extracts for cosmetic purposes. Natural cosmetics general term applied to all preparation and external conditioning and beautifying the body.

**Key words:-***Leucas aspera*, cosmetics, aromatic, medicine.

## Introduction:

According to world health organization (WHO) variety of drugs are obtained from ethnomedicinal plants. In developed countries almost 80% of individuals depends on compounds derived from ethnomedicinal plant. In this regard properties, safety & efficiency of them should be investigated<sup>1</sup>. Ethnobotany is systematic study of the relationship between plants and people. It is not simply the study of human use of plants rather ethnobotany locates plants within their cultural context in particular societies. The impacts of modern human societies on traditional cultures and natural habitats have caused huge losses of individual species and profoundly disrupted communities of species. The significance of ethnobotany and ethnomedicinal plant is manifold. The study of indigenous food production and local medicinal knowledge may have practical implication for developing sustainable agriculture and discovery of new medicines. Ethnobotany also encourage an awareness of the link between biodiversity and culture diversity as well as a sophisticated understanding of the mutual influence of plants mutual influence of plants and human. The Global strategy for Plant conservation, a plant to save the world's Plant species-grew out of the Convention on Biological diversity and is being fed into government policy around the world. The GSPC highlights the importance of plants and the ecosystem services they provide for all life on earth, and aims to ensure their conservation. The Global strategy for Plant conservation is a catalyst for working together at all levels-local national, regional and global-to understand, conserve and use sustainably the world's immense wealth of plant diversity whilst promoting awareness and building the necessary capacities for its implementation. Ethnomedicinal plant conservation strategies need to be understood and planned for based on an understanding

of indigenous knowledge and practices<sup>2</sup>. Gas chromatography and Mass spectrum is one of the best method to identify the plants chemical components. *Leucas aspera* contain essential oil which is volatile organic strong smell substance and have great importance in pharmaceuticals industries, food, cosmetics etc.



**Fig. *Leucas aspera***

### History And Description of *Leucas aspera* (L) Poit.

Lamiaceae family species are important for its medicinal properties among plants. This family represented by 45 genera and 574 species<sup>3</sup>. Number of aromatic plants come under this family. *Leucas aspera* (wild) belonging to the family of Lamiaceae is a aromatic herb commonly called “Tamba”, found as weed in Africa, Asia-temperate and Asia – tropical countries. *Leucas aspera* was first described by Linnaeus based on an illustration and description of plants growing in the Leiden botanic garden. *Leucas aspera* (wild) plant contains essential oil which is alkaloids.

### Methodology-

The present work is based on various site surveys made in Nagpur region( Maharashtra). The plant was collected and its identification was authenticated at research laboratory of Institute of Science, Nagpur. The information of traditional uses of the plant was gathered from respective site. GC-MS Analysis - The test plant extracts were subjected to GC-MS analysis at laboratory’s (IIT Bombay) Sophisticated Analytical Instrument Facility (formerly RSIC), Indian Institute of Technology, Powai, Mumbai – 400076, India.

### Result and Discussion:

The present investigation was carried out on plant *Leucas aspera* of Lamiaceae family to study the presence of medicinally active phytochemicals in the leaves. The chemical composition of the essential compounds from the leaves of *Leucas aspera* (L.) Poit collected from campus and PDKV forest which experienced different climatic and geographic circumstances, were determined by GC-MS. It has been already reported by various workers. As seen in the table- 1, different compounds were determined from the leaves of *Leucas aspera* (L.) Poit. The present investigations concluded that the leaf of *Leucas aspera* contains chemical compounds. These chemicals are widely used in Ayurvedic traditional medicines as well as cosmetics industry..

*Leucas aspera* contain chemical compounds and herbal ingredients, and it has been said that 70-80% of the world’s population relies on some form of non-conventional medicine<sup>4</sup> and around 25-40% of all prescription drugs contain active ingredients derived from plants in the United States<sup>5</sup>.

### Medicinal importance :

\**Leucas aspera* used to treat inflammatory and allergic conditions.

\*The entire plant is also used as an insecticide and indicated in traditional medicine for cough, colds, painful swelling and chronic skin eruption<sup>5</sup>

\*Apart from this, the plant possesses wound healing property and is used in cobra venom poisoning<sup>6</sup>

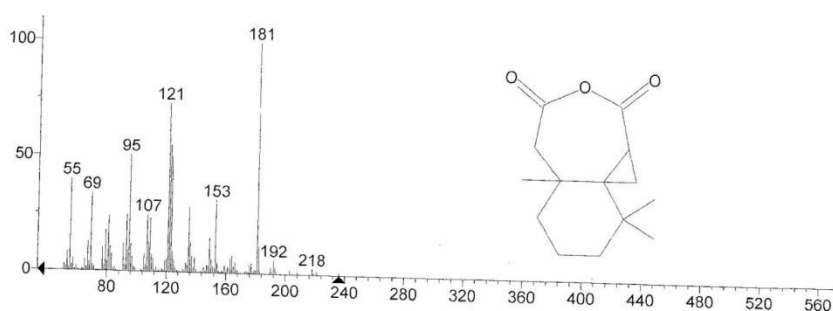
\*Aromatic oil is found in 1.33% in 3gm of dry weight of powder of leaves of *Leucas aspera*.

**Table1: The chemical Components *Leucas aspera* (L) Poit**

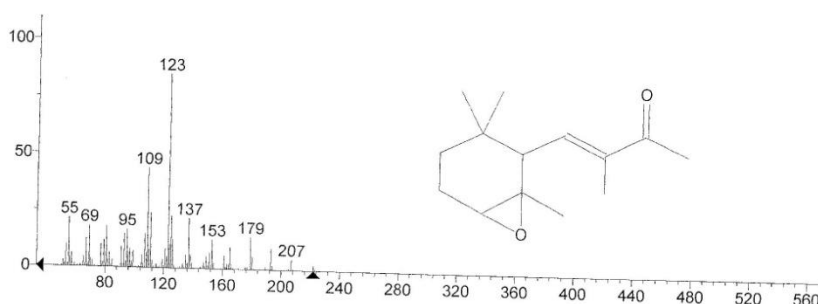
S. N.	R.T.	Name of compound	Molecular formula	Mol. Weight	Peak Area
1	13.6	9,9 trimethyloctahydrobenzo (d) cycloprop(c) oxepin-2,4-dione	C <sub>14</sub> H <sub>20</sub> O <sub>3</sub>	236	137364
2	13.6	3-Buten-2-one,3-methyl-4-(1,3,3-trimethyl-7-Oxabicyclo[4.1.0]heptan-1-yl)-	C <sub>14</sub> H <sub>22</sub> O <sub>2</sub>	222	137364
3	14.2	Tetratriacontane	C <sub>34</sub> H <sub>70</sub>	478	113304
4	14.2	Hexacosane	C <sub>26</sub> H <sub>54</sub>	366	113304
5	21.7	Heptacosane	C <sub>27</sub> H <sub>56</sub>	380	582218
6	21.7	Tetratetracontane	C <sub>44</sub> H <sub>90</sub>	618	582218

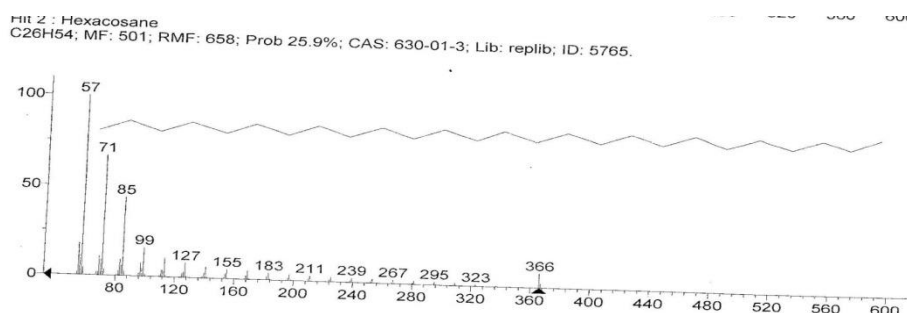
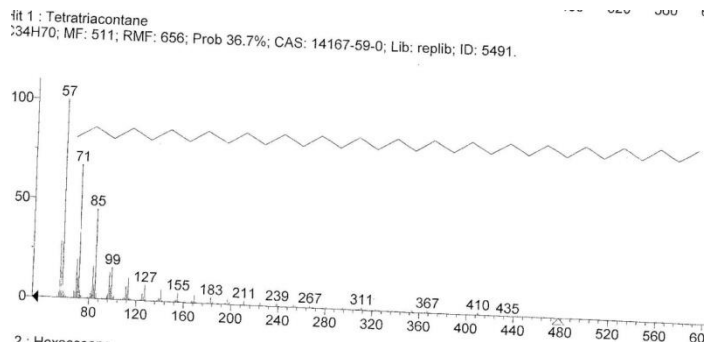
### Graphical Representation of *Leucas aspera*

Hit 1 : (1Ar-(1aalpha,5abeta,9ar(\*)))-5a,9,9-trimethyloctahydrobenzo(d)cycloprop(c)oxepin-2,4-dione  
C<sub>14</sub>H<sub>20</sub>O<sub>3</sub>; MF: 541; RMF: 673; Prob 15.8%; Lib: mainlib; ID: 133821.

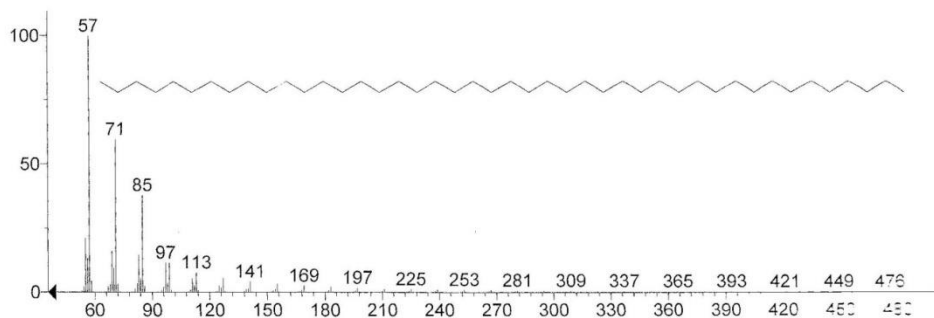


Hit 2 : 3-Buten-2-one, 3-methyl-4-(1,3,3-trimethyl-7-oxabicyclo[4.1.0]heptan-1-yl)-  
C<sub>14</sub>H<sub>22</sub>O<sub>2</sub>; MF: 537; RMF: 686; Prob 13.3%; CAS: 97371-44-3; Lib: replib; ID: 2939.

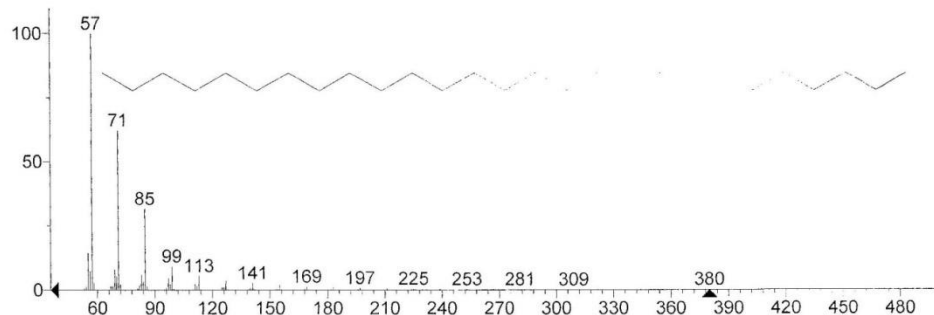




Hit 1 : Tetratetracontane  
 $C_{44}H_{90}$ ; MF: 743; RMF: 804; Prob 7.39%; CAS: 7098-22-8; Lib: replib; ID: 5520.



Hit 2 : Heptacosane  
 $C_{27}H_{56}$ ; MF: 736; RMF: 850; Prob 5.66%; CAS: 593-49-7; Lib: replib; ID: 5509.



### Detection of Oil in *Leucas aspera*

Ether is continuously volatilized, condensed and then allowed to pass through the sample to extract ether soluble materials. When the process is completed the ether is distilled, collected in another container, remaining crude fat is dried, weight and percent oil is calculated. I got 1.33% oil in leaves of *Leucas aspera*. Weight of sample 3 gm dry leaves powder.

**Table1 No.2: The oil Percentage of *Leucas aspera***

No. Plant	Plant Sample Name	Empty flask weight	Empty flask oil weight	Oil percentage of leaf
1	<i>Leucas aspera</i>	122.650 gm	122.690.gm	1.33 %

### Conclusion:

Most of the medicinal claims are centered on flower and inflorescence of the plant. The whole plant and leaves, are also administered in a few specific clinical conditions. The analysis of all the claims clearly indicates the potential of the plant to be an excellent analgesic, antipyretic and anti-inflammatory drug which needs to be validated through preclinical and safety and efficacy trials. The present GC-MS screenings are an essential tool for confirmation of the results and it may serve as a pavement for the researcher to select a group of plants having similar chemical constituents and their detailed investigation regarding their chemistry and functions is required, so that they can be used in allopathic or in Ayurvedic medicine as well as cosmetics industry.

### References :

1. Dowound G T M and El-Morsy T H (2012); Phytochemical microbial studies of *Petrea volubilies* L J American Science 8(8): 202-208.2) C.Kalu and. Anifowoshe E.I (2003) Ethnomedicinal uses of plants the Ekitis in Irepodun
2. Berkes, Fikret; Turner, Nancy J.(2006).”Knowledge, Learning and the Evolution of Conservation Practice for Social-Ecological System Resilience. Human Ecology 34(4): 479-494.[doi:10.1007/s10745-006-9008-2.](https://doi.org/10.1007/s10745-006-9008-2)”
3. Erik, S. and B. Tarikahya (2004): Turkiye Florasi Uzerine, Kebikec. 17: 139 – 163
4. Endangered Plants and Ecosystems –Plants Conservation Derived Medications
5. Chopra, R. N., Nayar, S. L. and Chopra, I.C. (2002): Glossary of Indian Medicinal Plant. National Institute of Science Communication and Information Resources, New Delhi Council of Scientific and Industrial Research (CSIR). Pp. 153.
6. Mangathayaru, K., D. Thirumuragan; P. S. Patel; D. V. Pratap; D. J. David and J. Karthikeyan (2006): Isolation and identification of nicotine from *Leucas aspera* (wild). *Indian J. Pharm. Sci.* 68: 88 – 90.
7. Arceusz, Agnieszka, Iwona; Marek (2010),”Identification Of diversity in elements content in medicinal plants belonging to different plants to different plants families”, Food Chemistry **120**: 52 - 58.[doi:10.1016/i.foodchem.2009.09.068.](https://doi.org/10.1016/i.foodchem.2009.09.068)
8. Food and Agriculture Organization of the United Nations (1997). Medicinal plants for forest conservation and health care. Food & Agriculture Org. PP 87-99 ISBN 978-92-5-104063-8 Retrieved 9 April 2011.
9. R. Srinivasan (2011). "[Leucas Aspera - Medicinal Plant: A Review](#)" (PDF). *International Journal of Pharma and Bio Sciences.* 2 (1): 153–159.