Research Article EMUJPharmSci ISSN 2651-3587 https://dergipark.org.tr/emujpharmsci

EMU Journal of Pharmaceutical Sciences

EMUJPharmSci

Aromatherapeutic Prescription Patterns and Their Evaluation in the Case of the Beyazıt Halk Pharmacy in Istanbul (Türkiye)

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Abstract

This study aims to evaluate the scientific basis of aromatherapeutic applications by analyzing the botanical contents, frequency of use and therapeutic purposes of aromatherapy prescriptions used in the field of health in Türkiye.

The prescriptions obtained from the archives of Istanbul Beyazıt Halk Pharmacy were examined and evaluated in terms of the herbal species, families, usage values (UV), functional consensus index (FIC) and chemical components included in the prescriptions.

According to the data obtained, the most frequently used plants in prescriptions are *Lavandula angustifolia, Matricaria chamomilla*, *Salvia rosmarinus* and *Eucalyptus globulus*; these plants are seen to have high UV values. FIC analysis revealed a high consensus in some therapeutic categories, especially respiratory disorders (FIC = 0.87). In addition, it was determined that the majority of the analyzed plants contain volatile components with scientifically proven therapeutic effects.

These findings show that aromatherapy is increasingly being adopted in both traditional and modern medical approaches in Türkiye and that its prescription use is beginning to gain a certain systematic structure. However, in order to make aromatherapy applications more effective and safer, clinical guidelines need to be established and scientifically based standardization processes need to be developed.

Keywords

Aromatherapy, functional consensus index, medicinal plants, prescription analysis, Türkiye, use value.

Article History

Submitted:17 May 2025 Accepted: 24 September 2025 Published Online: October 2025

Article Info

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Research Article:

Volume: 8 Issue: 2 Pages: 42-59

DOI: 10.54994/emujpharmsci.1698693

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INTRODUCTION

The first humans had the opportunity to experience nature very closely by living in a natural environment. The sense of smell, which is ten thousand times more sensitive than the sense of taste, was extremely important for them to sustain life, to estimate the location of existing dangerous animals and enemies, and to determine the location of food. Paintings from the pre-Christian period on the walls of the Lascaux cave in France show medicinal plants. The first humans associated bad smells with God's disapproval, discomfort or disease. According to them, a healthy person has a clean and fresh smell. Plants and spices protect food, help digestion and increase taste. Again, the first humans, by chance, noticed the pleasant and healing smoke that some plants emitted when they were dropped into fire and began to use resin and dried herbs in purification ceremonies. Over time, plants and aromatics became one of the few important things to be obtained, protected and continued (Miller and Miller, 2001; Hudson, 1998). Papyrus records dating back to 4500 BC show that balsam, perfumed oils, scented tree barks and resins were used and aromatic mixtures were produced. Believing that the physical body was important after life, the Egyptians developed the art of mummification by discovering aromatic and volatile oils with protective effects. The Mesopotamian, Indian and Chinese civilizations also exchanged information on herbal and aromatic products and how to use them. In India, Ayurveda, plants and aromatics are considered an important part of the philosophy of healing. The Greeks and Romans acquired the science of aromatherapy, the use of perfumes, scented oils and the understanding of herbal treatment from the Egyptians and established a connection with Indian culture (Brahms, 2004; Hudson, 1998).

Doctor Rene Maurice Gattefosse is considered the modern father of aromatherapy. When he realized that his hand, which was severely burned in a laboratory explosion, could be treated with lavender oil and the pain was reduced, he devoted the rest of his life to scientific research on the therapeutic properties of essential oils. He first coined the term ‘aromatherapy’ and published a book of the same name in 1937. French medical doctor Jean Walnet was greatly influenced by Gattefosse's work and successfully healed war wounds with antiseptic essential oil solutions during World War II. Later, the American Aromatherapy Association was founded in England under the leadership of Mallory, who was a student of Dr. Valnet. The use of aromatherapy began to increase

in the United States as the limitations of modern medicine and the importance of self-care were understood and the potent effects of essential oils were recognized (Brahms, 2004; Hudson, 1998).

Aromatherapy is the controlled use of essential oils obtained from plants in the treatment of physical and psychological disorders. Studies on aromatherapy in Türkiye have focused especially on nursing (Kurtgoz and Kiziltepe, 2022). Aromatherapy applications are used in the management of various health problems in Türkiye. It is stated that it can positively affect a person's mood and physical health in cases such as stress, sleep disorders, and menstrual cramps. It is also used in the treatment of disorders such as headache, muscle and joint pain, skin and hair problems (Kurtsan, 2021). Studies and applications on aromatherapy in Türkiye are increasing and it is considered as a complementary method in the management of various health problems. In this study, the use of aromatherapy for health purposes was evaluated with a statistical approach through aromatherapy prescriptions written by physicians.

Established in 1950, Beyazıt Halk Pharmacy is known as one of the oldest and most established pharmacies in Istanbul (Figure 1). Serving in the same location since its establishment, the pharmacy provides health services in the region with its long-standing experience and professional staff. The pharmacy's activities, which have continued for more than half a century, are supported by customer trust and a sustainable service approach. Beyazıt Halk Eczanesi is located in Beyazıt Square, which is considered the historical center of Istanbul, in a location adjacent to important cultural and historical structures. Its proximity to the main gate of Istanbul University, Beyazıt Mosque and the Grand Bazaar allows the pharmacy to be frequently preferred not only by locals but also by tourists. This location increases the diversity of the customer base that the pharmacy serves, allowing it to become a structure that appeals to both local and foreign visitors. The Beyazıt Halk Pharmacy, which contributed to this study, is considered a reliable reference point in the region for health services due to its long history. In addition to prescription drugs, the pharmacy also offers herbal and aromatherapeutic products, personal care products and medical supplies. The pharmacy's deep-rooted history, experienced staff and wide range of products allow it to provide reliable consultancy for health services.

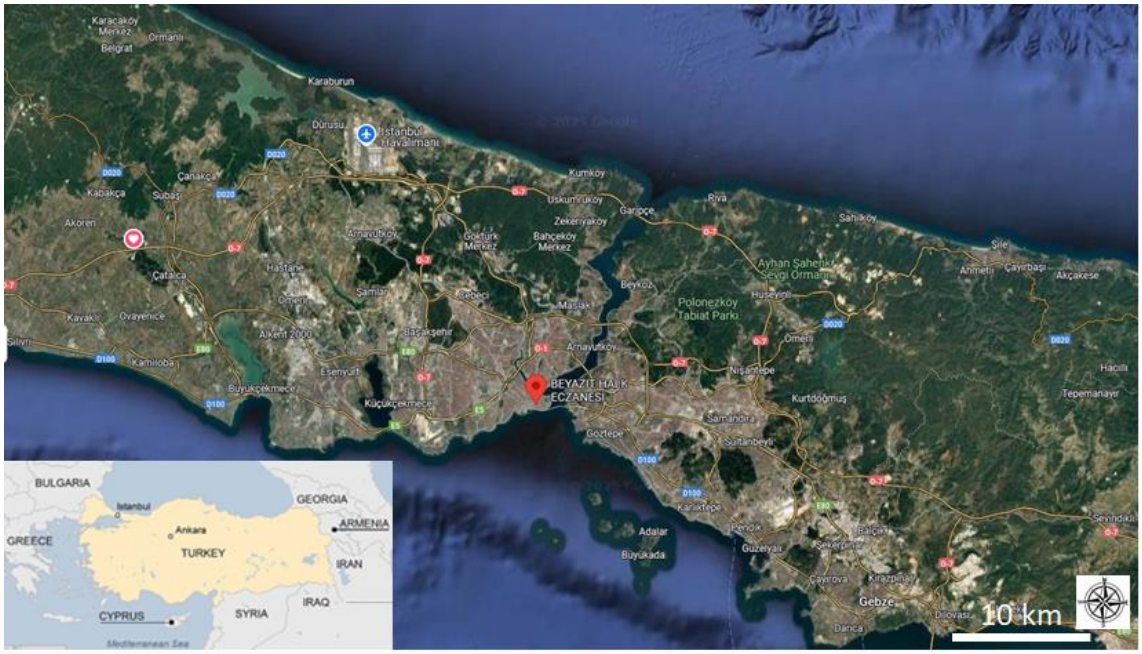

Figure 1: Location of Beyazıt Halk Pharmacy in Istanbul.

MATERIALS AND METHODS

During the first six months of 2020, 47 aromatherapeutic prescriptions received by Beyazıt Halk Pharmacy were recorded for review (Figure 2). The prescriptions were prepared by the first author himself. The essential oils used in the preparation of the prescriptions subject to this study were grouped into 3 classes:

I. 100% pure: not mixed with other essential oils

II. 100% natural: natural qualities not impaired by synthetic molecules

III. 100% holistic: not subjected to any application that would eliminate the molecules

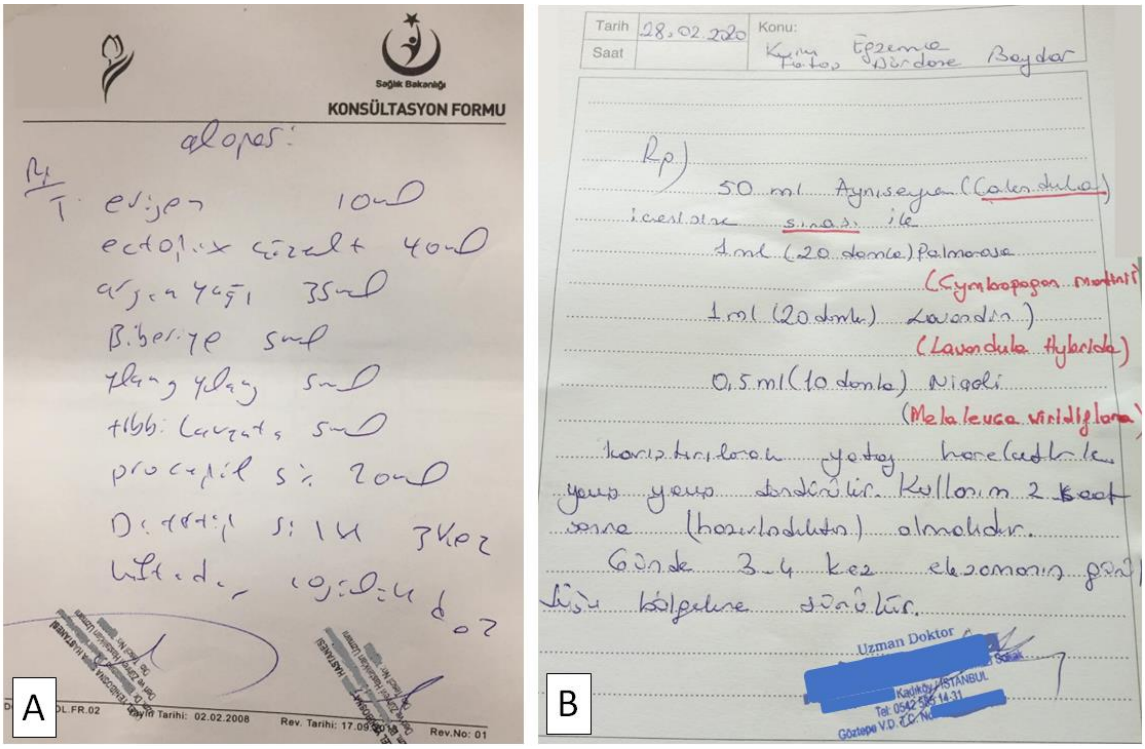

Figure 2: A prescription written for the treatment of alopecia (A), and eczema (B).

The oils used in the prescriptions are botanically and biochemically defined essential oils and are organic certified. The EOBBD (Essential Oil Botanically and Biochemically Defined) Certificate is a certificate that guarantees the quality, purity and chemical structure of essential oils. It was developed specifically to ensure the therapeutic effect of essential oils used in aromatherapy. This certificate is usually issued by international independent certification bodies such as Ecocert. Ecocert is a worldwide known and reliable certification body for organic agriculture and natural cosmetic products. Before preparing the recipes, essential oils are subjected to organoleptic analysis in order to evaluate their physical and chemical properties. These analyses include the evaluation of sensory properties of oils such as odor, color, taste and viscosity by experts. Organoleptic evaluation is considered a basic method for determining the originality, purity and quality of essential oils and is supported by chemical analysis. This process aims to ensure the therapeutic efficacy and reliability of oils (Figure 3).

Figure 3: Organoleptic control of oils before the preparation of recipes.

Also, Informant consensus factors (ICF or FIC) and the use-value UV formulas have been updated based on this study. ICF were calculated as [FIC=(Nur-Nt)/(Nur-1)] (Trotter and Logan, 1986). Total usage report ($Nur_{recipes}$): Number of all herb uses in recipes belonging to that category (if the same herb is used in more than one recipe, each one is counted). Total different species ($Nt_{recipes}$): The number of different plant species used in recipes belonging to that category. The UV value (Abu-Irmaileh and Afifi, 2003) was calculated both among the total plants used and among the plants in the recipes prepared for each ailment. UV=U/N, UV is the use-value of a species; U= the number of citations for every species in this recipes; N= the number of recipes. $UV_{ailment}$ =U/N, $UV_{ailment}$ is the use-value of a species for each ailment; $U_{ailment}$= the number of citations for every species in this recipes for each ailment; $N_{ailment}$= the number of recipes for each ailment.

RESULTS

As a result, 47 recipes containing 59 species belonging to 29 families are listed in Table 1. The scientific names of the species, their commercial names, families and the values used in the recipes are also listed in Table 2. It is clearly seen that aromatherapy prescriptions are preferred for skin diseases (FIC=0.62) (Figure 4). After this disease, aromatherapy is used for upper respiratory tract problems (FIC= 0.33), immune system problems (FIC= 0.18), mental (FIC= 0.16), and women's health disorders (FIC= 0.12). The taxa with the highest UV value are *Cananga odorata* (Lam.) Hook.f. & Thomson (0.22), *Lavandula angustifolia* Mill. (0.32), *Salvia rosmarinus* Spenn. (0.17), *Sideroxylon spinosum* L. (0.16), *Helichrysum* Mill. (0.13), and *Melaleuca alternifolia* (Maiden & Betche) Cheel (0.13).

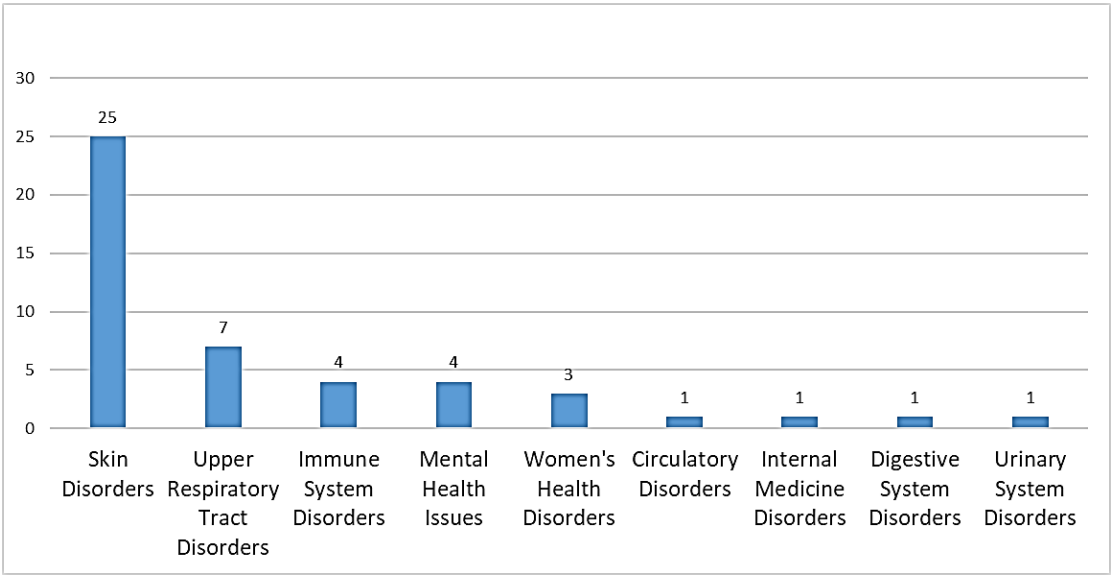

Figure 4: Frequency of use of aromatherapeutic prescriptions according to diseases.

The frequency of use of the first three plants most commonly used for each disease diagnosed in prescriptions was also calculated. According to these results, the species with the highest frequency of use in skin disorders are lavender ($UV_{skin\ disorders}$=0.12), chamamille ($UV_{skin\ disorders}$=0.08), and argan ($UV_{skin\ disorders}$=0.07). The plant with the highest usage value in prescriptions for upper respiratory tract problems is eucalyptus ($UV_{Upper\ respiratory}$=0.14), while peppermint, ginger and juniper also have the same usage frequency value and are the plants ranked 2nd ($UV_{Upper\ respiratory}$=0.09). The three most commonly used herbs in immune system-supporting prescriptions are jojoba, eucalyptus and peppermint, and the frequency of use value for all of them is same ($UV_{Immune\ System}$=0.09). In the prescriptions prepared for mental problems, two plants stand out. These are lavender

and rosemary, their frequency of use is equal ($UV_{Mental\ Health}$=0.1).

In the recipes prepared for women's health problems, 4 plants that are not used very often in other diseases are at the forefront. These are ylang-ylang, myrtle, clary sage, and sweet almond oil, their frequency of use is equal ($UV_{Women's\ Health}$=0.11). In the recipes prepared for women's health problems, cod fish oil, which is an animal product, is also used. Instead, vegetable oils such as Flaxseed oil, Chia seed oil, Hemp oil, which are rich in omega-3, can be used. The genera represented with the most species in the prepared recipes are *Citrus*, *Melaleuca*, and *Salvia* (Figure 5). The families represented by the most genera in the prepared recipes are Lamiaceae, Myrtaceae, Rosaceae and Lauraceae (Figure 6).

Table 1: Contents and application methods of aromatherapy prescriptions according to diseases.

Diagnosed Health Issue	Prescribed Herbal Oils	Preparation and Usage
Acne (adolescence)	- 50 ml lavender hydrosol (1.5%) - 2 drops manuka - 3 drops tea tree oil - 2 drops medical lavender - 3 drops blue chamomile	Applied 4-5 times a day.
Acne & Sunspots	- 50 ml argan oil - 20 drops Helichrysum - 20 drops tea tree oil	Applied once a day.
Alopecia Areata	- 10 ml Vitamin E ampoule - Terbinafine-containing preparation - 40 ml lotion - 3 ml argan oil - 5 ml rosemary - 5 ml ylang-ylang - 5 ml medical lavender - 20 ml Procapil 5%	Applied 3 times a day for 10 days as a powder.
	- 10 ml jojoba oil - 10 ml argan oil - 2 drops rosemary - 3 drops lavender - 2 drops oregano - 3 drops cedarwood	Massaged into the scalp for at least 4 minutes. After massaging, wash hands. Cover the hair with a shower cap and leave for 1-2 hours. Hair can be washed after.
	- 50 ml argan oil - 10 drops rosemary oil - 10 drops Helichrysum - 10 drops lavender	Applied morning and evening.
	- 30 drops argan oil - 30 drops castor oil - 30 drops lavender - 25 drops thyme - 5 drops rosemary	Applied morning and evening.
Anxiety	- 120 ml carrier oil - 6 drops vetiver - 6 drops medical lavender	Applied using a diffuser.
Aphthous Ulcer (AFT)	- 50 ml argan oil or 50 ml rose hydrosol - 5 drops tea tree oil - 2 drops peppermint - 1 drop blue chamomile - 2 drops medical lavender or fennel	Applied as a spray.

Atopic Dermatitis - Dry Skin	- 5 drops chamomile - 3 drops medical lavender - 1 drop rose oil - 1 drop patchouli oil - 1 drop ylang-ylang	Slowly added to a gold-based cream, left to rest, and then applied.
Body Odor	5% essential oil blend in hydrosol: -Patchouli, -Ylang Ylang	Apply once daily
Boil	- 40 ml olive oil - 4 drops oregano - 4 drops rosemary - 4 drops lavender - 7 drops chamomile - 4 drops peppermint	Applied once a day.
Bronchitis	- 100 ml jojoba oil - 10 drops cajeput - 10 drops niaouli - 10 drops myrtle	Applied by massaging the chest area.
Bronchitis (Child)	- 50 ml almond oil - 8 drops rosemary or ginger - 6 drops juniper oil - 7 drops peppermint or eucalyptus	Applied morning and evening.
Bronchitis (Baby)	- 6 drops lavandin - 2 drops vanilla - 100 ml almond oil	Applied by gentle massage.
Bronchitis (Dry Cough)	- 6 drops ginger - 4 drops juniper - 5 drops eucalyptus - 30 ml argan oil	Rubbed on the chest area.
Calluses Treatment	- 1 drop sage oil - 1 drop cypress - 1 drop Helichrysum - 1 drop Carpobrotus acinaciformis	Applied once a day.
	- 6% shea butter with - Oregano - Laurel - After the tissue has softened, Helichrysum is added	Applied once a day.
Cystitis	- 3 drops medical chamomile - 2 drops tea tree - 1 drop thyme (for pregnancy, use 1 drop tea tree)	Mixed in a glass of water and consumed.
Diaper Rash	- 30 ml chamomile water - 10 ml calendula - 10 drops medical chamomile	Applied twice a day.
Eczema - Itching	- 50 ml St. John's wort oil - 20 drops lavandin	Applied twice a day.
Eczema	- 1 ml palmarosa - 1 ml lavandin - 0.5 ml niaouli - 50 ml calendula oil	Applied twice a day.
Facial Paralysis	-50 ml rosehip oil -10 drops Rosemary cineole -5 drops Juniper -5 drops Marjoram	Apply with massage

Fibromyalgia	- 25 ml jojoba oil - 4 drops black pepper - 3 drops camphor - 4 drops sandalwood - 4 drops ylang-ylang	Applied by massage.
Haemorrhoid Treatment	- 3-4 drops chamomile EO in 1 liter of warm water - St. John's wort oil (topically)	Sitz bath with chamomile, topical application of St. John's wort.
Hair Loss	- 5 ml sesame oil - 5 ml castor oil - 5 ml almond oil - 2 ampoules containing dexpanthenol - 2 ampoules containing Vitamin E - 2.5 ml argan oil	Leave for 1 hour and wash.
Headache, Sinusitis, Cold	- 4 drops lavender essential oil - 4 drops peppermint essential oil - 2 drops frankincense essential oil	Applied using a diffuser.
Immune Boost	- 1 drop Helichrysum - 1 drop rose oil - 1 drop ginger - 1 drop thyme - 1g cinnamon	Taken internally.
Indigestion	- 6 drops chamomile - 6 drops lemon - 6 drops helichrysum - 30 ml coconut oil	Massaged onto the abdominal area.
Joint Pain	- 30 ml sweet almond oil - 30 ml apricot kernel oil - 10 ml jojoba oil - 8 drops lavender - 8 drops eucalyptus - 4 drops rosemary - 4 drops peppermint	Applied twice a day.
Lice	- 50 ml coconut oil - 7 drops lavender - 7 drops tea tree oil	Left on hair for 3-4 hours with a cap.
Menstruation (Regulation)	- 1 drop rose oil - 2 drops ylang-ylang - 2 drops myrtle - 2 drops grapefruit - 3 drops clary sage - 50 ml argan oil - 50 ml cod oil	Applied 3 times a day to the lower abdomen.
Menstruation (Pain Relief)	- 1 drop cedarwood - 2 drops ylang-ylang - 3 drops lavender - 2 drops myrtle - 2 drops jasmine - 70 ml sweet almond oil - 30 ml St. John's wort oil	Applied 3 times a day to the lower abdomen.
Nasal Congestion	- 10 drops eucalyptus in 1 liter of hot water	Inhaled as steam.
Neuropathic Pain	- 15 ml St. John's wort oil - 15 ml black cumin oil - 5 drops clove - 4 drops ginger - 6 drops black pepper - 3 drops rosemary - 2 drops wintergreen	Applied once a day.

Oily Hair	-9 drops Ylang Ylang -9 drops Lemon -8 drops Rosemary -50 ml grapeseed oil	Massage into scalp
Premenstrual Syndrome	- 6 drops palmarosa - 10 drops bergamot - 10 drops geranium - 4 drops clary sage - 50 ml sweet almond oil	Applied to lower back, tailbone, upper abdomen, and hips.
Rheumatoid Arthritis	- 2 drops peppermint - 2 drops wintergreen - 2 drops frankincense - 2 drops eucalyptus - 2 drops cypress - 30 ml coconut oil	Applied twice a day.
Scalp Dermatitis	- 10 ml St. John's wort - 10 ml calendula - 20 drops Helichrysum - 10 drops chamomile	Leave for 2 hours, then wash.
Shingles (*Herpes zoster*)	-100 ml rose or lavender hydrosol -5 drops Tea tree -2 drops Lemongrass -5 drops Lavender -3 drops Geranium	Spray 10 times, 5 times a day
Skin Discoloration (Spots)	- 3% calendula - Primrose - Avocado - Coconut - Cedarwood - Lemon - Bergamot - Helichrysum	Applied once a day.
Sleep Disorders	50 ml argan or jojoba oil -7 drops Lavandin -2 drops True Lavender -3 drops Palmarosa - 1 drop Lemongrass	Use with diffuser
Sore Throat, Hoarseness	- 2-3 drops tea tree oil in a glass of water	Used as a gargle 2-3 times a day.
Stretch Marks	- 10 drops frankincense - 5 drops geranium - 50 ml sweet almond oil	Applied once a day.
Sunburn	- 100 ml lavender or chamomile water - 10 drops tea tree oil - 5 drops medical lavender - 5 drops blue chamomile	Applied once a day.
Sweating	-5% sage essential oil in lavender hydrosol	Apply once daily
Ulcer	-1 drop Fennel -1 drop Rosemary -1 drop Lemon -1 drop Cumin	Take orally, morning and evening
Varicose Veins	-10 drops Geranium -15 drops Cypress -5 drops Lemon -30 ml carrier oil	Apply with massage

Table 2: The scientific names of the species, their commercial names, families and the values used in the aromatherapy prescriptions (**bold** species have the highest UV value).

Scientific names	Families	Commercial names	UV
***Sideroxylon spinosum* L.** **(Syn.:*Argania spinosa* (L.) Skeel)**	Sapotaceae	Argan	**0.16**
***Boswellia sacra* Flück.**	Burseraceae	Frankincense	0.048
***Calendula officinalis* L.**	Asteraceae	Calendula	0.048
***Cananga odorata* (Lam.) Hook.f. & Thomson**	Annonaceae	Ylang Ylang	**0.22**
***Carpobrotus acinaciformis* (L.) L.Bolus**	Aizoaceae	*Carpobrotus acinaciformis*	0.016
***Cedrus libani* A.Rich.**	Pinaceae	Cedarwood	0.048
***Chrysopogon zizanioides* (L.) Roberty**	Poaceae	Vetiver	0.016
***Camphora officinarum* Boerh. ex Fabr.**	Lauraceae	Camphor	0.016
***Cinnamomum verum* J.Presl**	Lauraceae	Cinnamon	0.016
***Citrus* × *limon* (L.) Osbeck** **(Syn.: *C.* × *bergamia* (Risso) Risso & Poit.)**	Rutaceae	Bergamot	0.03
***Citrus* × *limon* (L.) Osbeck**	Rutaceae	Lemon	0.079
***Citrus* × *aurantium* L.** **(Syn.: C. x *paradisi* Macfad.)**	Rutaceae	Grapefruit	0.016
***Cocos nucifera* L.**	Arecaceae	Coconut	0.03
***Cuminum cyminum* L.**	Apiaceae	Cumin	0.016
***Cupressus sempervirens* L.**	Cupressaceae	Cypress	0.048
***Cymbopogon citratus* (DC.) Stapf**	Poaceae	Lemongrass	0.03
***Cymbopogon martini* (Roxb.) Will.Watson**	Poaceae	Palmarosa	0.016
***Eucalyptus radiata* Sieber ex DC.**	Myrtaceae	Eucalyptus	0.079
***Foeniculum vulgare* Mill.**	Apiaceae	Fennel	0.03
***Gaultheria procumbens* L.**	Ericaceae	Wintergreen (Gaultheria)	0.03
***Helichrysum* Mill.**	Asteraceae	Helichrysum	**0.13**
***Hypericum perforatum* L.**	Hypericaceae	St. John's Wort	0.063
***Jasminum officinale* L.**	Oleaceae	Jasmine	0.016
***Juniperus communis* L.**	Cupressaceae	Juniper	0.048
***Laurus nobilis* L.**	Lauraceae	Laurel	0.016
***Lavandula angustifolia* Mill.**	Lamiaceae	Lavender	**0.32**
***Leptospermum scoparium* J.R.Forst. & G.Forst.**	Myrtaceae	Manuka	0.016
***Matricaria chamomilla* L.**	Asteraceae	Blue Chamomile	0.048
***Melaleuca alternifolia* (Maiden & Betche) Cheel**	Myrtaceae	Tea Tree	**0.13**
***Melaleuca cajuputi* Maton & Sm. ex R.Powell**	Myrtaceae	Cajeput	0.016
***Melaleuca quinquenervia* (Cav.) S.T.Blake**	Myrtaceae	Niaouli	0.03
***Mentha* × *piperita* L.**	Lamiaceae	Peppermint	0.095
***Myrtus communis* L.**	Myrtaceae	Myrtle	0.016
***Nigella sativa* L.**	Ranunculaceae	Black Cumin	0.016
***Oenothera biennis* L.**	Onagraceae	Primrose	0.016
***Olea europaea* L.**	Oleaceae	Olive	0.016
***Origanum majorana* L.**	Lamiaceae	Marjoram	0.016
***Origanum vulgare* L.**	Lamiaceae	Oregano	0.048
Pelargonium graveolens	Geraniaceae	Geranium	0.048
***Persea americana* Mill.**	Lauraceae	Avocado	0.016
***Piper nigrum* L.**	Piperaceae	Black Pepper	0.03
***Pogostemon cablin* (Blanco) Benth.**	Lamiaceae	Patchouli	0.03

***Prunus armeniaca* L.**	Rosaceae	Apricot	0.016
***Prunus amygdalus* Batsch**	Rosaceae	Sweet Almond	0.03
***Ricinus communis* L.**	Euphorbiaceae	Castor Oil	0.03
***Rosa canina* L.**	Rosaceae	Rosehip	0.016
***Rosa* × *damascena* Herrm.**	Rosaceae	Rose	0.079
***Salvia rosmarinus* Spenn.**	Lamiaceae	Rosemary	**0.17**
***Salvia officinalis* L.**	Lamiaceae	Sage	0.063
***Salvia sclarea* L.**	Lamiaceae	Clary Sage	0.016
***Santalum albüm* L.**	Santalaceae	Sandalwood	0.016
***Sesamum indicum* L.**	Pedaliaceae	Sesame	0.016
***Simmondsia chinensis* (Link) C.K.Schneid.**	Simmondsiaceae	Jojoba	0.079
***Syzygium aromaticum* (L.) Merr. & L.M.Perry**	Myrtaceae	Clove	0.016
***Thymus vulgaris* L.**	Lamiaceae	Thyme	0.048
***Vanilla planifolia* Andrews**	Orchidaceae	Vanilla	0.016
***Vitellaria paradoxa* C.F.Gaertn.**	Sapotaceae	Shea Butter	0.016
***Vitis vinifera* L.**	Vitaceae	Grape	0.016
***Zingiber officinale* Roscoe**	Zingiberaceae	Ginger	0.063

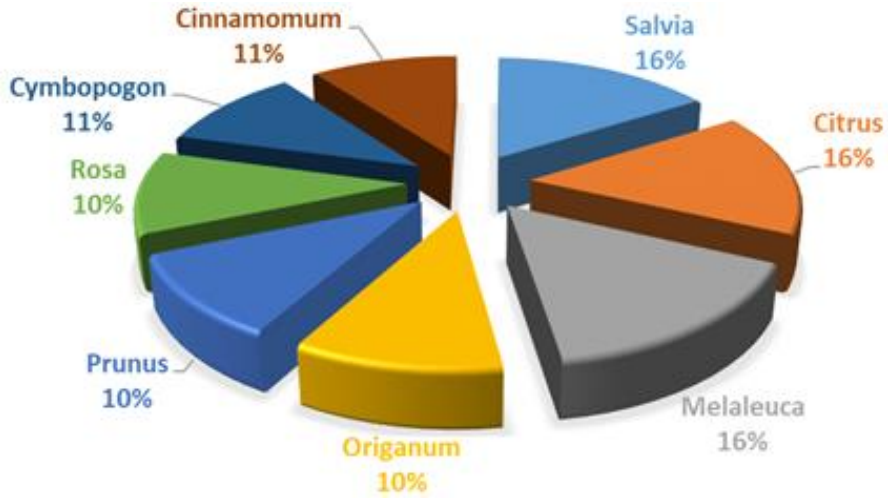

Figure 5: The genera represented by the most species in the prepared recipes.

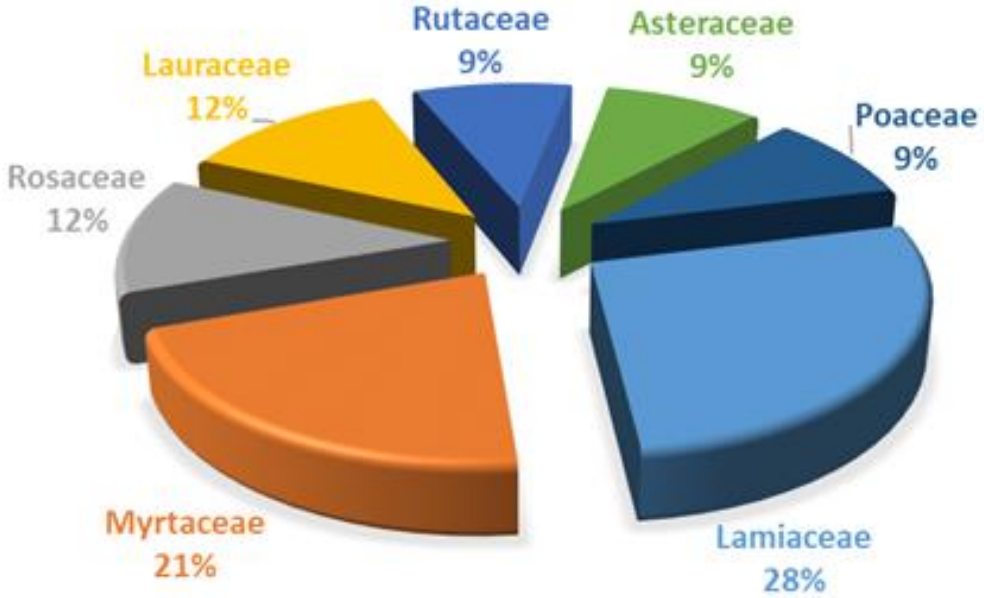

Figure 6: Families represented by the most genera in the prepared recipes.

DISCUSSION

In this study, medicinal plants included in prescriptions written by health professionals within the scope of aromatherapy applications in Türkiye were examined and evaluated in terms of species diversity, usage values (UV), functional consensus index (FIC) and therapeutic contents. The findings reveal that certain plants stand out in aromatherapy applications both culturally and therapeutically. For centuries, essential oils have been valued not only for their pleasant scents but also for the healing effects they provide on the body, mind and soul. The powerful plant compounds found in these oils have the ability to purify the environment from diseases, bacteria, viruses and fungi (Baratta et al., 1998). Essential oils offer multifaceted benefits such as strengthening the immune system, supporting hormonal balance, providing emotional balance, improving blood circulation, calming, strengthening memory and increasing mental alertness, as well as having antibacterial, antiviral and anti-inflammatory effects. These properties have been supported by many scientific studies and pilot projects (Scheau et al., 2024; Gokkaya et al., 2024).

First of all, the high UV values of the most frequently used plants in prescriptions, such as *Lavandula angustifolia, Matricaria chamomilla*, *Salvia rosmarinus* and *Eucalyptus globulus*, indicate that these plants are widely preferred both in traditional knowledge and in modern aromatherapy approaches. This finding has been reported in other ethnobotanical studies (Heinrich et al., 2006; Orhan et al., 2010). The high UV values reflect a consensus of preference based on common knowledge and experience between users and health professionals. This also suggests that the pharmacological efficacy of these species may have been observed in practice and therefore integrated into clinical decision processes.

The FIC values obtained in the study also support this view. The high level of FIC value of 0.87, especially in the respiratory diseases category, shows that there is a strong consensus on the plants used in this area. This situation shows that species rich in volatile compounds such as *Eucalyptus globulus, Mentha piperita* and *Thymus vulgaris* are effectively used in practice for their antimicrobial, expectorant and anti-inflammatory effects (Panchal et al., 2024; Ahsan et al., 2024). On the other hand, the lower FIC values in some usage categories reveal that there is more variety or uncertainty in prescriptions for these areas, and this situation shows that more clinical

studies and standardization are needed in the relevant areas.

Chemical component analyses show that the species preferred in aromatherapy largely contain well-characterized therapeutic constituents (Sadgrove et al., 2022; Bunse et al., 2022). For example, components such as linalool, 1,8-cineole, menthol and thymol stand out in aromatherapy with their sedative, bronchodilator, antimicrobial and anti-inflammatory effects. The presence of these compounds shows that aromatherapy is not only a traditional or complementary practice, but also has a pharmacological basis (Kurt and Cankaya, 2021; Stojanović et al., 2024; Yenikalayci et al., 2025).

Essential oils are complex mixtures of volatile compounds that are important for the plant itself and for people who have learnt how to use them over the years. According to ISO norm 9235:2013, an essential oils is a "product obtained from a natural raw material of plant origin, by steam distillation, by mechanical processes from the epicarp of citrus fruits, or by dry distillation, after separation of the aqueous phase—if any—by physical processes" (ISO NORM 2013). The European Pharmacopoeia defines an essential oils as "an odorous product, usually of complex composition, obtained from a botanically defined plant raw material by steam distillation, dry distillation, or a suitable mechanical process without heating." A physical process that doesn't change the composition of essential oils is usually used to separate them from the aqueous phase (EDQM 2021). It is clear from both definitions that only products made by steam or hydrodistillation can be called essential oils. Products made by other extraction methods that use solvents must be called extracts. Essential oils are primarily distinguished by the presence of terpenes/terpenoids and phenolic compounds (specifically, phenylpropanoids), which originate from the mevalonate/methyl erythritol and shikimic acid pathways, respectively. The term "100% natural," when used (and verified) in accordance with standards like ISO, indicates that there are no synthetic additives/chemical additions; it creates the perception of "chemical-free" for consumers. However, in practice, there may be compounds that are natural but can be toxic or allergenic; the misconception that "natural = safe" is risky (Iheukwumere et al. 2025). The term "100% holistic" means that the product has not been subjected to any treatments that would destroy the molecules. This may emphasize holistic, ethical, and sustainable methods (e.g., organic farming, fair trade, ritual practice) in terms of production, harvesting, processing, and perhaps application. However, this definition must also be

documented with evidence-based experimental reports. In the literature, the chemical composition of an essential oils are usually expressed as relative percent abundance (i.e., % area) or normalized percent abundance (i.e., normal % area) (Bicchi et al. 2008). This process is arduous and time-consuming, so few articles have accurately measured EO. Quality control of EO is important to ensure its safety. Adding cheaper EOs to EOs (e.g., adding bitter orange to sweet orange, peppermint to mint, or lavandin to lavender sugar) or adding cheap synthetic ingredients (e.g., adding synthetic linalool and linalyl acetate to bergamot EO) can often make the EO less pure. The term "100% pure" means that the product contains no other vegetable oils, diluents, or synthetic compounds. However, this statement alone has limited commercial validity; GC-MS, enantiomeric analysis, and other analytical methods are required (Gharibzahedi and Altintas 2025). Such degradation can be easily detected by looking at the normalized percent area of specific markers. Furthermore, because biosynthesis in plants is driven by stereochemistry, and terpenes and terpenoids generally have a specific enantiomeric composition, it can be used to detect whether essential oils have been degraded by the addition of synthetic volatile compounds (Capetti et al. 2021).

This study also reveals that aromatherapy has gained increasing interest among the public in Türkiye and has begun to be integrated into clinical practices. However, the contextual analysis of prescriptions also shows that this integration is still lacking a systematic approach (da Silva-Brandao et al., 2023). Parameters such as clinical effects, dosage information, interactions and patient profiles are often not included in prescriptions, which raises the issue of lack of standardization in aromatherapy practices (Brennan et al., 2022; Vora et al., 2024; Silva, 2025). In this context, structuring aromatherapy prescriptions in light of scientific evidence-based guidelines will both increase therapeutic efficacy and reduce possible toxicological risks.

In conclusion, this study is one of the rare examples of systematic evaluation of prescribed aromatherapy practices in Türkiye from botanical, ethnobotanical and therapeutic perspectives. The findings show that both folk medicine tradition and modern medical approaches come together in aromatherapy. In future studies, follow-up studies observing the clinical effects of these prescriptions will provide important contributions to public health policies and complementary medicine practices.

ACKNOWLEDGEMENT

The authors declare no conflict of interest.

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