

# PERFUME EXTRACTION FROM LEMON GRASS

## ABSTRACT

Perfume extraction refers to the extraction of aromatic compounds from raw materials, using methods such as distillation, solvent extraction, expression or enfleurage. The extracts are either essential oils, absolutes, concretes, or butters, depending on the amount of waxes in the extracted product. Heat, chemical solvents, or exposure to oxygen in the extraction process denature the aromatic compounds, either changing their odour, character or rendering them odourless. In this report use of three methods, solvent extraction, hydro distillation and enfleurage methods are discussed to extract essential oil from lemongrass. The extracted essential oil was formulated into perfume using a fixative and carrier solvent.

## BACKGROUND

Perfume is a fragrant liquid made from an extract that has been distilled in alcohol and water.

Since the beginning of recorded history, humans have attempted to mask or enhance their own odor by using perfume, which emulates nature's pleasant smells. Many natural and man-made materials have been used to make perfume to apply to the skin and clothing, to put in cleaners and cosmetics, or to scent the air. Because of differences in body chemistry, temperature, and body odors, no perfume will smell exactly the same on any two people.

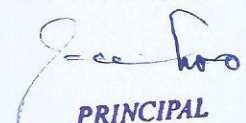
Perfume comes from the Latin "per" meaning "through" and "fume," or "smoke." Many ancient perfumes were made by extracting natural oils from plants through pressing and steaming. The oil was then burned to scent the air. Today, most perfume is used to scent bar soaps. Some products are even perfumed with industrial odorants to mask unpleasant smells or to appear "unscented."

While fragrant liquids used for the body are often considered perfume, true perfumes are defined as extracts or essences and contain a percentage of oil distilled in alcohol.

A perfume is composed of three notes. The base note is what a fragrance will smell like after it has dried. The smell that develops after the perfume has mixed with unique body chemistry is referred to as the middle note. And the top note is the first smell experienced in an aroma. Each perfumery has a preferred perfume manufacturing process, but there are some basic steps. The notes unfold over time, with the immediate impression of the top note leading to the deeper middle notes, and the base notes gradually appearing as the final stage. These notes are created carefully with knowledge of the evaporation process of the perfume. The top note consists of small light molecules that evaporate quickly. The middle note forms the heart of main body of a perfume and act to mask the often unpleasant initial impression of base notes.

Traditionally perfumes were made from plant and animal substances and prepared in the form of waters, oils, unguents, powders, and incense. This last method of fragrance gives us our word 'perfume' which means 'to smoke through'. Most modern perfumes are alcohol-

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based and contain synthetic scents. While the term 'perfume' usually refers to fragrances in general, in the more technical language of the perfumer, a perfume must contain over 15% of fragrance oils in alcohol. The preferred fragrances for perfumes are by no means universal, but differ according to cultural dictates and fashions. In the sixteenth century, for example, pungent animal scents such as musk and civet were very popular. In the nineteenth century, by contrast, such animal scents were generally considered too crude, and light floral fragrances were favored. Perfumes were held in high esteem and widely employed in the ancient world. The wealthy would perfume not only the body, but their furnishings and their favorite horses and dogs. On ancient altars perfumes were offered to the gods, while in the kitchens of antiquity the same scents — Saffron, Cinnamon, Rose, Myrrh — might be used to flavor food and wine.

Techniques involved in perfume extraction from plants include; solvent extraction, distillation and effleurage method. These methods to a certain extent, distort the odor of the aromatic compounds that are obtained from the raw materials.

Important thing in relation to perfume making is that there are three key ingredients you will need to produce perfume:

1. Essential Oils (these have been extracted from various plants (organic or nonorganic) and when combined give the smell of the perfume you are trying to produce.
2. Pure Grain Oil
3. Water

### **LEMON GRASS (Cymbopogon Citratus)**

Lemongrass is an aromatic grass about 210 to 315 cm tall, and belong to the plant family called Gramineae. The leaves are linear, Lanceolate (125 x 1.7 cm); panicle very large (30 to 80 cm long), drooping and lax. The color is grayish or grayish green, rarely with a tinge of purple. It is the compound with raceme pairs in dense masses, spreading and slightly hairy. It has low glumes of the sessile spikelet with 1 to 3 definite nerves, shallowly concave with 1 or 2 depressions. The crop is propagated vegetatively through slips obtained by the splitting up of individual clumps which give about 110 to 150 tiller/clump. Clumps bearing well over 200 slips have been observed.

It is fresh smelling oil that can be used with success for fighting jet lag, cellulite, revitalizing a tired body and mind, as well as keeping the family pet free of fleas and ticks.

### **LEMONGRASS OIL**

#### **Origin of lemongrass oil**

It is a perennial fast-growing aromatic grass, growing to about 1 meter (3 feet) high with long, thin leaves and originally was growing wild in India. It produces a network of roots and rootlets that rapidly exhaust the soil.

In India it is known as 'choomana poolu' and is also referred to as 'Indian Verbena' or 'Indian Melissa oil' and used in Ayurvedic medicine to help bring down fevers and treat infectious

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illnesses. It is a valuable ingredient in perfumes and citrus-type soaps and is also an insect deterrent.

### **Properties of lemon grass oil**

Lemongrass oil has a lemony, sweet smell and is dark yellow to amber and reddish in color, with a watery viscosity.

### **Chemical composition**

The main chemical components of lemongrass oil are myrcene, citronellal, geranyl acetate, nerol, geraniol, neral and traces of limonene and citral.

### **Extraction**

Lemongrass oil is extracted from the fresh or partly dried leaves by steam distillation.

### **Uses of lemon grass**

Lemongrass oil revitalizes the body and relieves the symptoms of jetlag, clears headaches and helps to combat nervous exhaustion and stress-related conditions.

It is a great overall tonic for the body and it boosts the parasympathetic nervous system, which is a boon when recovering from illness, as it also stimulates glandular secretions.

## **SOLVENT EXTRACTION METHOD**

130g of the dry sample of lemongrass were weighed from the sliced lemongrass sample and placed in a 500ml clean flat bottom flask. 600ml of N-hexane solvent were poured into the 500ml flask and stopped. The flask and content were allowed to stand for 24hrs; this was done to extract all the oil content in the lemongrass and for complete extraction. After which the extract was decanted into another 500ml beaker. 200ml of Ethanol were added to extract the essential oil since essential oil is soluble in Ethanol. The mixture was then transferred to 500ml separating funnel and separated by a process called liquid/liquid separation process. The content of the separating funnel was and allowed to come to equilibrium, which separated into two layers (depending on their different density). The lower Ethanol extract and the upper Hexane layer were collected into two separate 250ml beaker and were placed in a water bath at 78°C. This was done to remove the Ethanol leaving only the natural essential oil. The yield of oil was determined by weighing the extract on an electronic weighing balance. The difference between the final weight of the beaker with extract and the initial weight of the empty beaker gave the weight of essential oil.

## **ENFLEURAGE METHOD**

130g of the dry sample of lemongrass were weighed out and pounded with mortar and pestle (to reveal the tighter inner stem). The pounded sample was then placed in a 500ml beaker. About 70ml of light-flavored olive oil were warmed and mixed with the mashed lemongrass (to allow for efficient absorption of the essential oil). The beaker was covered with aluminum foil and shaken until the lemongrass was distributed throughout the oil. It was then allowed to stand for 24hours at room temperature for proper absorption. 140ml Ethanol were added to absorb the essential oil leaving behind the light-flavoured olive oil and the lemongrass residue. The Ethanol extract was decanted and placed on a water bath

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at 78°C to vaporize the Ethanol leaving behind the essential oil. The yield of oil was determined by weighing on an electronic weighing balance. The difference between the final weight of the beaker and the initial weight gave the yield of essential oil.

#### HYDRODISTILLATION METHOD

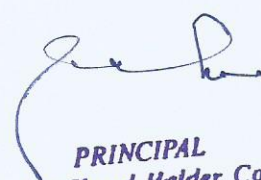
130g of fresh lemongrass sample were placed into a 500ml round bottom flask containing 250ml of distilled water. The flask was fitted with a rubber stopper connected to a condenser and heated. Water at 00C flowed counter currently through the condenser to condense the ensuring steam. When the water reached 100oC it started boiling ripping off the essential oil from the lemongrass. When the lemongrass got heated up, the essential oil that was extracted from the leaf mixed with the water vapour. Both passed through the condenser and the vapour was condensed into liquid. With the use of ice block, cooling was made possible and volatilization of the essential oil was avoided.

The condensate was directly collected using a 500ml beaker and then poured into a separating funnel. This formed two layers of oil and water. The tap of the separating funnel was opened to let out the water while the oil was immediately collected into a 100ml stoppered. The bottle was closed tightly to prevent vaporization of the essential oil. The oil was collected and the volume of oil obtained was weighed.

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