

Importance of *Rosa canina*'s In Terms Of Public Health And Turkey Forestry

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ABSTRACT

In this study of *Rosa canina* L. (Rosehip) species naturally occurring in Turkey, the importance of forestry and public health were examined. The plant diversity of our country is largely within the borders of the forest ecosystem. Forest ecosystems cover 28.6% of the country's land area of 78 million hectares. A species of distribution model studies is with demonstrated potential for spreading *Rosa canina*'s Turkey's forests. Accordingly, the ecological valence of a very large Rosehip, Turkey was determined that spread in all the forest.

Rosa canina is of great importance in terms of economic, ecological and social aspects. Fruits is that contain ascorbic acid, flavonoids, dimethyl sulfide, protein, tannin, Na, K, P, Mn, Mg, vitamins C, A, B, K, P, flavon, malic acid, pectin, stronelol, etc. The core contains vanillin. In public are known that berries are known to be used blood-calming, strengthening, whooping cough, colds, cough and painkiller, prevention of cardiovascular diseases, cancer, prevent gastritis and ulcers, against diabetes, leaves are known to be used against constipation and malaria. The fruit is dried and tea is used. Flowers and berries are used in the production of jam, syrup, marmalade and liquor. According to the results of in vitro and in vivo studies; antimicrobial, antioxidant, antimutagenic, anti-inflammatory agents are reported. There is also information about the use of a kind of drug used in the treatment of rabies in the past. The medical importance of *Rosa canina* is confirmed in pharmacopoeias of different countries. With these features, it is the most easily accessible medicinal plant in rural areas in terms of public health. *Rosa canina* that is one of the most important non-wood forest products is on sustainability of forest ecosystems and biodiversity conservation, is conservation in forest areas is of great importance.

Keywords: Public health, rosehip, non-wood forest products, *Rosa canina*, sustainable forestry, medicinal plants

INTRODUCTION

The diversity of plant species in our country is largely within the boundaries of forest ecosystems. Forest ecosystems have a width of 22.3 million hectares and cover 28.6% of the country as a whole (Anonymous, 2016). *Rosa canina* is a deciduous shrub with scattered hills that can be up to 3 meters long and deciduous in winter (Yücel, 2005). The leaves are green, the flowers are light pink-white color. Blooms in spring-summer. Fruit hazelnut, round-egg-shaped, fleshy, bright red, hairy inside (Yücel, 2008).

Non-wood forest products constitute the majority of the biological diversity of the forests of the country. Non-wood forest products include all kinds of plant or animal products that humans and other living creatures use to meet their needs or generate income (Anonymous, 2001). These products consist of bushes, shrubs and all kinds of plants and parts thereof, which are grown in forest ecosystems, harvested or collected for commercial and non-commercial purposes. Non-wood forest products are important both economically and culturally as well as ecologically or biologically. It is of great importance for rural people as well as for the country's economy. Non-wood forest products from forest ecosystems

meet the diverse needs of society. It is widely used in medicine, pharmacy, food, chemical and cosmetic industry. These products, which are among the most important sources of income especially in foreign trade, are an important element of sustainable rural development.

In this study, naturally occurring *Rosa canina* L. (*Rosaceae*) Turkey, plants of forestry and public health aimed to determine the significance of the pain.

MATERIALS AND METHODS

In this study, *Rosa canina* (Rosehip) was selected as the research material. First of all, literature studies on species have been done. The data obtained were evaluated collectively; *R. canina*'s natural distribution, ecological characteristics, potential distribution areas, economic and human health in terms of importance, active ingredients, consumption forms among the people in Anatolia, pharmacological properties, export and import value are given in order. The studies are concentrated in the Nur mountains in the west of Gaziantep. Selection of sample areas, grid cells from climate data were used. Arcis 10.2 package program was used to generate numerical backing maps of ecological variables (Anonymous 2015). The data generated at <http://www.worldclim.org> was used to create maps of climatic variables (Hijmans et al., 2005).

RESULTS AND DISCUSSION

***Rosa canina* 's ecological features and potential distribution area in Turkey**

79 sample areas were selected in Nur mountains of Gaziantep region. The species whose frequency value is higher than 10% are as follows; *Rosa canina*, *Pinus brutia*, *Abies cilicica*, *Arbutus andrachne*, *Cedrus libani*, *Cistus salvifolius*, *Crataegus monogyna*, *Crataegus orientalis*, *Echinops onopordum*, *Fagus orientalis*, *Juniperus oxycedrus*, *Paliurus spina-christi*, *Quercus c Rhus coriaria*, *Rubus caesius*, *Spartium junceum*, *Sytrax officinalis* (Karakaya, 2016).

R. canina prefers sandstone, claystone, siltstone and clastic sedimentary rocks and limestone bedrock. Rosehip; Basic, quaternary, basalt and carbonates do not prefer sites where bedrock species are present. It generally prefers places other than east and south east. The shape of the earth is not important in the cultivation of *R. canina*. The average annual rainfall is 791.2 mm, 50% of which falls in winter. According to Köppen's climate classification, it has a humid climate outside the steppe area (Karakaya, 2016). According to Thornthwaite classification, the research area is arid and slightly humid, second degree mesothermal, very strong water surplus in winter and close to marine conditions (Ertoprak, 2012). The most important factors affecting the distribution of Rosehip in the study area are the altitude and the rainfall in the hottest and driest months. *R. canina* can grow naturally in habitats where larch, blackberry and taurus fir grow. In the habitats where red pine grows, Rosehip is less likely. According to these results Rosehip some exceptions, it can be grown in a wide area in Turkey.

The importance of *Rosa canina* for economic and human health.

Rosa canina, known as rosehip in Anatolia, is generally consumed for food and medicinal purposes among the people. *R. canina* fruits are traded under the name "Fructus Cynosbati cum semi drog". Rosehip is registered in German, European, Swiss, Japanese British Herbal Pharmacopoeia and PDR Plant Monograph and Commission E monograph (Demirezer et al., 2011; European Pharmacopoeia, 2017).

Contains Active Ingredients: Tannin, vitamins (A, B1, B2, C, K, P), sugar, organic acids (Yücel, 2001), flavones, minerals, vanillin in the nucleus (Eröztürk 2002), malic acid, citric acid, pectin, geraniol, citronelol, vitamin C, B complex (Li 2002; Yücel, 2014) phenolics and carotenoids (Roman et al., 2013).

Use among the people in Anatolia; *R. canina* diuretic, blood-relieving, albumin, diabetes, red-nose, whooping cough, improving stomach spasms (Ivanov et al., 1999); strengthening, lowering blood sugar (Baytop, 1999); nourishing, strengthening the immune system, improving the common cold (Erozturk,

2002); leaves against constipation and malaria, fruit cough suppressant, antipyretic (Li et al., 2016); pain relief, diarrhea prevention, antioxidant, antiradicular, antiseptic, antispasmodic, sedative, lipoxygenase inhibitor, worm lowering (Duke et al., 2002); used against diabetes, liver diseases and hemorrhoids (Orhan et al., 2009); Root is a kind of drug used in the treatment of rabies disease, the roots are used in the treatment of prostate around Eskisehir (Yücel, 2008). In addition, *R. canina* has been reported to be effective in laxative and diuretic effects in kidney and product system diseases, blood purifier, scorbitis, rheumatism and gout treatment (Demirezer et al., 2011).

The mode of consumption among the people in Anatolia; lightly squeezed fruits 1 tablespoon 200 grams boiling water boiled for 10 minutes drink as tea; the seeds of the fruit are removed and finely chopped or the fruit is boiled by pouring into the water as a whole and the filtered water is drunk (Yücel et al., 2010). In another form, 2-2.5 grams of ground grinded drink prepared by infusion in 150ml of hot water is drunk 1-2 times a day (Güvenç, 2011).

Other Uses: *R. canina* is used in winter tea as a beverage by mixing with various plants in certain proportions, making flowers and fruits of jam, syrup, marmalade and liquor.

Pharmacological properties of *Rosa canina*

In vitro studies were performed on *R. canina* fruits and the following results were found; antibacterial (Aydın, 2008; Berber et al., 2013); anti-inflammatory, antimutagenic (Güvenç, 2011), antifungal(Berber ve ark., 2013), antioxidant (Barros et al., 2011; Kılıçgün and Altın, 2009) and antiviral (Güçlü and Yüksel, 2017) effect. And In in vivo studies, antigenotoxic (Kasımoğlu and Uysal 2016), hypoglycemic effects and antidiabetic effects (Orhan et al., 2009); antiulcerogenic, antidiarrheal, immunomodulator, antiproliferative activity (Orhan and Hartevioglu, 2013).

Export and import value of *Rosa canina*

Rosehip is used as a beverage and food supplement in Anatolia. The products obtained from *R. canina* are consumed in various countries as food supplements or mixed with some other substances and foods. Rosehip has drugs used against various diseases. 10 of them are traded in Turkey with permission from the Ministry of Agriculture. Turkey Statistical Institute according to 2017-2018 data; In 2017, 154,870kg of Rosehip were imported and paid \$ 88,322 (Fig. 1). In 2018, 84.50 kg of *R. canina* was imported, while 44.739 dollars were paid out, whereas 158 kg *R. canina* was exported and generated \$ 1,398 income (Fig. 2).



Fig. 1. Import values of *Rosa canina* in 2017.

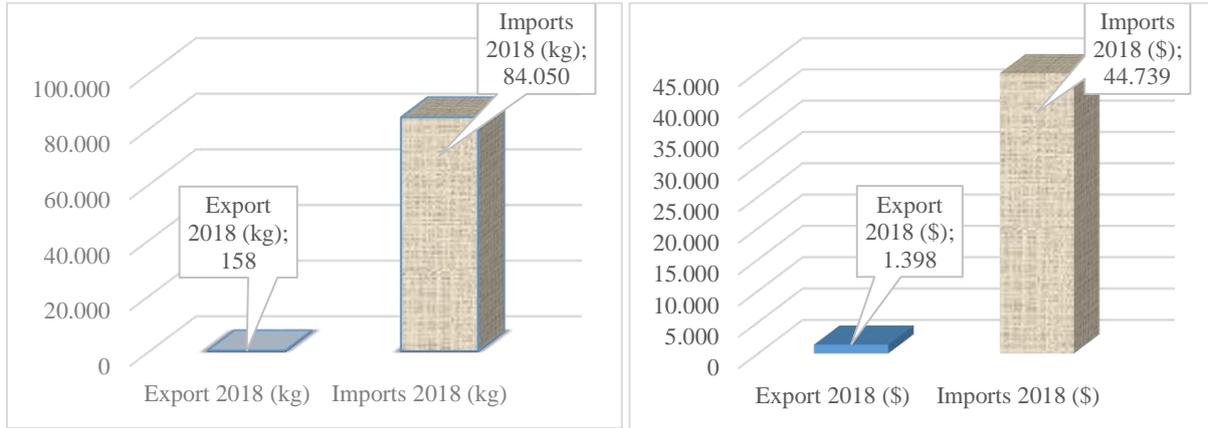


Fig 2. Export and import values of *Rosa canina* in 2018.

CONCLUSION

In Turkey it has a width of 22.3 million hectares of forests and covers 28,6% of the country overall. As a result of the rapid expansion of agricultural and residential areas, the diversity of plant species in our country can be found within the borders of forest ecosystems. Non-wood forest products are used in the medical, pharmaceutical, food, chemical and cosmetic sectors.

Rosa canina can easily adapt to different climatic and soil conditions. For this reason, it is widespread in the world and in Anatolia. The current range of Rosehip has been partially narrowed due to factors such as unplanned, incorrect and excessive utilization, plant diseases and fire. According to the results of this study carried out in the Nur Mountains; *R. canina*, *Abies cilicica*, *Pinus nigra*, *Rubus caesius* are positive indicator species. *Pinus brutia* was identified as a negative indicator species.

Treatment of infections caused by multiple antibiotic resistance microorganisms has increased in recent years. Various studies have shown that plants have high antimicrobial effects (Mohd Nazri et al., 2011). This result shows that natural antimicrobial agents obtained from plant extracts can be used. *R. canina* is commonly consumed among the public for food and medicinal purposes. In addition, flowers, seeds and roots are used for different purposes.

There are numerous in vitro and in vivo studies with *R. canina*. According to these studies; Rosehip has antibacterial, antifungal, antimutagenic, antioxidant, antiviral, antiulcerogenic, antiinflammatory, antinociceptive, antidiarrheal, immunomodulator, antiproliferative, antiulcerogenic, antidiarrheal, immunomodulatory and antiproliferative activity. In addition, the products obtained from Rosehip are consumed in various countries as food supplements or mixed with certain other substances and foods in certain proportions.

As a result; *Rosa canina* is used in complementary and alternative medicine practices in Turkey and the world. *Rosa canina* that is one of the most important non-wood forest products is on sustainability of forest ecosystems and biodiversity conservation, is conservation in forest areas is of great importance. As an important element of sustainable rural development, it is necessary to carry out detailed studies and to contribute to the national economy in order to protect *Rosa canina*, expand its areas and bring it into the economy.

REFERENCES

- Anonim (2001). DPT. 8 ci 5 Yıllık kalkınma planı, Ormançılık Özel İhtisas Kom. Rap. Ankara.
Anonim (2015). MTA. Gaziantep yöresi jeoloji paftaları.
Anonim (2016). Orman Genel Müdürlüğü, 2015 Yılı idare faaliyet raporu. Strateji Geliştirme Dairesi Başkanlığı, Ankara.
Aydın, B. D. (2008). Bazı tıbbi bitki ve baharatların gıda patojenleri üzerine antibakteriyel etkisinin araştırılması. *Kafkas Üniversitesi Veterinerlik Fakültesi Dergisi*, 14(1), 83-87.

- Barros, L., Carvalho, A. M., & Ferreira, I. C. (2011). Exotic fruits as a source of important phytochemicals: Improving the traditional use of *Rosa canina* fruits in Portugal. *Food research international*, 44(7), 2233-2236.
- Baytop, T. (1999). Türkiye’de bitkiler ile tedavi. Ankara, Nobel Tıp Kitapevleri.
- Berber, İ., Avşar, C., Çine, N., Bozkurt, N., Elmas, E., (2013). Sinop’da yetişen bazı bitkilerin metanolik ekstraktlarının antibakteriyel ve antifungal aktivitelerinin belirlenmesi. *Karaelmas Science and Engineering Journal*, 3(1), 10-16.
- Demirezer, Ö., Ersöz, T., Saraçoğlu, İ., & Şener, B. (2011). Tedavide kullanılan bitkiler “FED Monografları”. NM Medikal, Ankara, Nobel Tıp Kitabevi.
- Duke, J.A., Bogenschutz-Gudwin, M.J., Cellier, J., Duke, P-A.K., 2002, Hanbook of medicinal herbs, CRC Pres.
- Eröztürk, N., (2002). Bir yudum sağlık. İstanbul, Anahtar Kitaplar Yayınevi.
- Ertoprak, E. (2012). Nurdağı’ nın (Gaziantep) beşeri ve ekonomik coğrafyası. Yayımlanmamış Yüksek Lisans Tezi. Konya: Necmettin Erbakan Üniversitesi.
- European Pharmacopoeia, European directorate for the quality of medicines and health care (EDQM), Strasbourg, France, 2017 (<http://www.edqm.eu/>)
- Güçlü, İ., Yüksel, V. (2017). Fitoterapide antiviral bitkiler. *Deneysel Tıp Araştırma Enstitüsü Dergisi*, 7(13), 25-34.
- Güvenç, A. (2011). *Rosa canina* kuşburnu, 591-598p; in (eds: Demirezer, Ö., Ersöz, T., Saraçoğlu, İ., Şener, B. Tedavide Kullanılan Bitkiler FED Monografları). NM Medikal, Nobel Tıp Kitabevi.
- Hijmans, R. J., Cameron, S. E. Parra, J. L. Jones, P. G. & Jarvis, A. (2005). Very high resolution interpolated climate surfaces for global land areas. *International Journal of Climatology* (25), 1965-1978.
- Ivanov., I.I., Lancev, I.I., & Neşev, G.K. (1999). (Çev., Makaklı, B.), Şifalı bitkilerle tedavi atlası. İstanbul, Pamuk Yayıncılık ve Matbaacılık.
- Karakaya, T. (2016). Gaziantep yöresi Nur Dağı’nda Kuşburnu (*Rosa canina* L.)’nun ekolojik özellikleri ile potansiyel dağılım modellemesi ve haritalanması, Doktora Tezi, Anadolu Üniversitesi, Fen Bilimleri Enstitüsü.
- Kasımoğlu, C., & Uysal, H. (2016). Farklı test sistemleri ile somatik hücrelerde profenofos genotoksitesine karşı kuşburnu (*Rosa canina* L.) ekstrelerinin doğal bir antigenotoksik ajan olarak kullanılması. *Cumhuriyet Üniversitesi Fen-Edebiyat Fakültesi Fen Bilimleri Dergisi*, 37(1), 30-40.
- Kılıçgün, H., & Altın, D. (2009). Karbontetraklorür ile karaciğer hasarı oluşturulmuş sıçanlarda *Rosa canina*’nın (kuşburnu) in vivo antioksidan etkisi. *Fen Bilimleri Dergisi*, 30(2), 10-16.
- Li S.C.T. (2002). Chinese and related north american herbs. USA, CRC Pres LLC.
- Li, Y., Zhang, J. J., Xu, D. P., Zhou, T., Zhou, Y., Li, S., & Li, H. B. (2016). Bioactivities and health benefits of wild fruits. *International journal of molecular sciences*, 17(8), 1258.
- Mohd Nazri, NAA., Ahmat, N., Adnan, A., Syed Mohamad SA., & Syaripah Ruzaina SA. 2011. In vitro antibacterial and radical scavenging activities of malaysian table salad. *Afr. J. Biotech.*, 10:5728-5735.
- Orhan, D. D., & Hartevioğlu, A. (2013) Kuşburnu bitkisinin kimyasal bileşimi ve biyolojik aktiviteleri. *Spatula DD.*; 3(1):23-30.
- Orhan, N., Aslan, M., Hoşbaş, S., & Deliorman, D., (2009). Antidiabetic effect and antioxidant potential of *Rosa canina* fruits. Gazi University, Faculty of Pharmacy, 5(20) 309-315.
- Yücel, E., Güney, F., & Şengün Yücel, İ. (2010). The wild plants consumed as a food in Mihaliççık district and consumption forms of these plants. *Biological Diversity and Conservation*, 3(3) 158-175.
- Yücel, E. (2014). Türkiye’de yetişen tıbbi bitkiler tanıma kılavuzu. İstanbul, Türmatsan.
- Yücel, E. (2005). Ağaçlar ve çalılar 1 (Trees and Shrubs 1). İstanbul, Türmatsan.
- Yücel, E. (2008). Türkiye’de yetişen tıbbi bitkiler 1. Eskişehir, Cetemenler.
- Yücel, E. (2001) Eskişehir yöresi yaban güllerinin (*Rosa* spp.) doğal yayılışı ve ekolojik özellikleri, A.Ü. Fen Fakültesi Derg, 6, 15-32.