

# Isolation and Evaluation of Perfume from Flower of Tuberose (*Polianthes Tuberosa*)

Dr. Arpitaben Desai<sup>1</sup>, Jayesh Patil<sup>2</sup>

<sup>1</sup>Master of Sciences, Faculty Guide, Parul University, Faculty of Applied Sciences, P. O. Limda, Tal. Waghodia, Dist. Vadodara – 391760, India

<sup>2</sup>M. Sc. Semester IV, Parul University, Faculty of Applied Sciences, P. O. Limda, Tal. Waghodia, Dist. Vadodara – 391760, India

**Abstract:** *Perfume is integrant part of not only today's generation but also from thousands of years. We tried to extract scent from tuberose flowers. There are many more methods to do essential oil extraction like solvent extraction, drying, leaching and steam distillation etc. but we obtained more percentage of essential oil from steam distillation. I used ethyl butyrate as a solvent for steam distillation. Then I formulate perfume from essential oil and methanol. I used sandal wood extract for fresh and unique scent. Then I characterize the functional group of perfume using IR Spectroscopy.*

**Keywords:** steam distillation, ethyl butyrate, leaching process, *Polianthes tuberosa*, FT-IR Analysis, methanol, asparagales, perfume

## 1. Introduction

In ancient India, the city of Kannauj was recognized as the country's entire headquarters of perfumery. Here anyway, the fragrance being fermented in copper pots for five to six hours it until liquid turned on a golden hue.<sup>1</sup> Although each individual have different smell, body temperature, etc., the technique that perfume works or transmits fragrance differs depending on the individual. There are two variants of perfume: natural and synthetic. Natural perfume is invented from plant parts which including fruits, blossoms, leaves, roots, and buds, however synthetic perfume is manufactured using man-made substances including petrochemicals, which are made using petroleum and natural gas.<sup>2</sup>

Whenever primary elements are incorporated, perfumes acquire complex as well as themselves. Moreover, raw materials can be extracted sure obviously (from a combination of several molecules) or immorally, utilising synthetic materials (usually one molecule).<sup>3</sup> As a consequence, we chose to develop a perfume with using natural and synthetic constituents. For this purpose, we used a natural tuberose flower, which has a strong aroma characteristic of sweet honey, and a synthetic substance termed ethyl butyrate, which scents fruity and sweet like pineapple. Ethyl butyrate is also referred as butyric ether & ethyl butanoate. Soft drinks and artificial flavors are included as well ethyl butyrate.<sup>4</sup> In certain parts of India, tuberose is recognized to as Rajnigandha or Nishigandha. It is a well-known ornamental bulbous flowering plant that is notable for its unique fragrance and its long-lasting flower spikes. A tuberose flower is used to manufacture decorations and perfumes. Asparagaceae is the family that comprises tuberose. Mexico is the plant's native country. Tuberose production in India is primarily observed in the west Bengali cities of Bangan, Kolaghat, Midnapur, Panskura, Ranaghat, and Krishnanagar. Assam's Guwahati and Johrat. Guntur, Andhrapradesh's Chitoor. Maharashtra's Sangli, Nashik, and Pune. There's many several more locations in India, especially Navsari and Valsad in Gujarat.<sup>5</sup> Alcohol serves an important significance in perfumery. Alcohol is a volatile liquid than efficiently preserves fragrance; it is the mechanism by which aroma is received.<sup>6</sup>

There are several and cutting-edge techniques to extract aromas, namely solvent extraction and Soxhlet extraction.<sup>7</sup> We utilised methanol for manufacture of perfume but in appropriate and minimum quantity which does not injure human skin after absorption. From the very beginning early days of scientific chemistry up to the present time, perfumes have significantly contributed to the development of organic chemistry in terms of approach, systematic classification, and theory, “acknowledged Leopold Ruzicka, the 1939 Novelist in Chemistry, in 1945.<sup>8</sup> In Pyrgos, Cyprus, archaeologists have discovered the oldest surviving perfumes in the world in 2003. The aromas date back over 4, 000 years. At least 60 stills, mixing bowls, funnels, and perfume bottles were located in a 300 square metre (3, 230 square foot) factory that was once a perfumery.<sup>9-12</sup>



Figure 1: Tuberose Flower<sup>13</sup>

### Plant Profile:

Botanical name: *Polianthes tuberosa*

Synonyms: *Agave amica*

Family: Amaryllidaceae

Local names in India: Rajanigandha or Nishigandha

Local names in other countries: Hawaiiin= kupaloke

### Scientific Classification:

Kingdom: Plantae

Class: Angiosperms

Order: Asparagales

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Family: asparagaceae

Genus: Agave

Species: A. amica

## 2. Materials & Methods

### 1) With Ethyl Butyrate:

We take 20 grams of crushed fresh tuberose petals in 100 ml of round bottom flask and added 50 ml of Ethyl butyrate, kept it for 24 hours under continuous observation at room temperature, we observed that aroma is not really effective and sweet as earlier. Then we try it with higher room temperature, as Ethyl butyrate is a volatile liquid it evaporates easily so on higher temperature results are not so satisfied. Therefore, this method also not that much efficient.

### 2) With Distilled water:

We take 20 grams of tuberose fresh petals in 100 ml of round bottom flask and added 50 ml of Distilled water in it, kept it for 24 hours at room temperature and we observe not much aroma from solution. Then we try this method with slightly higher temperature than room temperature still not gets any effective results. Therefore this method is not efficient to extract aroma from tuberose flower.

### 3) Leaching method:

- We take 20 grams of fresh petals in 100 ml round bottom flask and added 50 ml of methanol in it, tightly stoppered to RBF with grease and Teflon and kept it for 3 days with continuous observation. And we found nice aroma.
- We take 20 grams of fresh petals in 100 ml RBF and added 50 ml of ethanol in it, tightly bind RBF with grease and Teflon and kept it for 3 days under continuous observation. And we found good fragrance.

### 4) Steam Distillation

We take 50 grams of fresh tuberose petals into large bottom flask and added more than half measured Ethyl butyrate with wide T mouth and secure it with clamp. Hang thermometer into mouth of adaptor. Then we attach condenser to another mouth of T adaptor and at the end of condenser mouth we introduced vacuum adaptor and for collection of essential oil we kept volumetric flask. whole setup is secure with clamp and metal foil. Heating continuous with electric heater at 50-60 celsius temperature for 3 hours and collect 15 ml essential oil mixture. Kept it in tightly packed stoppered bottle. Allow to set it.



Figure 2: Steam Distillation

### 5) Evaluation of perfume

#### Using Methanol:

We take 15 grams of essential oil in 50 ml of beaker then we add 5 ml of methanol and 5 grams of menthol crystal, mixture was shaken vigorously for 5 min. until yellow colour is shown.

Then Pour the perfume liquid in clean and dry glass bottle. And the perfume is ready.



Figure 3: Perfume

#### Applications of Perfume:

- Gives nice smell to body, increases self confidence.
- Enhances mood and give pleasant atmosphere.
- Perfume balances hormonal coordination of body and enhances body energy.
- Used in psychotherapy for peace and control mood swings.
- Stimulate sexual receptors of body.
- increases strong immune system.
- Heals stress and depression.

#### Characterization

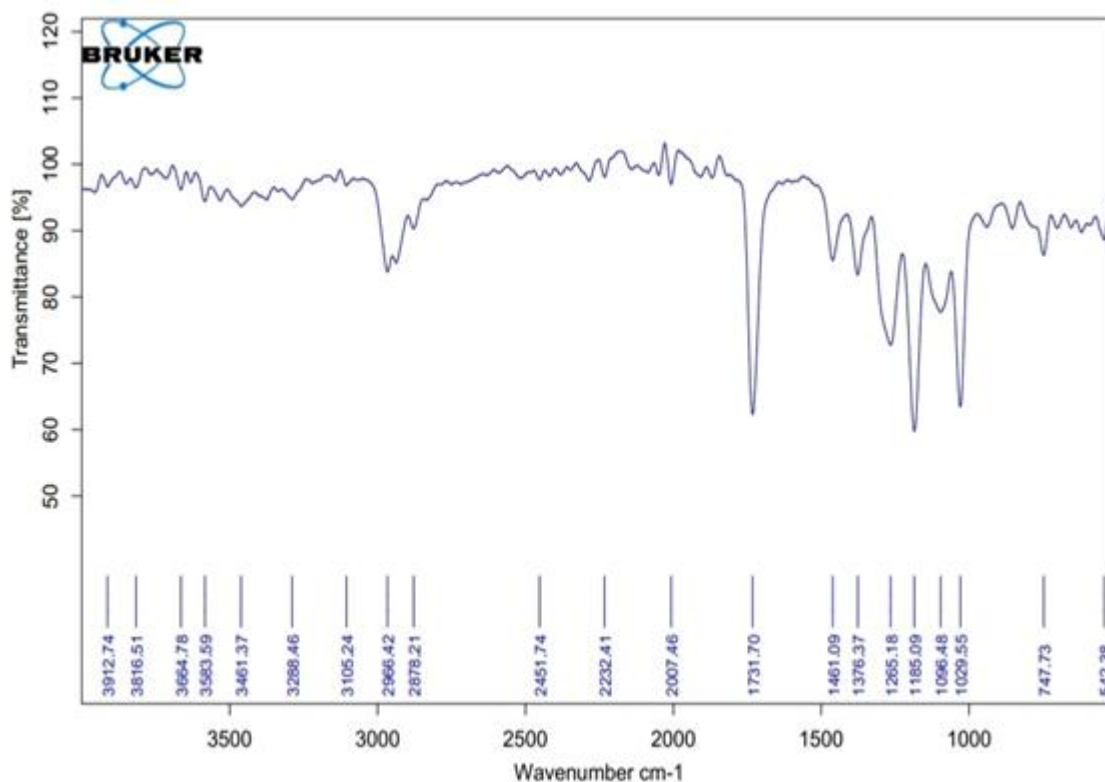


Figure 4: FT-IR Analysis of perfume

Here, 2966.42 peak shows alcohol group which is obtained from methanol, 1731.70 peak represent aromatic c-c bonding of tuberose flower, 1185.09 peak is for aliphatic ether, it is of ethyl butyrate and other peaks are arises due to menthol crystals and sandalwood extract.

IR Range	Functional Group
2966.42	Alcoholic (-OH) group
1731.70	Aromatic C-C bonding
1185.09	Aliphatic ether group

### 3. Result & Discussion

Finally, we made successful formulation of perfume from tuberose flower and ethyl butyrate, here is combination of natural and synthetic material. We found steam distillation is best method for extraction of essential oil, and yield was also better than any other methods.

### 4. Conclusion

This days, Perfume is nearly everyone's part of life. This project has its objective to built a very nice scented perfume to local peoples with cheap raw materials and easy extraction. It will help to develop perfume industry. And also helps to get job for farmers which cultivates tuberose flowering plant.

### References

- [1] <https://timesofindia.com/lifestyle/fashion/buzz/all-about-perfumes-in-india/articleshow/91574125.cms>
- [2] <https://www.wedoact.com/en-gb/weblog/free-from-natural-synthetic-fragrance/>

- [3] Turin and Luca, The secret of scent, Faber and faber limited, New York (2006).
- [4] [https://en.wikipedia.org/wiki/Ethyl\\_butyrate](https://en.wikipedia.org/wiki/Ethyl_butyrate)
- [5] A. Safeena S.; Thangum M.; Singh, N. P, Evaluation of different cultivars of tuberose under humid agro climatic conditions of goa, Journal of horiculture sciences, (2019).
- [6] [https://oola-lab.com/blogs/news/why-use-alcohol-inside-perfume#:text=Alcohol%20is%20the%20perfect%20carrier,once%20its%20job%20is%20done.,Tary,dan,\(2021\).](https://oola-lab.com/blogs/news/why-use-alcohol-inside-perfume#:text=Alcohol%20is%20the%20perfect%20carrier,once%20its%20job%20is%20done.,Tary,dan,(2021).)
- [7] <https://experimentalperfumeclub.com/how-to-extract-perfume-oil/>
- [8] Shyndriayeva, Galina, "Perfume of Forefront of Macrocyclic compound Research: From Switzerland to Du pont", International workshop of history of chemistry, Tokyo, (2015).
- [9] Roach, John, "Oldest Perfumes Found on "Aphrodite's Island"". Archived from the original on 12 October 2013. Retrieved (21 June 2014).
- [10] "Ancient Perfumes Recreated, Put on Display in Rome". Fox News
- [11] Elis, Kiss "Ancient perfume recreated for anniversary show". Kathimerini English Edition. Retrieved 6 June 2018. (2 June 2018).
- [12] Thompson, C. J. S. The Mystery and Lure of Perfume. London: John Lane the Bodley Head Limited. p.140 (1927).
- [13] <https://images.app.goo.gl/CS1GM5jmY1pPoKbm7>