Aromatherapy and methods of applying essential oils

Monika Michalak
Department of Dermatology and Cosmetology, Faculty of Medicine and Health Sciences,
Jan Kochanowski University in Kielce, Poland

Abstract

Aromatherapy involves the use of high-quality essential oils entering the body via the airway or skin. When the first route is used, essential oils are inhaled; room aromatisation is less common. In direct aromatherapy, essential oils, diluted in water or a fatty carrier, are applied directly to the skin. Numerous aromatherapeutic methods and preparations are available, providing a wide range of application options. Aromatherapeutic procedures or their elements can be used for therapeutic, cosmetic or marketing purposes. A suitable choice of high-quality essential oils and safety of their use are pivotal to successful aromatherapy.

Key words: aromatherapy, essential oils, health, cosmetology

Introduction

Aromatherapy (from the word aroma - fragrance and therapy - treatment) is the use of natural essential oils of a definite origin. Aromatherapy involves the use of high-quality essential oils entering the body via the airway or skin [1, 2].

People have been interested in fragrances since the 6th millennium BC. Essential oils have been used in various cultures for many purposes [1]. The Egyptians used aniseed, cedar and myrrh to prepare perfumes, cosmetics and ointments. In China and India over 700 substances were used for therapeutic purposes, including cinnamon, ginger, myrrh and sandal tree; in ancient Greece, thyme, saffron, marjoram, caraway, and pepper mint were applied [2]. Aromatherapy has established itself for the treatment of various conditions and diseases. Over the centuries the essential oils have gained their importance in therapeutic, cosmetic and aromatic uses [1].

The essential oils are obtained from raw plant materials (flowers, leaves, roots, herbs, wood, bark, branches, seeds, fruits, etc.) by distillation with water vapour or water, squeezing or spinning of fruit peels or dry distillation of wood. Moreover, maceration and extraction are applied. The above mentioned processes require chemical solvents, however their residues can remain in the final product, i.e. the essential oil. Therefore, only oils obtained by natural methods are recommended for aromatherapy procedures. The remaining products can be applied only for room aromatisation or as the ingredients of fragrant compositions [3].

The aim of the present review is to discuss in detail the essence of aromatherapy, as well as aromatherapeutic procedures and methods.

Aromatherapy raw materials

Essential oils are volatile substances, mostly colourless or light yellow, of intense odour and oily consistency, soluble in liquid fats, alcohol, ether or chloroform [1, 4].

The oils designed for aromatherapeutic procedures should fulfil high quality standards according to the Polish or European Pharmacopoeia. Moreover, they can be approved by the National Institute of Hygiene and meet the recommended norms (Polish - PN, international -

ISO, European - CEN). The oils used over the skin can also be registered as the products designed for contact with skin, i.e. cosmetics, according to the detailed regulations on cosmetics [3]. The basic information that a particular product is a cosmetic is provided on the outer pack according to the International Nomenclature of Cosmetic Ingredients (INCI). Seals of approval and norms should be specified on the outer pack and in the leaflet. Furthermore, essential oil labels should contain the phases "Essential oil" or "Natural essential oil", the name of a particular oil (plant) in Polish with a detailed specification of the plant part used to obtain the oil, the full name according to INCI, the name and address of a manufacturer or distributor, expiry date, methods of application or possible limitations of its use [5].

To ensure proper product quality, the essential oils used in aromatherapy should be packed in airtight, dark, light impervious, glass containers with a dropper to facilitate oil dosing. In order to maintain their quality, the oils should be stored at suitable temperatures, i.e. 5-10°C. The stability of oils depends on their type; the stability of citric oils is 12-18 months while that of wood, resin and root oils - even 3-4 years. The remaining oils can be stored in proper containers for up to 2 years [4, 6, 7].

The biological activity and fragrance of oils are conditioned by their chemical composition. The oil composition depends on numerous factors, including the origin of raw materials or conditions of plant growth. The essential oils are not chemically homogeneous; in most cases, they are the mixtures of many organic compounds (terpene hydrocarbons and their oxygen derivatives, alcohols, aldehydes, ketones, organic acids, esters, ethers). In general, one substance predominates in a particular oil (Table 1), accompanied by a variety of complementary substances in lower amounts [1, 2, 4]

Table 1. Some of the dominant ingredients found in aromatic plants

Main ingredient	Aromatic plant
limonene	mint, hyssop, lavender, marjoram, oregano, thyme, vervain
β-pinene	parsley, basil, caraway, fennel, marjoram, oregano, sage
carvone	dill, coriander
camphor	balm, basil, lavender, marjoram, sage
thymol	marjoram, oregano, thyme, balm
α-thujene	dill, balm, caraway, lavender, marjoram, oregano, sage

The source: [2]

The effects of essential oils are multidirectional (Table 2) and markedly depend on the properties of a dominant ingredient. Moreover, they can result from synergistic or antagonistic action of the individual constituents [8, 9]. The essential oils show the antimicrobial activity against bacteria, viruses, fungi and protozoa [2, 8, 10, 11, 12]. They also exert antiseptic, immunostimulating, antioxidative, antineoplastic, anti-inflammatory, analgesic, expectorating, vaso-dilating and anti-diabetic effects [1, 2, 13, 14, 10, 15, 12]. According to the available literature data, they also have anxiolytic, tranquillising, anti-stress and adaptogenic effects [1, 13, 16, 17].

Routes that essential oils penetrate the body

In classic aromatherapy, the natural plant oils are administered via the airway or skin, never orally [1]. The inhalation route is the most popular and typically associated with aromatherapy. Patients inhale oils with water vapour or smoke of burnt oil material. The oils enter the body through the nasal mucosa and lungs to reach the bloodstream exerting systemic effects and affecting the patient`s mind. The procedures associated with this route include classic inhalation (an inhaler, oil vapours dropped into hot water, a cloth soaked in

Table 2. Possible uses of some essential oils

Effects of essential oils on the human body	
some health issues, effect on mood and mental status	**effect on skin**
fatigue: *Angelica archangelica, Citrus aurantium, Coriandrum sativum, Cymbopogon nardus, Eucalyptus radiata, Juniperus communis, Mentha spicata, Pelargonium graveolens, Pinus sylvestris, Rosmarinus officinalis, Salvia sclarea, Zingiber officinale*	**antibacterial activity:** *Melaleuca alternifolia, Leptospermum scoparium, Rosmarinus officinalis, Lavandula officinalis*
insomnia: *Angelica archangelica, Cananga odorata, Citrus aurantium, Cistus ladaniferus, Citrus bergamia, Citrus limon, Citrus reticulata, Citrus sinensis, Cuminum cyminum, Juniperus communis, Lavandula angustifolia, Litsea cubeba, Melissa officinalis, Myrtus communis, Ocimum basilicum, Origanum majorana, Valeriana officinalis*	**antifungal activity:** *Melaleuca ericifolia, Melaleuca armillaris, Melaleuca leucadendron, Melaleuca styphelioides, Mentha piperita, Brassica nigra, Angelica archangelica, Cymbopogon nardus, Skimmia laureola, Artemisia sieberi, Cuminum cyminum*
anxiety, agitation, stress: *Angelica archangelica, Cistus ladaniferus, Citrus aurantium, Citrus aurantium, Cymbopogon martinii, Eucalyptus staigeriana, Lavandula angustifolia, Litsea cubeba, Ocimum basilicum, Origanum majorana, Pelargonium graveolens , Pogostemon patchouli, Valeriana officinalis*	**anti-inflammatory action:** *Melaleuca alternifolia, Citrus limon, Lavandula officinalis, Pogostemon patchouli, Rosmarinus officinalis, Santalum album*
mental exhaustion, burnout: *Mentha piperita, Ocimum basilicum, Helichrysum angustifolium*	**strengthening vascular walls**: *Pelargonium graveolens Citrus amara, Rosmarinus officinalis, Rosa damascena*
memory loss: *Litsea cubeba, Mentha piperita, Rosmarinus officinalis*	**delaying skin ageing**: *Citrus limon, Citrus amara, Rosa damascena*
pains of various origins, including bone and joint pains: *Rosmarinus officinalis, Juniperus communis, Cinnamonumzeylanicum, Zingiber officinale, Lavandula angustifolia, Matricaria recutita, Leptospermum scoparium, Origanum majorana, Pinus mugo*	**removal of metabolic wastes, improvement of lymph circulation, anti-cellulite action:** *Citrus limon, Juniperus communis, Pelargonium graveolens, Cupressus sempervirens, Rosmarinus officinalis, Santalum album, Citrus paradisi*

The source: [1, 2, 5, 12]

oil solution) and room aromatisation (burners, nebulisers, pot-pouri) [1, 5, 7].

The essential oils applied to the skin, either dissolved in water (baths, poultices, compresses) or in a fatty carrier (massage), have topical effects; however, with suitably long skin exposure, they can permeate the bloodstream. The inhalation of oil vapours during such procedures is unavoidable, thus direct aromatherapy is usually accompanied by air aromatherapy [18].

Possible uses of essential oils

Inhalations

Smelling and inhaling the vapours of essential oil solutions should be carried out using a special device directing the vapour stream directly into the nostrils and the oral cavity. This method enables patients to control and regulate the air outflow and oil intensity. The easier methods involve inhaling the vapours of oils poured into a container with hot water or smelling a cloth soaked in oil solution. The undeniable asset of inhalation, as compared to oral administration of drugs, is that the gastrointestinal tract is not affected, particularly when the target is to be the airway and /or lungs. This method is particularly important in the treatment of respiratory system diseases, inflammations of the oral cavity and throat, or nervous ailments; moreover, it can activate the immune system and assist in psychotherapy [3, 4, 7, 16]. The studies regarding the absorption of inhaled essential oils are scarce; however, the available data demonstrate that direct delivery of lipophilic components of essential oils is substantial and quick. According to one study, 1.8-cineol is quickly absorbed from eucalyptus

oil and the peak serum concentration is observed after 18 minutes [6].

The ingredients of compositions designed for inhalation include also the oils exerting expectorating and antiseptic effects, e.g. pine, turpentine, eucalyptus, thyme, cajeput, juniper, carnation or mint oils [12].

Aromatherapeutic massages

The basic procedure of direct aromatherapy is massage. Each type of massage can be applied in aromatherapy yet the key element is a suitable choice of oils. The effects of aromatherapy massages result from the massage itself and from the oil being used. The oil or a mixture of oils selected for the procedure should be dissolved in an appropriate carrier, i.e. the base oil of high quality facilitating the distribution of a small amount of the essential oil over the larger body area. The most valuable plant oils used for aromatherapeutic massages include sesame, grape seed, avocado, jojoba, almond, wheat sprout, as well as apricot, peach or plum stone oils [5, 7]. Most commonly, the aromatherapeutic massage is combined with the strengthening or relaxing massage [1, 19, 20]. The study conducted in a group of 40 individuals undergoing massages with the mixture of lavender and bergamot oils has confirmed their positive effects on the mental status and provided evidence for their use to treat depression or anxiety [20]. According to Ćwirlej et al. (2005), the aromatherapeutic massage exerts better analgesic effects, as compared to the classical massage [21] and is particularly useful for relieving pain when pharmacological agents are not recommended [22]. The essential oils of antioxidant properties, which improve the lymph circulation and detoxify the body (e.g. ginger, rosemary, clary sage, cypress, geranium, juniper or sandal oils) can also be used for enhancing the effects of lymphatic massage [23].

Aromatherapeutic baths

Aromatherapeutic baths are special procedures, in which the therapeutic properties of essential oils are used. During the bath, the therapeutic substances contained in essential oils penetrate the bloodstream through the sebaceous and sweat glands as well as the airway. Full and partial immersion baths are administered in aromatherapy. The temperature of water should be about 40°C and the bath should last 15-30 minutes; it is important that soap and foaming agents are not used. After the bath, the body should be rinsed with water and fully dried. The aromatherapeutic bath can be supported by hydro-massage or underwater massage [4, 7]. The aromatherapeutic baths are applied for various systemic, dermal, nervous or cardiovascular diseases and as muscle relaxing or strengthening procedures. They are available in spa and wellness centres as cosmetic or relaxation procedures [5, 24, 25, 26].

Sauna

Another example of the use of essential oils in spa and wellness centres is sauna, which is a combination of air and skin aromatherapy. Sauna creates the conditions (dilatation of superficial blood vessels resulting from high temperature, increased perspiration) facilitating the penetration of oils to the body. Regular use of sauna relaxes, toughens up the body, increases the body immunity and helps to maintain physical efficiency. The individually chosen mixtures, e.g. generally relaxing, calming-relaxing, stimulating or restoring the airway patency, can be applied in various ways, taking into consideration the body condition and scent preferences of clients [5, 24].

Essential oils as the ingredients of cosmetic preparations

Smell is a relevant criterion for purchasing cosmetic preparations. Essential oils are added to

skincare and bath cosmetics, massage preparations as the substances providing fragrance and as active ingredients of cosmetic products. They have antiseptic, anti-acne, antioxidative, anti-wrinkle, anti-dandruff effects and prevent hair loss [12, 27, 28]. Moreover, they stimulate skin regeneration and support wound healing [29].

Essential oils are also used in modern cosmetics and dermocosmetics as promoters of absorption, i.e. auxiliary substances reacting with lipids of the stratum corneum, reversibly altering its structure [12, 30]. The promoters of the transepidermal route, that the ingredients of essential oils belong to, (including menthol, limonene, carvacrol, linalool, α-pinene or terpineol) increase the skin permeability not only to themselves but also to hydrophilic components of cosmetic preparations [9, 12].

Due to their potent antimicrobial action, essential oils are also used as natural preservatives to prolong the durability of cosmetics [9].

Moreover, the fragrant composition is of importance for creating new cosmetic preparations. A wide range of essential oils is offered and their marketing potential is enormous [31]. Scent is an element of sensory analysis of cosmetics. Together the instrumental analysis of the skin and hair, sensory analysis is one of the most dynamically developing fields regarding knowledge about cosmetics [32].

Aromatherapy offers a variety of possible applications of essential oils in beauty salons or spa and wellness centres. The addition of suitable essential oil mixtures to creams, masks and massage preparations enables the preparation of novel care programmes adjusted to the skin condition as well as individual needs and preferences of clients [33].

Air aromatisation

Air aromatisation in shopping centres, public places or workplaces mainly for marketing purposes is enjoying a renaissance [34, 35]. Such strategies depart from treatment, especially when synthetic fragrant compositions are used; due to mental changes induced by particular smells, clients are urged to purchase certain goods or eat certain foods, associate products or services with brands; air aromatisation is also used to increase the concentration of employees, which results in their higher efficiency. Moreover, scents are likely to affect the pleasure of staying in beauty salons or spas. A suitably chosen mixture of essential oils favours relaxation, creating joyful atmosphere and encouraging clients to come back. Air aromatisation is one of the mildest forms of aromatherapy as it is characterised by the lowest intensity of oils and can be used without direct involvement of patients; therefore, it is suitable for therapeutic procedures in children or disabled individuals [33, 34, 35, 36].

Safety issues in aromatherapy

Although aromatherapy uses only natural agents, some adverse side effects are associated with it and therefore should be applied with great caution [1]. The most common side effects are allergic reactions and skin irritations due to hypersensitivity or allergy to oil ingredients. The ingredients which may trigger allergic reactions include benzyl alcohol, cinnamyl alcohol, eugenol, hydroxycitronellal, isoeugenol, benzyl salicylate, cinnamaldehyde, coumarin, geraniol, anisyl alcohol, benzyl cinnamate, farnesol, linalol, benzyl benzoate, citronellol, or limonene [6]. In order to avoid allergic reactions, the sensitivity test should be performed. A minimum amount of oil mixture in a given carrier should be applied to a place of potentially high susceptibility and permeability and possible reactions observed for 24-48 hours. Whenever reddening, itching or swelling are observed, the tested oils should not be used [7, 37].

The applications of aromatherapy are limited in pregnant and breast-feeding women or small

children. Great caution should be exercised in individuals with epilepsy, hypertension, lung or oncologic diseases as well as the history of allergies, skin irritations and hypersensitivity to UV radiation. There were cases of berloque dermatitis, resulting from sun exposure following skin contact with bergamot oils or other citric oils. The other phototoxic essential oils include yarrow, angelica, neroli, petitgrain, cedarwood, rosemary, cassia, calamus, eucalyptus, anise, bitter almond or ylang-ylang oils. The individuals sensitive to fragrances can develop headaches, dizziness, nausea, fatigue, dyspnoea and concentration difficulties. Therefore, pre-procedure consultations with patients prove useful to determine possible scent intolerances [6, 7, 37, 38].

It should be also mentioned that essential oils have potent, sometimes irritating effects, and they should not be applied without dilution. For safety reasons, it is important to choose a proper ratio of oil to solvent (e.g. water or a massage carrier). The recommended dose should not be exceeded as it can be dangerous and intensify side effects [3, 7, 37].

Conclusion

Aromatherapy is readily used for therapeutic and cosmetic purposes. Since a variety of aromatherapeutic methods and agents are available, the application options are wide. Essential oils have holistic properties, affecting the organic, mental and spiritual structure of a human being; therefore, they are an excellent remedy for complaints resulting from improper diets, habits, fatigue or stress.

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Corresponding author address:

Monika Michalak

e-mail: monika.michalak@ujk.edu.pl

Department of Dermatology and Cosmetology,

Faculty of Medicine and Health Sciences,

Jan Kochanowski University in Kielce,

Poland