Medicinal plants and their uses and benefits with reference to small farmers in Armenia

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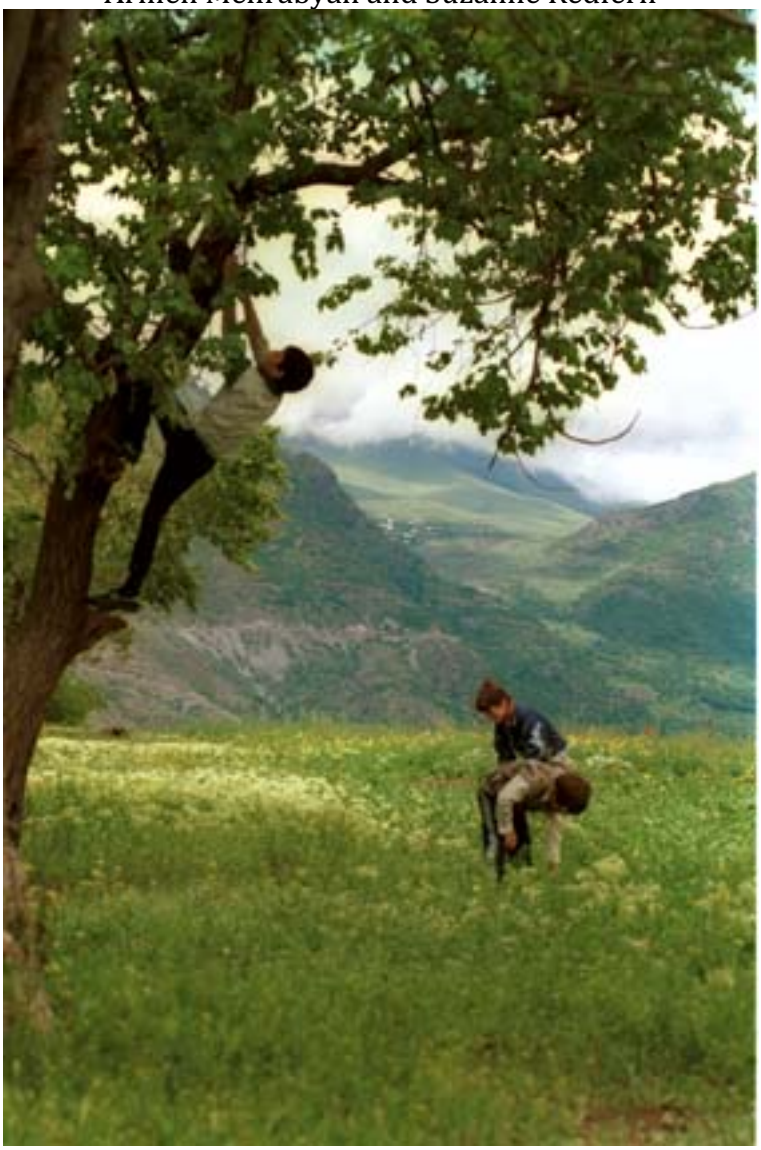


Abstract

The use of medicinal plants is increasing both in the developed world, where people are turning towards natural remedies as a preference over chemical compounds, and in the developing world, as an alternative healthcare method and as a means of additional income. This paper uses Armenia as an example of the importance of medicinal plants to rural populations.

Background:

Traditional medicine has been used by humankind for centuries, in particular in rural communities, as demonstrated in treatises that date back to antiquity. A Sumerian tablet from about 2 100 BC is the earliest known medicinal text. It contains a dozen prescriptions and proscribes plant sources. In China, the *Shennong pen TS'ao ching*[1], contains about 100 herbal remedies. The *Ebers Papyrus*, a medical treatise from ancient Egypt from 1 550 BC, includes material that dates 5 to 20 centuries earlier. In Greece, *Theophrastus: Enquiry into Plants* devotes a chapter to herbs as medicines. The earliest known Greek herbal (a collection of descriptions of plants that have been put together for medicinal purposes), written in the third century BC by Diocles of Carystus, does not survive but a few fragments from an illustrated herbal of Krateuas survive from the first century BC. The herbal (*De Materia Medica*) by Pedanios Dioscorides of Anazarba, a Roman army physician, written in the year 65, was slavishly referred to, copied, and commented on for over 1 500 years. There is also evidence of medicinal plant use in the Bible and the Quran.

Medicinal plants are becoming an alternative to modern medicine worldwide; they have contributed to over 7 000 different compounds in use today as heart drugs, laxatives, anti-cancer agents, hormones, contraceptives, diuretics, antibiotics, decongestants, analgesics, anaesthetics, ulcer treatments and anti-parasitic compounds (Apkarian and Ayrapetian, 1997). In fact, about 50 percent of prescription drugs are based on a molecule that occurs naturally in plants (Foster and Johnson, 2006) for example *Papaver sumniterium,* commonly known as morphine. This is also demonstrated, for example, by the increase in the use of herbal teas. In the United States of America alone, over 7 000 metric tons (USD 45 million) of plants and plant parts for use in herbal teas were imported in 2001 (Mehrabyan, 2009). Since plant-based medicines do not contain chemicals and synthetic materials, more people in the developed world have begun to turn to the use of traditional medicine as remedies for treating and preventing disease.

Today, there is also a trend to move towards the use of traditional medicine, derived from medicinal plants, as a cultural preference. For example, in Germany in 2001, 31 percent of the over-the-counter products were derived from plants (BAH, 2002, cited in Schippmann, Leaman and Cunningham, 2002). Table 1 shows how many plants are used medicinally worldwide; there are 52 885 medicinal plant species out of the global total of 422 000 flowering plant species.

[1] Legend has it that Emperor Shennong, who is considered the founder of Chinese herbal medicine, composed the *Shennong pen Ts'ao ching* or *Great Herbal* in about 2700 BC.

Table 1: Use of medicinal plants worldwide

Country	Plant species	Medicinal Plant species	Percent
China	26 092	4 941	18.9
India	15 000	3 000	20.0
Indonesia	22 500	1 000	4.4
Malaysia	15 500	1 200	7.7
Nepal	6 973	700	10.0
Pakistan	4 950	300	6.1
Philippines	8 931	850	9.5
Sri Lanka	3 314	550	16.6
Thailand	11 625	1 800	15.5
USA	21 641	2 564	11.8
Viet Nam	10 500	1 800	17.1
Average	13 366	1 700	12.5
World	**422 000**	**52 885**	

Source: Duke and Ayensy, 1985; Govaerts, 2001; Groombridge and Jenkins, 1994, 2002; Jain and DeFillipps, 1991; Moeraman, 1996; Padua *et al.,* 1999, *In Schippmann, Leaman and Cunningham, 2002*

In the developing world, one-third of the population does not have access to essential drugs (WHO, 2005a) and, therefore, owing to this lack of accessible healthcare, the cultivation of medicinal plants plays an essential role, not only for the well-being of millions of people but also as a potential source of employment and income generation for rural populations. Many of the world's poorest countries rely on the collection of wild medicinal plants for their subsistence needs and income generation (FAO, 2001; BGCI, 2008) owing to the fact that they generate a higher economic return per unit area compared to that of traditional crops (IFAD, 2008). Medicinal plants, defined as all higher plants that are assumed to have some form of medicinal quality, therefore play a vital role in the livelihoods of rural people, although in many developing countries the use of medicinal plants is limited to local production (Bannerman, 1982). The medicinal uses of herbs today remain popular in various forms, despite the questionable efficacy of many popular herbs and the reliance of many herbal recommendations on superstition and astrology. The fact that most drugs were originally plant-based has encouraged a new look at the medicinal properties of plants. It is estimated that worldwide there are approximately 53 000 medicinal plants in use (Schippmann, Leaman and Cunningham, 2002) and indeed 80 percent of the world's population relies on traditional medicine for their primary healthcare needs (WHO, 2008).

Medicinal Plants in Armenia:

Figure 1

Source: United Nations Cartographic Section, 2008.

One developing country that relies on local production of medicinal plants is the Republic of Armenia, due to its immense wealth of plant diversity; Table 2 gives a listing of the major medicinal plants and their known uses. In Armenia, out of 3 200 wild useful plants, more than 1 500 are used for medicinal purposes (Mehrabyan, 2006). More details of two of the most important medicinal plants are given as examples of their value to the rural population: *Sambucus nigra* (elder tree) (Box 1) and *Scabiosa Caucasica* (Armenian chrysanthemum) (Box 2).

Armenia lies in the Southern Caucasus (Figure 1), bordered by Azerbaijan to the east, Georgia to the north, Turkey to the west and Azerbaijan and the

Islamic Republic of Iran to the south. It is characterized by seven climate zones (out of the nine existing in the world), ranging from subtropics (375 metres above sea level) to alpine meadows (4 090 metres). On a territory of only 29.8 thousand km^2, this means that one can travel from "hot summer" to "ice-cold mountains" in 5–6 hours. Armenia has everything from desert plants to oak, beech and pine forests, wet marshland and sub-tropical plants to alpine meadows teeming with wild flowers. These variations throughout the regions have meant that the local people have had to adjust plant life cycles, and production and reproduction mechanisms, to cope with their region's climate.

Studies of Armenian history have shown that Armenia was one of the centres of origin of numerous economically valuable plants (CBD, 2010) and the development of early agriculture. For centuries, Armenia has used plants to support its healthcare needs. The great Armenian epoch of herbal manuscripts appeared in the fifth century[2] and has been enhanced from the eleventh century[3] onwards. However, about 2 000 species of flowering and aromatic plants have been found in burial sites in Armenia. An exquisite bas-relief, depicting a visual representation of the fragrance from essential oils being extracted from an herb, is found in the ancient royal tombs and temples. The ancient Armenians loved flowers, as evidenced by murals portraying court ladies wearing Armenian rose flowers or the longevity tree (pomegranate flowers and tree and funeral garlands). There are also illustrations in ancient manuscripts and architectural embellishments, such as those that adorn the sixth century church in Odzun with plant motifs and monks teaching about herbs, as well as in the first written story of Gilgamesh where the Sumerians mention the land of the Ararat Mountain.

Medicinal plants were cultivated in gardens founded by King Vagharshak (second century BC) and Astashes (first century AD). For over 7 000 years, the tradition of gathering and blending wild herbs and flowers has been an integral part of the daily lives of the Armenian people. This has led to a plethora of natural medicaments that have been preserved and are used today. For example, Armenia has a rich tradition in the use of herbal teas. The production of wild-crafted herbal teas and beverages derived from their native lands involved techniques that were developed by Armenian royal families. These infusions have been used for centuries or even millennia as complements to the fine dining experience. The methods of collection, processing, blending and brewing have passed from generation to generation to this day. Wherever and whenever there is a social gathering, flower petal tea is brewed to share with family and friends. Nowadays people use herbal teas as an integral part of a tasty and healthy diet and, as in ancient Armenia, this represents current food and beverage culture. The criteria used for these herbal teas are: first and foremost, great flavour; second, finest quality; and third, their ability to stimulate digestion, induce relaxation, and enhance the overall enjoyment of a fine meal. The blends are ancient, the flavours robust and earthy.

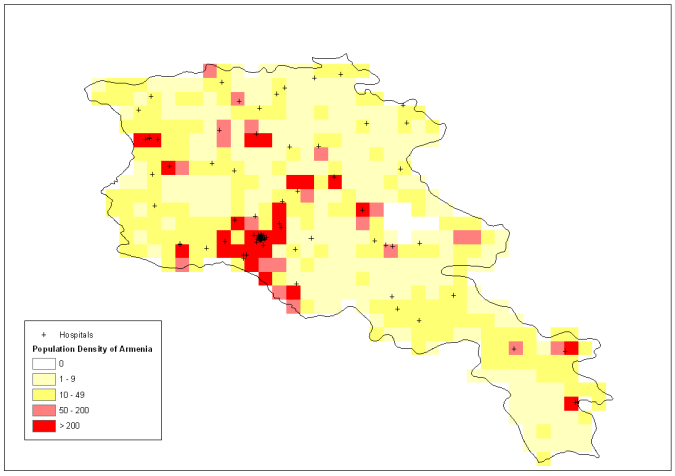
Armenia has inherited a healthcare system organized according to the Semashko model[4], which assured free medical assistance and access to the entire population. It has 11 administrative districts, that each has a hospital and associated clinic providing ambulatory and primary care. Many rural areas are provided with health posts (with inpatient units), and ambulatories (Hovhannisyan *et al.,* 2001). Out of a total population of 3.01 million, 1.5 million live in the capital

[2] Yeznik Kokhpaci, Davit Anhakht, Ghazar Parpeci, Agatangegos, Anania Shirakaci

[3] Of which the most notable are: Angitac Anpet (XI AD) by Amirdovlat Amasiaci; Germac Mkhitarutyum (XII AD) by Mkhitar Heraci; Meknutyun Albert Meci Yagags gaghtniac kakanac by Grikor Magistros (X AD), Bgshkaran by Gagik Hetum (X-XI AD) ; Haybusak by Alishan.

[4] A mixed system of Bismarck (financing) and Beveridge (provision), in which oral health care is mainly financed by compulsory social insurance (Kirch, 2008).

Figure 2



Source: adapted from FAO, 2011

city of Yerevan, and approximately 53.13 percent live in rural areas (UNICEF, 2010). The healthcare system, although improving, is however insufficient to cover the needs of the rural people (Figure 2). According to a family survey conducted in 2006 by the United Nations Population Fund (UNFPA), 28.4 percent of people that needed healthcare did not apply, predominantly owing to lack of financial resources[5]. People therefore are beginning to self-medicate and hence turn to traditional medicine to supplement their health needs.

BOX 1

Elder tree (*Sambucus nigra*)

(ECOCROP, 2007)

The elder tree has flat-topped masses of creamy-white, fragrant blossom, followed by large drooping bunches of purplish-black juicy berries. It has been used for millennia[6] as food (in the form of preserves, wine, juice, jellies, etc.,) and for medicinal purposes (as supplements, extracts, syrups, lozenges, etc.,). In Armenia it grows mainly in the regions of Lori, Shirak, Tavush, Tashir, Kotayk, Aragatsotn, Syunik, and Ararat where it has been used medicinally for hundreds of years (Thole *et al.,* 2006).

It has been used to treat bronchitis, cough, asthma, upper respiratory cold infections, digestive system, fever, dried skin and wounds (HMPC, 2008; FAO, 2007). As reported in ancient Armenian manuscripts, it has also been used as balsamic vinegar – BALASAN- that enriches the blood, assisting the liver and kidneys, it calms the nerves, promotes the metabolism of alcohol, balances internal secretions and enhances immunity.

The elder leaves are used either fresh or dry in the preparation of an ointment known to treat bruises, sprains, chilblains, for use as an emollient, and for applying to wounds. The leaves, when bruised, are known as an insect repellent for both humans and other plants (Grieve, 1971). The flowers are used fresh to create elderflower water. It is also used as a remedy for inflammation caused by cold and fever (Zakay-Rones *et al.,* 1995). A tea made from the dried berries has been known to help treat for colic and diarrhoea (FAO, 2001). It has also been shown to have anti-inflammatory, anti-viral and anti-cancer properties (Thole *et al.,* 2006) and it has shown to be useful in epilepsy. In folk medicine, the elderberry has been recommended as a remedy for stomach upsets, as an eye lotion, as a salve for bruises, and as a diuretic.

[5] 50.9% of the population in Armenia live below the poverty line (UNDP, 2008)

[6] As documented by John Evelyn in 1664, when he said "If the medicinal properties of its leaves, bark and berries were fully known, I cannot tell what our countryman could ail for which he might not fetch a remedy from every hedge, either for sickness or wounds" (Grieve, 1971).

BOX 2

Armenian chrysanthemum (*Scabiosa Caucasica*).

(ECOCROP, 2007)

The Armenian chrysanthemum is a perennial species, native of subalpine meadows in the northern Caucasus and Transcaucasus. It is a wild *Scabiosa*, which grows in high mountain meadows over 2 500 metres elevation and is mainly grown in Lori, Syunik, Tavush, Aragatsotn, Gegarkunik, Vayots Dzor and Shirak regions of Armenia. However, it is difficult to find and harvest, as the flowering period is very short.

The Armenian chrysanthemum is most commonly known for its properties of curing irritation of the skin, such as scabies. In Armenia, it is generally used as a herbal tea to combat the feelings of influenza. According to traditional Chinese medicine, the tea can used to fight off sore throat, used to clear the eyes and liver, and promote the reduction of fever. In the western world, it is used to treat circulatory disorders such as varicose veins and atherosclerosis. It is also taken for headaches, dizziness, hearing disorders and has in addition been used as a treatment for high blood pressure (Skinner, 2001). Furthermore, it can be used as an eyewash to reduce inflammation. Extracts of the plant (stem and flower) have been shown to help with antibacterial and antimycotic infections and have shown potential as an anti-HIV-1 medication.

About 50 species of medicinal plants, collected *in-situ* and *ex-situ,* are widely used. At present, about 40 medicinal plant species grown in Armenia are being sold in drug stores (UNDP/GEF, 2004). These are all subject to the regulations on herbal medicines that began in 1998 through the national drug law that also regulates conventional pharmaceuticals.[7] These plants also provide essential oils necessary for the human metabolism, such as carvacrol, eugenol, menthol, geraniol, thymol and boras camphor. In Armenia, there are over 250 oil-bearing plants growing throughout the different zones (FAO, 2010). The rural population generally harvest and process the many medicinal plants growing wild throughout the country, but it is also common to find such plants being cultivated in home gardens, both in urban and rural areas. In general, the plants are used for home consumption as an affordable healthcare option, but they are also a source of employment and additional income. Dried plants are often sold at roadsides, or taken to the local market.

Challenges and the future of medicinal plants:

Interest in medicinal plants is growing and will continue to grow both in the developing as well as in the developed world. The issue is that no concerted effort has been made to ensure that there will be enough medicinal plants for the future. With the increase in demand coupled with the increase in population and extensive destruction of plant-rich habitats such as the tropical forests, wetlands, Mediterranean ecosystems and parts of the arid zone, medicinal plants are suffering from extinction (WHO, IUCN and WWF, 1993). In addition, there is also a lack of knowledge about harvest times and practices, undefined land-use rights and the lack of legislation and policy guidance (Schippmann, Leaman and Cunningham, 2002).

Further scientific research is therefore warranted on the cultivation and demand for the medicinal plant species market. There is a need for good collection strategies in order to be able to conserve the valuable medicinal plants *in-situ* while addressing the needs of the people, otherwise hundreds of species may be over-harvested, improperly cultivated or unprotected and as a consequence will

[7] It should be noted that development of national policy regulations are an essential indicator of the level of integration of such medicine (WHO. 2005b).

become extinct. For example institutions, such as the *Botanical Garden of the Armenian National Academy of Sciences in Yerevan,* need to play an active role as research units in order to educate rural people on the properties, uses and benefits of medicinal plants. This may in turn allow small-farmers to be able to grow medicinal plants not only in their own family gardens, but possibly on a larger scale. This will also help in the creation of genebanks that will aid in the conservation and protection of medicinal plants. Governments will also need to help promote the use and benefits of medicinal plants by integrating them into national healthcare systems. This will also allow for more control on over-harvesting and also provide sustainable standards.

Medicinal plants are increasing in the benefits that they have in relation to small-farmers. This paper takes Armenia as an example; however the use of medicinal plants is augmenting all over the world. Not only are people in developing countries beginning to depend more and more on medicinal plants as their primary healthcare, but there has been an increase in the developed world. The problem now lies in the conservation and management of these plants to meet demand, while not damaging the environment.

Bibliography:

Apkarian, A.V. & Ayrapetian, S. 1997. *Pain mechanisms and management*. IOS press. US**.**

Bannerman, R.H. 1982. Traditional medicine in modern health care. *World Health Forum*. 3(1):8–26.

BGCI (Botanical Gardens Conservation Institute). 2008. Plants for life: medicinal plant conservation & botanic gardens. B. Hawkins.

CBD (Convention on Biological Diversity). 2010. Fourth National Report to the Convention on Biological Diversity- Republic of Armenia.

FAO. 2007. ECOCROP*. Sambucus nigra.* [Available at http://ecocrop.fao.org/ecocrop/srv/en/cropView?id=2413].

FAO. 2001. Non-wood forest products in Africa. A regional and national overview. S. Walter. Rome.

FAO. 2010. *Gardens of Biodiversity*. C. Batello, D. Avanzato, Z. Akparov, T. Kartvelshvili & A. Melikyan (eds). Rome.

FAO. 2011. FAO Country Profiles and Mapping Information System- Armenia. [Available at: http://www.fao.org/countryprofiles/Maps/ARM/10/pt/index.html]

Foster, S. & Johnson, R. 2006. *Desk Reference to Nature's Medicine*. National Geographic Society, Washington D.C, US.

Grieve, M. 1971. A Modern Herbal (Volume 1, A-H): The Medicinal, Culinary, Cosmetic and Economic Properties, Cultivation and Folk-Lore of Herbs, Grasses, Fungi, Shrubs & Trees with Their Modern Scientific Uses

HMPC (Committee on Herbal Medicinal Products). 2008. Assessment report for the development of community monographs and for inclusion of herbal substance(s), preparation(s) or combinations thereof in the list. *European Medicines Agency, Evaluation of Medicines for Human Use.* London, UK.

Hovhannisyan, S.G., Tragakes, E., Lessof, S., Aslanian, H. & Mkrtchyan A. 2001. Health Care Systems in Transition, Armenia. European Observatory on Health Care Systems.

Hurtel, J. 2006. *Preparing Medicinal Plants*. [Available at http://www.phytomania.com/2-preparation.htm]

IFAD (International Fund for Agricultural Development). 2008. *The role of high-value crops in rural poverty reduction in the Near East and North Africa.* Rome.

Kirch, W. 2008. Encyclopedia of Public Health, Volume 1: A - H Volume 2: I – Z. Springer.

Mehrabyan, A. 2006. Production of Herbal Teas in Lori Region, Yerevan, PhD Thesis.

Mehrabyan, A. 2009. Example of rural enterprise development in Armenia. Presentation.

Schippmann, Leaman &Cunningham, 2002. Impact of Cultivation and Gathering of Medicinal Plants on Biodiversity: Global Trends and Issues. *In:* FAO. 2002. Biodiversity and the Ecosystem Approach in Agriculture, Forestry and Fisheries. Satellite event on the occasion of the Ninth Regular Session of the Commission on Genetic Resources for Food and Agriculture. Rome, 12-13 October 2002. Inter-Departmental Working Group on Biological Diversity for Food and Agriculture. Rome.

Skinner, P. 2001. *Encyclopaedia of Alternative Medicine: Chrysanthemum flower.*

Theophrastus. 1916. *Enquiry into Plants*. Translated by: A. Hort. Loeb Classical Library.

Thole, J.M., Burns Kraft, T.F., Suerio, L.A., Kang, Y-H., Gills, J.J., Cuendet, M., Pezzuto, J.M., Seigler, D.S. & Lila, M.A. 2006. A Comparative Evaluation of the Anticancer Properties of European and American Elderberry Fruits. *J Med Food.* 9(4): 498–504.

Torosyan, A. 1983. *Armenia's Medicinal Plants.* Hayastan.

United Nations Cartographic Section. 2008. Map of Armenia. No. 3762 Rev. 4, [Available at: http://www.unhcr.org/refworld/docid/4937c7b63.html].

UNDP (United Nations Development Programme). 2008. Human Development Indices: A statistical update 2008. [Available at: http://hdr.undp.org/en/media/HDI_2008_EN_Tables.pdf]

UNDP/GEF. 2004. Armenia as a producer of medicinal plants: possibilities and perspectives. Yerevan**.**

UNFPA (United Nations Population Fund). 2006. Family Survey.

UNICEF (The United Nations Children's Fund). 2010. Armenia. [Available at http://www.unicef.org/infobycountry/armenia_statistics.html#68].

WHO, IUCN & WWF (World Health Organization, International Union for Conservation of Nature and Natural Resources and World Wide Fund for Nature). 1993. Guidelines on the Conservation of Medicinal Plants.

WHO (World Health Organization). 2005a. Legal Status of Traditional Medicine and Complementary/Alternative Medicine: A Worldwide Review. Geneva.

WHO (World Health Organization). 2005b. National Policy on Traditional Medicine and Regulation of Herbal Medicines - A Report of a WHO Global Survey. Geneva.

WHO (World Health Organization). 2008. WHO factsheet on traditional medicine. [Available at http://www.scidev.net/en/features/integrating-modern-and-traditional-medicine-facts-and-figures.html].

Zakay-Rones, Z. Varsano, N., Zlotnik, M., Manor, O., Regev, L., Schlesinger, M. & Mumcuoglu, M. 1995. Inhibition of Several Strains of Influenza Virus *in Vitro* and Reduction of Symptoms by an

Elderberry Extract (*Sambucus nigra* L.) during an Outbreak of Influenza B Panama." *J. Altern. Complement. Med* . 1: 361–369.

Table 2: Most common medicinal plants in Armenia

Species name	Common name	Medicinal properties
***Achillea millefolium* L**	Yarrow	It contains astringent properties and has been used to treat inflammations, such as haemorrhoids, and headaches. Today it is valued mainly for its action in colds and influenza, and also for its effect on the circulatory, digestive, excretory, and urinary systems.
***Acorus calamus* L.**	Sweet flag/Calamus	It helps to treat gastro-intestinal problems. It is used externally to treat skin eruptions, rheumatic pains and neuralgia. An infusion of the root can bring about an abortion whilst chewing the root alleviates toothache. It is a folk remedy for arthritis, cancer, convulsions, diarrhoea, dyspepsia, and epilepsy. Chewing the root is also said to kill the taste for tobacco.
***Agropyron repens* (Z) R.B.**	Couch grass	Used to treat inflamed bladders, painful urination and water retention. It also has antiseptic properties.
***Allium ursinum* L.**	Wild garlic/Ramsons	It is anti-bacterial, anti-inflammatory, and a bile stimulant. Expectorant. Lowers blood sugar.
***Althaea officinalis* L.**	Marshmallow	The leaves, which are collected in summer as the plant begins to flower, have demulcent, expectorant, diuretic, and emollient properties. It is generally used in ailments of the lungs and the urinary systems, specifically in arthritis and kidney stones. The root, which is harvested in late autumn, has demulcent, diuretic, emollient, and vulnerary properties. It is generally used for digestive and skin problems, specifically inflammations of the mouth, gastritis, peptic ulcer, enteritis, and colitis. It increases the flow of breast milk and soothes the bronchial tubes. It has been used to treat constipation as well as irritable bowel syndrome. Externally the root is used in treating varicose veins, ulcers, abscesses, and boils. The root extract (halawa extract) is sometimes used as flavouring in the making of a middle eastern snack called halva. It is also used as a gargle to treat mouth and throat ulcers. Allegedly, it is also useful for gastric ulcers.
***Arctium* L.**	Burdock	Folk herbalists have used dried burdock as a diuretic, diaphoretic, and a blood-purifying agent. It is also used as a scalp treatment applied to improve hair strength, shine and body, help reverse scalp conditions such as dandruff, and combat hair loss. Burdock leaves are used by some burn care workers for pain management and to speed healing time in natural burn treatment.
***Armoracia rusticana* (Lam.) Gaertn.**	Horseradish	Known to have diuretic properties, the roots have been used to treat various minor health problems, including urinary tract infections, bronchitis, sinus congestion, in growing toenails and coughs.
***Artemisia absinthium* L.**	Absinthium/Worm wood	It is known to have demulcent, expectorant, diuretic, and emollient properties. It is generally used in ailments of the lungs and the urinary systems, specifically in arthritis and kidney stones. used as a gargle to treat mouth and throat ulcers.
***Asparagus officialis* L.**	Asparagus	The roots are used as a diuretic and a cordial and are also useful to treat kidney complaints. the young stems are prescribed for liver and back pains. It also acts as a mild sedative that has been used historically to treat asthma, bronchitis, and whooping cough. The herb's antispasmodic effect improves bile flow in the gallbladder and has been reputed to treat gallstones and gallbladder pain.
***Astragalus microcephalus* Wild.**	Astragalus	This has been used against cough and fever diseases. It has sedative qualities, as well as a positive effect on asthma and tongue inflammations. It also helps with breast and intestine diseases.
***Berberis vulgaris* L.**	Barberries	Among its numerous usages in controlling different illnesses (stimulates digestion and reduces the gastrointestinal pains). It is also known for toughening the immune system. The bark contains a large number of alkaloids (berberine, berbamine, oxyacantha) and tannins. Barberry fruits contain glucose, fructose, malic acid, pectin, and vitamin C. The active substances from the herb bring about the following effects: haemostatic, diuretic, vasodilator, hypertensive, antibacterial (kills bacteria and parasites), and anti-inflammatory.
***Bryonia alba* L.**	White Bryony)	This has been used as a laxative and to treat respiratory problems. The tincture is used for laryngitis, bronchitis, pneumonia and pleurisy. Other uses include muscular rheumatism, polyarthritis and sciatica.
***Centaurea cyanus* L.**	Cornflower	Helps in the treatment of conjunctivitis, and as a wash for tired eyes.

***Chelidonium majus* L.**	Greater celandine	It acts as a herbal aid in removing warts, papillomas and other skin malformations.
***Cichorium intybus* L**	Chicory	It is variously used as a tonic and as a treatment for gallstones, gastro-enteritis, sinus problems and cuts and bruises. It is used to eliminate intestinal worms.
***Crataegus* L.**	Hawthorn	People use the fruit and the flowers for tea to cure a number of heart related diseases, dizziness, coughs and sleeplessness. Good for the heart; they improve the blood circulation of heart and brain, are good for vessel spasm, pains and heaviness around the heart, they normalize high blood pressure and the heartbeat rhythm, have long-term relaxing affect
***Cuscuta* L.**	Convolvulus/Bind weed	Mixed with other medicines, this has used against malaria, fever, gall-bladder inflammations, and spleen diseases. The medicinal plant was used as pills against headaches, and a number of eye and bone diseases.
***Daphne mezereum* L.**	Daphne	The alcohol extract from cortex and fruits is used against rheumatism, podagra, neuralgia, paralysis, different types of diathesis, some skin diseases, etc. In some countries the fruit is used against trombophlebitis.
***Daucus carota* L.**	Carrots	It is known as a diuretic, to normalize the functioning of the kidney and urethra and stimulate menstruation.
***Digitalis ferruginea* L**	Foxglove	Used in the treatment of heart conditions
***Equisetum arvense* L**	Field horsetail	It is known for having diuretic properties. It is used to treat kidney and bladder problems, gastro-enteritis, and prostate and urinary infections, and is particularly indicated for enuresis in children. Externally it is used for chilblains and wounds.
***Fragraria vesca* L.**	Strawberry	Strawberries are widely used by different countries of the world. In Armenian folk medicinal practice the strawberry was used for better appetite, and to stabilize digestion. It is also used against gallstone diseases, podagra and hepatitis. The leave decoction is used against menstrual bleeding, ulcer, gastritis, anaemia, hypertonic and heart diseases, and atherosclerosis.
***Galium verum* L.**	Lady's bedstraw	It is known to help with the treatment of verrucas and small cuts. It is also know to contain astringent and diuretic properties.
***Helichrysium plintocalix* D. Sosn.**	Immortelle brick-cup	Helps against menstrual problems. Cures jaundice in a few days when used as tea. It has been mentioned that the plant also stops bleeding, is good against liver cirrhosis.
***Hippophae rhamnoides* L.**	Sea buckthorn	It has cardiovascular functions and coronary microvessels. Russian cosmonauts have used its oil for protection against radiation burns in space.
***Humulus lupulus* L.**	Hop	Known to cure general weakness, neurasthenia, climacteric neurosis, and stomach-intestine diseases. It is used to cure sexual problem, especially painful erection, sleeplessness, appetite absence, jaundice, urethra inflammations, menstrual problems and headaches.
***Hypericum perforatum* L.**	St. John's wort	Used in the treatment for depression. It may be useful for treatment of alcoholism.
***Inula helenium* L.**	Horse-heal/Elecampane	Has been used by doctors to cure stomach infections, it helps to eliminates intestinal worms, and as a strengthener for body. Can also be used as a diuretic. These plants also have been known to reduce acute and chronic bronchitis.
***Juniperus* L.**	Junipers	It was used against gingivitis, malaria, neural and a number of feminine diseases, rheumatism, scab, and podagra.
***Leonurus* L.**	Motherwort	Have sedative influence on the central nervous system; it stabilizes the heart rhythm, drops the heart pressure.
***Marrubium vulgare* L.**	White horehound	To aid digestion, sooth sore throats, and relieve inflammation. it is also a natural grasshopper repellent.
***Melilotus officinalis* (L.) Pall.**	Yellow sweet clover	It has been often used in herbal medicine to fight hypertension and insomnia. Naturopaths claim that it helps promote lymphatic drainage and reduces fluid retention, particularly in the tissues of the vein wall.
***Mentha* L.**	Mint	This has been used against diarrhoea and vomits. Heratsi also mentions the fever reducing quality of mint in case of high temperature diseases. Mint is good for headache, eliminates garlic and onion scent in the mouth, helps the excessive heart beat, smoothens the stomach functions, helps against vomit, cures jaundice, kills the worm, cures stomach upset, stops bleeding, cures dog bites, scorpion and bee stings. The mint is also contraceptive.
***Ononis arvensis* L.**	Rest harrow	It stops bleeding, and cures headache, rheumatism, chronic skin spots, urethra inflammation.
***Onopordum acanthium* L.**	Cotton thistle	Used to treat cancers and ulcers and to diminish discharges of mucous membranes.
***Origanum vulgare* L**	Oregano	Oregano is used to promote perspiration as a treatment for colds, flu, and fevers. A tea of oregano is often used to bring on menses and relieve associated menstrual discomfort. It is also used in baths, inhalations and infusions, to clear lungs and bronchial passages. Externally it can help alleviate dry itching skin. The essential oil is used to treat viral infections,

		respiratory ailments, and muscle aches. It is also used as an antiseptic as well as a cure for stomach and respiratory ailments.
***Peganum harmala* L.**	Harmala	It is used as an analgesic and anti-inflammatory agent.
***Plantago major* L.**	Plantain	The seeds of the plant used against cough and diarrhoea. It has also been used to treat a number of fever and intestine diseases.
***Polygonum carneum* C. Koch.**	Buckwheat	Used in the treatment of urinary track infections.
***Primula* L.**	Primrose	Widely used against bronchitis, blue cough, pneumonia, bronchial asthma, flu and rheumatic pains. The plant in Armenia is used against respiratory diseases, chronic bronchitis and pneumonia. It is also used against cough. If the cure is combined with antibacterial preparations, the efficacy of the plant is raised.
***Prunus spinosa* L.**	Blackthorn	It has astringent, and stimulates the metabolism, cleans the blood, and is used as a laxative and diuretic. It helps with indigestion, eczema, herpes, allergies, colds, catarrh, neurosis, weak heart, kidney stones, skin, bladder, and prostrate problems. The liquid from the boiled leaves can be used as a mouthwash for sore throat, tonsillitis and laryngitis. It is also good for circulations, blood strengthening, and nutrient absorption." Blackthorn is also used to treat constipation, nosebleeds, blood disorders, bowel problems, stomach problems, some eye problems, and the flu. The syrup is an anti-rheumatic. Sloes have been made into a paste for whitening teeth and removing tartar.
***Quercus* L.**	Oak	Used in the treatment of cancer, bed-wetting, ulcer, diabetes, skin diseases, fever, high blood pressure.
***Rosa* L.**	Rose	The Ancient Romans consumed the petals as food and marinated them in wine to use them as a cure for hangovers. In the Middle Ages, the blossoms were used in aromatherapy for the treatment of depression. It is also known to treat indigestion, sore throats and skin rashes.
***Rubia tinctorum* L.**	Madder/dyer's madder	Alternative, astringent, deobstruent, diuretic, emmenagogue. Useful for all problems with the urinary tract, particularly where the urine becomes alkaline. It has been used for rickets, slow-healing broken bones, inflammations, lack of appetite, diarrhoea, dropsy, jaundice, blood purifier, and fever. Externally, a decoction of madder can be used for skin problems, especially tubercular conditions of the skin and mucous tissue.
Rubus armeniacus	Blackberry	Treatment for diarrhoea and rheumatism. A similar infusion was used as an external wash to treat piles (e.g., haemorrhoids). It was combined with honey to prepare a wash for sore throats, and a decoction of leaves was prepared to regulate urination. Also used to treat stomach trouble and sore eyes.
***Rubus caesius* L.**	Dewberries	Used to treat diarrhoea and rheumatism. A similar infusion was used as an external wash to treat piles (e.g., haemorrhoids). It was combined with honey to prepare a wash for sore throats, and a decoction of leaves was prepared to regulate urination.
***Rubus idaeus* L.**	Raspberry	In Armenian medical practice the raspberries were used against flu, chronic rheumatism and other diseases. The concentrate of the fruit with honey was used against rubella. The fruit is widely used against gum diseases, anaemia, and stomach ache, as well as for easing digestion and for sobering from drunkenness.
***Rumex* spp.**	Sorrel	The leaves of most species contain oxalic acid and tannin, and many have astringent and slightly purgative qualities. In Western Europe, dock leaves are a traditional remedy for the sting of nettles. it is also known as a treatment for inflammation, cancer, diarrhoea, scurvy and fever. A tea made from the stem and leaves can be made to act as a diuretic.
***Sambucus nigra* L.**	Elder/Elderberry	It is used to treat bronchitis, cough, upper respiratory cold infections and fever. The flowers can be used to make an herbal tea as a remedy for inflammation caused by colds and fever.
***Sanguisorba officinalis* L.**	Burnett officinalis	In Armenian folk medicinal practice, burnet was used against diarrhoea, intestine bleedings, menstrual problems, nyctalopia (night-blindness), and high blood pressure. . Having strong phytoncide qualities, burnet squash has a destroying influence on intestine, typhus, paratyphoid, and dysentery viruses. Burnet is also used against all types of diarrhoea (especially blood type), stomatitis, gingivitis, some types of internal bleedings, flu, angina and climax.

***Saponaria officinalis* L.**	Soapwort	Used as an expectorant and laxative.
Scabiosa Caucasica	Armenian Chrysanthemum	It is most commonly known for its properties of curing irritation of the skin, such as scabies. It is also used in aiding in recovery from influenza and acne. According to traditional Chinese medicine, the tea can used to fight off sore throat, used to clear the eyes and liver, and promote the reduction of fever. In the western world, it is used to treat circulatory disorders such as varicose veins and atherosclerosis.
Sorbus aucuparia	Mountain ash	The ripe fruit of sorbus, when infused with water, furnishes an acidulous and astringent gargle for acute diseases of the pharyngeal vault and tonsils, with excessive secretion. The bark and the unripe fruit are employed in infusion, or decoction in scurvy and diarrhoea, and topically to relaxations of the anal or vaginal walls and throat, all with profuse secretion.
***Taraxacum officinalis* Wilg.**	Dandelion	Notably for liver detoxification, as a natural diuretic and for inflammation reduction. dandelion leaves contain potassium, a mineral that is often lost during increased urination. There is also evidence that this property of dandelion leaves may normalize blood sugar.
***Thymus serpyllum* L.**	Thyme	Remedy for many ailments, from epilepsy to melancholy. Nowadays, it is prescribed by herbalists for intestinal worms, gastrointestinal ailments, bronchial problems, laryngitis, diarrhoea, and lack of appetite. It has antiseptic properties, and can be used as a mouthwash, skin cleanser, anti-fungal agent for athlete's foot and as an anti-parasitic for lice, scabies, and crabs.
***Tilia* L.**	Lime	The flower is known to treat colds, cough, fever, infections, inflammation, high blood pressure, headache (particularly migraine), and as a diuretic (increases urine production), antispasmodic (reduces smooth muscle spasm along the digestive tract), and sedative.
***Tussilago farfara* L.**	Coltsfoot	Soothes sore throats and chesty coughs.
***Urtica dioica* L.**	Nettle	The juice is diuretic in patients with congestive heart failure A folk remedy for rheumatism Can be used to treat arthritis, anaemia, hay fever, kidney problems, and pain Alleviate symptoms of benign prostate enlargement. he whole plant is antiasthmatic, antidandruff, astringent, depurative, diuretic, galactogogue, haemostatic, hypoglycaemic and a stimulating tonic. Externally, the plant is used to treat skin complaints, arthritic pain, gout, sciatica, neuralgia, haemorrhoids, and hair problems.
***Valeriana officinalis* L.**	Valerian	Used for insomnia and other disorders as an alternative to benzodiazepine drugs. A sedative for nervous tension, hysteria, excitability, stress and intestinal colic or cramps.
***Verbascum* L.**	Mulleins	An effective treatment for asthma and respiratory disorders. Extracts made from the plant's flowers are a very effective treatment for ear infections.
***Viscum album* L.**	Mistletoe	It is used It is used externally for to treat: chill blains, frostbite, sores, ulcers, varicose veins. Also uses in the treatment of bleeding; bleeding from the lungs or intestines caused by typhoid or dysentery, disturbance in blood circulation, combined with Horsetail, internal and external haemorrhage, nosebleed. Used for brain and nervous system conditions such as: convulsions, convulsive nervous disorders, delirium, dizziness, epilepsy, headaches, hysterical complaints, nerves, nervous debility, neuralgia, It is also used for cardiovascular conditions such as: arteriosclerosis, hardening of the arteries, heart disease heart and circulatory complaints, heart flutters, normalizes circulation, poor circulation, prevention and treatment of strokes, raises low blood pressure. It is used to counteract the side effects of abnormal blood pressure, such as: blood rushing to the head, buzzing in the ear, dizziness, visual defects. In women it is helpful for bleeding after childbirth, chronic cramping, female infertility, and heavy menstruation, uterine and menstrual disorders. It is also helpful for women during menopause for; breathing difficulties, feelings of anxiety, heart palpitation, hormonal imbalance, hot flushes, normalizing circulation. It helps with a faulty digestive processes. It is beneficial to the whole glandular system, favourably influences the pancreas, and stimulates glandular activity relating to digestion. It is used to help with urinary disorders and arthritic pain and also aids metabolism and diabetes. It has been known have positive effects on cancer and the lack of energy and unwillingness to work.

Sources: Torosyan, 1983; Apkarian and Ayrapetian. 1997; FAO, 2010.