



MEDICINAL PROPERTIES OF LAVENDER ESSENTIAL OILS FOR THE BRAIN: WITH EFFECT ON EPILEPSY, DEPRESSION, ANXIETY AND MIGRAINE

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Abstract

Lavender belonging to the *Lamiaceae* family and has several species. The most commonly species are used for the commercial extraction of essential oil are: *Lavandula angustifolia*, *Lavandula latifolia*, *Lavandula stoechas* and *Lavandula intermedia*. Essential oils to have many medicinal properties and are used as a part of alternative medicine, in medicine, cosmetics, and aromatherapy. Lavender essential oil has anxiolytic, anti-inflammatory, antinociceptive, antioxidant, and antimicrobial effects. Studies indicate that lavender essential oil has a positive effect on Many studies indicate the effect of lavender on several neurological disorders, including epilepsy, depression, anxiety, migraine, and Alzheimer's disease was investigated. It is necessary to continue research on Lavender essential oil in the field of medicine in order to increase its contribution to clinical practice.

Key words: *Lavender; essential oils; alternative medicine; medicine.*

Introduction

Lavender belonging to the *Lamiaceae* family. Most commonly used species of lavender include *Lavandula angustifolia*, *Lavandula latifolia*, *Lavandula stoechas*, and *Lavandula intermedia* are used for the commercial extraction of essential oil. Essential oils to have many medicinal properties and are used as a part of alternative medicine, in medicine, cosmetics, and aromatherapy. Essential oils offer a safe alternative to relatively risky pharmacological agents. [1] Lavender essential oil is known to be rich in medicinal properties like anxiolytic, anti-inflammatory, antinociceptive, antioxidant, and

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antimicrobial effects. Herbal products like lavender essential oils may offer a solution to the problem of antibiotic resistance, side effects and drug addiction. These properties make lavender a very useful medicinal herb due to the advent of drug resistance. Utilization lavender essential oils will benefit the patients in many ways. Many studies indicate that lavender essential oil has a positive effect on sleep quality, anxiety relief, reduction of depression condition, influences gradual pain relief, in dentistry, preoperative treatments, obstetrics, burns, and cancer patients as an alternative or adjuvant therapy. It can also be used for treat local infections, as an alternative to antibiotics, in reducing dental anxiety, or to prevent the formation of biofilm on teeth. Due to the vast applicability of the lavender species due to its medicinal properties, there is a need for focused attention to its use in the field of medicine and to contribute to clinical practice [2].

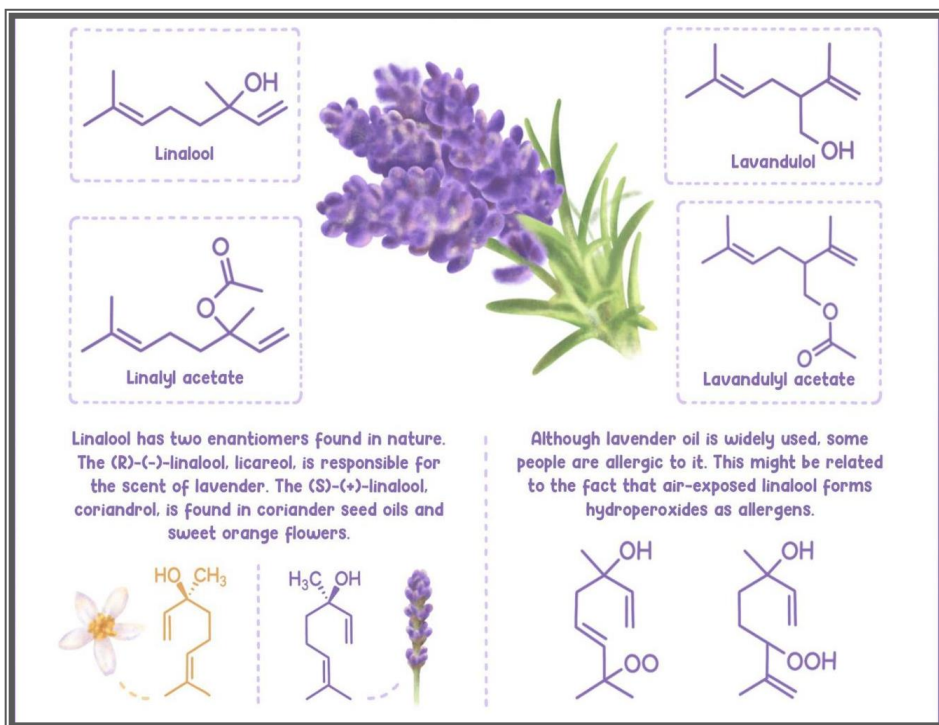
Herbal medicine has long been used to cure neurological diseases. Neurological disorders are diseases of the central and peripheral nervous systems. These disorders affect hundreds of millions of people all over the world. More than 50 million people suffer from epilepsy. Globally, there are 47.5 million people with dementia. Dementia is the major cause of Alzheimer's disease (AD) in 7.7 million new cases who develop the disease every year. The prevalence of migraine is more than 10% worldwide. Patients with neurological problems may experience depression or anxiety [3]. The aim of this study was to examine the application and importance of lavender in medicine.

Material and methods

In this study, the literature was searched using scientific search engines and databases (Google Scholar, Science Direct, Scopus, and PubMed) for papers published to 2024.

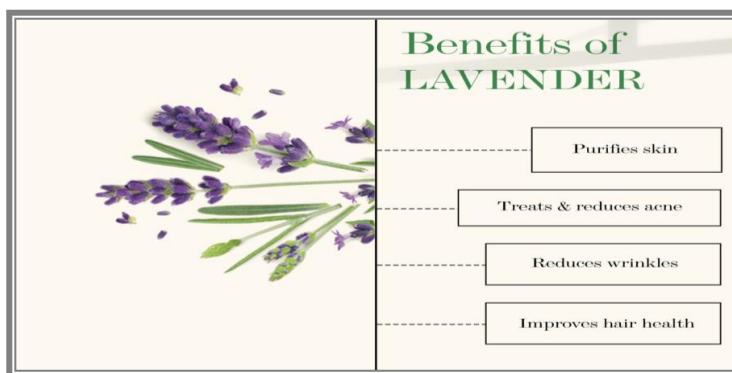
Results and discussion

Neurological diseases affect the nervous system, including the brain, spinal cord, cranial nerves, nerve roots, autonomic nervous system, neuromuscular junctions, and muscles. Herbal medicine has long been used to cure these diseases. One of these plants is lavender, which is composed of various compounds, including terpenes, such as linalool, limonene, triterpenes, linalyl acetate, alcohols, ketones, polyphenols, coumarins, cineole, and flavonoids. Lavenders and their essential oils have been used in alternative medicine for several centuries. The volatile compounds that comprise lavender essential oils, including linalool and linalyl acetate, have demonstrative therapeutic properties, and the relative abundance of these metabolites is greatly influenced by the genetics and environment of the developing plants Picture 1. [4]



Picture 1. The chemicals of lavender smell

Folk and traditional therapeutic use of the essential oil of English lavender for pain, infection, relaxation, and sedation dates back centuries. Current research focusing on the inherent synergism of *Lavandula angustifolia* Miller demonstrates great potential for future applications. Today's investigations may provide the key to eradicating degenerative inflammatory disease, infectious disease, and carcinogenesis), Pictures 2-4. [5]

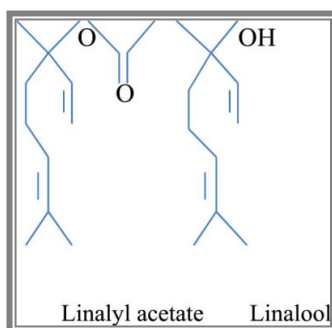


Picture 2. Benefits of Levander, b.



Picture 3. Benefits of lavender essential oil

Essential oils distilled from members of the genus *Lavandula* have been used both cosmetically and therapeutically for centuries with the most commonly used species being *L. angustifolia*, *L. latifolia*, *L. stoechas* and *L. x intermedia*. Many studies indicate that lavender oil is antibacterial, antifungal, carminative (smooth muscle relaxing), sedative, antidepressive and effective for burns and insect bites, Pictures 3 and 4. [6]



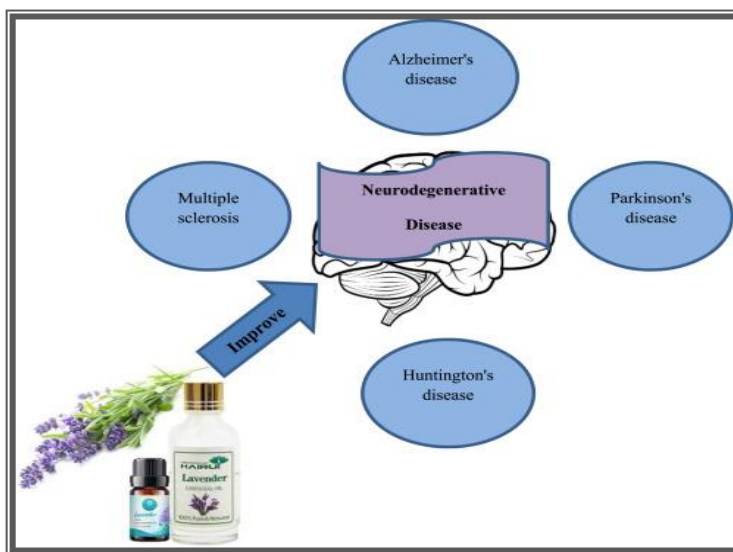
Picture 4. The structure of lavender containing linalool and linalyl acetate. Linalool inhibits gamma-aminobutyric acid (GABA-A) receptors

Essential oils are abundant and volatile compounds obtained from plant parts, like leaves, seeds, and flowers through different methods, such as distillation. [7] This plant, especially as an essential oil, has various applications in medicine to treat psychological diseases, such as calming the nervous system, particularly in cases with depression, anxiety, and sleep disorders. [8, 9] Its positive effects on the nervous system are related to the impact of its volatile compounds on the hippocampus and amygdala. [10] Either when orally administered (100 mg/kg) or inhaled for 60 min lavender essential oil significantly reduced the acetic acid-writhing response in a



naloxone-sensitive manner. In the hot plate test, analgesic activity observed after oil inhalation was inhibited by naloxone, atropine, mecamylamine pretreatment suggesting the involvement of opioidergic as well as cholinergic pathways. Regardless of the administration route and the experimental model used both linalool and linalyl acetate did not produce significant analgesic response. Concerning the gastric effects, lavender oil, linalool and linalyl acetate oral administration protected against acute ethanol-induced gastric ulcers but did not prevent indomethacin-induced lesions indicating no interference with arachidonic acid metabolic cascade. In conclusion, besides this gastroprotection, lavender oil reveals an interesting analgesic activity mainly relevant after inhalation, at doses devoid of sedative side effect, suggesting the interest for potential application of this oil in aromatherapy. [11]

Aromatherapy using its oil, especially in anxiety and sleep disorders, has been found with very promising results. [12] Lavender has been employed using various methods in different studies, including inhalation, massage therapy, combined massage therapy with aromatherapy, and oral administration. [13] Lavender, exerts its healing effect on many diseases, such as anxiety and depression through an inhibitory effect on GABA. The anti-inflammatory effects of this plant have also been documented. It improves depression by regulating glutamate receptors and inhibiting calcium channels and serotonergic factors, such as SERT. Its antiepileptic mechanism is due to an increase in the inhibitory effect of GABA and potassium current and a decrease in sodium current. Many vegetable oils are also used in herbal medicine. The healing effect of lavender on several neurological disorders, including epilepsy, depression, anxiety, migraine, and Alzheimer's disease was investigated, Picture 5. [3]



Picture 5. Use of lavender essential oil in medicine

Lavandin essential oil has been found to have antioxidant and biocidal activity (antimicrobial, nematocidal, antiprotozoal, insecticidal, and allelopathic), as well as



other potential therapeutic effects such as anxiolytic, neuroprotective, improving sleep quality, antithrombotic, anti-inflammatory, and analgesic. Unlike its parent species-*Lavandula angustifolia* (LA)-lavandin essential oil is not officially recognized as a medicinal raw material in European Pharmacopeia. Whenever compared to LA in shared studies, it has shown similar effects (or even more pronounced in the case of biocidal activities). This suggests that lavandin has similar potential for use in medicine. [14]

Conclusion

Lavender essential oil are used in herbal medicine. Lavandin essential oil has been found to have antioxidant and biocidal activity (antimicrobial, nematocidal, antiprotozoal, insecticidal, and allelopathic), as well as other potential therapeutic effects such as anxiolytic, neuroprotective, improving sleep quality, antithrombotic, anti-inflammatory, and analgesic. Many studies indicate the effect of lavender on several neurological disorders, including epilepsy, depression, anxiety, migraine, and Alzheimer's disease was investigated. All findings strongly support the traditional uses of lavender. More clinical studies are needed to investigate the effect of the plants' pharmacological active constituents on the treatment of life-threatening diseases in humans.

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