Bulletin of Pure and Applied Sciences.
Botany, Vol.44 B, No.2.
July-December 2025: P.69-83
Original Research Article

Print version ISSN 0970 4612
Online version ISSN 2320 3196
Available online at www.bpasjournals.com

Overview of Essential Oils and Their Oily Waters (Hydrosols): Using for Aromatherapy in Türkiye

Hasan ÖZÇELİK*

Author's Affiliation
S. Demirel University, Faculty of Engineering and Natural Sciences, Dept. of Biology, Isparta-Türkiye

***Corresponding Author:**
Hasan ÖZÇELİK,
S. Demirel University, Faculty of Engineering and Natural Sciences, Dept. of Biology, Isparta-Türkiye
E-mail: hasanozcelik@sdu.edu.tr;
https://orcid.org/ 0000-0002-0207-0921

Keywords:
Essential oils, Aromatherapy, Phytotherapy, Aromatic plants.

Received on 10.02.2025
Received on 20.05.2025
Accepted on 30.06.2025

Abstract

The essence of every plant is hidden in its essential oil. Essential oils; due to their wide range of use, chemical structures and biological activities, they are of interest to many branches of science. They are generally of plant origin. Their smell and healing properties are found in the oil of the plant. Before modern medicine, essential oils were used as medicine. Today, they are used as treatment support materials or functional foods. There are many diseases and methods of use for which essential oils are used. This use varies depending on culture and application experience. The effect of the treatment is closely related to the chemical composition of the oil. Its chemical composition also varies according to the species of the living being, intraspecific variation, ecological environment where it grows, the harvest period of the plant, its organ and partly the processing method of the raw material. Essential oils are more effective in skin application, while oily waters are more effective in internal use. Water plays an important role in the transportation of the active substance and the activity of the cells. There are approximately 500 plants used for medical purposes and have commercial value in Turkey. However, the number of plant species from which essential oils can be produced is much more than 500. This article provides correct definitions of some technical terms and includes the production, purposes of use, and physical and chemical properties of essential oils. The source of the information is our experience and observations based on approximately 40 years. Very important information is provided to practitioners. In addition to the chemical composition of essential oils, method of use and dosage also affect the results. Some aromatic plants are poisonous, their oils are practically not extracted. Some ones are very expensive, they can only be sold as raw materials. When using herbal drugs, it is necessary to know temperament of diseases, patient and materials to be used in the treatment. Before modern medicine, this information, namely the 'science of temperament', was the most important subject for doctors. Today, it has fallen into oblivion. In modern medicine, only the chemical composition of the plant is taken into account. Aromatherapy is essentially a treatment method that increases blood flow, protects the body against infections, and strengthens the immune system by providing mineral supplements. It is being forgotten day by day. Treatment with essential oils has not been abandoned despite modern medicine, and its importance has gradually increased. Because its composition is natural, suitable for the physiology of the living being. Their production are organics.

They are not a single compound for a disease. Modern medicine does not seem to have made an effort to produce drugs in proportions suitable for the living being and from organic materials. There are many different methods of use, so it is very easy to apply. For this reason, treatment with essential oils is far superior to modern synthetic drugs. It has very few or no side effects. It cannot be abandoned despite developing technology.
.

How to cite this article: ÖZÇELİK H. (2025). Overview of Essential Oils and Their Oily Waters (Hydrosols): Using for Aromatherapy in Türkiye. *Bulletin of Pure and Applied Sciences-Botany,* 44B (2), 38-52.

INTRODUCTION

Plants have been used in treatment since 5000 BC. Hittites, Egyptians, Sumerians, Assyrians and Mesopotamians had been treated with plants for years. Although the introduction of synthetic drugs into production over time has caused a decrease in the use of medicinal and aromatic plants, the demand for treatment with natural products has increased again with the discovery of side effects of synthetic drugs and awareness of the harms of synthetic substances in food and beverages to human health (Göktaş and Gıdık, 2019). In addition to the natural plants that have been used by many civilizations in Türkiye, and its surroundings, there are also many cultivated plants. Famous doctors such as P. Dioscorides (AC 40-90), Galenos(AC 129-216), Ibn Sina(980-1037), and Sabuncuoğlu Şerafettin (1385-1468) lived and practiced their professions in this geography. In Türkiye, it is officially forbidden to treat by people other than modern doctors. Despite the developing technology today, people still prefer traditional methods in treatment. For this reason, essential oils are not treated as treatment materials, but can be processed and produced as food additives. Treatment with plants is more common, especially in family circles and in the Eastern and Southeastern Anatolia regions (Tonbul and Altan, 1989; Öztürk and Özçelik, 1991). However, it is still preferred in rural areas of Western Anatolia (Tümen, 1989; Özçelik, 2015). Even if herbal treatment is reduced or banned, it will never be forgotten, because it is a known method with few side effects. Therefore, it is preferred (Yeşilada and Sezik, 2003; Tabata et al., 1988). The cultivation, technology and trade of medicinal and aromatic plants have shown a significant increase in nowadays. This situation has a positive impact on employment and the economy (Ceylan, 1997; Faydaoğlu and Sürücüoğlu, 2011; Özçelik, 2015). The most common method of using plants in treatment is to consume them as food (Özçelik, 2023; Özçelik and Demir Yaylalı, 2024). The plants used in treatment are spread all over the country, but they are mostly concentrated in the Mediterranean region. The gene center of Labiatae, Umbelliferae, Anacardiaceae families and *Rosa* genera is also the Mediterranean region. These taxa have very high medical importance. (Tümen, 1989; Özçelik 2015; Havla and Pukka, 1987; Karadoğan et al., 2000-2003).

The period when herbal treatment reached its peak was the Middle Ages. Hippocrates, Galenos and Ibn Sina were the most respected physicians during this period. According to these physicians; everything emerged from the number 4: it was accepted that there were 4 elements in nature (earth, water, fire and air), 4 elements in humans (blood, phlegm, yellow bile and black bile/ sevda in Turkish), 4 qualities (warmth, coldness, dryness, wetness). Diseases were also divided into 4 according to their qualities (hot, cold, moist, dry) (Uçkun, 2024).

In other words, the quality of the plant that is the treatment tool and the temperament of the patient affect the treatment method (Akpolat, 2025; Kızıleniş and Aykıt, 2020). Humans are a small sample of the universe. In other words, humans are a small universe and the universe is a large human. Their characteristics are the same. For example, 1/4 of the human body is water. 1/4 of the earth is covered with water. As in humans, the disruption of the balance of the 4 elements in the universe means the disruption of the system called 'natural balance' today. According to this perspective, understanding humans and treating

their illnesses also means bringing the universe to where it should be. Because humans are the only beings that interfere with the universe and its natural balance. The negative and wrong thoughts in the spiritual structure of humans turn into actions and disrupt the structure of the universe, making the biosphere uninhabitable, as is the case today. For this reason, it is necessary to value medieval medicine, its method and philosophy (Akpolat, 2025).

The word 'Mizaç in Turkish' means mixture. 'The mizaç science' is a medical theory in terms of its effect on physical health. It has an important place in the medical understanding of Hippocrates, Galenos and Ibn Sina. The basic building blocks of the human body, body fluids (blood, phlegm, black bile and yellow bile/ Sevda in Turkish) are called 'ahlat-ı erbaa'. Each of the body fluids should be present in equal amounts in the body. The difference or imbalance between the amounts and ration of these fluids is the main reason for health problems, namely diseases (Kızıleniş and Aykıt, 2020). Theoretically, temperament is divided into two: In balanced temperament, opposite qualities are seen when they are equal in quantity.

In unbalanced temperament, the qualities are not equal, they tend to one side. If one of the hot, cold, dry and wet is dominant, a simple imbalance occurs in the living body. If some of these four qualities are dominant, a compound imbalance occurs (Bilgin, 2019). This makes treatment more difficult.

Greek philosophers talk about four elements regarding beginning of the universe. These 4 elements caused the formation of different temperaments specific to all beings; and manifested themselves in the human body as blood, phlegm, bile and love. According to Hippocrates; it is possible to protect human health with the balance of the elements (hılt or functional fluids) he describes as 4 the mizaç (temperament) in the body. With this fluid balance, each person's unique temperament structure is created. The concepts of hılt(or functional fluids) and temperament were made more systematic with the findings of Galenos and the boundaries he drew. The theories of hılt (or functional fluids in the body) and temperament, which were further developed with the contributions of Islamic physicians Abu Bakr al-Razi and Ibn Sina, maintained their validity in the Eastern and Western worlds for centuries. It is understood that the science of mizaç (temperament is the general understanding of Medieval medicine. According to these; medicines/drugs are divided into two groups:
1. If the use of a drug does not cause any change in the human body, that is, if it does not change the balance of temperament, it is a moderate (balanced) drug. 2. If the use of a drug changes the qualities (the balance of coldness, heat, humidity and dryness) in the human body, the drug is unmoderate (unbalanced).

It is understood from this that some drugs are unbalanced and are cause of disease. Disease is deterioration of the temperament or organs, and as a result, the body cannot perform its normal functions completely or partially. Since balance of the body is disrupted in the disease, medicine must be given to restore the temperament to its former balance.

Aromatherapy is a small-scale, that is, a home-based therapy. It is a traditional treatment culture that is gradually disappearing. It is the main material of treatment methods before modern medicine. It is the primitive substance of drug. This article provides brief information about the science of temperament and provides important information about the methods of using essential oils in treatment, aromatic plants, production techniques, product types, their side effects, etc.

MATERIAL AND METHOD

This article provides correct definitions of some technical terms and includes the production, purposes of use, physical and chemical properties of essential oils. Source of information is our experience and observations of nearly 40 years. As part of a long-term study, elderly people living especially in rural areas of the country were visited, their practices were observed on site, the plants they used were collected and turned into herbarium materials, and valuable samples were given inventory numbers, and they are preserved in the GUL herbarium. The scientific identification of the plant taxa were made by us based on the relevant

literature (Davis, 1965-1988; Baytop, 1984). The local names of the plants were also given using the relevant literature (Öztürk and Özçelik, 1991; Özçelik et al., 2016; Özçelik, 1987) and our observations. There are approximately 200 of plant species. Only a few of the essential oil plants that are considered important are described in the article, not all of them. The majority of the information in the findings consists of our experiences and observations. Plant names in latin frequently mentioned in the paper are abbreviated in an easy to understand way, usually with their first letter.

OVERVIEW OF ESSENTIAL OILS AND THEIR OILY WATERS (HYDROSOLS)

Essential oils obtained from aromatic plants have been used in medicine, food, cosmetics, aromatherapy and phytotherapy for centuries. Due to their wide range of use, their chemical structures and biological activities, are of interest to many branches of science. Before modern medicine, essential oils were used as medicine (drug). Today, some technical terms are confused with each other and this causes problems in application and perception. For this reason, some technical terms that are close to each other on the subject are explained below by us:

Essential oils and essences: Essential oils are the raw materials used in essence production; since they are formed from several essential oils, their smells are more pleasant and strong. Essences are produced in laboratories by imitating the smells in nature. They are copy/imitation smells that resemble or resemble any smell. They are mixtures that contain certain amounts of essential oil. Their most distinctive feature is that they are volatile and have a delightful smell. Among the public, they are known as 'essential oil, volatile oil, etheric oil, scented oil, essential oil, aromatherapy oil or spirit'. They are generally synthetic and used in perfumes and room fragrances. Their medical and internal use is problematic. They are cheaper and have a longer shelf life than organic essential oils.

Flavors: Like essences, they are produced in laboratories. They are pleasant and light scents that imitate the smells in nature and give flavor to foods and medicines. They can be synthesized naturally or synthetically. They are mostly used in the food sector, but they can also be used to suppress unwanted odors in medicines and cosmetics.

What are Aromatherapy Oils, How are They Used and What are Their Benefits?

A large number of plants are used in aromatherapy. The majority of the plants used belong to several families. In order of importance; Labiatae (Lamiaceae), Rosaceae, Rutaceae, Umbelliferae (Apiacee), Pinaceae, Cupressaceae, Cruciferae (Brassicaceae), Leguminosae (Fabaceae), Caryophyllaceae, Lauraceae, Anacardiaceae, Ranunculaceae, Cucurbitaceae, Solanaceae, Cistaceae, Oleaceae, Violaceae, Liliaceae, Irıdaceae, Orchidaceae etc. Some of the important ones in Türkiye are described below:

Rose (*Rosa* spp.) oils: It is a very important medical material due to its anti-aging effect, antiviral and antiseptic, relaxing, cell regenerative properties. It was used as a medicine in the Ottoman period. One of the most important benefits of rose oil is that it nourishes the skin and improves its health. In addition to its anti-inflammatory and antioxidant properties, it has also been used to treat various skin conditions such as acne, eczema and psoriasis. Applying rose oil to the skin or drinking its oily water improves and relaxes the mood. It is soothing against stress and nervousness. This makes it very important for those who suffer from insomnia (Altıntaş, 2009). It is also added to cosmetic products as an emulsifier and is mostly used purely for skin care. There are raw material products such as fine rose oil, concrete, absolute, and vax. Those for medical purposes are obtained only by distilling rose flowers produced in organic agriculture. Although there are essential oils of *R. damascena, R. moschata, R. alba, R. gallica, R. borboniana, R. stipulata, R. comantema* and *R. odorata,* commercial rose oil is obtained only from R. damascena (Özçelik and Koca, 2021).

As an example of essential oil production, rose flower processing steps are shown below. **Fig. 1.**

Figure 1: Rose flower processing steps and rose products (rose oil and its hydrosols).

Laurel (*Laurus nobilis*) oil: It is used for skin care, acne, respiratory tract disorders, muscle spasms, joint pains and migraine disorders with its anti-bacterial, anti-inflammatory, anti-spasmodic, anesthetic properties. Its essential oil is produced only from the leaves and ripe fruits of the plant.

Myrtle (*Myrtus communis*): Its fruits are eaten against diarrhea. It has a heart strengthening feature. Its leaves are very valuable in terms of medicine. Its essential oil is produced only from the leaves of the plant. Its oil and oily water are very effective against diabetes. It grows naturally in humid areas in the Mediterranean region, especially in stream beds. Toros villagers put its fresh branches in graves during grave visits. It has a pleasant smell. There is a culture variety and two wild forms as with purple and black fruits. Fresh leafy branches are widely used in making wreaths. Leafy branches are added to the water prepared while washing the dead. It has high antiseptic properties (Özçelik, 1987).

Gum trees (*Pistacia* spp.): *Pistacia lentiscus* var. *chia*: The island of Chios is the main center of this plant. There are many mastic trees there. The saplings are produced in Urla and Karaburun districts of Izmir. The saplings are very expensive. Mastic trees produced in the region are not enough for the country's needs. Some places in Türkiye also call it Mesteki mastic/Mesteki Sakızı in Turkish. Its leaves are dark green, the ground powder of its leaves is added to foods to give them a flavor. Mastic balsam collected by leaking from the trunks of the tree is very expensive. It has a delicious smell. It is added in small amounts to desserts such as rice pudding, salep, etc. The mastic is also chewed in the mouth. It is recommended for bad breath, strengthening the jaw bones, and those suffering from stomach upset. This mastic can be used against almost every disease (Özçelik and Kündük, 2021).

Menengiç, Sakızlak trees are in wild form. It is called the wild ones of the *Pistacia* species. In the Mediterranean, Toros villagers often use the name 'Çöğre' for *P. terebinthus*. A species similar to *P. khinjuk* is grown abundantly on the Van, Akdamar Island, and another species similar to *P. terebinthus* is grown in the Konya Ermenek region. 'Dibek coffee' is made in the Diyarbakır and Mardin regions, and 'Menengiç coffee' is made by roasting and powdering the fruits of wild species. *P. khinjuk* is grown in the Siirt region as 'Bıttım', and *P. vera* is grown in the Gaziantep and Hatay regions. It is called 'Antep pistachio'. The fruit of each species is consumed as a snack. It has high commercial value and therapeutic importance. They are very rich in minerals. No essential oil is extracted from any *Pistacia* species because it is very expensive. However, it can be extracted if desired.

Citrus tree (*Citrus* spp.) oils: Lemon or orange oil is used for its benefits such as facilitating digestion in stomach problems, in oily skin and oily hair care, in the treatment of varicose veins and many other diseases; it also disinfects the air, its scent is good for fatigue and gives pleasure. It is calming and soothing. Ants do not come to the smell of lemon. Its essential oil is mostly found in fruit peels and flowers. Cologne made from lemon blossom is very famous in Türkiye. Ants do not come to the smell of lemon. People who

get car sick are made to smell lemon. It is produced in large quantities in the Mediterranean region. It has many varieties. Lemon juice or oil, either plain or mixed with garlic, is used to lower high blood pressure. It is used against hoarseness when mixed with honey. Lemon oil, together with almond oil, is used in the production of wet cloths prepared for medical purposes against diaper rash and redness in babies.

Malaria tree (*Eucalyptus cameldulensis*) Oil: It is called 'Sıtma ağacı' in Turkish. Since it is a swamp tree, it dries the habitat of mosquitoes and prevents the formation of malaria disease. It is generally used against cold infections and respiratory tract disorders. It facilitates breathing by thinning mucus and relieves muscle pain with its anti-inflammatory properties. It is used against sinusitis and bronchitis. It is preferred against fungal infections (foot fungus and scalp fungus). Its essential oil is obtained by distilling the leaves of the malaria tree (*Eucalyptus* sp.). It is considered the most important raw material for the evaporative ointment called Vicks. It is grown extensively on the coasts in Türkiye. It is exotic.

Lavender (*Lavandula* spp.) Oil: Used for wounds, cuts, burns and insect bites. Known for its calming properties. Obtained by distilling the flower state.

Peppermint (*Mentha* spp.) Oil: It is used as a mental enhancer, energy booster, stress reliever, in oral care and hygiene, against pain, spasms and migraine disorders. There are different amounts of volatile oil in all above-ground parts. It grows and is cultivated in many environments from meadows to arid areas in Türkiye. It is mostly seen in humid areas. It has many local and exotic genotypes. Its volatile oil can be crystallized. This provides serious advantages in transportation, shelf life and storage.

Sage (*Salvia* spp.) Oil: It is known for its stress-reducing, calming properties. It strengthens the immune system. *Salvia fruticosa, S. officinalis, S. sclera, S. tomentosa* are widely used. The volatile oil of *S. fruticosa* is known as 'Apple oil', others as 'Çalba oil'. It is used internally and externally. There are more than 100 *Salvia* species in Türkiye, 5 species are commercially produced and used for oil. Several species are exotic. *S. microphylla* is an exotic landscape species.

Rosemary (*Rosmarinus officinalis*) Oil: Known to relieve skin problems, prevent hair loss, and calm. It is highly preferred for diabetes. It has a natural species and many chemotypes produced in Türkiye. Although its natural forms are seen in the mountains of Muğla, the genotypes produced are culture races.

General Properties of Essential Oils: Essential oils are generally of plant origin; they are partly of animal origin. Fish oil, sheep tail fat, musk essence from musk ox, snake oil, ant oil, etc. are animal products.

A plant without odor does not have essential oil. Every organic substance with odor contains essential oil and this is source of the odor given to the atmosphere. Each essential oil is characteristic according to the type, variety and even the growing environment of the plant.

While some plants synthesize completely essential oil or fixed oil, some essential oil plants can synthesize some fixed oil; fixed oil plants can synthesize some essential oil. Rose (*Rosa* spp.), thyme (*Thymus, Origanum, Satureja* spp. etc.), lavender (*Lavandula* spp.), cinnamon (*Cinnamomum camphora*), ginger (*Zingiber officinale*) synthesize only essential oil. Walnut (*Juglans regia*) oil contains both in high amounts. Sesame (*Sesamum indicum*) oil, olive (*Oleum europeum*) oil, terebinth (*Pistacia terebinthus*) oil, hazelnut (*Corylus avellana*) oil, etc. have low volatile oil and high fixed oil. Even in small amounts, volatile oils have a strong odor. They evaporate and reach our noses through the air in a short time, and we notice their presence. They can evaporate completely at room temperature. If there is a part that does not evaporate, this part is a hydrocarbon derivative, chemical compounds that thicken the oil and reduce its fluidity. It has little medical and economic importance.

Freezing point of essential oils is very low and energy is high compared to fixed oils. The freezing point of the oil may vary depending on its origin**.** Essential oils have the property of being entrained by water. Therefore, they are obtained by steam distillation.

They show their effects shortly after use. A significant portion of essential oil plants are spice plants. Spice plants with a pleasant smell are both food and essential oil plants. Spice plants with a pleasant smell and flavor are generally dried and powdered and added to foods in small amounts as flavoring. Adding large amounts is not desired and harms the consumer. If the dose is increased, it becomes a medicine: Thyme (*Thymus, Origanum, Thymbra, Satureja* spp.), black pepper (*Piper nigrum*), mint (*Mentha* spp.), parsley (*Petroselinum crispum*), dill (*Anethum graveolens*), cress (*Lepidium sativum*), fennel (*Foeniculum vulgare*) etc. are some of them.

Essential oils for medical purposes must be produced only by steam distillation. They are also known as 'thin oil'. They may contain very small amounts of fixed oil. Their fluidity is high and their specific gravity is lower than other oils. For example, the specific gravity of rose oil, which is an important material in medical terms, is around 0.85. The specific gravity of absolute is close to 1, meaning it is heavier than thin oil. Fixed oils are produced by cold pressing. Sesame oil, olive oil, sunflower oil, and safflower oil are examples of fixed oils. Their fluidity is low and they have a more viscous structure than essential oils. Tar is also a type of oil, and is obtained by burning the wood of oily trees, melting the oil, draining it in an area and collecting it.

One or more compounds dominant in an essential oil create the characteristic odor of the product. Carvacrol and Tymol represent thyme (*Thymus* and *Origanum* spp.), menthol represents mint (*Mentha* spp.), anethole represents anise (*Pimpinella* spp.), pine pine (*Pinus* spp.), phenyl ethyl alcohol represents rose (*Rosa damascena* etc.), ficine represents fig (*Ficus carica*) milk, oleoropin represents olive (*Olea europea*), heypericin represents thousand-delelic herb/St. John's wort (*Hypericum* spp.) in terms of chemical composition. Fig. 2

.

Figure 2: Various essential oils and hydrols with oils. Evaporation of essential oil to clean the atmosphere and give scent to the surroundings.

Medical properties of essential oils: Since essential oils are secondary metabolite products, their chemical compositions are different from primary metabolites. All mineral substances and compounds necessary for the living being cannot be obtained from plant group foods that produce only primary metabolites. Therefore, with the intake of secondary metabolites, the missing minerals in the living being are completed; the activity of the body is increased with the production of vitamins, enzymes, hormones, etc. With this way, the functions of cells, tissues and organs increase. Secondary metabolites are very diverse. More than 400 volatile substances have been identified in rose oil. There is not such a variety of substances in fixed oils. In short; with the intake of essential oil, the functions of body organs are fulfilled. The body's immune system is strengthened.

Antiseptic, antioxidant, digestive stimulant, antimicrobial and enzymatic effects are the most important known functions of essential oils.

Since each of the essential oils has its own unique smell, bad breath is eliminated during drinking and by gargling in the mouth. Gargling provides significant benefits to the health of the mouth, jaw and teeth. However, since they are generally acidic, excessive intake can harm the digestive system. Drinking juniper oil and thyme oil for a long time damages the digestive and excretory systems.

All essential oils have antimicrobial, antiviral, antifungal properties. However, the essential oils of the thyme, cinnamon, and clove group are stronger. Therefore, they can be used against abdominal distension (gases produced by bacteria breathing) and stomach and intestinal gases caused by indigestion. However, fennel (Foeniculum vulgare) is used more against stomach gases. Because it serves the purpose, but its side effects are unknown.

All essential oil plant waters (hydrosols) are digestion accelerating and appetite stimulating properties. It is widely used and taken in small amounts. For this reason, spice group plants are not cooked, if they are cooked, they are not eaten with appetite, and if they are eaten, they can be emetic.

If there are internal parasites such as tapeworms and worms in the intestines and external parasites on the skin, the use of essential oils poisons these parasites and disrupts their living environment. Parasites are poisoned and eliminated from the body. Especially hot pepper oil and pumpkin seed oil are very effective against intestinal parasites.

They have properties that increase the absorption of nutrients from the intestines. For this reason, people who drink aromatic waters gain weight, but they do not gain fat. Since it is effective against parasites, the body is better nourished; physical and mental strength increases. Their moral values increase.

All herbal essential oils are fat/lipid burners. Therefore, they are slimming. In this respect, they are weight loss.
The energy values that occur as a result of carbohydrate breakdown are very low. On the other hand, it carries extremely active components due to the movement of its molecules. It mixes with the air in a short time.

It is surrounded by intercellular fluid (intercellular substance). Nutrients and oxygen are delivered to the cells with this substance. Aromatic oily waters with lower density pass into this intercellular fluid more easily than volatile oils with higher density. Thus, if there are toxic substances in the intercellular fluid, they destroy them and prevent them from entering the cell, and help to remove toxic compounds and solid substances that cannot be excreted from the body, namely cholesterol (Uysal, 2022), and to expand the veins. This is especially important in patients receiving chemotherapy, in the recovery of the body after the end of treatment and in cardiovascular diseases. The effects of drugs in patients receiving chemotherapy manifest themselves with conditions such as paralysis, numbness, spasm, pauses, and blood pressure disorders. This condition can be largely treated by drinking a small amount of aromatic oily water every day for about 3 months.

Things to Consider When Using Aromatherapy Oils: It is dangerous to use essential oils by swallowing them. It can damage the sense of taste and digestive organs. It can cause allergic reactions. Aromatherapy oils used orally should definitely be used with a doctor's advice and not exceed the required dose. For example, clove oil is used for viral and bacterial infections, and mint is used for its pain-relieving properties. Oils taken orally should definitely be used under the supervision of a doctor. Doctors should also have sufficient knowledge about essential oils and herbal extracts.
Side effects may occur when using oils applied to the skin. It can cause hives and burns on the skin. Allergic skins can be affected more.

Harmful effects of essential oils and recommendations for use: Herbal aromatic oil products should not be consumed for a long time and in high amounts.

They should be used carefully. Volatile oils rich in caustic substances such as carvacrol, capsaicin can irritate the skin if applied excessively. Thyme (*Thymus, Origanum, Satureja* spp.) oil, clove (*Syzygium aromaticum*) oil, cinnamon (*Cinnamomum verum*) oil and hot pepper oil (*Capsicum annuum*) are caustic and irritating. In such cases, olive oil should be applied to the irritated skin part.

If essential oils are used in a mixture, their effectiveness increases. However, in case of a side effect, it is not known which plant the side effect comes from. We do not have enough information about whether they will transform into a different

structure when mixed with each other. Solving the problem may also become difficult. For this reason, it is preferable to use essential oils individually. In case of a side effect, it will be beneficial to stop the application for one day.

Since there are many different minerals and compounds in essential oils, using them in small amounts can fill the missing minerals in the body, but excessive consumption can have a toxic effect. Therefore, using them for 1-3 months is sufficient for treatment. It is recommended not to use them for more than three months. They can be used again after a one-two month break.

The idea of using essential oil by diluting it with olive oil is wrong, it does not provide the desired benefit. Olive oil is the antagonist of essential oil. If there is irritation in the throat due to the consumption of essential oil, the person should drink olive oil. Olive oil with lemon juice may be more beneficial.

Due to its antimicrobial effects, long-term and intensive use can damage the intestinal and stomach flora. Bacteria called intestinal microbiota live in our intestines. This microbiota plays a role in the functioning of our digestive system and the strengthening of our immune system.

There are also volatile oils that have unpleasant odors. Such as the plant *Teucrium scordium*, fish oil, and sheep tail fat. Such materials are very rare. However, they also have medical importance. Since volatile oils used internally in excess of the dose are not pleasant, they can be used as emetics. They should be used less and should be taken on a full stomach. Among fish, trout is the most used for medical purposes. Perhaps trout is the most consumed. Despite this, its oil is not consumed with appetite. The smell of its oil is not very pleasant. It is recommended to drink fish oil for goiter and tonsil diseases, but many people do not want to drink fish oils.

The use of volatile oils in babies is risky. They should not be used or should be used very carefully. Very, very carefully should be used in sensitive organs such as eyes, ears, and groin areas.

Salt and volatile oils should not be preferred because the oil's properties are impaired when used together.

Poor quality and stale volatile oils or oily waters can be added to cattle feed and used. Or it can be used to protect wild animals from agricultural products, etc. It is not suitable for therapeutic use.

Methods of using essential oils:

Use as food:

Drinking essential oils and oily water: For an adult, it is recommended to take at most a few drops of essential oils, half a cup of oily water per day, and one cup/day of oily water. It is recommended not to drink another oil or oily water on the same day; it is recommended to change the medical supplies as the day changes.

By making food, jam, molasses, paste and eating or wrapping: The plants in this group contain little volatile oil. Aromatic plants can also be used to add aroma to food: Adding basil/Fesleğen, Reyhan (*Ocimum basilicum*) branches while boiling grape/Asma, Tevek (*Vitis vinifera*) molasses, adding quince fruit slices to grape molasses, adding black pepper (*Piper nigrum*), red pepper/Susam (*Solanum annuum*) powder to soup, adding parsley/Maydanoz in Turkish (*Petroselinum crispum*), rocket/Roka (*Eruca vesicaria* subsp. *sativa*), cress/Tere (*Lepidium sativum*), mint/Nane(*Mentha piperita*) to salad, etc. Strained honey is usually used in making the paste, it is eaten and rarely wrapped around the problematic/diseased limb. Celery/Kereviz (*Apium graveolens*) meal, Quince/Ayva(*Cydonia oblonga*) jam, Pine /Çam (*Pinus* spp.) cone/Andız in Turkish molasses(*Juniperus drupa*'s molasses) and halva, Carob/Keçiboynuzu (*Ceratonia siliqua*) molasses, Pumpkin/Kabak (*Cucurbita moschata*) molasses, Beetroot/Pancar (*Beta vulgaris*), Rosehip/Kuşburnu (*Rosa* spp.) syrup and marmalade, Walnut/Ceviz (*Juglans regia*) sausage, Mulberry (*Morus alba*) pulp, İncirkarma (mixture of grape molasses and fig fruit), etc.

By pounding/chewing and eating: *Pistacia* spp. (*P. terebinthus, P. khinjuk, P. lentiscus* etc.) fruits are pounded and crushed in a mortar, brought to the consistency of halva, and then placed between yufka bread and eaten as a wrap. Carob (*Ceratonia siliqua*) fruit, poppy (*Papaver somniferum*) seed, sesame (*Sesamum indicum*) seed and black cumin (*Nigella sativa*) seed are also like

this, they are pounded and crushed and eaten in small amounts from time to time. Clove (*Syzygium aromaticum*) buds are served after meals in restaurants. Bad breath is eliminated by chewing.

By making coffee: Black cumin coffee (in Burdur), Dibek coffee (in Diyarbakır), Menengiç coffee (in Toros villages), Turkish coffee (all over the country), Kenger coffee (in the Eastern Anatolia region) are made and consumed by the whole population. 1-3 cups can be drunk per day.

By drinking tea: Parsley, fennel, rosehip, rose, mint-lemon, thyme, sage, olive leaf, fig leaf, ginger, laurel, linden, etc. can be made into tea and drunk for pleasure or for medicinal purposes. Teas can be prepared in 2 ways: by boiling (decoction) and by brewing (infusion). Thin and perishable organs such as leaves are brewed. Hard to break organs such as rosehip fruit, fennel seed, ginger rhizome can be prepared by boiling tea. A few cups can be drunk per day.

Methods of preparing tea from plant-based materials:

Infusion: Put it in boiling water, disconnect it from the fire and wait for 5 minutes. It should wait for a maximum of 10 minutes. Then it can be served.

Decoction: Put enough medical material in boiling water and boil it for about 5-10 minutes. Then it can be served.

Smelling (inhalation) and Steam:

By steaming: Volatile oil or oily water is added to the hot water that will create steam and mixed with the steam. It is intended to disinfect the air. Lung patients can also inhale this steam. Smells quickly enter the body through the respiratory tract and relax the brain and lungs. It increases bioactivity by activating some hormones.

By adding to bath water: A bath is taken by adding essential oil or oily water or plant parts to hot water. By adding essential oil to a container full of hot water and inhaling, it is used in the treatment of colds and lung diseases by taking a bath. This method is called 'Buğu' among the public. Chamomile oil can be used against nasal congestion; eucalyptus oil against sinusitis; juniper oil against lung diseases; sage, lavender and rose oil against mental distress. All essential oils can be used by adding to bath water against infectious diseases.

By making incense/Tütsü: It means burning pine (Pinus spp.) resin, sweetgum (Liquidambar orientalis) balsam, peganum harmala (harmal) seed etc. on red embers and releasing its scent into the atmosphere. It is intended to disinfect the air in places where people gather. It is frequently used in funeral ceremonies, weddings and mosques.

By spreading odor into the atmosphere: Buhur.

Applying to the skin and wrapping (topical): Essential oils can be easily absorbed by the skin. After application, it should be covered with stretch film and kept like this for a few hours.

Sticking a plaster to the back for colds, wrapping a poultice around the knee joints for rheumatic diseases, putting drops of essential oil on cotton and placing it on the aching tooth for toothaches, applying essential oils to the skin as a disinfectant and to the head for hair growth, etc.

Massage application: It is one of the therapy methods applied using volatile oils found in plants. In massage application, volatile oils must be diluted with fixed oils (bitter almond oil, olive oil etc.). For example, tea tree (*Melaleuca alternifolia*) oil is used for its healing properties, sage (*Salvia* spp.) for its pain-relieving properties, and rose (*Rosa damascena*) oil for its anti-aging, antiviral and antiseptic properties.

Chemical and physical properties of volatile oils:

They are oils obtained from the leaves, flowers, bark, seeds and roots of plants by steam distillation or extraction, evaporate at room temperature, are generally in liquid form, mostly colorless, pale yellow, red or blue, and have a specific gravity of less than 1 g/cm^3.

Table 1: pH values of some plants (measurement date: February 2025).

Product name	Name of plant in Latin	Production		pH
		Date	Organ(-s)	
Black Cumin Oil/ Çörekotu yağı	*Nigella sativa*	2024	Seed	9,12
Juniper essential oil/ Ardıç yağı	*Juniperus excelsa*	2017	Leaf, stem, cone, wood	2,60
Basil essential oil hidrosol/ Fesleğen yağlı suyu	*Ocimum basilicum*	2024	Above ground parts	5,40
Rosehip marmalade/ Kuşburnu marmelatı	*Rosa* spp.	2022	Fruit	3,20
Rosehip vinegar /Kuşburnu sirkesi (production without salt, with honey)	*Rosa* spp.	2022	Fruit	3,65
Molasses/Melas (from sugar beet)	*Beta vulgaris*	2017	Tuber	7,5
Pine tar/Püse	*Pinus brutia*	2017	Cone, wood	4,20

Ecological and Geographical Characteristics of Essential Oils:

Essential oil plants are generally of Mediterranean region origin. The gene center of the Labiatae, Umbelliferae and Lauraceae families is the Mediterranean region. The gene center of most genera belonging to the Rosaceae family is the Mediterranean region, and the gene center of the *Rosa* genus is the Lakes Region. In the geography we are in, aromatic plants and essential oil plants are the majority in countries bordering the Mediterranean.

Essential oil plants in the country generally like high altitude arid areas. The quality of those grown in fields and wetlands is poor, but their yield is high. If it is to be used for medicinal purposes, the herb should be obtained from those grown in natural environments. They like cold, dry and hot climates. They synthesize oil to protect from cold, and to prevent water loss from heat. The smell of some of them attracts insects and flies and is effective in pollination and spread. Scented plants are usually pollinated by insects, fertilized and spread. In addition, some essential oil plants repel insects such as flies, bugs, ticks, fleas and scorpions from the area. In this respect, they are important public health materials.

Essential oils are generally obtained from the following organs of the plant:

Essential oils obtained from flowers and inflorescences: Rose (*Rosa* spp.), Carnation (*Syzgium aromaticum*), Lily (*Lilium* spp.), Tulip (*Tulipa* spp.), Jasmine (*Jastminum* spp.), Honeysuckle (*Lonicera* spp.) etc.,

Essential oils obtained from leaves: Laurel (*Laurus nobilis*), Olive (*Olea europea*), Violet (*Viola* spp.),

Essential oils obtained from aboveground parts: Thyme (*Thymus, Thymbra, Origanum, Satureja* spp.), Mint (*Mentha* spp.), Lavender (*Lavandula* spp.), Sage (*Salvia* spp.), Sage (*Sideritis* spp.), Lemon balm (*Melissa officinalis*), St. John's wort (*Hypericum* spp.), Chamomile *(Anthemis, Matricaria, Tanacetum* spp.), Valerian *(Valeriana* spp.), Parsley *(Petroselinum crispum*), Cress (*Lepidium sativum*), Fennel (*Foeniculum vulgare*), Dill (*Anethum graveolens*) etc.

Essential oils obtained from fruits and fruit peels: Citrus fruits (Rutaceae), Laurel (*Laurus nobilis*), Black pepper (*Piper nigrum*) etc.

Plants from which essential oil is obtained from their seeds: Sesame (*Sesamum indicum*), Cumin (*Cuminum cyminum*), Fennel (*Foeniculum vulgare*), Dill (*Anethum graveolens*), Anise (*Pimpinella anisum*).

Those from which essential oil is obtained from underground stems (bulb, rhizome, corm, stolon etc.): Onion (*Iris, Allium, Merendera, Crocus*), Ginger (*Zingiber officinale*), Lily (*Lilium* spp.), Iris (*Iris* spp.) etc.
Those from which essential oil is obtained from stem and rhizome barks: Cinnamon (*Cinnamomum camphora*),
Kozalak ve taze yaprakları uçucu yağ elde edilenler: Gymnospermae taxa (*Pinus, Juniperus, Cupressus* spp.) etc.
Those from whose wood essential oil/tar is obtained: Gymnosperms (Pine/*Pinus*, Juniper/*Juniperus,* cedar/*Cedrus libani,* Fir/İledin/ *Abies,* Cypress/*Cupressus* spp. etc.).
Those from whose resin and balsam essential oil is produced: Pine/*Pinus* spp. (turpentine), Fir,/İledin/*Abies,* Sweetgum/*Liquidambar orientalis,* Gum/Mesteki tree/*Pistaica lentiscus* var. *chia.*

These characteristics determine the harvest period of the plant. For example, if the rhizome, root, bulb, tuber will be used, it should be obtained and distilled at the end of the plant development season, usually in October and November. If the inflorescence or flowers will be used, it should be during the plant's blooming period or when the flowers open (such as May-June). If the fruit peel will be used, it should be harvested when the fruits are harvested; if the cones will be used, it should be harvested and the seeds should be extracted, etc. Since old seeds, old flowers, old fruits lose their oil day by day, the desired quality cannot be obtained. The products obtained until the collected material is distilled and after distillation should be stored in separate places. For example, thyme should not be placed in the storage where rose flowers are placed. Their oils, oily waters(hydrosols) etc. should not be stored in the same place.

Various raw material products obtained from essential oil plants:
Fine oil (essential oil), oily water, underwater water, concrete, absolute (essence), powder, tar/pese, turpentine, gum, resin.

Quality determination: Essential oils are produced ecologically and their physical and chemical analysis is performed in a laboratory. Sensory analysis is performed by up to 30 people and the answers given are recorded.

In this way, the quality parameters and variations of unknown essential oils or samples obtained under laboratory conditions can be determined. Standards can be established. For example, synthetic rose water and organic rose water; rose water obtained from flowers produced by conventional agriculture can be distinguished. The difference between lavender essence and lavender oil, oily water; production date (shelf waiting time) and production conditions can be easily understood. These data can be used as a guide/reference and used in the comparison of unknown oils. Deviations in this comparison should not exceed 10%. If it passes, the possibility of being from the same main mass is strengthened, but it cannot be the same species.

DISCUSSION AND RESULTS

A significant portion of essential oil plants are spice plants. They are used in small amounts as food and are appetizing. The non-aromatic part is not used as food and can be extracted and its essential oils used for medicinal purposes.

The use of some essential oils in treatment requires experience and may have many side effects. For this reason, herbalists (Attar in Turkish) and those who sell to the public commercially prefer to dilute burning, irritating essential oils with other essential oils and sell them. This means that the product is spoiled and its effect is reduced. Like using thyme oil mixed with olive oil.

Essential oil plants are generally collected from nature. The consumer always prefers the one collected from nature. These products are more effective due to their mineral diversity. However, thyme cultivation is popular in Denizli, İzmir and İstanbul, Anise in Burdur, and Oil Rose in Isparta and Burdur provinces. Synthetic drugs and chemical fertilizers should not be used in production. It can be used for cosmetic purposes, and if it is to be produced for medical purposes, the growing conditions should be ecological.
In addition, certification and registration are required in terms of standardization of the varieties to be used in production. The purity and

quality of essential oils are very important in international trade. For this reason, the minimum standards of each product should be determined and inspected by an official institution. For this reason, some problems are experienced in import and export, causing problems between countries and companies. Türkiye, as a country that exports a lot of raw materials, should establish such an official organization. This organization should be run by employing experts from other countries. Experts should be selected from the countries with the most trade or company representatives, and the analysis result and product classification decision given should be acceptable in the same way by the other country. In this way, inspection procedures at customs and problems regarding the return of the goods to be sent can be solved.

Some plants have become depopulated due to excessive collection from nature. Collection can be limited for the continuation of their species.

Since the prices of some essential oils are very high, cost is reduced by adulteration, that is, dilution with cheap oils. Inspections must be strict.

Thin oil is more fluid than cold pressed oil; tar is generally more dense/viscous and heavy than all oils. By looking at its fluidity, it can be easily understood from the physical properties of the oil what kind of production it was obtained from. Cold-pressing is generally done from seeds and fruits, distillation from flowers and leaves.

Essential oils can evaporate completely at room temperature. If there is some 'wax' left at the bottom of the oil after evaporation, these are the hydrocarbon group. They have little medical importance. Hydrocarbon group chemical compounds weaken the quality of the oil.

Essential oils do not spoil, on the contrary, they are chemical substances that prevent spoilage. For this reason, oily aromatic waters(hydrosols) are more effective than essential oils and oil-based waters for internal use for therapeutic purposes.
In this effect, it is more difficult to cheat on oily waters, and if cheating has been done, it is easy to understand; since the volatile oil is strong, the cheating cannot be easily understood with sensory analysis, but it can be understood with chemical analysis. All herbal volatile oils have a strong energy and a feature that increases blood flow rate and nourishes the body in terms of minerals. They are all antimicrobial. The main effect of volatile oils is to accelerate blood flow, thus increasing the nutrition of the problematic area and protecting it from infection. For this reason, there are those who resort to using one of the volatile oils if the other is not available. It is certain that such a wrong application will have negative effects. However, it can also have beneficial aspects.

If oily plant waters or essential oils are to be produced for therapeutic purposes, the production technique is very important. If the flowers are to be used, they should be harvested in the early hours, if the underground part is to be used, they should be harvested at the end of the vegetation period, if the herb is to be harvested, they should be harvested at the beginning of flowering. Stainless steel cauldrons or tinned copper cauldrons should be used in distillation. Energy should be provided by wood fire. Oak and juniper trees should be preferred. Pine, fruit trees, coal, fuel oil, electricity and natural gas should not be preferred as energy sources. Distillation should be slow, high-quality products cannot be obtained from accelerated distillation. The raw material of the first harvest, the distillation made in the first hour of distillation is super quality. The harvest of recent times and the end of distillation are low-quality products. The quality of the raw material coming from nature is higher than field production.

Essential oils are usually yellow in color, while lavender and lily oils can be bluish, and some types of mint can be reddish. Basil oil is black or brown. If rapid production is done at high heat, the color of the product may not be white. It will be colored.

If there is deterioration in an oily water for healing purposes, that is, if molds have formed in the oily water, it means that there is no volatile oil left in the material. Its taste has deteriorated and its color has darkened. It should not be used in any way. Molds can be of various types, and their colors may change accordingly. At first, they

form sparse hyphae, then a small cluster and are floating in the water. As they multiply, mold micelles settle to the bottom. Mold fungi can live in all kinds of acidic and basic environments. However, they mostly develop in acidic environments. As mold fungi multiply in the product, a moldy smell is felt. Under-oil waters deteriorate more quickly. Because only the oil that cannot be removed remains in the product, that is, the amount of oil is very small. Molds start to decompose the remaining organic matter in a short time.

Volatile oils and oily waters should be stored in dark-colored and thick glass containers. The amount to be used should be in a small container and with a dropper to prevent oxidation (deterioration). Storage containers should be new and used for one material or used only once. If the container is insufficient, the container of the lightly scented material can be used for the heavy/strong scented one. The opposite is not appropriate. In other words, rose water or oil should not be put into the container where thyme oil/water is placed. The thyme scent passes into the rose water and spoils its composition. The same applies to the distillation process. Thyme can be distilled after rose distillation. However, if rose distillation is done after thyme distillation, the rose scent will be spoiled. After thyme distillation, the boiler should be thoroughly washed and ventilated for a few days. Distillation locations should be different and even distillation boilers should not be placed in the same place. The storage locations of the products should also be different.

Let us state again that the treatment varies according to the temperament. Medicines and foods also have temperaments (hot, cold, dry, moist). The treatment of the disease is to correct the disturbed humor balance (Budak, 2022; Akpolat, 2025). Treatment is only possible by correcting the disturbed humor by using drugs that are opposite to its qualities (Akpolat, 2025). Situations such as the continuation of anger or resentment, establishing long-term friendships, having a strong memory, and having an excessive imagination are signs that the temperament may be dry. While a strong heart and a wide chest indicate the heat of the temperament, a weak heart and a feeling of tightness in the chest indicate that the temperament is cold. Not being afraid or frightened by anything indicates that the heart is strong, and being afraid and shy about different events and objects indicates the weakness of the heart. A person's temperament can be easily understood according to the characteristics of the heat, cold, moisture and dryness of the foods a person consumes. For example, if the organs are immediately warmed up with warming foods such as thyme, ginger and cloves, it is concluded that the temperament of those organs is hot. However, if a rapid cooling occurs in the organs when cooling foods such as carrots, watermelon, cherries, salep and raisins are consumed or when objects that give a feeling of cold are used, it is concluded that the temperament of that person's organs is cold. Because everything affects its own kind more quickly.

The color changes, darkness of color, and excessive odor (unpleasant) seen in metabolic wastes excreted from the body through urine, feces, and sweat indicate the warmth of a person's temperament. The opposite signs; for example, the lack of color change in feces, its hardness, and the lack of odor are evidence of a cold temperament. Situations such as sudden anger, sadness, intelligence, common sense, courage, good intentions, health, moral maturity, fast action, and hard work are signs of a warm temperament. The opposite situations may also indicate that the temperament may be cold. The science of temperament must definitely be taken into consideration in treatment. The foundation of Uyghur medicine is based on the science of temperament.

REFERENCES

Altıntaş, A. (2009). *Gül, gül suyu: tarihte tedavide ve gelenekteki yeri (Rose hydrosol: its place in history, treatment and tradition*). Maestro Reklamcılık, İstanbul.

Akpolat, T. (2025). Ortaçağ tıbbi, tedavi ve uygun bitki seçimi. https://tekinakpolat.com/ortacag-tibbi-tedavi-ve-uygun-bitki-secimi/

Baytop, T. (1984). *Türkiye'de bitkiler ile tedavi (Treatment with plants in Türkiye).* İstanbul Üniv. Yay. No: 3225; Eczacılık Fakültesi Yay. No: 40, 520 s.

Bilgin, Ö. (2019). Is temperament theory of İbn Sina only a physiological problem? *Journal of International Social Research,* 12(65), 580-599.

Budak, M. (2022). *A review on temperaments and treatment traditional İslamic medicine,* T.R. İstanbul Sabahattin Zaim Univ. Graduate Institution of Education History and Civilization Studies Dept., İstanbul, 112 pp.

Ceylan, A. (1997). *Medicinal Plants-II: (Essential oil plants).* Ege University Faculty of Agriculture Pub. No: 481, 306 pp.

Davis, P.H. (1965-1988). *Flora of Turkey and East Aegean Islands,* I-IX, Edinb. Univ. Press.

Faydaoğlu, E. & Sürücüoğlu, MS. (2011). The use of medicinal and aromatic plants from past to present and their economic importance. *Kastamonu University Forestry Faculty Journal,* 11(1), 52-67.

Göktaş, Ö. & Gıdık, B. (2019). Uses of Medicinal and Aromatic Plants. Bayburt Univ. Journal of Fen Bilimleri (BUFBD) 2(1), 136-142.

Havla, S. & Pukka, L. (1987). Studies on fertilization of dill (*Anethum graveolens* L.) and basil (*Ocimum basilicum* L.). *Journal of Agricultural Sciences in Finland*, 59, 11-17.

Karadoğan, T., Özçelik, H., Baydar, H. & Çarkçı, K. (2000-2003). *Determination of plant species belonging to the Lamiaceae family in the Lakes Region and determination of their medicinal and aromatic values.* Project number: TÜBİTAK-TOGTAG-2599, Ankara.

Kızıleniş, G. & Aykıt, A. (2020). The possibility of the change of habits within the framework of Temperament Theory in Ikhwān al-Ṣafā, *Eskiyeni,* 41, 515-540.

Özçelik, H. (1987). Local names and uses of some useful plants growing naturally in the Akseki region. *DOĞA TU Botany J.,* 11(3), 316-321.

Özçelik, H. (2015). Our medicinal plants and our region. *Anamas J.,* 3(3), 3-5.

Özçelik, H. & Koca, A. (2021). Türkiye's rose taxa for economic purposes (Rosa L. spp.) and investigations on their classification and productions, *Biological Diversity and Conservation,* 14(2), 292-324.

Özçelik, H. & Kündük, Ş. (2021). Preliminary Trials on Medical Gum Production. *Süleyman Demirel Univ. Journal of Natural and Applied Sciences.* 25(2), 185-194.

Özçelik, H. (2023). Functional foods used for medical purposes in Türkiye. *Acta Scientific Nutritional Health,* 7(3), 3-16.

Özçelik, H. & Demir Yaylalı, M. (2024). Basil (Ocimum L.) Genus in Türkiye from various aspect. *Bio-Science Research Bulletin,* 40(2), 79-96.

Öztürk, M., Özçelik, H. (1991). *Doğu Anadolu'nun Faydalı Bitkileri (Useful Plants of East Anatolia),* SİSKAV (Siirt, İlim, Spor, Kültür Vakfı), Semih Ofset Basım Tes. Ankara.

Özçelik, H., Korkmaz, M., Özgökçe, F., Ünal, M. & Sakçalı, S. (2013). Ecological and geographical characteristics of Turkish roses (*Rosa* L. spp.), *Süleyman Demirel Univ. Faculty of Arts and Science, Journal of Science,* 8(1), 9-21.

Tabata, M., Honda, G. & Sezik, E. (1988). A Report on traditional medicine and *medicinal plants in Turkey*. Faculty of Pharmaceutical Sciences, Kyoto Univ. Japan.

Tonbul, S. &Altan, Y. (1989). Various usages of some plants in Elazığ province, *J. of Fırat University,* 3, 267-278.

Tümen, G. (1989). Labiatae family as medicinal plants from balıkesir district in Turkey. *Uludag University Education Faculties Journal,* 4(2): 7-12.

Uçkun, A. (2024). Geleneksel Uygur Tıbbı: Siyer, Nebevi Şuurundan Medeniyet İnşaasına. https://www.siyerdergisi.com/gelenek sel-uygur-tibbi/

Yeşilada, E. &Sezik, E. (2003). A survey on the traditional medicine in Turkey: Semi-Quantitative Evaluation of the Results *Recent Progress in Medicinal Plants 7: Ethnomedicine and Pharmacognosy, II,* 389-412.

****