

## Medicinal and Health Benefits of Lemon

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**Abstract:** Today, we still understand the collaboration between plants, drugs and food. Herbal medicines have been used for many years because of their mild side effects, suitability, and influence. Citrus is a liquid plant in the family of Rutaceae. In the genus citrus, approximately 140 genera and 1300 species are present. The word lemon comes from "limon" in ancient French. There are several other lemon fruit names available. The main components of the chemical makeup are flavonoids, acids, caffeine, pectin and minerals. Many ingredients contain basic citrus oil, and limonene is the main ingredient in its odour. Lemon has many qualities, such as antimicrobial, antifungal, anti-inflammatory, anti-cancer, depurative, antiscorbutic, etc. Lemon essential oil is toxic, especially in pregnancy, breastfeeding and radiation exposure. This article provides the information about medicinal and health benefits of lemon.

**Keywords:** Lemon, antimicrobial, antifungal, anti-inflammatory, anti-cancer, depurative, antiscorbutic, human health, weight loss, skin health, scurvy.

### I. Introduction

Lemon is an important Rutaceae family medicinal plant originating in tropical and subtropical Southeast Asia. <sup>6</sup> With its internal parts divided into divisions, it has a distinctive berry. It is primarily cultivated for alkaloids exhibiting anticancer and antibacterial activity in rudimentary extracts of various sections (i.e., stem, root, leaves and flower) of lemon versus clinically relevant activity in bacterial strains.<sup>9</sup> Lemons, oranges, limes, pomelos (pummelo, pommelo), grapefruit, and mandarins (tangerines) are other members of the genus Citrus. Most of the members of the Citrus genus originated as hybrids, and according to various taxonomies, the hybridised varieties of citrus, such as lemon (Citrus limon), may or may not be recognised as species.<sup>8, 12</sup>

Lemon peel contained crude fibres (15.18%), crude fat (4.98%), and protein (9.42%). Ash content of lemon peel is 6.26%.<sup>6</sup> Lemon juice is about 5% acid, which gives lemons a sour taste and pH of 2 to 3.

A lemon tree can grow up to 33 feet (10 metres), but it's typically smaller. An open crown forms the branches and they are thorny. The leaves are green, glossy and elliptic-acuminate. Flowers have a heavy scent and, with a violet streaked interior, are white on the outside. Flowers and fruits can be found at the same time on a lemon tree. In cooler winter areas, lemon and lime trees should not be grown, since they are more vulnerable than other citrus fruits to winter cold.

### II. Scientific Classification

Kingdom – Plantae, Angiosperms, Eudicots, Rosids
Order – Sapindales
Family – Rutaceae
Genus – Citrus

Species – <i>C. × limon</i>
Binomial name - <i>Citrus × limon</i>

### III. Botanical Distribution

The lemon grows on thin, thorny trees that are 10 to 20 feet tall. The lemon leaves are dark green in colour and on the stem they are arranged alternately. The lemon has a white, fragrant, five-petaled flower. A lemon cultivar called 'Pink Lemonade' comes from this particular flower. This cultivar's leaves are variegated and the fruit is striped.

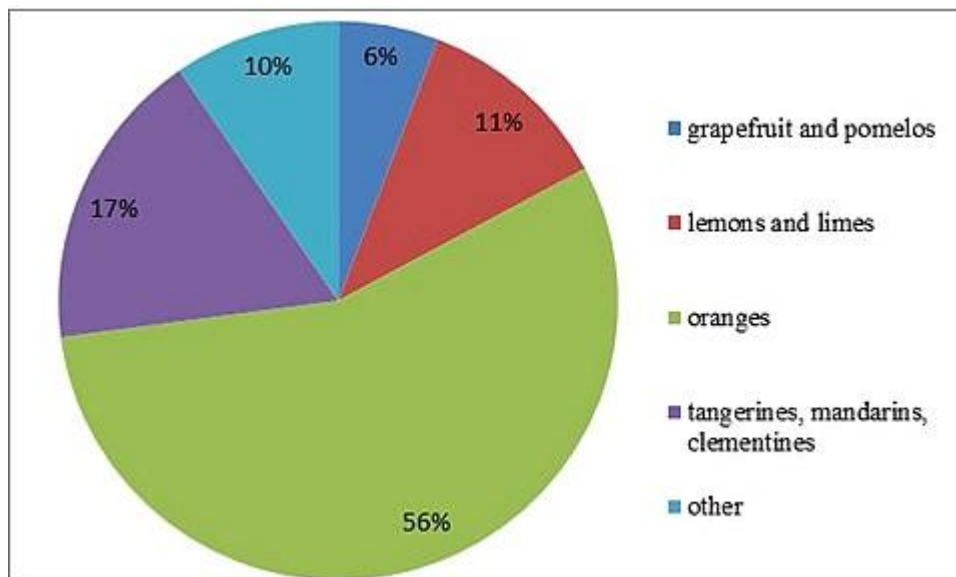
Lemons are oval citrus fruits with porous skin that is smooth. On the bottom of the fruit, some fruits have a pointed tip, while other lemons at the base are rounded. Some types of lemons are much larger and resemble elongated grapefruits than other lemon varieties. There are a variety of varieties of lemon, including Bush lemon, Eureka, Lisbon, Ponderosa, Variegated Pink, Verna, Villafranca, Yen Ben and Yuzu.

The lemon fruit colour scheme varies from greenish yellow to bright yellow. Lemons look very similar to limes, except when mature, where limes are orange, lemons appear to be a little bigger and are yellow.

### IV. Production

In 2010, the production of citrus fruit worldwide was estimated as 122.5 million tonnes with ~8.7 million hectares harvested; oranges were 50%–62% of the total area harvested and total production<sup>2</sup> (Figure 1).

Figure 1. World production of citrus by fruit type in 2010 <sup>2</sup>.



### V. Nutritional Value

Following is the nutritional value of 100 grams of raw lemon without peel

Energy – 121 kJ (29 kcal)
Carbohydrates – 9.32 g
Sugars - 2.50 g
Dietary fibre – 2.8 g
Fat – 0.30 g
Protein – 1.10 g

Thiamine (Vit. B1) – 0.040 mg (3%)
Riboflavin (Vit. B2) – 0.020 mg (1%)
Niacin (Vit. B3) – 0.100 mg (1%)
Pantothenic acid (B5) – 0.190 mg (4%)
Vitamin B6 – 0.080 mg (6%)
Folate (Vit. B9) – 11 µg (3%)
Vitamin C – 53.0 mg (88%)
Calcium – 26 mg (3%)
Iron – 0.60 mg (5%)
Magnesium – 8 mg (2%)
Phosphorus – 16 mg (2%)
Potassium – 138 mg (3%)
Zinc – 0.06 mg (1%)

## VI. Nutritional and Phytochemical Content Of Citrus

Citrus contains no cholesterol, sodium or fat. The average energy content of citrus is very low, which may be significant for obesity-conscious consumers. Citrus contains substantial quantities of vitamin C and moderate amounts of carotenoids, folate, and fibre (some of which are capable of converting to vitamin A).

## VII. Phytoconstituent

There are mostly fruit acids in fruit juice, primarily citric acid (8%) and sugar. There are two layers of lemon peel: the outer layer (pericarp, zest) contains an essential oil (6%) consisting of citral (5%) plus citronellal and limonellal (90%) traces, alpha-terpineol, geranyl acetate and linalyl. In other words, the inner layer (mesocarp) contains no essential oil but a number of derivatives of coumarin and bitter glycosides of flavone. It also has a very limited volume of potash, sugar and gum. By dissolving tartaric acid in water, then adding sulfuric acid and flavouring with lemon oil, an imitation lemon juice was prepared. Dextrogyre is the oil of a lemon. This includes 7 to 8% of citral, an aldehyde that produces geraniol, a small amount of citronellal and pinene when reduced.<sup>13</sup>

## VIII. Pharmacological Profile

*Prevent kidney stones-* By drinking one half-cup of lemon juice per day, citrate levels in the urine increase. In tests, lemon juice showed that this could protect the kidney from calcium stones.

*Soothe a sore throat-* Honey mixing with lemon juice can help alleviate and discomfort to treat nasty sore throat.

*Support weight loss-* The old idea of Master Cleanse was the only way to lose weight with the aid of lemons in ancient times. New studies have shown the ways in which lemon juice facilitates weight loss. Lemon juice requires pectin, a soluble fibre that has been shown to lose weight.

*Start your day right-* Leave behind caffeinated beverages and stimulate the digestive tract by using hot water and fresh lemon juice and adding vitamin C.

*Stop an itch -* When it comes to bites of insects or poison ivy, rubbing lemon juice on the area will soothe the skin. Anti-inflammatory and anaesthetic properties are seen in lemon juice.

*Anticancer properties-* Studies have supported the citrus liminoids show anticancer activity, compounds that protect cells from damage which is the formation of cancer cells.

*Potassium power-* Lemons contain 80 milligrams of vitamin C mineral. Vitamin C with Bananas that helps your body stay strong and nimble.

*Bring down a fever-* Drinking a lemon juice mixture can help bring your fever down faster. When body temperature goes up.

*Balance pH -* While lemons may seem quite acidic, lemon is good source of an alkaline food that can help balance pH of body.

## **IX. Health Benefits of Lime**

Weight loss, skin care, healthy nutrition, constipation relief, eye care and treatment of scurvy, piles, peptic ulcer, respiratory disorders, gout, gums, urinary disorders, etc. are the health benefits of lime.

When it comes to medicinal uses, the first fruit that comes to our minds is maybe the good old lime. What many specialist drugs do not do, this sour citrus fruit can do. Lime, which bears the scientific name *Citrus Aurantifolia*, has been used for the treatment of different ailments for decades.

## **X. The Benefits and Medicinal Uses of Lime**

*Scurvy:* Lime is so popular as a treatment for scurvy, a disease induced by vitamin C deficiency and marked by recurrent cough and cold infections; cracked lips and lip corners; tongue and mouth ulcers; spongy, swollen and bleeding gums, etc., that even a child will tell you that for a day now. Since its cause is vitamin-C deficiency, none other than vitamin-C is its cure, and this vitamin is blessed with lime. In the old days, lime was given to soldiers and sailors to stay healthy from scurvy, which was then a feared disease. Even now, to protect them from scurvy, it is spread among employees working in polluting environments such as those operating in furnaces, painting shops, heat treatments, cement factories, mines, etc.

*Skin Care:* If ingested orally or applied externally, lime juice and its oil are very beneficial to the skin. Owing to the presence of a significant amount of vitamin C and flavonoids, both of which are class 1 anti-oxidants, anti-biotics and disinfectants, it rejuvenates the skin, keeps it bright, protects it from infections and eliminates body odour. When applied externally to the skin, its acids clean off the dead cells, cure dandruff, rashes, bruises, etc., and if its juice or oil is mixed with your bathing water, give you a soothing bath.

*Digestion:* Lime has an enticing fragrance that waters the mouth and thus facilitates primary digestion (even before you taste it, the digestive saliva fills your mouth). Then the acids that are in it do the rest. Flavonoids, the compounds found in fragrant oils derived from lime, stimulate the digestive system and increase the secretion of digestive juices, bile and acids, while they break down the macro molecules of the food, and also stimulate peristaltic movement. This is why an age-old tradition in India and some of its neighbouring countries is to have lemon pickle with lunch and dinner.

*Constipation:* In fact, by washing and cleaning the tracts, the abundance of acids found in lime helps clear the excretory system, just as other acids are used to clean the floor and toilets. Then the roughage in it tends to relieve constipation as well. It is primarily due to high acids, however. An excess of salt-containing lime juice also serves as an excellent purgative without side effects, thus relieving constipation.

*Peptic Ulcer:* Lime contains special compounds called Flavonoids (Limonoids such as Limonin Glucoside), in addition to vitamin C, that have anti-oxidant, anti-carcinogenic, anti-biotic and detoxifying effects that help cure peptic and oral ulcers.

*Respiratory Disorders:* The oil, containing Flavonoids and certain oils, extracted from lime is extensively used in anti congestive medicines such as balms, vaporizers, inhalers etc. due to presence of Kaempferol. Just scratching the peel of a lime and inhaling it gives immediate relief in congestion and nausea.

*Eye Care:* Vitamin-C again! Its anti oxidant properties protect eyes from aging and macular degeneration. Flavonoids help protect them from infections.

*Gout:* Gout has two major causes. While the accumulation of free radicals in the body is the first cause, the second is the accumulation of toxins, especially uric acid. Limes will now help you with all of these things. It is a reservoir of vitamin-C & flavonoids (anti oxidants & detoxifiers) that free radicals and detoxify the body.

*Gums:* Vitamin-C deficiency (Scurvy, which provides bleeding and spongy gums) and microbial growth are the root causes of gum problems. Sometimes, the causes are often ulcers and wounds from bones, rough surfaces, etc. Limes will assist you with all of these. Flavonoids prevent microbial growth and potassium and flavonoids help heal ulcers and wounds. The vitamin-C cures scurvy.

*Piles:* Since lime in the digestive system and excretory system helps to heal ulcers and wounds and also offers relief from constipation, it eradicates all the root causes of piles.

*Weight Loss:* An outstanding weight reducer as well as a great refresher and anti oxidant drink is a glass of warm water with a full-lime juice in it. An outstanding fat burner is the citric acid found in lime. Only have two glasses a day and within a week, see the amazing outcome.

## **Conclusion**

Lemons are a fruit that is very versatile and nutritious. It has nutritional and medicinal significance. It is a healthy appetiser and helps to treat diseases with digestive aids. Lemon does not disclose any adverse effects, according to literature, but it is used all over the world as a traditional medicine.

### **Acknowledgment**

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