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USE OF ESSENTIAL OILS IN MEDICINE AND SPA

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ABSTRACT

This article is a short historical overview of the use of essential oils and aromatherapy from ancient times until present days. It presents brief characterization of essential oils and the possible ways of application as well as the main methods of their extraction. The focus is on aromatherapy as a main form of essential oil use, the mechanism of action of these oils and the basic biological and physiological effects on the human organism. The main modes of their application are described together with some possible side effects. Special attention is paid to the use of aromatherapy in spa. Conclusion: Aromatherapy can be used as a means of restoring the balance and harmony between the individuals and the environment they live in by helping the organism with managing the stress. Essential oils are not panacea, but are an excellent and efficient way of improving the mood, conquering the emotions, and balancing the hormones. There is a need of current and more thorough studies on the effect of essential oils and aromatherapy on the different organs and systems, and in many diseases and functional conditions.

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Introduction. Humankind has known the miraculous effects of essential oils since ancient times. The first credible information about extracting essential oils from plants was found on a Sumerian clay tablet dating back to 5000 BC. In ancient Egypt aromatic plant extracts were used to treat body and soul. The Father of medicine – Hippocrates, recommended daily aromatic baths and essential oil massages to his patients. In the Orient – India, China, Japan, and Arabian countries, it is thought that fragrances settle the mind and open the soul. Cave paintings, Egyptian papyri, preserved ancient manuscripts, archeological objects, pyramids with royal burials, the Bible, the Quran, and other sources tell us of the incenses used in the different periods, in different countries and the reason they were used for (1).

In 1928, René-Maurice Gattefossé – a French chemist and perfumer introduced the term “aromatherapy” (literally – treatment with fragrances). His observations proved the impressive curative powers of the oils. In his initial studies using essential oils for perfumes, Gattefossé suffered a work accident. After burning his face and hands during distillation in the laboratory, he soaked the affected area in the nearby jar containing lavender oil and discovered that, in addition to the nearly immediate pain relief, his wounds started healing faster with almost no resulting scars (2). During the 1930s, all progressive clinics in Europe started using essential oils when treating patients with traumas, as well as in cases of some serious conditions, such as tuberculosis, diabetes, etc. (3).

In the 1960s, new scientific evidence on the curative effects of essential oils was added to the basic theories of Hippocrates, Galen, and Avicenna. Nowadays, about 2500 different types of essential oil producing plants have been studied. We are at the third millennium AC. The rich experience in the sphere of aromatherapy acquired during different periods of human history has a global nature. All nations around the world have contributed to the development of this field of medicine. The history of aromatherapy has become part of human culture. Its centuries-old traditions are based on the unity

between humans and nature. The ancient experience in using plant essential oils helps the current generation understand the present by studying the past (1).

Definition. Essential oils are various volatile mixes of plant origin, which possess a specific smell and are part of the non-nitrogenous chemical compounds. The major part of the essential oil components consists of carbon, hydrogen, and oxygen, and the most common components are turpentine and their oxygen derivatives. They are almost always denser or thinner liquids, soluble in alcohol, hydrogen sulfide, fats, and nearly insoluble in water.

Based on their properties and chemical nature, essential oils are starkly different from plant fats and oils in that they evaporate at normal temperature and do not leave stains on fabrics and paper.

The essential oil content in the fresh green parts of plants does not exceed 1%, and in seeds it may reach 10%. The amount of essential oils in plants varies from barely detectable traces to 2–3%, rarely more. Even the different parts of the same plant have different essential oil content. The accumulation of oils and their quality are influenced by the vegetation stage, the humidity, climate, soil, the hours of gathering the materials, etc. (1).

Methods of Essential Oil Production.

Method of *steam distillation* (leaves, flowers, grass, roots, coniferous matter, moss): This is the most common method. Steam distillation is based on evaporation and the subsequent condensation of the liquid vapors, and the ability of water vapor to enter into essential oils.

The method of *mechanical expression* is used in cases when the raw material has a high essential oil content, e.g. citrus fruits. Citrus essential oil is extracted by cold pressing or centrifuging.

The method of *maceration* is used in the processing of aromatic flowers. The essential oil is extracted with fat or neutral oil heated to 60-70°C.

Method of *extraction*: an organic solvent with a low boiling point is used for the essential oil extraction, e.g. petroleum ether, ethanol, etc. After that, the solution containing the extracted oil and aromatic compounds is strained and the solvent is distilled. The remainder consists of the essential oil mixed with resins and waxes. The product is called an extract.

The method of *absorption or enfleurage* does not use heating and is applied in some types of flowers: roses, jasmine, tuberose, etc., which after picking, in varied amount of time, produce essential oils again. It is based on the ability of fats and fatty oils to absorb essential oils. With this method, the flower petals, after picking, are arranged on a thin layer of pork or beef fat. The petals are left for 24-72 hours after which they are replaced by fresh ones. When the fat is maximally saturated with essential oil, it is washed with alcohol in order to make the aromatic products soluble. Then the alcohol is evaporated and the absolute is left behind.

Cold pressing is used mainly to extract essential oils from the bark or fruits of plants. This is how grapefruit, orange, lemon and bergamot oil are obtained (4).

The global production of essential oils amounts to 4.5 million kilograms annually. The average yield of essential oil from raw materials is 1.5%.

Bulgaria has serious traditions in the cultivation of various essential oil plants. During the recent years, under the influence of the globally increasing demand, there has been an increase in the cultivated land both for the more common plants, such as the damask rose, lavender, coriander, as well as for the less common ones - peppermint, lemon balm, fennel, etc. Bulgarian rose oil possesses unique and traditional fragrance, and has long been known in many parts of the world. In the recent years Bulgaria has become a world leader in the production and trade with lavender oil (5).

Essential Oil Use.

Essential oils can be used internally and externally.

External use. The oldest way of using essential oils is diffusion. Nowadays, essential oil vapors are used. They can be obtained from aroma vials or materials, which can be saturated with essential oils - spruce branches, dry flowers, fabric, aromatic wax, etc. Another type of external application are the cold or warm inhalations, cold or warm packs, gargle or mouthwashing. The aromatherapy massage usually uses essential oils diluted with carrier oils. There are a variety of ways for the external use of essential oils in spa.

Internal use. The internal use of essential oils started in France. Many researchers think that, applied under doctor's observation and in controlled quantities, essential oils taken internally can be exceptionally efficient (6,7). It is important to know that for internal application only 100% pure essential oils are used. The risks must be taken into consideration. They can be rare allergic reactions,

overdose, poor quality of the compound or overestimation of the efficiency (7). In Great Britain, many aromatherapists think that aromatic oils are not safe when used internally. This mode of application with therapeutic purpose requires more attention than people realize. According to Tisserand "... only practitioners, who are qualified to establish a diagnosis, trained in weighing the risks against the benefits, and familiar with the pharmacology of the essential oil, should prescribe essential oils for oral use" (8).

Aromatherapy. Aromatherapy is one of the main sections of the science of oleoetherology, which deals with essential oils. Aromatherapy is treatment with scents or fragrances, and has the privilege to simultaneously be one of the most ancient and most recent therapeutic approaches. Aromatherapy can be defined as the use of essential oils for the improvement of health, well-being, and hygiene (9). It uses concentrates extracted from plants called essential oils, which are natural chemical compounds, complex and highly volatile, characterized by a strong smell and produced as secondary metabolites of aromatic plants (10). The essential oils in aromatherapy are complex products, which contain on average around 100 or more chemical compounds, some of which in minute quantities. Each one of these components has an elaborate effect on the organism (11). Essential oils act on different levels influencing the functions of the respiratory, nervous, digestive, excretory, reproductive system, etc.

The effect of essential oils on the organism depends on their application – inhalation, oral intake or through the skin. When the contact is via inhalation, the molecules of essential oils stimulate the olfactory nerves, which are directly connected to the limbic system (2), which is responsible for emotions, feelings, and motivational impulses. The "olfactory memory" is a result of an identifying olfactory process, a specific scent, which is associated with different memories triggered by the limbic system.

Although the physiological mechanism of action of essential oils, hence aromatherapy, has not been fully established, it is thought that their molecules stimulate neurotransmitters, such as enkephalin and endorphins, which have an analgesic effect and create a feeling of wellness and relaxation (12).

Research shows that the stimulation of the sense of smell causes immediate changes in physiological parameters such as blood pressure, pulse, muscle tonus, pupil dilation, body temperature, blood circulation, and brain activities (13).

When the molecule of the essential oil is inhaled, it reaches the airways, where it is absorbed by the pulmonary blood vessels and then spread within the body via the blood circulation and tissues. When applied on the skin, the molecules penetrate through the skin and mucosa, where they are absorbed and distributed in the body tissues through the blood circulation. With oral intake, the entering of molecules is via the intestinal mucosa, wherefrom they reach the circulatory system and are distributed within the body (8).

Essential oils have valuable biological and physiological properties. They suppress the development of microorganisms (14), stimulate tissue regeneration, stimulate the immune processes in the organism, improve the circulation, decrease muscle pressure and edemas, can have a diuretic effect, improve sleep quality, or make one feel refreshed or relaxed (15, 16, 17). Many authors highlight the proved analgesic effect of essential oils (18, 19, 20). Aromatherapy has a beneficial effect in conditions related to stress, premenstrual syndrome, depression, digestive disorders, infections, migraines, and skin problems. Even a minimal concentration of essential oil vapors in the air can lead to tangible changes in the body (21).

Aromatherapy can be used as a means of recovering the balance and harmony between the individuals and the environment they live in by helping cope with stress.

Despite the number of studies proving the beneficial effects of essential oils, there is also a certain dose of skepticism in regard to their efficiency (22).

Energy measurement of essential oils have been conducted using Raman spectroscopy (23), which is based on the frequency of a monochromatic light source. These studies support the hypothesis for the existence of energy in essential oils by suggesting that these plant concentrates can act in compliance with the energy models of the organism, or change them.

Essential oils are dynamic. Strongly sensitive to the way of preservation, entering the body they have their effect, remain there about 3-4 hours after which are eliminated, unlocking the recovery process, which can take from several days to a week.

There are three main ways of applying essential oils in aromatherapy:

- Holistic aromatherapy where the goal of the treatment is to achieve a harmonic balance between body, mind, and spirit (24).

- Medical (clinical) aromatherapy where essential oils are taken orally and are prescribed by a doctor. The method was best developed by the aroma school of Dr. Valnet according to which essential oils possess healing properties, which must be controlled. In addition, they enhance the effect of synthetic medicaments (25).

- Esthetic aromatherapy – the use of essential oils in beauty salons and spas.

Aromatherapy and Spa.

Nowadays, spa centers are a place where everyone can find a cure for the mind, body, and soul. People visit spas to maintain a good shape, manage stress, find calmness, health, wellness, or just for pleasure. Spas offer a large variety of methods – traditional and contemporary, Eastern and Western, with the aim of satisfying the variety of needs of their clients (26).

The use of essential oils is widely spread in spa centers. Fragrances play a key role in spa both in the form of procedures and to add a scent to a room by using products and oils with aromatic characteristics.

In order to add scent to certain rooms, the most commonly used sources are aroma lamps. Aroma lamps are suitable for spaces such as hammam, laconium, caldarium, where the heat is dry and does not exceed 40-45°C. The relaxation takes place on warmed benches with the main effect being removing toxins from the body via sweating. Therefore, it is suitable to use essential oils with calming effect – lavender, peppermint, eucalyptus.

The use of aroma lamps in massage rooms should be in accordance with the procedure, which takes place, its duration, and the individual preferences of the client.

In order to add scent to a sauna, 5-10 drops of essential oil are added to a wooden bucket full of water, which is poured on the hot stones at certain time intervals. Eucalyptus or peppermint oil are the most commonly used ones due to their bronchodilating effect.

Scenting a steam bath is done by adding essential oil to the water in the steam generator – aroma steam bath.

A key moment is the use of essential oils during a massage – a method known for millennia. Both 100% pure essential oils as well as essential oil mixed with carrier oil can be used. Most frequently, a mix of a carrier and several essential oils is used. Carrier oils are extracted from the most fat-saturated parts of the plant, such as kernels and seeds. They are used to dilute essential oils, which may sometimes irritate the skin if applied in a concentrated form (9). Carrier oils have a structure similar to the human fatty tissue and are absorbed easily. They help the skin absorb the otherwise difficultly penetrating essential oils. They are obtained by cold pressing. Such are almond, argan, cocoa, apricot, jojoba, shea, and linseed oils among others (27).

In spa, essential oils can be used in various body therapies – exfoliation, moisturizing facial mask, and relaxing massage.

The oils can also be part of a foam massage. Several drops of essential oil are added to foam from scentless African black soap. The foam deep cleanses the skin while the oil moisturizes, improves circulation, stimulates regeneration and acts as a relaxant for the senses.

Aromatherapy baths should not be overlooked. Depending on the oil diluted, they can have relaxing, energizing or generally calming effect. The therapeutic effect of aromatic baths is due to the stimulation of skin receptors by essential oils. The components of these compounds penetrate the skin, enter the circulation, and have a reflective and humoral effect (1).

It is possible to mix essential oils with sea salt or mineral water, therapeutic mud, and algae, where the oil effects are combined with the specific or non-specific effect of the therapeutic procedures. Due to their easy penetration through the skin and their reflective effect, aromatic plant compounds, in a combination with natural factors, have not only a general effect on the body, but also influence the cardiovascular and central nervous systems, the endocrine and immune systems because of their multicomponent composition and multipurpose effect (1).

Side Effects of Essential Oil Use.

Side effects are rarely observed in routine aromatherapy. However, when improperly used, adverse effects may occur. Here as well applies the rule – “the dose makes the medicine.” The prolonged use of essential oils in high concentrations may lead to adverse reactions in the organism. For example, taken in high doses, saffron can cause vomiting and diarrhea. Marjoram oil has a potent spasmolytic effect but in large doses can become a narcotic substance. A similar effect can be observed in overdosing with anise, peppermint and oregano oil. The possibility of allergic reactions

and skin irritations is not excluded. Therefore, essential oils must be applied with care and should not be taken randomly and for long periods of time. The specific use of the essential oils, as well as the individual approach to each client or patient depending on the age, physical condition and psychoemotional status should be taken into consideration. The use of essential oils must not be something that a person is afraid of, but safety when using these oils is important (28, 29).

Conclusions. Humankind has known the miraculous properties of essential oils since ancient times. Aromatherapy is one of the main sections of oleoetherology, which deals with essential oils. Aromatherapy consists of treatments with scents and fragrances and has the privilege of being simultaneously one of the most ancient and most modern therapeutic methods. Essential oils have valuable biological properties. They stimulate tissue regeneration, the immune processes in the organism, improve circulation, decrease muscle pressure and edemas, improve sleep quality, and have a refreshing and relaxing effect. Aromatherapy can be used as a means of recovering the balance and harmony between the individuals and the environment they live in by helping manage stress. The use of essential oils in spa centers is very popular. Fragrances play a key role in spa both in the form of procedures and to add a scent to a room by using products and oils with aromatic characteristics. Despite the low risk of side effects, prolonged use of essential oils in high concentrations may lead to adverse reactions in the organism. Therefore, essential oils must be used with care and not taken randomly and for long periods of time. They are not a panacea but an excellent and effective way to make our life easier, improve our mood, control our emotions and balance our hormones.

There is a need of current and more thorough studies on the effect of essential oils and aromatherapy on the different organs and systems, and in many diseases and functional conditions.

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