1

Nomenclature of Aromatic Plants

- System of naming using Latin binomials
- Binomial = Genus + species
- Provides precise, universal identification
- More accurate than common names
- Internationally recognized

2

Taxonomy

Kingdom	Plantae
Phylum	Streptophyta
Class	Equisetopsida
Subclass	Magnoliidae
Order	Lamiales
Family	*Lamiaceae*
Genus	*Lavandula*
Species	*Lavandula latifolia*

3

- A subspecies is a taxonomic rank between species and variety. It represents a distinct population within a species that has evolved to be noticeably different from other populations, often due to geographical or ecological isolation.
- **Key characteristics:**
  - Evolved to be noticeably different from other populations
  - Often due to geographical or ecological isolation
  - Can interbreed with other subspecies but usually don't
- **Naming convention:**
  - Denoted with "subsp." or "ssp." in scientific names
- **Importance:** Highlights evolutionary divergence within a species
- **Examples:** *Lavandula stoechas* subsp. *luisieri*, *Lavandula stoechas* subsp. *stoechas*

4

- A naturally occurring variation within a plant species. A variety is a form of a species that is slightly different than the "regular" species but not different enough to warrant a new species. Varieties are often found in nature, as opposed to being created by plant breeders.

Key characteristics:
- Develops in nature, often as environmental adaptations
- Reproduces true-to-type from seed
- Can interbreed freely with other members of the same species

Naming convention:
- Denoted with "var." followed by a lowercase italicized name
- Example: *Lavandula spica* var. *latifolia*
- Important note: Represents natural diversity within a species

5

- A plant selected, bred, or created through human intervention

Key characteristics:
- Result of hybridization or naturally occurring mutations ('sports')
- Must be propagated vegetatively (cuttings, grafting, tissue culture)
- Seeds often don't produce identical plants

Naming convention:
- Denoted with single quotation marks and capitalized names
- **Example:** *Lavandula angustifolia* 'Hidcote' or 'Munstead'
- There are over 40 different cultivars of lavender
- Legal considerations: Special rules may apply for propagation

6

The Lavenders

Lavender

LAVANDULA ANGUSTIFOLIA

is native to the mountainous regions of the Mediterranean from Spain to France and Italy, where it grows generally at altitudes over 1500 m

Lavender 'Hidcote'

LAVANDULA ANGUSTIFOLIA

'Hidcote' is a compact English Lavender that grows only 18-24 inches tall, with highly fragrant, deep purple-blue flowers.

Lavender 'Maillette'

LAVANDULA ANGUSTIFOLIA

Famous French cultivar, a clonal variety of Lavandula angustifolia that does not reproduce by seed.

7

The Lavenders

Spike Lavender

LAVANDULA LATIFOLIA

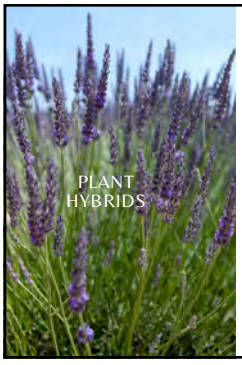
a drought-tolerant shrub native to the Mediterranean basin, and it is distributed throughout central Portugal, Spain, southern France, and northern Italy

Spanish Lavender

LAVANDULA STOECHAS

growing around the Mediterranean basin, including in Morocco, Algeria, Tunisia, Spain, Greece, France, Italy, and Turkey.

8



- Result of cross-pollinating two different plant varieties
- Offspring of this mix with selected traits from both parents
- Hybrid seeds may not grow "true" to parent plants
- Hybridization occurs in nature, but most commercial hybrids are man-made

Example: Lavandula x intermedia = Lavandula angustifolia + Lavandula latifolia

9

LAVENDER

LAVANDULA ANGUSTIFOLIA

10

FINE LAVENDER

Lavandula angustifolia syn. *L. vera* syn. *L. officinalis*

- Also known as "True Lavender" or "Population Lavender"
- Grows wild and cultivated in warm, arid climates
- **Altitude:** 800-1800 meters (2,624-5,905 feet)
- Identifiable by small, fuzzy leaves and pink to dark blue flowers
- **Annual bloom:** July to August
- True Fine Lavender is costly: Source price approaching 300 euros per liter

11

WILD LAVENDER / HIGH ALT LAVENDER

Lavandula angustifolia syn. *Lavandula vera*

- Highly prized in aromatherapy
- Notable properties:
  - Calming
  - Healing
  - Antiseptic
  - Promotes relaxation and sleep
- Hand-harvested during peak bloom (July)
- Processed using innovative low-temperature distillation

12

CULTIVATED LAVENDER - FIELDS OF PROVENCE

Lavandula angustifolia syn. *Lavandula vera*

- More slender than wild variety
- Widely used in aromatherapy and perfumery
- Prized for refined aromas
- Vast fields create iconic Provençal landscapes

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COUNTRY OF ORIGIN

LAVANDULA ANGUSTIFOLIA SYN. LAVANDULA VERA

France	England
Bulgaria	South Africa
Greece	USA
India	China

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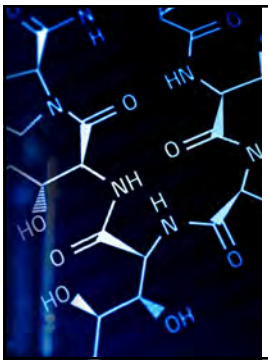


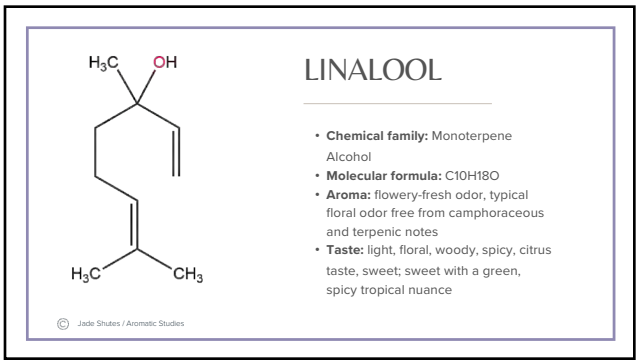
AROMATIC CHEMISTRY

Lavandula angustifolia syn. *Lavandula vera*

- Seventy-seven+ components make up 97.3% of the essential oil of Lavandula angustifolia.
- The core components include linalool (25-38%) and linalyl acetate (25-45%).

High Alt. Lavender will have lower linalool (18-20%) content and a higher linalyl acetate (41%) content when distilled at altitude. And a terpinene-4-ol content of 11%.

15


H3C
OH
H3C
CH3
LINALOOL
• Chemical family: Monoterpene Alcohol
• Molecular formula: C10H18O
• Aroma: flowery-fresh odor, typical floral odor free from camphoraceous and terpenic notes
• Taste: light, floral, woody, spicy, citrus taste, sweet; sweet with a green, spicy tropical nuance
© Jade Shutes / Aromatic Studies

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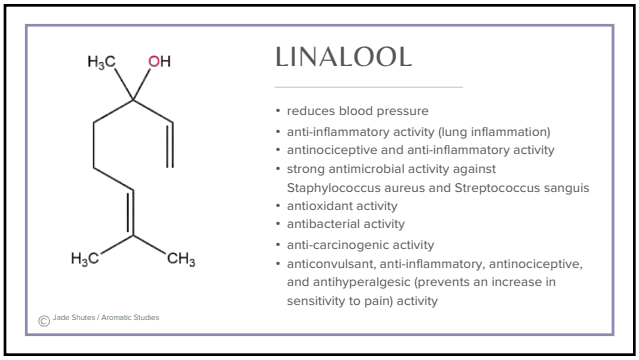
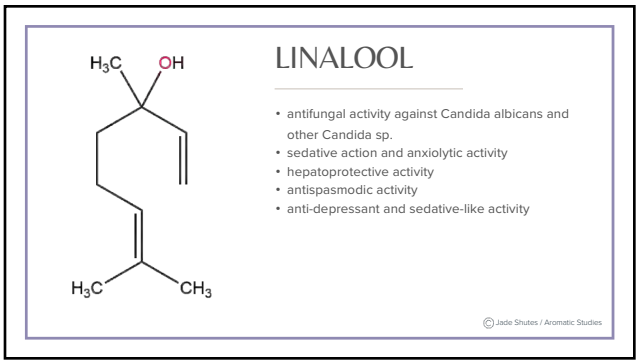

H3C
OH
H3C
CH3
LINALOOL
• reduces blood pressure
• anti-inflammatory activity (lung inflammation)
• antinociceptive and anti-inflammatory activity
• strong antimicrobial activity against Staphylococcus aureus and Streptococcus sanguis
• antioxidant activity
• antibacterial activity
• anti-carcinogenic activity
• anticonvulsant, anti-inflammatory, antinociceptive, and antihyperalgesic (prevents an increase in sensitivity to pain) activity
© Jade Shutes / Aromatic Studies

17


H3C
OH
H3C
CH3
LINALOOL
• antifungal activity against Candida albicans and other Candida sp.
• sedative action and anxiolytic activity
• hepatoprotective activity
• antispasmodic activity
• anti-depressant and sedative-like activity
© Jade Shutes / Aromatic Studies

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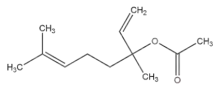
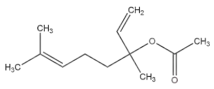
LINALYL ACETATE



- **Chemical family:** Ester
- **Molecular formula:** C12H20O2
- **Aroma:** Sweet, floral-fruity odor
- **Taste:** Sweet, fruity, pear-like with a faintly floral note

19

LINALYL ACETATE



- strong anti-inflammatory agent
- local anaesthetic activity
- smooth muscle relaxant
- analgesic activity, which may be of benefit in treating dysmenorrhea
- antibacterial activity
- anti-hypertensive activity
- immune modulatory activity
- preventative to vascular damage caused by hypertension

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THERAPEUTIC ACTIONS OF LAVENDER ESSENTIAL OIL

Musculoskeletal System	Analgesic, antinociceptive
Skin	**cell regenerative (cytophylactic), vulnerary, tissue healing**
Cardiovascular system	hypotensive
Nervous system; Psyche/emotion	antidepressant, **antistress**, **anxiolytic**, nervine, **sedative**
General	**anti-inflammatory**, antiseptic, **antispasmodic**, antiviral, antinociceptive

21

Lavender

Lavandula angustifolia syn. *L. vera* syn. *L. officinalis*

System Affinities

Nervous system: restlessness, insomnia, stress, shock, headaches, migraines, neuralgia, nausea, stress-related disorders (O+++, I+++, C+++, D++)

Skin: burns (recommend using Lavandula latifolia instead or in conjunction with), scrapes, abscesses, acne, athlete's foot, eczema, inflamed skin conditions, psoriasis (as an anti-inflammatory), sunburn, relieves itching, insect bites, hives, open wounds or sores, poorly healing wounds, allergy (expressed on the skin), razor burn, stretch marks (C+++)

22

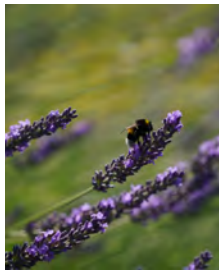
The Commission E approved the internal use of lavender for restlessness or insomnia and nervous stomach irritations, Roehmheld's syndrome, meteorism, and nervous intestinal discomfort. For balneotherapy: Treatment of functional circulatory disorders.

The German Standard License for lavender tea lists it for restlessness, sleeplessness, lack of appetite, nervous irritable stomach, meteorism, and nervous disorders of the intestines. Lavender preparations are traditionally used to treat symptoms of neurotonic disorders, especially minor sleeplessness.

Essential oil: 1-4 drops (approximately 20-80 mg), e.g., on a sugar cube.
Note: Combinations with other sedative or carminative herbs may be beneficial.

External:
Bath additive: 20-100 g for a 20 liter bath.

23



SPIKE LAVENDER

LAVANDULA LATIFOLIA

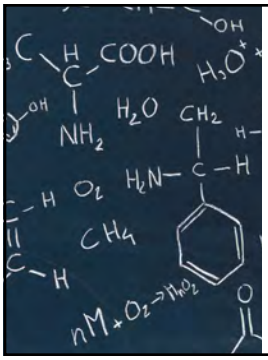
24

Lavender Spike

Lavandula latifolia

- Grows at lower altitudes (up to 800 meters/2,624 feet)
- Thrives in Mediterranean climates and calcareous soils
- Cultivated in Spain
- Taller than Lavender Vera
- Distinctive features:
  - Large leaves
  - Short ears
  - Pale purple flowers
- Blooms from June-July

25



AROMATIC CHEMISTRY

Lavandula latifolia

- Thirty three+ components make up 95% of the essential oil of Lavandula latifolia.
- The core components include 1,8 cineole (27+%), linalool (40+%) and camphor (10+%).

26

Lavender Spike

Lavandula latifolia

Characteristics and Uses

- Strong cineole aroma
- Key compound: 1,8 cineole

Primary benefits:

- Anti-infectious
- Analgesic
- Anti-inflammatory
- Ideal for skin applications (insect bites, irritations, burns)
- Tissue healing

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Lavender
Spike

Lavandula latifolia

Therapeutic Applications

- Underrated antiviral and mucolytic agent
- Skin-friendly and well-tolerated
- Effective for:
  - Flu symptoms
  - Sinus and pulmonary congestion
  - Recent burns
  - Wasp and jellyfish stings
- Pairs well with Thyme ct. thujanol for respiratory issues (OSA)

28

Spike Lavender oil is most effective in the treatment of recent burns and can detoxify wasp and jelly fish stings – even more so than True Lavender (*L. angustifolia*).

Kurt Schnaubelt (OSA)

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SPANISH LAVENDER

LAVANDULA STOECHAS

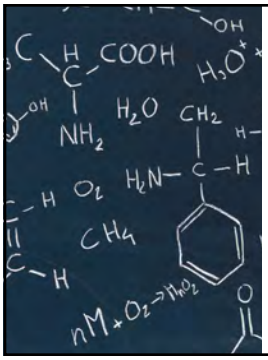
30

Spanish Lavender

Lavandula stoechas

- Also known as French, Spanish, or Butterfly Lavender
- Distinctive butterfly-like flowers
- Less cold and heat tolerant than Lavender Vera
- Habitat: Milder climates, Coastal areas (e.g., Portugal, Hyères islands in France)
- Flowering: Starts in early spring, Earlier than other *Lavandula* species

31



AROMATIC CHEMISTRY

Lavandula stoechas

- Forty six+ components make up 94% of the essential oil of *Lavandula stoechas*.
- Rich in Fenchone (upwards of 35%), supported by 1,8 cineole (17+%) and camphor (15+%), small amount of linalool (5%)

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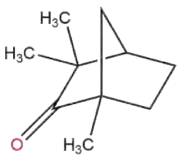
FENCHONE



- **Chemical family:** Ketone
- **Molecular formula:** C10H16O
- **Aroma:** Camphor herbal earthy woody aroma

Fenchone is a monoterpene ketone that contributes significantly to the characteristic scent and biological activities of *L. stoechas* essential oil.

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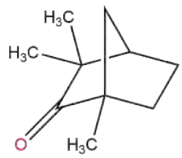
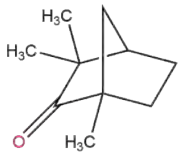
FENCHONE



- antinociceptive activity
- anti-inflammatory and antimicrobial activity on wound healing, increased collagen synthesis (rats)
- antioxidant activity: Protects cells from oxidative damage
- antimicrobial properties: effective against various bacteria and fungi
- antidiabetic effects: Inhibits α-amylase and α-glucosidase enzymes, which may help regulate blood sugar levels

34

FENCHONE



- antihyperglycemic activity: May contribute to blood glucose regulation
- potential dermatoprotective effects:
- Exhibited inhibitory activity against tyrosinase enzyme
  - Tyrosinase is an enzyme that plays a crucial role in melanin production, which gives color to our skin and protects it from UV radiation. However, overactivity of this enzyme can lead to skin hyperpigmentation disorders, prompting researchers to study its characteristics and potential inhibitors to address these issues.
- Possible anticandidal properties: As a component of L. stoechas essential oil, may contribute to antifungal effects.

35

FENCHONE

Additional References

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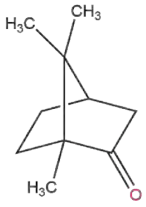
El Hachlafi, N., Benkhaira, N., Al-Mijalli, S. H., Mrabti, H. N., Abdnim, R., Abdallah, E. M., Jeddi, M., Bnouham, M., Lee, L. H., Ardianto, C., Ming, L. C., Bouyahya, A., & Fikri-Benbrahim, K. (2023). Phytochemical analysis and evaluation of antimicrobial, antioxidant, and antidiabetic activities of essential oils from Moroccan medicinal plants: Mentha suaveolens, Lavandula stoechas, and Ammi visnaga. Biomedicine & pharmacotherapy = Biomedecine & pharmacotherapie, 164, 114937. https://doi.org/10.1016/j.biopha.2023.114937

36

CAMPHOR

- **Chemical family:** Ketone (cyclic monoterpene ketone)
- **Molecular formula:** C10H16O
- **Aroma:** strong mothball-like odor; fragrant, penetrating
- **Taste:** pungent aromatic taste

37



CAMPHOR

- counterirritant, rubefacient, and mild analgesic action, and is a major component of liniments for the relief of fibrositis, neuralgia, and similar conditions. It can be used as a mild expectorant.
- effective antitussive activity
- antipruritic
- protective against bone loss (oral) by inhibiting bone resorption
- analgesic activity

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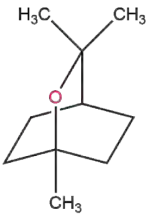

1,8 CINEOLE

- **Chemical Family:** Ether (cyclic ether and monoterpenoid)
- **Molecular formula:** C10H18O
- **Aroma:** Strong, camphor-like, balsamic, fresh
- **Taste:** sweet, camphor, and eucalyptus tasting

Eucalyptol is a monocyclic terpene with an ether bridge between carbon 1 and 8. The name 1,8 refers to the fact that the oxygen atom is bonded to the first and eighth carbon atoms.

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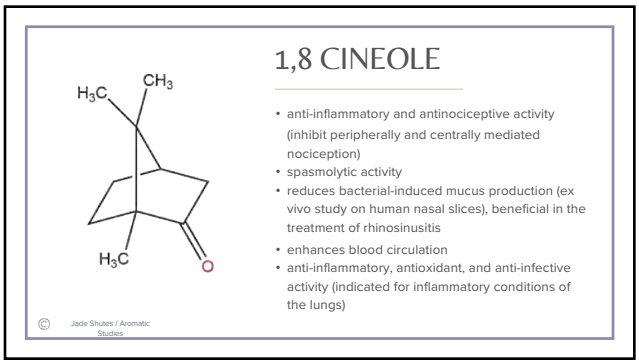
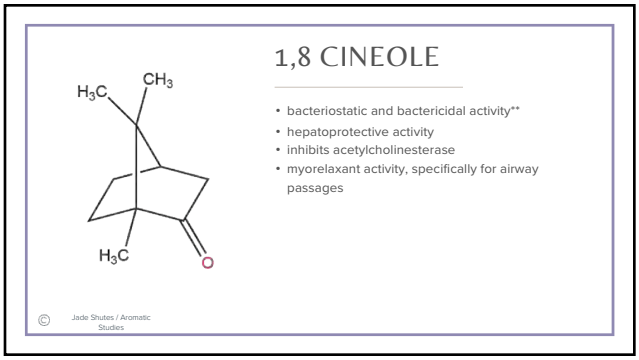

1,8 CINEOLE
• anti-inflammatory and antinociceptive activity (inhibit peripherally and centrally mediated nociception)
• spasmolytic activity
• reduces bacterial-induced mucus production (ex vivo study on human nasal slices), beneficial in the treatment of rhinosinusitis
• enhances blood circulation
• anti-inflammatory, antioxidant, and anti-infective activity (indicated for inflammatory conditions of the lungs)
© Jade Shutes / Aromatic Studies

40


1,8 CINEOLE
• bacteriostatic and bactericidal activity**
• hepatoprotective activity
• inhibits acetylcholinesterase
• myorelaxant activity, specifically for airway passages
© Jade Shutes / Aromatic Studies

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The Lavandins
Lavandin 'Grosso'
LAVANDULA X INTERMEDIA
Super Lavandin
LAVANDULA X BURNATI
Lavandin 'Abrial'
LAVANDULA HYBRIDA SSP. ABRIALIS

42

The main commercial use for lavandin is essential oil production. Lavandin produces significantly more essential oil than English lavender - about 3 times as much oil per acre of plants. This higher yield is the main reason lavandin dominates the lavender oil market.

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LAVANDIN GROSSO

LAVANDULA X INTERMEDIA 'GROSSO'

When in the 1920s farmers noticed that Lavandin plants had a pleasant fragrance and a much higher yield than Fine Lavender a new industry was born. According to Stefan Arctander, Lavandin EO is one of the most successful oils ever. L. Grosso is distilled from clippings of the original plant, selected in the early 1920s by a certain Monsieur Grosso and propagated and continuously replanted ever since. (OSA)

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LAVANDIN ABRIAL

LAVANDULA HYBRID VAR. ABRIALIS

- Effective mucolytic and expectorant due to cineole content
- Antibacterial
- Gentler than Spike Lavender

45

LAVANDIN SUPER

LAVANDULA HYBRID VAR. SUPER OR LAVANDULA X BURNATI

Cultivated in France and Spain

Similar in chemistry to Lavender but with a hint of cineole and camphor

A hybrid variety, from the crossing between Fine and Spike Lavenders. (Florihana)

46

It is commonly used as an economic replacement for Lavender.

Kurt Schnaubelt

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Difference in chemical composition between *L. x intermedia* abrial, grosso, and super hybrids

Chemical	Lavandula x intermedia abrial	Lavandula x intermedia grosso	Lavandula x intermedia super
1,8 cineole	6-11%	4-7%	1.86-10.88%
cis-ocimene	1.5-4%	not fixed	
trans-ocimene	3-7%	not fixed	
linalool	30-38%	25-35%	23.55-47.88%
camphor	7-11%	6-8%	5.03-14.79%
borneol	2-4%	1.5-3%	
lavandulol	0.5-1.5%	0.3-0.5%	0.20-1.04%
terpinen-4-ol	<1.0%	2-4%	
linalyl acetate	20-30%	28-38%	32.53-52.20%
lavandulyl acetate		1-2%	1.5-3%

This chart was constructed with information provided by Dr. Brian Lawrence, Essential Oils 1981-1987

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THERAPEUTIC ACTIONS OF LAVANDIN ESSENTIAL OILS

Musculoskeletal System	Analgesic, antinociceptive
Skin	**cell regenerative (cytophylactic), vulnerary, tissue healing**
Cardiovascular system	hypotensive
Respiratory system	Effective mucolytic and expectorant (Abrial)
Nervous system; Psyche/emotion	**anxiolytic**, nervine, **sedative**
General	**antibacterial, anti-inflammatory**, antiseptic, **antispasmodic**, antiviral, antinociceptive

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Thank you for attending!

- Questions? Comments?

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