MEDICINAL AND AROMATIC PLANTS AND GOOD LIFE

Bilge KEYKUBAT
İZMİR Commodity Exchange, R&D Department

Kasım 2016

Translated by: Semih ÇATAK
İZMİR Commodity Exchange, Corporate Communications Department

MEDICINAL AROMATIC PLANTS AND GOOD LIFE

The theme '**Good Life**' stands out in today's world where healthy and sustainable environment and life get more and more important day by day.

What is meant by good life is a healthier, better and longer life...

In this context, natural and herbal nutrition comes out.

Plants provide the oxygen and nutrients necessary for a sustainable life, and protect our health.

With the beginning of human life on earth, the use of plants for treatment has also begun. From the first day on, humans have benefited from the healing power of plants for the sake of "Good Life".

Many drugs used in today's modern medicine are derived from plants.

Herbal abundance in our country stems mainly from the fact that it is located at the intersection of three phytogeographical regions; that it is a bridge between the florae of Southern Europe and Southwest Asia and that it is a centre of origin and differentiation of many breeds and sections. In addition to hosting a large number of medicinal and aromatic plants, this rich flora is also the gene centre for most of these plants. However, we can say that this abundance in plant varieties is not sufficiently exploited.

The plants present in the natural flora are used by people generally as food, tea, spices, paint, insecticide (pesticide), resin, gum and for therapeutic (Phytotherapy: treatment with medicinal plants) purposes, treatment of animal diseases, use of their essential oils and in cosmetic industry.

Turkey is among the leading countries in the trade of medicinal and aromatic plants as it is the supplier of raw materials for many important sectors such as herbal medicines, plant chemicals, food additives, cosmetics and perfume and paint industries.

Although these plants are used in the field of alternative medicine (used in place of medical treatment) in today's world, where they should actually be made use of is the field of complementary medicine (used together with medical treatment).

Echinacea (Purple Coneflower)

HISTORY

That the use of plants for treatment is as old as the history of mankind has been revealed by the examination of ancient cities and remains. In a grave which was discovered during excavations **in Shanidar Cave** located south of Hakkari in Northern Iraq in 1957 and is believed to belong to a shaman, various plant species such as yarrow, canary grass, rose mallow, blue knapweed, mallow and sea grape were found. The residues found in the grave dating back to 60 thousand years ago have been accepted "for now" as the **first data** related to the beginning of human-plants relationship.

These plants that are postulated to have been put in the grave in a society, which began to bury the dead, in contemplation of their use by the deceased when she returns to life are also thought to be an indicator of that they started to be classified as edibles and medicinal plants.

One of the oldest prescription patterns known in history belongs to **the Hittites**.

The discovery of **ancient Egyptian** medical papyri expanded information on Egyptian medicine and drugs. The most important one of the papyri related to medicines and treatment is the Ebers Papyrus estimated to have been written in around 1550 B.C. This papyrus was found between the legs of a mummy in the tomb of El Assassaif in Thebes. There are records of 77 herbal, animal and mineral drugs and more than 800 prescriptions. The prescriptions mostly name prickly lettuce, juniper berries, henbane, crocus, mustard, castor oil, fig, gentian, flaxseed, coriander, elderberry, cortex granati fructuum, herba absinthii, pistacia, aloe, onion, cinnamon, turpentine and grape.

It is indicated by researchers that the first written sources about medicinal plants belong to **Sumerians and the Chinese**. The written sources belonging to Sumerians are in the form of tablets and date back to 4000 B.C. while those belonging to the Chinese date back to 3700 B.C.

The remains discovered show that there were about 250 herbal drugs used in the **Mesopotamian civilization** period and that the prescriptions inscribed on the tablets belonging to that period mostly included mandrake, henbane, helleborus, sweet flag, poppy, mustard, thyme, tragacanth, gallnut, mint, cortex granati fructuum, fennel, saffron and turpentine oil.

It is estimated that there were about 600 medicinal plants used in treatment while around 4000 medicinal plants were used during the Arabian-Moroccan civilization period.

The five-volume pharmacopoeia of ***Dioscorides*** called ***"De Materia Medica"*** elaborates on 500 medicinal plants and the use of medicines that can be obtained from them. It is a nice and exciting fact that most of these plants also grow in Anatolia.

Anatolia, which acts as a bridge between Asia and Europe and is an important loop of migration and trade routes has played an important role in the trade of herbal medicines and spices for hundreds of years.

While people initially used the plants that grew in their surroundings for treatment, they began using all kinds of other plants growing in different parts of the world for treatment in parallel with the development of trade.

Some Myths and Philosophies related to Medicinal and Aromatic Plants

Sage: It is known that the Romans regarded the sage as sacred and collected the sage with due diligence as in a special ceremony. There is a belief in the Arab world that those who grow sage do not die. The sage representing immortality, wisdom and protection is also one of the symbols of Virgin Mary in Christianity.

Anise: Today, eating cakes especially in birthdays and weddings is a common habit. This habit actually dates back to the Roman period. The Romans used aniseed, which they used abundantly to sweeten their food, in cakes they had on special occasions, holidays and in ceremonies.

Juniper: Juniper is a respectable tree among Turks. There is widespread belief in Central Asia that the juniper tree has a divine, magical power. Juniper represents getting cleaned using fire. It was believed that evil spirits were scared of the juniper tree and people sought the help of the juniper tree to ward off evil creatures such as jinn, devil etc. The Central Asian Turks planted the juniper tree especially in the graveyards. In Anatolia, the juniper tree still maintains the importance attached to it for hundreds of years. Both the ancient Uighur inscriptions and the Epic of Manas mention the juniper tree.

Rosemary: Rosemary has been known to stimulate the mind and strengthen the memory since the ancient times. It is known that in ancient Greece the students kept their minds fresh by wearing crowns made of rosemary leaves or carrying the rings made of this plant on their necks. This plant, which was very popular in ancient Greece and Rome, was accepted as a symbol of loyalty. It was used symbolically in weddings and ceremonies in ancient times. Even today, planting rosemary that is believed to protect and bring good luck around houses is very common in many cultures.

Bay: The bay tree was dedicated to Apollo whose love was not reciprocated in ancient Greece. Many other valuable people, famous poets and heroes apart from Apollo crowned their foreheads with bay leaves. The Roman Empire had not yet adopted a polytheistic belief in the early years of its founding and had a different understanding of religion. In this belief system, the Romans were trying to manipulate nature through various worships. For example, every year, on the first day of March, they hanged a bay branch at the door of their houses. They believed that they would thus have an abundant and productive year. In Chinese mythology, the bay is known as a tree rich in spiritual material. The red bay tree is evergreen as it embodies the essence of life, and it is thus thought to heal all kinds of sufferings.

Thistle: It is a plant symbolizing the sin and the suffering of Jesus in Christianity. In addition, it is also known to represent austerity and grievance.

Basil: In ancient Greece, the basil did not connote nice things to people. It was known as the symbol of misfortune and ill luck. However, in Indian culture, it was believed to bring good fortune and protect from the evil, contrary to the ancient Greece. Another known effect of basil throughout history is that it enhances sexual strength.

Linden: Linden is in many legends about Zeus and Hermes.

Nettle: This plant was the most important thing that protected the Roman soldiers when they were fighting in the extreme cold. The Roman soldiers managed to get less affected by cold weather conditions by rubbing the nettle on their bodies.

Thyme: In Greek mythology, the thyme is told to have started growing on the spot where the tears of Helen of Troy, who sparked the Trojan War, fell. Thyme is known as the plant of nobility and courage in ancient Greece. The practice of giving presents to the brave men going to war is told to have originated from this belief. Moreover, fuming thymes in front of the doors of the rich was an indicator of power and nobility. It is also known that Roman soldiers bathed in thyme to gain courage.

Hemp: In China and Iran, it was believed that a pill made of the seeds of hemp that is a plant that has been grown since ancient times prolonged the lifetime and granted the people the power of prophecy together with the sense of pleasure it created.

Saffron: The Hittites called the saffron 'A-Zupiru' and benefited from it as medicine. The trade of saffron was very important during the Greek, Roman and Ottoman periods. In his Geographica, Strabo wrote that in the Roman period, the best saffron grew in the present-day Silifke near 'Hell Cave'. The Syriac monastery called Deyrulzafaran located near Mardin in Southeastern Anatolia today took its name from the saffron plant. Deyr means monastery while zafaran means saffron.

PRODUCTION OF MEDICINAL AND AROMATIC PLANTS

Classification of Medicinal and Aromatic Plants

Before moving on to the production of medicinal and aromatic plants, it should be noted that the medicinal and aromatic plants have been classified in different ways, but the following is the most common form of classification:

- **Chemical Classification**

It is the sort of classification made on the basis of the active matter in the body of the plants. It is more often used in pharmacognosy.

1. Plants that produce Essential Oil : Anise, Parsley, Mint
2. Plants containing bitter substance: Vermouth, Gentian
3. Plants containing glycosides: Digitalis, Scilla
4. Plants containing saponin: Gypsophila, Saponaria, Hedera Helix
5. Plants containing alkaloids: Datura, Atpora, Poppy, Nicotiana
6. Plants containing flavonoid: Silybum, Verbascum
7. Plants Containing Tannins: Hammelis, Quercus

- **Classification by Type of Consumption and Use**

1. Soft Drinks, Herbal Teas and Stimulating Plants: Tea, Coffee, Tobacco
2. Spice Plants: Black pepper, Mustard, Thyme
3. Medicinal Plants: Digitalis, Atropa
4. Perfume Plants: Lavender, Rose
5. Gum and Mucilage Plants: Acacia, Astragalus, Plantago
6. Resin Plants: Sweetgum, Ferula
7. Tannin Plants: Rhus, Oak
8. Dye Plants; Rubia, Bixa, Alkana Tinctorium
9. Insecticide Plants: Phyretrum, Anabasis, Neem
10. Wax Plants: Jojoba, Myrica

Secondary Metabolites

Plants produce a wide variety of organic compounds that do not have any functions during their growth and development. These compounds are called secondary metabolites, secondary products or natural products.

Secondary metabolites generally do not have direct roles in photosynthesis, respiration, dissolved matter transfer, transport, protein synthesis, digestion and the formation of carbohydrates, proteins and lipids. Secondary metabolites have a limited distribution in the plant kingdom.

They are distinguished from the primary metabolites (amino acids, saccharides etc.) with these characteristics. While primary metabolites are present in all plants, secondary metabolites are found only in some plants.

Secondary metabolites are divided into three main groups:		
A- Terpenes	**B- Phenolic Compounds**	**C- Nitrogen Compounds**
1- Essential Oils	1- Phenylpropanoids	1- Alkaloids
2- Cardenolides - Glycosides	2- Coumarins	
3- Saponins	3- Benzoic Acid Derivatives	
4- Steroids	4- Lignin	
5- Resins	5- Anthocyanins	
6- Rubber	6- Flavonoids	
7- Gibberellins	7- Tannins	

Latin and Turkish names of some herbal drugs

Drugs	**Turkish Names**
Cortex Rhamni Franguale	Barut ağacı kabuğu
Flos Tiliae	Ihlamur çiçeği
Folium Lauri	Defne yaprağı
F. Salviae	Adaçayı yaprağı
F. Rhus Coriariae	Sumak yaprağı
Fructus Anisi	Anason meyvesi
F. Capsici	Kırmızı biber
F. Cumini	Kimyon
F. Mahalep	Mahlep
F. Rhamni petiolari	Cehri
F. Vaccini (artosthapyli)	Ayı üzümü meyvesi
Herba Origani	Mercanköşk
Gemmae	Kebere
Capparidis	
Oleum Rosae	Gül yağı
Radix Cichoru intybi	Yabani hindiba kökü
R. Liquiritae	Meyan kökü
R. Rusci aculeati	Sıçandikeni kökü
R. Saponariae alba	Çöven kökü
Semen Colchici	Acı badem otu
S. Papaveris	Haşhaş tohumu
S. Sinapis	Hardal tohumu
Styrax Liquidus	Sigala yağı
Succus Liquiritae	Meyan balı
Gummi	Kitre zamkı
Tragacanthae Tubera Salep	Salep yumrusu
Vatonea	Palamut kadehi

WORLD

Total number of plants in the world is thought to be 320 thousand. 270 thousand of all these plants are indicated to be known. Of these 270 thousand plants, the experts claim that 70 thousand are utilized while 3 thousand are used as sources of food, 25 thousand for therapeutic purposes, 5 thousand for industrial purposes and 15 thousand as ornamental plants.

The medicinal and aromatic plants that are mostly traded in the world are **coffee, sesame, garlic, red pepper, allspice, black pepper, green tea, mustard seeds, poppy seeds, ginger, salep and cumin**.

Distribution of these plants on the earth is not even. Tropical regions are known as the richest places in terms of species diversity. The number of species decreases as one moves towards the poles. The richest places in terms of species are the northern parts of South America and the archipelago of Indonesia.

The most reliable and healthy data on world trade and value are obtained from the International Trade Statistics Database (UN Comtrade) in Geneva.

The USA, the UK, Germany, France, the Netherlands, China and India which are among the countries that import medicinal and aromatic plants are also the exporter countries of many plants in the world.

It is stated that the number of popular medicinal plants used in the world is around 4-6 thousand, and the number of species traded is around 3 thousand.

Number of Medicinal Plants used by Countries in the World

Countries	Number of Medicinal Plants
China	4.941
India	3.000
The USA	2.564
Vietnam	1.800
Thailand	1.800
Pakistan	1.500
Malaysia	1.200
Korea	1.000
Nepal	900
France	900
The Philippines	850
Bulgaria	750
Sri Lanka	550
Jordan	363
Hungary	270
TOTAL	**22.388**
Other	49.612
WORLD	**72.000**

Source: **Schippman et al. 2006**

WORLD PRODUCTION RANKING IN SOME MEDICINAL AND AROMATIC PLANTS (2013)									
PRODUCT	PRODUCTION (1,000 tons)	1. COUNTRY		2. COUNTRY		3. COUNTRY		TURKEY	
		NAME	%	NAME	%	NAME	%		%
Garlic	24.255	China	79%	India	5%	S. Korea	1%	17th	0,4%
Dried Pepper	3.459	India	39%	China	8%	Peru	4%	27th	0,4%
Buckwheat	2.348	Russia	35%	China	31%	Ukraine	7%		
Spices and other	2.157	India	69%	Bangladesh	7%	Turkey	6%		
Ginger	2.140	India	31%	China	19%	Nepal	10%		
Anise, fennel, coriander	941	India	58%	Mexico	6%	Syria	5%	12th	1%
Black pepper	473	Vietnam	34%	Indonesia	18%	India	11%		
Cinnamon	200	Indonesia	44%	China	34%	Vietnam	11%		
Clove	137	Indonesia	71%	Madagascar	16%	Tanzania	4%		
Hop	110	The USA	25%	Germany	25%	Ethiopia	19%	8th	1%
Vanilla	8	Indonesia	38%	Madagascar	37%	Mexico	5%		
Total	36.228								
Source: FAO									

TURKEY

Turkey is a country that is rich in plant diversity. It is stated by various sources that around 200 natural plant species are sold by herbalists within the country.

The experts state that the number of plant species collected from the nature in Turkey for commercial purposes and sold in domestic and foreign markets is 347. It is also indicated that 35 of these 347 plant species are endemic and the number of natural plant species collected from the nature and sold abroad is around 100. Furthermore, it is estimated that at least 1000 of the species in our country have been utilized in various ways and some 400 have been traded.

Although Turkey imported $30 million and exported $150 million dollars of spices in 2014, these figures are far below our potential in the light of the abundancy we have in plant species.

The production areas and quantities of the important plants that hold a significant place in the export of medicinal and aromatic plants of our country are as follows:

Production Area and Amount of Turkey for Medicinal and Aromatic Plants

Years	Red Pepper		Anise		Cummin		Thyme		Nigella		Fennel		Coriander		Ling	
	Area (Da)	Production (TON)	Area (Da)	Production (TON)	Area (Da)	Production (TON)	Area (Da)	Production (TON)	Area (Da)	Production (TON)	Area (Da)	Production (TON)	Area (Da)	Production (TON)	Area (Da)	Production (TON)
2010	104.049	196.900	119.177	9.472	190.110	14.533	84.957	12.329	-	-	-	-	-	-	-	-
2011	91.557	186.272	186.450	13.992	171.242	12.587	85.351	11.190	-	-	-	-	-	-	-	-
2012	112.677	162.125	211.542	14.879	200.117	13.193	77.707	10.953	-	-	-	-	-	-	-	-
2013	112.736	165.527	194.430	11.023	226.294	13.900	94.283	11.598	2.299	161	15.775	1.862	11	1	19.059	2.798
2014	108.508	198.636	152.431	10.046	247.045	17.050	89.137	13.658	3.261	352	13.848	1.994	11	1	15.221	2.124
2015	112.887	186.291	140.506	9.309	224.421	15.570	92.959	11.752	1.717	140	15.848	2.289	11	1	14.600	2.010

Source : TÜİK November 2016

St John's-wort

Production Area and Amount of Plants Used in Fields such as Perfumery, Pharmacy etc. (November 2016)						
Years	Poppy (Capsule)		Hop		Melissa	
	Area (da)	Production (Ton)	Area (da)	Production (Ton)	Area (da)	Production (Ton)
2010	518.970	33.555	3.550	1.842	-	-
2011	549.110	40.979	3.570	1.759	-	-
2012	135.106	3.497	3.442	1.752	450	238
2013	322.773	19.244	3.544	1.852	505	238
2014	266.212	16.223	3.530	1.832	505	238
2015	615.919	30.730	3.500	1.869	512	242

Years	Nettle		Salvia officinalis		Rose (oil)		Lavender	
	Area (da)	Production (Ton)	Area (da)	Production (Ton)	Area (da)	Production (Ton)	Area (da)	Production (Ton)
2010	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-
2012	3	0	54	7	30.832	10.225	509	123
2013	3	0	30	4	28.012	10.769	709	105
2014	3	0	130	19	28.359	10.831	2.189	297
2015	0	0	536	80	28.243	9.483	3.218	400

Source: TÜİK

Medicinal and aromatic plants are both collected from the nature and grown as cultivated plants.

It is known that only 10% of the 70,000 plant species benefited by the mankind are cultured; 90% of some 1,200 plant species present in Europe are collected from the nature, and the majority of plants used in traditional Chinese medicine in China are collected from the nature.

In our country, 75% of medicinal and aromatic plants are collected from the forest and natural growing areas. There is limited number of cultured plant species and they are cultured in a limited area.

Some of the Medicinal and Aromatic Plants Collected from the Nature:

- Laurel, Mahaleb Cherry, Linden, Sage, Rosemary, Liquorice, Juniper and some Thyme

Some of the Medicinal and Aromatic Plants Cultured:

- Cumin, Anise, Thyme, Fenugrek, Fennel, Mint, Hop, Coriander, some Sage

Collecting from the nature poses a major problem for medicinal and aromatic plants. Today, according to the IUCN (International Union for Conservation of Nature) data, 15,000 medicinal plant species are endangered at different levels in the world. As a result of the excessive, uncontrolled and early collection from the nature, populations of some medicinal plants are in danger of failure to reproduce.

Due to heavy demand in the world, plant species such as Adonis vernalis, Ginko Biloba, Panax Ginseng, Harpagophytum Procumbers are endangered.

The orchid genus included in the Orchidaceae family, whose tubers are used to make salep in our country, and the species such as Gypsophila Arrostii and Gentiana Lutea are in danger of extinction due to excessive collecting.

Exporting the tubers and drugs of some species of especially the Orchidaceae family has been prohibited. The prohibitions are determined by the "Natural Flower Bulbs Commission" that gathers annually.

In addition, collecting and selling wild orchid tubers naturally growing in forests is prohibited with the aim of preserving the ecological balance.

Factors that Increase Damage in Collecting Plants from the Nature

1. Excessive Collecting,
2. Early Collecting,
3. Uncontrolled Collecting,
4. Part of the Plant Collected,
5. Replacement of Plants Collected by other Plants

Plants cultivated in our country:

- Poppy, cumin and saffron are plants that have been cultivated since ancient times.
- Anise, fennel, coriander, mint, basil, nigella sativa, fenugrek, red pepper, rose oil, tea, bitter gourd and hop,
- Rosemary, echinacea, caper, thyme, lavender, chamomile,
- Bulbous plants such as gypsophila, hypericum perforatum, snowdrops, salep, leucojum, peltandra, dracunculus, lily, fritillaria imperialis and tulips are among the newly-cultivated plants.

Unfortunately, we have either very few or no registered plants which we have been planting for thousands of years in our country. Some varieties of such plants as flax, poppy, anise, coriander, fenugrek, thyme, sage, basil, garden cress, arugula have been or begun to be registered in recent years.

When cultivating, marketing and improving the medicinal and aromatic plants, in addition to the drug efficiency, efficiency of the active matter is also very important.

Post-harvest processes are among the most important determinants of quality in medicinal and aromatic plants.

Errors or misapplications in post-harvest processes have significant effect on medicinal and aromatic plants. These processes can be listed as washing, drying (one of the most important factors affecting the post-harvest quality), separation-chipping-chopping, storage and packaging.

"Extraction" processes are also among the important applications related to the medicinal and aromatic plants.

Fixed Essential Oil Extraction: The products, which are light in weight but heavy in value, such as essential oils, fixed oils, alkaloids, phenolic and colouring agents are obtained through extraction or advanced methods. While **rose oil** is obtained by water distillation, **thyme, sage and bay oils** are extracted by steam distillation. As a result of the distillation process, two different products with commercial value come out: pure essential oil and distillation water.

By mechanically cold pressing the fruit peels of citrus such as **lemon, orange, bergamot, grapefruit and lime, essential oils** are extracted.

Hot water and hexane are used as extractor **in the production of laurel berry oil.**

Cold pressing method is preferred in extracting flax seed, almond, pumpkin seed and black cumin oils.

Dry Extract: In food supplements and herbal drugs in the form of capsules or tablets.

Liquid Extract: Carob and Juniperus drupacea syrups are among the most commonly used liquid extracts. Stevia extract and liquorice are also made use of.

TRADE OF MEDICINAL AND AROMATIC PLANTS

WORLD

GLOBAL IMPORT - EXPORT DATA FOR MEDICINAL AND AROMATIC PLANTS						
IMPORTER COUNTRY	IMPORT			EXPORTER COUNTRY	EXPORT	
	QUANTITY (Ton)	VALUE ($1,000)			QUANTITY (Ton)	VALUE ($1,000)
USA	374.343	1.472.995		CHINA	1.910.282	3.242.388
INDONESIA	507.585	726.987		INDIA	624.954	1.663.940
GERMANY	119.055	661.797		USA	98.039	655.322
JAPAN	186.137	624.734		SPAIN	119.644	515.587
FRANCE	64.074	567.480		GERMANY	50.880	507.235
ENGLAND	110.090	530.787		FRANCE	32.819	447.636
THE NETHERLANDS	137.569	419.520		THE NETHERLANDS	103.762	397.132
SINGAPORE	64.708	405.182		ARGENTINA	103.166	390.488
BRAZIL	181.279	366.079		IRAN	28.796	339.040
MALAYSIA	219.165	337.795		BRAZIL	71.696	295.080
TURKEY (ranks 39th)	13.106	43.341		TURKEY (ranks 18th)	59.978	177.888
TOPLAM	**1.977.111**	**6.156.697**		**TOTAL**	**3.204.016**	**8.631.736**
Other	2.349.431	5.610.443		Other	825.727	3.304.916
WORLD TOTAL	**4.326.542**	**11.767.140**		**WORLD TOTAL**	**4.029.743**	**11.936.652**

WORLD TRADE DATA FOR SOME MEDICINAL AND AROMATIC PLANTS				
PRODUCT	QUANTITY		VALUE	
	IMPORT (Ton)	EXPORT (Ton)	IMPORT ($1.000)	EXPORT ($1.000)
Essential Oil	205.186	225.576	3.678.184	3.637.140
Spices	363.379	417.297	1.350.913	1.463.937
Garlic	1.850.917	1.975.108	2.355.292	2.834.780
Dried Pepper	546.853	536.163	1.308.303	1.317.222
Ginger	537.350	137.384	672.431	643.373
Anise, fennel, coriander	305.412	295.018	601.348	598.749
Clove	66.121	55.268	712.425	388.062
Hop	48.631	36.799	340.420	333.935
Cinnamon	141.583	133.350	317.784	322.690
Poppy	84.112	87.657	153.676	173.960
Buckwheat	170.704	124.710	152.955	110.191
Vanilla	6.294	5.413	123.409	112.619

Source: FAO 2011

When one thinks of the main commercial centres for plant products in the world, China, Germany, the USA, France, Italy, Japan, Spain, England, India and Hong Kong come to mind.

Japan is the country where the consumption level of herbal drugs per person is the highest in the world.

TURKEY

Export Data for Turkey

An annual income of $140 million is generated from the export of medicinal and aromatic plants.

Turkey exports medicinal and aromatic plants to approximately 100 countries worldwide.

Turkey exports mainly to the countries in North America, the European Union, Latin America, the Far East and North Africa. Of these countries, the USA, Germany, Vietnam, the Netherlands, Poland, Brazil, Canada, Italy, Belgium, Greece, France and Japan rank at the top of the list.

Turkey is also an important supplier country in thyme, laurel, cumin, poppy seeds and alkaloids, caper and tea.

Moreover, she also exports extracts of morphine, rose oil, thyme oil, laurel oil, sage oil, geranium oil, sweetgum oil, cumin oil, resin, turpentine, oleoresin, sweetgum, tragacanth and gum.

When the recent export data have been analysed, it can be seen that the export figures of our country has followed a horizontal trend despite the increase in world export figures in years.

EXPORT FIGURES OF TURKEY FOR MEDICINAL AND AROMATIC PLANTS
(2016)

MAP	2012		2013		2014		2015		2016 *	
	QUANTITY (KG)	COST ($)	QUANTITY (KG)	COST ($)	QUANTITY (KG)	COST ($)	QUANTITY (KG)	COST ($)	QUANTITY (KG)	COST ($)
Ginger	6.408	39.039	11.598	77.293	8.164	63.570	13.830	99.749	8.779	59.702
Saffron	2.104	25.860	3.879	41.557	3.105	5.823	3.369	65.814	1.659	21.068
Turmeric	8.864	56.942	21.324	123.013	13.330	94.990	14.198	66.079	18.881	86.310
Curry	10.203	58.096	11.772	50.556	16.469	63.426	18.609	59.625	12.970	44.062
Fenugrek	87.485	176.739	86.242	163.447	138.173	286.615	265.768	399.980	102.460	221.753
Thyme	13.900.361	39.718.997	14.718.245	55.976.428	15.490.927	59.699.747	15.153.249	55.703.347	12.188.613	44.237.582
Bay	10.482.554	29.951.348	10.676.875	32.231.082	12.255.915	35.762.159	12.723.657	35.831.347	10.033.823	28.982.316
F. Mahalep	144.240	1.745.584	101.711	1.716.151	71.165	1.457.354	213.952	4.673.812	100.484	1.830.783
Rhus	1.205.632	2.613.616	1.292.100	3.012.971	1.538.564	3.570.603	1.743.159	4.199.172	1.276.897	3.210.225
Nigella sativa	44.676	170.109	65.131	219.136	57.400	224.544	52.445	244.489	56.952	265.428
Rosemary									457.524	1.409.102
Vermouth	100	3.527			21.560	38.269	80	381	90	514
Garden balsam	24.453	1.936.776	39.653	144.573	105.700	235.155	110.144	402.935	66.968	259.547
Anatolian marjoram	22	926	87	1.692	40.084	9.823	57.524	15.036	6.720	3.950
R. Liquiritae	433.781	810.749	621.113	1.259.866	1.329.258	2.321.804	919.531	1.522.501	225.503	573.603
Linden	61.172	888.230	67.861	974.451	77.441	861.797	61.594	666.299	26.519	331.497
Sage	1.489.820	5.850.911	1.345.911	5.891.903	1.644.249	6.341.455	2.029.563	7.633.673	1.422.095	5.147.802
Mint	166.393	805.545	189.560	1.010.017	205.356	1.045.155	360.585	1.314.201	277.579	1.030.523
Locust	875.873	661.805	1.416.006	1.085.242	948.047	847.173	542.793	600.412	1.026.376	747.680
Fennel + Anise + Cummin + Juniper	1.837.814	6.322.749	1.944.227	7.902.851	3.808.886	14.186.420	3.250.740	11.589.069	2.462.150	8.749.434
Cummin	3.731.985	10.167.323	7.941.931	20.574.688	6.011.182	15.398.651	3.764.989	11.134.100	6.511.754	17.975.521
Coriander	76.170	192.797	228.596	566.088	71.394	144.727	166.743	307.265	134.046	221.269
Garlic (fresh+dry)	331.440	381.386	60.887	171.186	69.676	189.057	56.322	181.035	43.146	434.884
Red Pepper	617.511	2.538.805	855.796	3.520.518	1.223.142	4.457.867	1.272.161	4.018.914	1.132.789	3.502.190
Clove (dry)	3.011	83.946	3.748	106.316	3.476	110.899	3.804	109.795	6.342	100.960
Cinnamon	1.990	12.687	5.070	32.468	4.709	37.675	6.407	49.120	6.047	45.149
Hop	0	0	576	1.001	0	0	0	0	800	2.000
Poppy	16.200.625	49.330.928	20.721.449	84.802.178	16.597.999	59.472.266	12.125.046	37.688.041	19.191.327	53.067.654
Buckwheat	0	0	2.680	3.813	5.040	9.775	4.920	9.766	2.666	5.423
Vanilla	223.454	799.214	276.436	1.042.868	217.293	778.768	99.515	257.000	90.564	255.536
Blackpepper	90.189	954.176	124.626	1.407.679	150.099	1.679.071	177.590	1.871.019	107.244	1.160.262
Spices (mixed)	257.139	1.477.983	326.116	2.100.551	396.171	2.454.205	697.319	3.423.573	894.593	3.280.641

SOURCE: TÜİK

*: January-October 2016

Import Data for Turkey

Turkey imports some of the medicinal and aromatic plants it needs. Import value of our country has been in a rising trend, albeit a little.

Medicinal and aromatic plants such as cinnamon, black pepper, clove, ginger that do not grow in our country are imported particularly from the Far East. In addition, we see that we import some of the medicinal and aromatic plants that we already cultivate in our country as they are cheaper in cost in other countries. Many of these products are processed within the country and exported.

For example;

- Different types and varieties, which we cannot cultivate, of the thyme that is an item in the imports table of Turkey and an important value for our country are imported in order to export after processing and hold an active position in the world thyme market.
- It is essential to import the medicinal sage (Salvia officinalis), which does not grow in the natural flora of our country and is not cultivated, to export.
- Carob and linden are also imported in line with requests from the foreign markets and exported back.

IMPORT FIGURES OF TURKEY FOR MEDICINAL AND AROMATIC PLANTS
(2016)

MAP	2012		2013		2014		2015		2016 *	
	QUANTITY (KG)	COST ($)	QUANTITY (KG)	COST ($)	QUANTITY (KG)	COST ($)	QUANTITY (KG)	COST ($)	QUANTITY (KG)	COST ($)
Ginger	1.151.310	950.650	1.162.047	1.017.816	1.743.748	1.765.524	1.950.618	1.801.487	1.399.807	1.283.241
Saffron	80	51.678	64	13.184	124	35.677	49	26.996	61	29.198
Turmeric	378.702	479.934	389.579	666.670	498.616	422.503	506.542	607.976	445.620	486.229
Curry	184.152	138.619	211.074	167.477	299.552	246.099	227.588	193.093	313.145	279.145
Fenugrek	915.759	571.222	315.575	172.668	97.856	54.609	21.100	37.135	37.133	41.131
Thyme	1.687.976	3.341.972	1.695.371	4.303.706	1.360.191	3.654.247	1.348.315	3.875.277	1.368.087	4.006.214
Bay	716.060	1.274.010	882.412	1.537.690	1.140.492	1.769.828	2.302.200	3.455.169	1.379.956	1.720.954
F. Mahalep	0	0	0	0	13.000	56.130	0	0	6.400	20.115
Rhus	123.500	13.680	217.923	21.792	451.176	93.338	131.900	60.740	315.822	153.425
Nigella sativa	2.218.248	1.731.436	2.287.785	1.909.520	2.932.987	2.766.173	2.898.392	3.017.157	2.498.934	2.645.365
Rosemary									95.002	146.333
Vermouth	0	0			0	0	0	0	0	0
Garden balsam	130.845	2.049.250	1.910.348	1.728.259	1.350.177	1.426.631	1.654.920	1.678.512	990.864	1.180.686
Anatolian marjoram	180	1066	510	4.027	120	1.188	420	4.365	607	6.232
R. Liquiritae	197	1.695	57.148	80.364	267.110	198.087	36.483	46.842	280.940	311.987
Linden	88.400	369.371	110.165	605.947	83.706	413.841	105.013	398.212	26.290	78.019
Sage	843.924	2.337.254	489.377	1.431.003	993.219	2.865.054	838.294	1.927.055	950.478	2.010.636
Mint	150.417	217.324	168.095	224.534	7.870	30.208	8.865	21.560	27.331	53.829
Locust	349.520	151.683	114.510	49.630	1.802.402	913.562	2.865.211	917.875	619.105	254.643
Fennel + Anise + Cummin + Juniper	1.749.813	3.562.422	774.690	1.965.624	1.344.901	3.971.533	1.040.566	2.594.201	1.131.249	2.622.631
Cummin	307.870	859.283	601.541	1.661.714	736.443	2.031.505	1.791.364	4.438.898	1.233.193	3.229.116
Coriander	44.080	27.727	93.880	65.409	493.888	388.296	510.791	396.647	965.889	609.842
Garlic (fresh+dry)	3.073.304	7.765.493	4.088.727	9.803.669	3.895.585	10.940.432	3.537.361	12.289.066	3.192.634	11.164.425
Red Pepper	536.315	1.084.220	1.114.162	2.284.553	282.028	738.612	165.400	474.660	205.995	591.740
Clove (dry)	173.709	381.639	116.858	172.689	371.783	571.265	305.519	593.680	76.860	121.595
Cinnamon	1.035.885	864.391	1.232.895	1.007.308	1.668.793	1.381.219	999.006	991.830	863.633	903.133
Hop	11812	181408	0	0	295	5193	1517	28747	10659	149.197
Poppy	0	0	0	0	0	0	600	2.540	0	0
Buckwheat	237700	202930	235.500	203.681	198.500	182.265	417.094	410.921	281.088	275.639
Vanilla	3.595	164.979	3.290	140.928	3.551	243.141	3.853	318.357	2.144	175.921
Blackpepper	3.407.484	5.877.398	4.086.219	6.484.125	3.286.566	5.220.014	3.127.215	5.657.906	3.448.508	6.139.000
Spices (mixed)	53.249	177.589	45.501	156.808	45.825	89.840	90.408	176.854	205.718	170.882

SOURCE: TÜİK

*: January-October 2016

COMPLEMENTARY MEDICINE

The percentages of the use of traditional and complementary medicines in the world are as follows: 70% in China, 70% in Canada, 49% in France, 46% in Australia, 42% in the USA and 31% in Belgium.

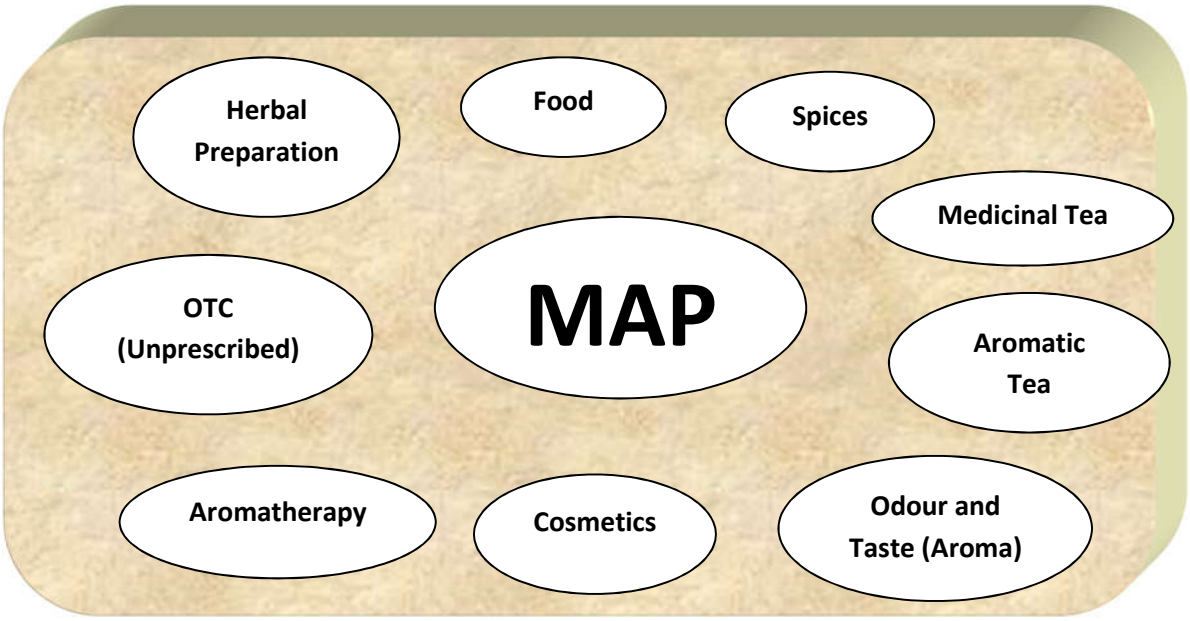
CLASSIFICATION OF COMPLEMENTARY HEALTH APPROACHES		
NATURAL PRODUCTS	**MIND-BODY MEDICINE**	**OTHER COMPLEMENTARY APPROACHES**
Herbal Medicines	Meditation	Ayurvedic Medicine
Vitamins	Acupuncture	Traditional Chinese Medicine (TCM)
Minerals	Yoga	Homeopathy
Probiotics	Tai-Chi	Naturopathy
	Hypnotherapy	Tibetan Medicine
	Qi-gong	Unani Medicine
	Chiropractic and Osteopathic Manipulation	Shaman Medicine
	Massage Therapy	Spa
	Movement Therapy	

The 10 most common complementary health approaches preferred by adults in the world in 2012

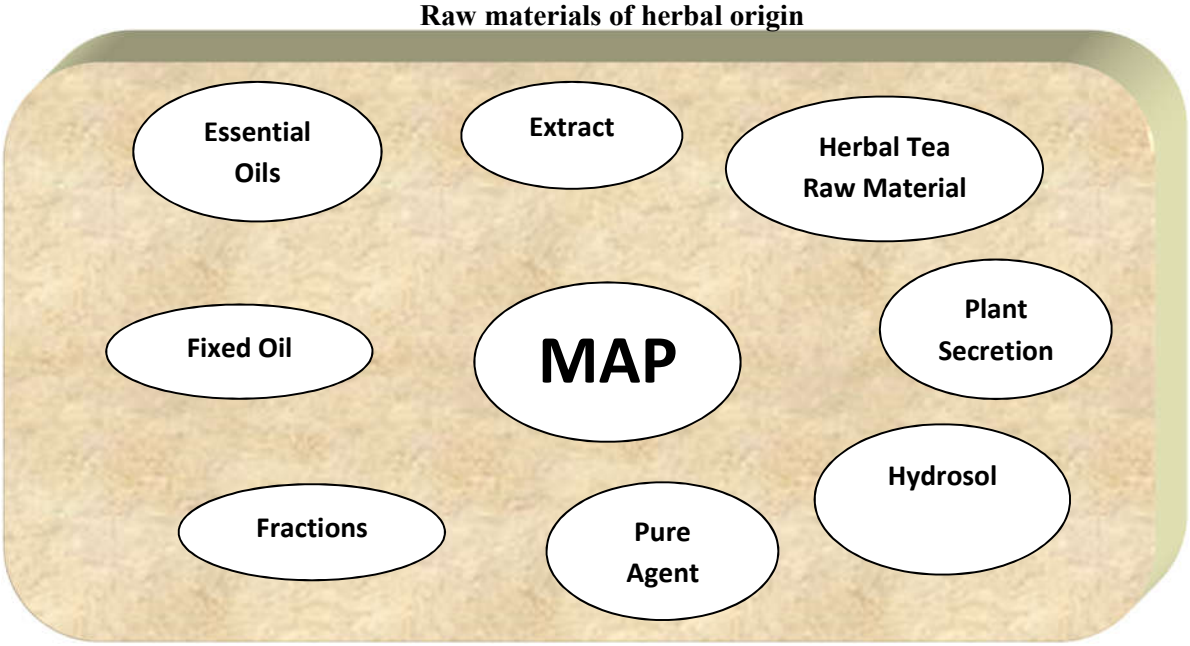
- Catathymia % 1,70
- Progressive Relaxation % 2,10
- Homeopathy % 2,20
- Special Diet % 3,00
- Massage % 6,90
- Meditation % 8,00
- Chiropractic and Osteopathic % 8,40
- Yoga, Tai-Chi or Qi-qong % 10,10
- Deep Breath % 10,90
- Natural Products % 17,70

As can be seen from the above data, Medicinal and Aromatic Plants are the most used complementary health products today. This renders the cultivation, marketing and trading of these plants very important.

Areas of Use of Medicinal and Aromatic Plants



Raw materials of herbal origin



Experts state that approximately 80% of the world population resort to traditional medicine and medicinal aromatic plants to pull through.

The trading of medicinal and aromatic plants has gained great importance in parallel to the widespread use of these plants due to the economic uncertainty and difficulties our world has been in recent years.

The market for medicinal and aromatic plants is expected to be ~60 billion USD in 2000, ~95 billion USD in 2015 and ~110 billion USD in 2017.

Turkish market for Medicinal and Aromatic Plants is ~2.5 billion TL

Total value of medicines market in our country:

Prescribed drugs market ~ 22 billion TL
OTC (herbal product + preparation) market ~ 4 billion TL
Herbal Products Market ~2.5 billion TL
Medical Products Market ~ 3.5 billion TL

In our country:

Number of pharmacies 25.000
Number of medical stores 4.000
Number of herbalists 6.500

İzmir is the most important province in the domestic trade and export of medicinal and aromatic plants.

Coridothymus capitatus (kara kekik)

Satureja hortensis (cibrise)

Origanum onites (İzmir kekiği)

Origanum vulgare (İstanbul kekiği)

MARKETING STRATEGIES FOR MEDICINAL AND AROMATIC PLANTS

- Various kinds of subsidies are paid for the plants cultivated in our country. Medicinal and aromatic plants should be cultivated with dry farming on barren lands where they don't affect other cultivated plants, and subsidies should be granted for the cultivated medicinal and aromatic plants in order to support both the producers and the sectors related to these plants,
- There is some sort of deductions on medicinal and aromatic plants collected from forests or nature in general. For this reason, these products collected from the nature cannot be recorded completely. Many of them remain unrecorded. Subsidies should thus be granted for these plants that are collected from forests, rocky grounds or rough slopes in order to be able to take their collection under control and record,
- The product quality should be improved to increase the exports of our country,
- More work should be carried out on resolving the issue of adulteration that is a major problem for products in our country,
- More attention should be paid to post-harvest processes, especially to drying and storage,
- Supply of raw materials should be abandoned, and finished or semi-finished products should be produced and exported,
- Many plants unique to Turkey are exported as raw materials, processed in other countries and distributed to the world. We need to be present abroad in packaged goods market.
- We should more carefully analyse the expectations of people in the changing and developing world, and seek new products and markets.
- Countries that lead the market of medicinal and aromatic plants should be analysed,
- More active role should be played in the herbal teas market that becomes more and more popular day by day,
- Price policies should be determined by carefully examining the world prices,
- The virtual world that has become an indispensable part of the developing world should be used more actively and effectively as a means of advertising,
- More active part should be taken in international fairs,
- Bureaucratic procedures in our country should be facilitated and expedited in order to increase the number of registered products,
- Product stories should be created and embedded in the minds of people,
- Continuous trainings regarding products and the sector should be provided for the producers and businesses,
- New product-based fields and sectors should be created, (Aroma therapy, vinotherapy, apitherapy, beauty centres, massage centres, cosmetics, health sector...)
- Alternatives should be found for the currently used medicinal and aromatic plants,
- Sound and reliable statistics should be kept regarding the sector,
- It is difficult to reach correct and reliable information particularly about the herbal plants on the internet. More accurate information should be available in this respect on the internet.
- Herbalists should be audited more effectively,
- The legal legislation should be updated to make sure plant diversity is protected and sustainability is ensured,
- Genetic material should be enriched,
- Pesticides used on medicinal and aromatic plants should be accurately determined and licensed.

References:

- Faydaoğlu, E., Sürücüoğlu, M.S. 2011. Geçmişten Günümüze Tıbbi ve Aromatik Bitkilerin Kullanılması ve ekonomik Önemi
- Ceylan. A., 1996 Tıbbi Aromatik Bitkiler, Ege Üniversitesi Tarımsal Uygulama Araştırma Merkezi Teknik Bülten 29
- Ceylan,A. Bayram,E. 1996 E.Ü.Z.F.Tarla Bitkileri Bölümünde Tıbbi ve Aromatik Bitkilerle Yapılan Çalışmalara Genel Bakış. Prof.Dr.Vamık Tayşi Anısına Yapılan Bilimsel Toplantı İzmir. S.48-57
- Akdemir, H. 2016. Apelasyon E-Dergi (http://apelasyon.com) Türkiye'de Tıbbi Aromatik Bitkiler ve Sektör Sorunları. http://apelasyon.com/Yazi/401-turkiyede-tibbi-ve-aromatik-bitkiler-sektoru-ve-sorunlari
- Harput, Ş. 2016. Tıbbi Bitkisel Ürünlerde Toplum Sağlığı İçin Güvenlik ve Etkinlik Çalışmaları.
- Afyonkarahisar II. Tıbbi ve Aromatik Bitkiler Çalıştayı Sonuç Raporu 2016
- Trabzon Tıbbi ve Aromatik Bitkiler Çalıştayı Sonuç Raporu 2015
- Güneş, A. Tıbbi Aromatik Bitkiler
- Arslan, N., Baydar, H., Kızıl, S., Karık, Ü., Şekeroğlu, N., Gümüşçü, A. 2015. Tıbbi Aromatik Bitkiler Üretiminde Değişimler ve Yeni Arayışlar.
- Demirci. F. 2016. Tıbbi ve Aromatik Bitkilerin Ulusal ve Uluslararası Ölçekli Üretim ve Pazarlaması.
- Faydaoğlu. E., Sürücüoğlu. M.S. 2011 Geçmişten Günümüze Tıbbi Aromatik Bitkilerin Kullanılması ve Ekonomik Önemi.
- Karık, Ü. 2014. Apelasyon E-Dergi (http://apelasyon.com) Dertlere Deva Bitki Kekik. http://apelasyon.com/Yazi/188-dertlere-deva-bitki-kekik
- Civelek, A. 2016. Apelasyon E-Dergi (http://apelasyon.com) Güzeller Güzeli Bir Nympha Defne. http://apelasyon.com/Yazi/540-guzeller-guzeli-bir-nympha-defne
- Uğurluoğlu. Ö.K., Filiz. Zafer. 2016 Tıbbi Aromatik Bitkiler
- TÜİK (http://www.tuik.gov.tr/)
- Gezgin. D. 2010. Bitki Mitosları
- Özer. Z., Tursun. N., Önen. H. 2004 Yabanı Otlarla Sağlıklı Yaşam
- http://www.nazimtanrikulu.com/
- Kırıcı, S. Türkiye'de Tıbbi Aromatik Bitkilerin Genel Durumu
- Marshall, E. 2011 Health and Wealth from Medicinal Aromatic Plants (FAO)
- Tanriseven, M. Tıbbi Aromatik Bitkiler Bio Sağlık ve Ekonomi
- Tümen, İ. Tıbbi Bitkilerin Ekonomik Değeri.
- TOBB Türkiye Tarım Sektörü Raporu 2013
- Orta Anadolu Kalkınma Ajansı Tıbbi Aromatik Bitkiler Sektör Raporu 2015
- http://www.omicsgroup.org/journals/medicinal-aromatic-plants.php
- http://www.icmap.org/icmap/icmap.php?page=home
- http://www.ishs.org/
- http://www.acmap.org/
- http://bhma.info/
- http://nmpb.nic.in/
- http://www.europam.net/
- http://tibbiaromatik2016.org/