



Importance of *Cymbopogon citratus* (lemongrass)

(*R Nandhikumar and Elumalai D)

¹Adhiyamaan College of Agriculture and Research, Krishnagiri, Tamil Nadu, India

*Corresponding Author's email: nandhikumar@gmail.com

Lemongrass is a herbal and flowering aromatic plant with a lot of secondary metabolites. It is a Poaceae family and is grown in many tropical regions of Asia and Africa. In India, many lemongrass species are grown and cultivated in warm, mild, and wettest conditions (25°C). Its scientific name is *Cymbopogon citratus* and is very important for the grass family because it gives several benefits to human beings. These lemongrass leaves and lemongrass extracted products are used for the treatment of high blood pressure, chest pain, cough, common cold, knee ache, and tiredness. Lemongrass is a high nutrient compound like protein, fats, fiber, and mineral products; there are several bioactive products like tannins, flavonoids, terpenoids, and phenols. These herbal plants give wonderful products like lemongrass tea, lemongrass oil, lemongrass fragrance, lemongrass face cream, and lemongrass herbal bathing soap. Lemongrass oil is mainly used in the manufacture of perfume for soaps, hair oils, scents, and medicines. Lemongrass oil shows antibacterial properties, and a mixture of lemongrass oil and cinnamon oil is used as a mosquito and house fly repellent.

Cultivation and Harvesting method

Lemongrass plants grow well in sandy loams and red soil (pH 5.8-8.0) with good manuring, but are not suitable for water-logged areas. They need a warm, humid climate and medium rainfall because they can also stand in a low rainfall climate. It can be cultivated vegetatively by slips with good manure. In May and June are good months for planting lemongrass. Earlier planting, the field is prepared and fixed into 6 m x 6 m size field beds with good fertilizers (phosphorous and potash nitrogen). Ridges are opened at 60 cm distance.

Lemongrass slips (seed) are prepared by extracting all the old roots and eliminating the leaves totally for planting. The lemongrass slips are planted at about half way down the slopes of the ridges at a land spacing of 60 cm x 60 cm. After planting the lemongrass slips, if there is no rainfall, the planting plots should be well irrigated every alternating day for about a month and then once a week depending upon the soil nature and weather climate conditions. The lemongrass field is kept free of all types of weeds until a whole cover of the crop is obtained. No serious insect pests and diseases have been reported to attack this lemongrass crop.

The lemongrass plants are flowering in nature and can give a crop up to 5-6 years. Harvesting lemongrass is done by cutting the grass 10-15 cm above the ground level. Throughout the first year of planting, 30-35 cuttings are obtained, and in subsequent years, 5 cuttings are obtained. Harvesting is done in about 85-90 days after planting and subsequently at 50-60 day intervals. The harvested lemongrass leaves can be stored under darkness for 3-4 days without much adverse effect on the lemongrass oil yield or quality of



lemongrass oil. They are then sliced into smaller pieces before distillation in Soxhlet apparatus. We may obtain an herbage yield of 1tonne per harvest and a recovery of 5-7 litre of oil from fresh lemongrass grass. The yield of lemongrass oil from second year onwards would be increased.

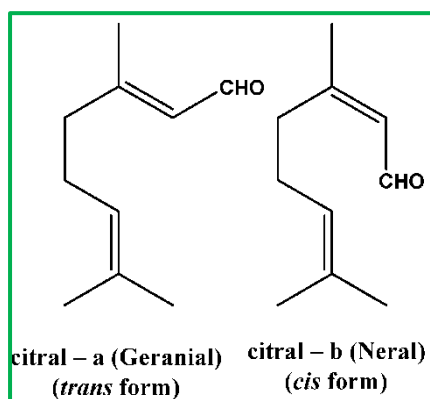


Chemical compositions

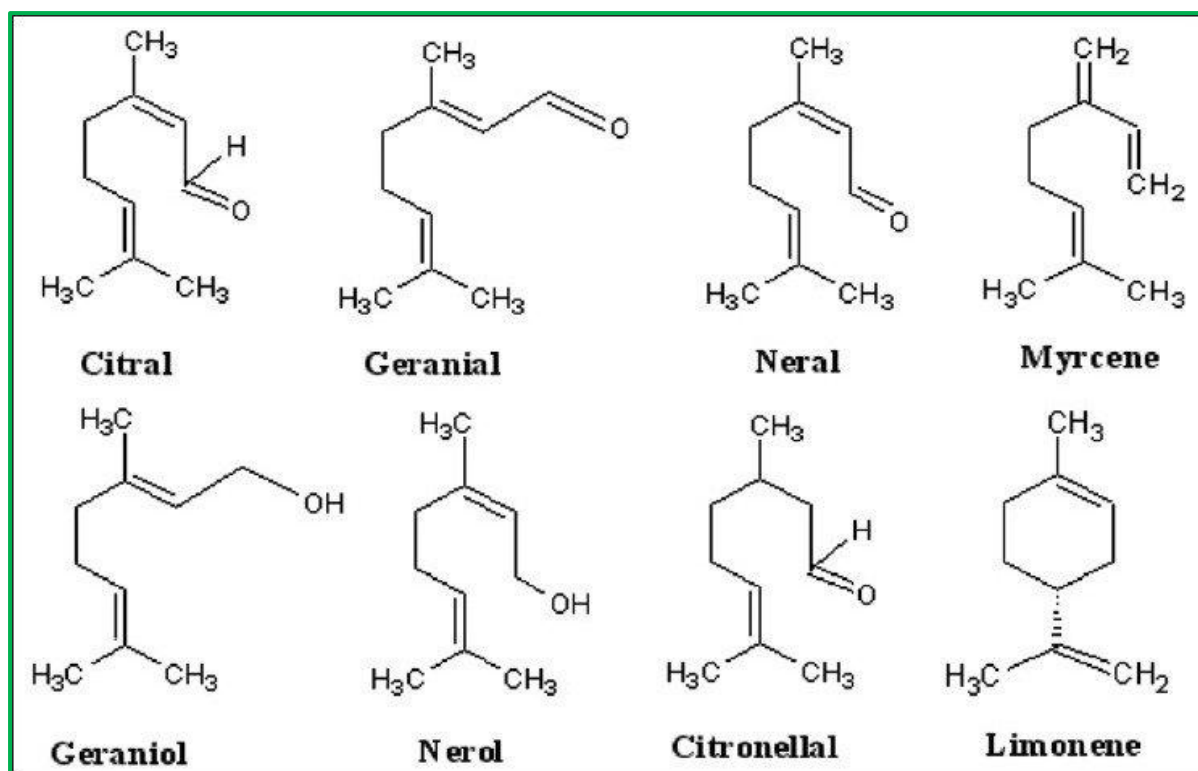
The lemongrass oil mainly contains citrus (lemon smell oil) and table.1 shows the total lemongrass chemical components details.

Table: 1 Chemical component

S. No	Components	Present of oil	Reference
1	Terpene	20-70	
2	Tetaraniol	20-24	
3	Cihronellular	30-40	
4	Ci-Malic	0.0-3.5	Langan <i>et al.</i> ,2017, Diop <i>et al.</i> , TA
5	Geraniol	0.0-22.5	Tran <i>et al.</i> , 2018., Olayemi <i>et al.</i> ,
6	Beta-pinene	3.5	Premathilake <i>et al.</i> , 2018., Boeira <i>et</i>
7	Gel-terpine	7.5	<i>al.</i> , 2020., Bhatt <i>et al.</i> , Markovic <i>et</i>
8	Jwarankusa	20-6	<i>al.</i> , 2018., Bonferroni <i>et al.</i> , 2017.
9	Terpene-piperitone	20-6	
10	Citral alpha	40.8	
11	Citral Beta	32	
12	Nerol	4.18	
13	Methylheptenone	0.2	
14	Borneol	0.1-0.4	
15	Citronellal	2.10	
16	Geranyl acetate	0.83	
17	Myrecene	0.72	
18	Terpinol	0.45	
19	Linalyacetate	0.1	



Molecular formula of Citral: $C_{10}H_{16}O$
IUPAC Name: 3,7-dimethylocta-2,6-dienal



Mineral and vitamins: The lemongrass also has the lot of mineral and vitamins and table .2 shows the details of vitamins and minerals.

Table 2: Mineral/ Vitamin content of Lemongrass.

S. No	Mineral /Vitamin	Quantity(mg/100mg)	Reference
1	Na	54.8	
2	Ca	39.5	
3	K	59.5	
4	Mg	7.0	Asaolu <i>et al.</i> , 2009,
5	Fe	0.0024	Kkpenyong <i>et al.</i> ,
6	Zn	121	2014.
7	Mn	0.952	
8	P	89.3	
9	Phytate	11860	

Therapeutic activity: The lemongrass leaves and oil used to cure several treatment as mentioned below the table 3.

Table: 3 Lemongrass and their benefit in common diseases.

S. No	Disease	Benefits	Reference
1	Cancer prevention	Kill cancer cell	
2	Common cold	Strong immune system	
3	Cough	Antioxidant	
4	Diabetes	Lower blood sugar level	Gavahian Mohsen
5	Epilepsy	Antiepileptic drugs	<i>et al.</i> , 2020,
6	Fever	Preventing infections	Dangkulwanich
7	Hypertension	Control high BP	<i>et al.</i> , 2020,
8	Musculoskeletal pain	Reliever	Majewska <i>et al.</i> ,
9	Rheumatism	Relieves arthritis pain	2019
10	Sleeplessness	Freshness and delightful smell	

Microbial activity: Lemongrass oil possess anti-malarial activity (Medet *et al.*, 2016), Anti-hepatotoxic activity (Arhoghro *et al.*), Anti-nociceptive activity of lemongrass (Manvitha *et al.*, 2014), Cardioprotective activity of lemongrass (Ullah *et al.*, 2020), and Anticancer activity of lemongrass (Li *et al.*, 2018). Table 4 shows the microbial activity.

Table: 4 Microbial activity of lemongrass oil

S. No	Microorganism	Zone of Inhibition of lemongrass	Reference
1	<i>E. coli</i>	No zone of inhibition	
2	<i>P. aeruginosa</i>	14.9+0.24	
3	<i>K. pneumoniae</i>	14.2+0.41	(Spriha <i>et al.</i> , 2021)
4	<i>P. mirabilis</i>	8.9+0.21	
5	<i>S. aureus</i>	15.5+0.33	
6	<i>C.Albicans</i>	16.5+0.49	

References

1. Minasari and Dheina Lianisa Nasution, 2017. Advances in Health Science Research, volume 8, International Dental Conference of Sumatera Utara.
2. Spriha, Rattandeeep Singh and Anupam Kumar, 2021. Biological Forum – An International Journal 13(2): 298-308.