



## Review Article

### BASKETFUL BENEFIT OF CITRUS LIMON

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#### ABSTRACT

Citrus lemon is most important fruit in all over world. *Citrus limon* is well known nutritional and medicinal property. All part of citrus limon is used as a traditional medicine. *Citrus limon* belong to the family rutaceae. The main characteristic of lemon plant is thorny branches and white flowers with purple edges. Major medicinal property of *Citrus limon* include anti-cancer activity, Prevent kidney stones, Bring down a fever, Balance pH. Phytochemically in whole plant contain citral, limonene, terpineol, geranyl acetate, linalyl.

**KEY WORDS:** *Citrus limon*, anti-cancer, lemon

#### INTRODUCTION

Lemon (*Citrus × limon*) is a hybrid of the plant genus *Citrus*, as well as the common name of the popular edible fruit of this small tree. The citrus fruit known in ancient times in Europe since the lemon (*Citrus limon*), lime (*Citrus × aurantiifolia*), pomelo (*Citrus maxima*) and bit-ter orange (*Citrus × aurantium* L.) were all introduced in Europe by the Muslims via the Sicily and Iberian Peninsula.<sup>1</sup> The main characteristic of lemon plant is thorny branches and white flowers with purple edges, the acidic, juicy fruit is oval (shaped like egg), has an aromatic rind that is yellow when ripe (green as immature and under certain environmental conditions), and has a prominent bulge or nipple on the blossom end.

Lemon is an important medicinal plant of the Rutaceae family that originated in tropical and subtropical Southeast Asia.<sup>2</sup> It has a distinctive berry with its internal parts divided into segments. It is cultivated mainly for alkaloids, which show anticancer activities and the antibacterial activities in crude extracts of different parts (viz., stem, root, leaves, and flower) of Lemon against clinically significant in bacterial strains.<sup>3</sup> Other members of the *Citrus* genus include citrons, oranges, limes, pomelos (pummelo, pommelo), grapefruit, and mandarins (tangerines). Most members of the genus *Citrus* arose as hybrids, and the types of hybridized of citrus, such as lemon (*Citrus limon*), may or may not be recognized as species according to different taxonomies.<sup>4,5</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 10 meter (33 feet), but they are usually smaller. The branches form an open crown and are thorny. The leaves are green, elliptical-acuminate and shiny. Flowers have a strong fragrance and are white on the outside with a violet streaked interior. On a lemon tree, flowers and fruits can be found at the same time.

Lemon and lime trees should not be grown in cooler winter areas, because they are more sensitive to winter cold than other citrus fruits. The largest producer's places are Italy and the United States. Lemons are commercially grown in cooler-summer or moderate-winter coastal Southern California in the United States, since sweetness is neither attained nor expected in retail lemon fruit. Other top producing nations include Greece, Spain and Argentina.

**Table 1: Botanical classification of limon<sup>7</sup>**

Kingdom	Plantae	Plants
Subkingdom	Tracheobionta	Vascular plants
Superdivision	Spermatophyta	Seed plants
Division	Magnoliophyta	Flowering plants
Class	Magnoliopsida	Dicotyledons
Subclass	Rosidae	-
Order	Sapindales	-
Family	Rutaceae	Rue family
Genus	<i>Citrus</i> L.	<i>citrus</i> P

**Table 2: Indian synonyms of lemon<sup>8</sup>**

Language	Name
Sanskrit	Jambira, Maha Nimbu
Bengali	Patinebu, Kagghinebu, Baranebu
English	Lemon
Hindi	Nimbu, Bara Nimbu, Pakari Nimbu
Kannada	Nimbe, Lime hannu, Nimbe hannu
Punjabi	Nimbu
Urdu	Limu, Neebu

**Table 3: International synonyms of Lemon**

Country	Name
French	Citron
German	Zitrone
Italian	Limone
Japanese	Remon
Romanian	Lămâi (tree), Lămâie (fruit)
Russian	Limón
Serbian	Limun
Spanish	Limón
Thai	Manao farang, Ma nao leung, Som saa

**Table 4: Different species of lemon**

<i>C. medica cedar</i>	<i>Cedrat Lemon</i>
<i>C. Javanica</i>	<i>C. medica acida</i>
<i>C. medica</i>	<i>C. Limetta</i>
<i>C. margarita</i>	<i>C. Lumia</i>

**Table 5: Different variety of lemon<sup>9</sup>**

S.N.	Variety	Characteristics
1	The Avon	First grown in Florida and used primarily for frozen concentrate
2	The Baboon	A bright yellow Brazilian variety with a flavour similar to lime
3	The Bearss	Which is large and rich in oil, is also known as the "Sicily", and similar to the "Lisbon"
4	The Berna	Spain's leading lemon, is a medium-sized fruit
5	The Cameron Highlands	A small, round lemon with pale green flesh and many seeds was discovered in the Cameron Highlands of Malaysia where it grew wild.

## HISTORY

The lemon was firstly introduced into southern Italy in 200 A.D. and spread to Iraq and Egypt by 700 A.D. Lemon was throughout widely distributed the Mediterranean region by 1000-1150 A.D. and was cultivated in China approximately 760-1297 A.D. Lemon was introduced in the Spanish to the Island of Hispaniola in 1493 and sometime the first settlement of St. Augustine, Florida. Lemon was introduced into California in 1751-1768.<sup>10</sup> Lemons were originally developed as a cross between the citron and the lime. Lemons are thought to have originated in China or India, cultivated in these regions for about 2,500 years. The major productions of lemons today are the United States, Turkey, Israel, Italy, Spain and Greece. Lemons originated in Himalaya near the North Eastern India. In 1493, the first lemon trees in America planted by the Italian Navigator Christopher Columbus.

## GEOGRAPHICAL DISTRIBUTION

It is indigenous to North India, but cultivated on a very large scale in countries like Sicily, Italy and Spain. It is also cultivated in India, Florida and California. In India, the cultivation is carried out in U.P., M.P., Punjab and Karnataka.<sup>6</sup>

## BOTANICAL DESCRIPTION

Lemon grows on thorny, small trees which reaches a height of 10 - 20 feet. The colours of leaves of the lemon are dark green. Leaves are arranged alternately on the stem. The lemon has a fragrant, white flower with five petals. This specific flower comes from a lemon cultivar called 'Pink Lemonade'. The fruit is striped and the leaves of this cultivar are variegated. The lemon fruit colour range is from greenish yellow to bright yellow. Lemons seem very similar to limes, but are yellow when ripe, where limes are green and lemons tend to be a little larger.<sup>7</sup>

### Leaves

Leaves 6.5 to 100 mm, serrulate, acute to acuminate. Leaf jointed to the petiole. Petiole narrowly winged. Leaf blade elliptic to ovate, 8-14×4-6 cm, apex usually mucronate, margin conspicuously crenulate.

Figure 1: [www.growfruitandveg.co.uk](http://www.growfruitandveg.co.uk)

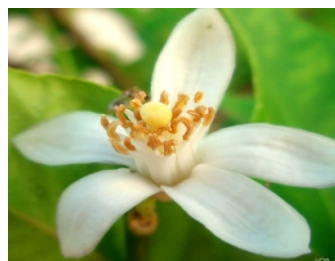
### Fruit

Fruits are ovoid or globose, berry, hesperidium, and yellow when ripe.<sup>11</sup> Fruits belonging to the citrus group are called as "hesperidium,". Fruit shape can change as the fruit matures or the trees get older and are also largely governed by variety choice. Fruit size is influenced by variety, crop load, rootstock and irrigation practices. Mature lemons turn green to yellow, weigh about 50- 80 g in weight and measure about 5-8 cm in diameter.

Figure 2: [images5.fanpop.com](http://images5.fanpop.com)

### Flowers

Flowers male or bisexual. Petals white and tinged purple. Stamens 20-30; Fruit oblong or ovoid mamillate, yellow when ripe; pulp strongly acid and abundant.

Figure 3: [pre14.deviantart.net](http://pre14.deviantart.net)

### Seed

Seeds of lemon nestle within the pulp near the center of each fruit. Their size and numbers vary according to variety, but most are white, wrinkled, hard, oval or elliptical and measure about 3/8 inch long.<sup>12</sup>



Figure 4: 2.bp.blogspot.com

## POLLINATION

A lemon flower's stigma must receive pollen which contains the flower's sperm. More specifically, the pollen grains sperm must be transferred to the stigma, which found the top and the longer column in the middle of the flower. Lemon trees can be easily grown in open area in warmer climate. Lemon trees can be growing in pots in cooler region. Pollen was characterized by a very different emission profile with respect to other parts of flower. The trans-nerolidol (30.7%) is the main volatile detected in pollen.<sup>13</sup>

## PHYTOCONSTITUENT

The fruit juice mainly contains fruit acids, mainly citric acid (8%) and sugars. Lemon peel consists of two layers: The outer layer (pericarp, zest) contains an essential oil (6%), which is composed of citral (5%) plus traces of citronellal and limonene (90%),  $\alpha$ -terpineol, geranyl acetate and linalyl. The inner layer (mesocarp), in the other word, contains no essential oil but a variety of coumarin derivatives and bitter flavone glycosides. It also contains a very little potash, sugar and gum. An imitation lemon juice has been prepared by dissolving tartaric acid into water, then adding sulphuric acid and flavouring with oil of Lemon. Oil of Lemon is dextrogyre. This contains 7 to 8% of citral, an aldehyde yielding geraniol upon reduction, a small amount of citronellal and pinene<sup>8</sup>

## PHARMACOLOGICAL PROFILE<sup>14</sup>

**Prevent kidney stones-** Citrate levels in the urine raises by drinking one half-cup of lemon juice every day. In studies lemon juice shown that this could protect against calcium stones in the kidney.

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

**Support weight loss-** Ancient time the old notion that the Master Cleanse was the only way lose weight with the help of lemons. New studies have shown the ways lemon juice supports weight loss. Lemon juice contains pectin, a soluble fibre which shown weight-loss.

**Start your day right-** Leave caffeinated drinks behind, and stimulation of digestive track by the using fresh lemon juice and hot water and add vitamin C.

**Stop an itch** -When it comes to insect bites or poison ivy, lemon juice rubbing on the area can soothe the skin. Lemon juice show anti-inflammatory and anaesthetic effects.

**Anticancer properties-** Studies have supported the citrus limonoids 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.

## MEDICINAL USE OF LEMON

- Blood Purifier
- Blood Sugar Balance
- Osteoporosis
- Insomnia
- Brain and Nerve Food
- Asthma
- Nausea, Vomiting and Travel Sickness
- Rheumatism, Arthritis and Bone-Related Diseases
- Acne, Spots and Pimples
- Treat Throat Infections

## TRADITIONAL USES<sup>15</sup>

- The intake of lemon juice and honey is one of the key health benefits associated with Weight loss.
- Lemon juice has a wide property of skin benefits. Lemon juice is rich in Vitamin C can helps in lightening the skin.
- Lemon juice also used by people suffered with UTI (Urinary Tract Infection) problem, it can help flush high level of uric acid.
- Mixture of lemon juice and olive oil to cure gall bladder stones and kidney stones.
- Lemon juice is also used for liver stimulant, controls nausea and relieves heartburns and irritable bowel syndrome.

## DISHES CONTAINING LEMON<sup>9</sup>

- Lemon curd
- Lemon syrup
- Lemon-Garlic soup
- Sour mix
- Lemonade
- Pink Lemonade Popsicles

## STRANGE FACT

- Nutritionally, the lemon constitutes potassium, a mineral that support in normalizing blood pressure, promotes clear thinking and works with sodium to regulate the water balance in the body.
- Add the equal amount of one lemon juice and hot water for an anti-bacterial gargle.
- Lemons prevent scurvy because of high amount of Vitamin C, a disease that causes aching joints, loose teeth and bleeding gums.
- Acne scars, marks are embarrassing and pain treated by the citric acid which is present in lemon juice.
- Lemon juice gives shine on faces.
- Lemon juice also stimulates the metabolism.

**Table 6: Nutritional Value<sup>11</sup>**

Elements	Amount
Sodium (Na)	0.83
Water	92%
Potassium (K)	0.24
Magnesium (Mg)	0.59
Zinc (Zn)	0.15
Protein	9.42
Vitamin C	38.7 mg
Phosphorus (P)	0.11
Fibre	15.18
Fat	4.98
Calcium (Ca)	0.32
Copper (Cu)	0.22
Iron (Fe)	0.54

## CONCLUSION

Citrus is well known for its nutritional and medicinal value in all over world. Its plants part are used as a traditional medicine. According to available literature does not reveal any adverse effect. Citrus is one of most popular plant in all over world.

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