

The Extraction Method and Clinical Application of Lavender Essential Oil

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Abstract:

Lavender is a very common medicinal material and raw material. It is widely used in aromatherapy, beauty, cosmetics and perfume. In these respects, lavender essential oil has a very significant effect as a sedative. In addition, because of its anti-inflammatory effect, it also becomes an effective fungicide, which can improve the function of the immune system, balance the body condition, fight bacterial and fungal infections, relieve depression and reduce inflammation. For acne, burns, eczema, skin recover, sleep problems and stress. And because of its unique fragrance, lavender is loved by users. Lavender has also become a popular fragrance in aromatherapy. A brief introduction to the functions and uses of lavender essential oil, as well as its main benefits for individual skin problems. This paper introduces the different characteristics of the extraction methods of lavender essential oil and their different needs. Some typical extraction methods and the differences between these methods are introduced. The future development of lavender essential oil in medicine and aromatherapy is prospected. Providing reference

Keywords: lavender; Lavender essential oil; Extraction method; Incense therapy; Depression anxiety

1. Introduction to lavender and its essential oil

First of all, lavender is a native herb of the Mediterranean region and tropical Africa belonging to the Lamiaceae family. One of the most common origin as provence in France, Australia, Italy, Hokkaido and ili in xinjiang. Its flowers are bluish-purple and dense; Spiky. The color of the flower is very bright and its fragrance is very unique and characteristic. It is a very popular ornamental plant. Second lavender water is low, with cold resistance, suitable for planting, so widely planted. In addition, lavender is also very common medicinal materials, are widely used in herbology. Lavender flower, insect repellent, the effect of heat-clearing and detoxifying, during the period of the black death, the French glass commonly used lavender soaked clothes to expel the flea. According to the clinical study showed that plant acetate in the lavender ingredients aloe and left-handed linalool help sleep calm effect, so the lavender essential oil is widely used in skin care products, often as a tranquilizer cosmetics, aromatherapy products. Lavender essential oil is made from a lavender extract, French provence and xinjiang ili best quality production of essential oils. Among them is *Lavandula angustifolia*, which is produced in the western Mediterranean, the United Kingdom, the highlands of Bulgaria, Australia, and the Qingshui region of Gansu Province in China. It

made essential oil has a sweet taste, can be applied directly to the skin. It is often used as the main ingredient of balm, ointment, perfume and cosmetics. Yield efficiency is the highest *Lavandula angustifolia*, essential oils of lavender best quality varieties. But because of its limited output, is not widely used in business. In the UK, *Lavandula angustifolia* is often used as an aromatic agent in cooking. Because of the sweet notes of lemon and citrus in its fragrance, it is very good as a spice and condiment. And in England, the buds and green leaves of lavender are used as tea leaves. Processing with honey lavender buds but make it single flower honey, very nutritive value and special food. The Dutch lavender (Dutch lavender) is by the *L.A. angustifolia* and *L.l. atifolia* hybridization. It's more than the narrow leaf lavender flowers, easier to harvest. The Netherlands the essential oil of lavender extract contains higher terpene (C H) and Camphor (Camphor), the Netherlands the fragrance of lavender more, obvious, more special, more acute. Dutch lavender is widely cultivated, making it the most widely cultivated lavender in the world. Because of these characteristics, it yields large quantities, so it has commercial value. However, due to artificial cultivation, its quality is lower than that of narrow-leaf lavender. It is often used in perfumes, soaps and daily chemicals, and is grown in the Provence region of France and the Yili region of China's Xinjiang Uygur Autonomous region.

2. Lavender essential oil function

Lavender essential oil can be used in skin care products and cosmetics to clean the skin, control oil, eliminate spots and whitening, remove wrinkles and tender skin, and remove dark circles under eyes. Not only that, lavender essential oil can also promote the repair of damaged skin tissue, and the function of the skin. Lavender essential oil has a sedative effect on the heart, can reduce the effect of high blood pressure, calm heart palpitations. It is a great improvement for insomnia. Besides lavender essential oil has beauty to the human body, relieve pressure, the effect of muscle relaxation. Lavender essential oil is known as “plant hormone”, because the nature of many essential oils is similar to human hormones, which plays a pivotal role in human skin care. It is often used as a calming fragrance in aromatherapy. Lavender essential oil stimulates the olfactory nerve through nasal breath, and then transmits the stimulation to the brain center, making the brain excited, so as to regulate the function of nerve activity; And control the secretion of glands through neural regulation, so that the body fluid activity is accelerated, and the whole internal environment of the human body is regulated. Lavender essential oil can also directly kill or reduce bacteria and microorganisms to a certain extent. It plays a role in strengthening the body’s immunity. Lavender essential oil is used in cosmetics and skin care products through affinity to rapidly change the local tissue cells and the living environment of cells, so that its metabolism is accelerated, so as to comprehensively solve the skin problems caused by local metabolic disorders. Then through the exchange of body fluids into the blood and lymph, promote blood and lymph circulation, accelerate the metabolism of the human body. Have the effect of regulation on the whole body internal and can prevent skin problems appear again. Studies have shown that lavender has significant effects on common skin problems. The first lavender essential oil can effectively treat acne (acne). Provence’s finest lavender with Australian tea tree, has a strong anti-bacterial and anti-inflammatory effect. It can quickly enter the hair follicles to remove acne bacteria, eliminate epidermal zits, pimples, acne, etc., repair damaged cells and promote cell regeneration. Second lavender essential oil can improve pimples and scars. (Acne marks and acne scars). Lavender essential oil with scientific golden ratio has excellent repair effect. It can quickly reduce skin acne marks, scars and pits while eliminating acne, inhibit acne bacteria from growing again, and maintain healthy skin without acne marks for a long time. The third lavender essential oil can improve the blackhead problem. The black “plug” is formed at the mouth of the hair follicle caused by the blockage of the hair follicle. Lavender deep conditioning

essential oil quickly enters the hair follicle, removes the accumulation in the hair follicle, and dredges the pores to remove excess oil. Fourth, for the problem of Easy to be sensitive skin, lavender essential oil can relieve and repair allergic skin, relieve the weakening of skin natural resistance caused by stress, mental tension and depression, restore skin self-repair function, and strengthen skin resistance to the outside world. Lavender oil can relieve repair allergic skin, relieve pressure, mental stress and depression caused by skin natural resistance is abate, restore skin self repair function, strengthen the skin resistance to the outside world. Finally can improve oil Water imbalance (Water and oil imbalance) problem. Lavender oil can clean the dirt from the pores blocked, firming skin skin, convergence pores, restrain skin oil secretion, prevent the formation pore bulky again, promote cells regeneration, improve dull and dry aging skin and pore is bulky. It is obvious that lavender essential oil plays an obvious role in soothing, and because of its low cost, it is widely used in skin care products and cosmetics, which has excellent commercial value.

3. Extraction method of lavender essential oil

For lavender essential oil, the most common and prevalent extraction methods are steam distillation, Soxhlet extraction, and organic solution extraction. They have the advantage of being simple to operate and less prone to operational errors. It is suitable for the most basic extraction experiments and essential oil extraction experiments that do not require high purity. The disadvantages of these extraction methods are the loss of volatile compounds and the consumption of large amounts of samples due to low extraction purity and low efficiency. And it takes a long time. In addition to the problem of toxic solvent residues, it is easy to cause danger. Therefore, it is not suitable for extracting too many essential oils with high purity and mass production of lavender essential oil.

Solid phase extraction (SPME) is an extraction method that combines sampling and pre-concentration, and transfers the analyte to a standard gas chromatographer. The advantages of SPME are that it does not require other solvents and the operation method is simple. It is now widely used in the determination of essential oils in plant materials and traditional Chinese medicine. The disadvantage is that the evaporation rate of volatile components from plant materials is very slow. So it takes a long time. And it is not suitable for high-temperature extraction with traditional heating methods. The reason is that the use of traditional heating methods will lead to the same increase in sample temperature, resulting in the change of layer and

sample partition coefficient under high temperature extraction will destroy the equilibrium amount. It is not suitable for mass production of essential oils and time-limited experiments. Solid phase extraction (SPE) is a traditional extraction method for essential oil determination.

However, the traditional heating method is not suitable for solid phase extraction, so a new extraction method, high speed solid phase extraction (MD-HS-SPME), has been developed. This method uses microwave heating extraction (MD) method on the basis of solid phase extraction (SPME), and its principle is to use microwave heating to internal heating based on conduction and dielectric polarization caused by microwave radiation. This heating method can quickly achieve high temperature effect, thus can improve the efficiency. And can be applied to the raw material of different materials. Compared with the traditional heating method, the use of high speed solid phase extraction (MD-HS-SPME) essential oil is more efficient. Fresh medicinal herbs contain sufficient water to absorb the water generated during microwave heating to evaporate the essential oil in high-speed solid-phase extraction (MD-HS-SPME). For dried herbs, some microwave absorbing medium for absorbing microwave energy, such as magnetite material, can be added. The disadvantages of reducing the solid phase extraction (SPME), improved the time-consuming long problem. High solid phase extraction (MD - HS SPME) become a kind of very good method of extraction of lavender essential oil. It is suitable for extracting all kinds of essential oils, and essential oils can be produced in large quantities by this method. It can be used for commercial mass production of lavender essential oil.

Super street carbon dioxide extraction method (Supercritical carbon dioxide extraction method) is a continuous loop by Supercritical carbon dioxide fluid extraction of essential oil. The biggest advantage of this extraction method is that it can extract lavender essential oil at an ultra-high concentration. It is suitable for the experiments of concentrated extraction of lavender essential oil at high concentration. But because the process is complex, difficult to operate, so do not apply to the production and commercialization. It is only suitable for experiments where the concentration of essential oil is too high.

4. The clinical use of lavender essential oil

The clinical use of lavender essential oil is divided into two aspects: aromatherapy and medicine, in which it is usually used as a relaxant. Due to the high pressure of life today, people are prone to anxiety and depression. The use of lavender as an anti-anxiety and depression deodorant

can improve the sleep quality of patients with insomnia, reduce the time to fall asleep, treat neurasthenia, and improve cognitive impairment. It can effectively treat depression and anxiety. The clinical manifestations of anxiety and depression are: ① often inexplicable tension, anxiety, ② excitable, unwilling to talk with people, ③ poor concentration, memory loss; Sleep disorders, waking up early, insomnia, dreaminess; Gastrointestinal symptoms, poor appetite, nausea, vomiting; And difficulty breathing, cold sweat, frequent urination, dizziness, heart palpitations and so on. And because depression and anxiety often coexist, it is called anxiety and depression syndrome. Anxiety disorders are often associated with complications, usually manifested as sweating, chest tightness, anxiety and other neuroses accompanied by autonomic disorders and other features. Due to its more clinical symptoms and complex condition, it is easy to relapse, and the main clinical treatment is Western medicine. However, it is often accompanied by adverse reactions, slow onset and many other problems. And because of the complexity of the condition, it will lead to repeated or combined drugs, which will increase the burden on the liver, kidney, heart and other organs of the patient. There are obvious disadvantages of treating depression and anxiety through drugs. So olfactory intervention is a viable way to treat depression. Smell is the only factor that directly affects the amygdala, which can control people's emotions and the perceptual system of the brain through the inhalation of lavender essential oil. So as to intervene in the recurrence of disease symptoms and mood fluctuations. Lavender essential oil (LVO) as incense or compound essential oil can improve and treat insomnia caused by depression and anxiety. Avoid neurasthenia, protect cranial nerves, and improve cognitive impairment. According to studies on the effects of lavender essential oil on anxiety and depression, inhalation or cavity injection of lavender essential oil can relieve emotional anxiety during fear conditions. It can affect the expression of GRN2B and other related proteins by regulating the level of neuroticism such as 5-HT in the hippocampus of the brain. Moreover, the intervention of McPp-induced anxiety behavior and CUMS-induced depression behavior can improve the mood and behavior of anxiety and depression. Is a new way of thinking for the treatment of depression and anxiety.

Lavender essential oil also has significant effects on skin allergy and anti-bacterial. Lavender essential oil, the main components in with characteristics of volatile oils, is often used in traditional Chinese medicine compound preparations, day-to-day work fragrances and repellent materials are widely used. Lavender essential oil, as a natural plant essential oil, is popular for its environmental protection and safety reasons. Linalool and 1, 8-eucalyptus brain are

the main components in the oxygen-containing monoterpenes and sesquiterpenes of lavender essential oil. These main components have antibacterial, anti-inflammatory, sedative and hypnotic effects. Bacteriostatic agent, can be used to fight infection and, against myocardial infarction, treatment of alzheimer's disease, antidepressant and other central nervous regulation.

Lavender essential oil is also very important in the treatment of skin diseases. Studies have shown that the main causes of skin problems are: (1) *Staphylococcus epidermalis*, which plays a key role in maintaining skin health. (2) *Escherichia coli* is the main cause of skin infections such as furuncles, carbuncle and folliculitis. (3) *Candida albicans* is a common commensal bacteria, which exists in respiratory tract, oral cavity and other sites. It is often co-pathogenic with *Staphylococcus aureus* and *Escherichia coli* when the immune function is low, which can cause skin infections such as furuncles, carbuncle and folliculitis. (4) *Propionibacterium acnes* is the main cause of comedones. For *Propionibacterium acnes*, *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans*, which cause skin problems and hormone levels in the body, lavender volatile oil played an inhibitory effect on them. The degree of antibacterial effect of lavender essential oil on them was *Staphylococcus epidermidis* > *Escherichia coli* > *Candida albicans* > *Staphylococcus aureus* > *Propionibacterium acnes*. Lavender essential oil plays an inhibitory role and does not cause allergic or inflammatory reactions in the body, which is a very safe and soothing inhibitor. Lavender essential oil plays a very significant role in treating skin problems or repairing skin problems.

5. Summary and Outlook

Lavender essential oil is one of the most important basic materials in clinical medicine and aromatherapy. Because of its low cost, easy mass production and its sedative and calming properties, it is suitable for various commercial and clinical applications. It is not only used in medicine, but also a very popular incense source. Many beauty products, skin care products and perfumes are made of lavender as raw materials. Because it smells good, is unique and functional, it can calm the skin while preventing skin allergies or further irritation. It has a wide range of applications and is a very popular subject of research. Different extraction methods of lavender essential oil are used. The commonly obtained lavender essential oil results in the loss of many important compounds, while the new extraction method is not only simple but also efficient. Thus, this problem is solved, and the commercial demand of mass production can be achieved. Not only that, according to the different experimental needs, there are also methods

to extract high purity lavender essential oil, which can meet various needs. Lavender essential oil is also widely used in clinical applications. It is mainly used as a relaxant in aromatherapy and as a sedative, antispasmodic, antiviral and antibacterial agent in pharmaceutical applications. Because of its low cost, it is a very high quality choice compared with other sedative drugs. Due to the high pressure of life in today's population, easy to anxiety and depression, the use of lavender as an anti-anxiety and depression deodorant can improve the sleep treatment of insomnia, reduce the time to fall asleep, treat neurasthenia, improve cognitive impairment, and effectively treat depression and anxiety. At the same time, lavender is also often used in cosmetics and skin care products. It has a good antibacterial effect and calming skin anti-allergic effect. Lavender volatile oil has obvious therapeutic and relieving effects on skin problems. So lavender essential oil is a very good raw material to be used in cosmetics and skin care products. Because its fragrance can also play a calming and calming effect, it will not make people disgusted. More importantly, it does not cause skin allergy and inflammation, so it is very suitable for external application. Against depression and anxiety in future clinical trials, lavender essential oil remains the value in the study. Its medicinal properties are very unique and have high commercial value. It is suitable for a wide range of therapeutic and pharmaceutical applications. As a new treatment for depression and anxiety, aromatherapy is a very good and effective option, which can be used in clinical application with the use of fixed psychotropic drugs, play a complementary role. It can effectively reduce the burden of drugs on the body. For patients, it can avoid the body organ failure caused by the treatment of depression and anxiety, so as to get a better treatment effect.

6. References

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