



Research Article

Contributions to the Woody Plants Flora of Şanlıurfa (Türkiye)

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Received: November 5, 2024

Accepted: December 2, 2024

Online Published: December 4,
2024

Abstract: This study material consists of woody plants naturally growing in Şanlıurfa province. Within the scope of this study carried out between 2014 and 2017, all natural growth areas within the borders of Şanlıurfa province were visited and 19 genera and 24 taxa belonging to 13 families were identified in these areas. The most frequently identified natural woody plants are *Pistacia khinjuk* (Bittim), *Pistacia terebinthus* subsp. *palaestina* (Wild Pistachio), *Rhus coriaria* (Sumac), *Quercus brantii* (Persian Acorn Oak), *Ficus carica* subsp. *carica* (Fig), *Punica granatum* (Pomegranate), *Amygdalus communis* (Almond), *Rosa canina* (Rosehip) and *Cerasus mahaleb* (Mahaleb).



Keywords: Flora, Forest, Natural, Plant diversity, Şanlıurfa, Woody plants.

Citation: Aslan, M., & Hasan Akan, H. (2024). Contributions to the Woody Plants flora of Şanlıurfa (Türkiye). *International Journal of Nature and Life Sciences*, 8 (2), 197-203.

1. Introduction

Flora is the list of plant species that have a certain boundary and cover an area. In fact, although the term 'flora' includes the whole plant community, it is generally used for ferns (Pteridophyta) and seed plants (Spermatophyta), i.e. the vascular plants (Güner et al., 2000). Turkey hosts a rich variety of plants due to some special reasons. Among these reasons, Turkey geomorphological structure, geographical location, climate diversity and being at the intersection of gene centers (Davis, 1965-1985; Davis et al., 1988). According to the latest current status, Turkey flora contains around 11.707 taxa, 3.649 of which are endemic (Güner et al., 2012). The most important researcher investigated the plant diversity of Turkey is undoubtedly the English botanist Peter Hadland Davis. The name of the work he published was "Flora of Turkey and the East Aegean Islands". Like previous foreign researchers, he collected many plant samples from Turkey. He carried out these studies mostly between 1938 and 1966. He completed the first volume in 1965 and the ninth volume in 1988. Later, 2 additional volumes were added. The additional volumes included mostly new species that were later introduced to Turkey (Davis 1965-1985, Davis 1988).

Turkey has 232 woody plant genera belonging to 80 families of Gymnospermae and Angiospermae seeded plants, 871 woody species, 168 subspecies and 159 varieties. 18 species of *Quercus* sp. from woody taxa are indicators of genetic richness in Anatolia. In addition, there are around 300 tree and tall shrub species, the most notable genera are *Sorbus* sp., *Malus* sp., *Mespilus* sp., *Crataegus* sp., *Amygdalus* sp., *Prunus* sp., *Cerasus* sp., *Cotaneaster* sp., *Pistacia* sp. This situation shows that the gene center of fruit trees is Anatolia. Anatolia is also the gene center of *Abies* sp., *Picea* sp., *Cedrus* sp., *Juniperus* sp., *Liquidambar* sp., *Castanea* sp., which are forest trees (Aksoy, 2014).

The aim of this study is to determine the woody plants growing naturally in Şanlıurfa province.



2. Materials and Methods

Şanlıurfa has hosted many civilizations throughout history and has been called Ruha, Reha, Urfa and Edessa in the past (Aslan, 1984). This study was conducted in natural areas of Birecik, Hilvan, Karaköprü and Haliliye districts in Şanlıurfa. within the borders of Şanlıurfa province between 2014-2017. Şanlıurfa is a province located in the Southeastern Anatolia Region of Turkey, neighboring the provinces of Mardin, Gaziantep, Adiyaman and Diyarbakır, and surrounded by the Syrian border (Figure 1). Its population is around 2.213.964 (<https://www.tuik.gov.tr/>). Its average elevation is 518 m and its surface area is 19,451 km² (Güzel, 2020).



Figure 1. The map of study area (www.cografyaharita.com).

Şanlıurfa's economy is based mostly on agriculture, animal husbandry and tourism. In Şanlıurfa, which alone has 10% of the total irrigable land in Turkey, 35% of these lands are currently irrigable lands (Aydoğdu and Akan 2005). Şanlıurfa has a predominantly continental climate, but Mediterranean climates are also seen. The average total rainfall in Şanlıurfa is around 453 mm. The annual average temperature in Şanlıurfa province is 18.3 °C (Öztürk Tel, 2014). The important rivers and ponds of the city are: Euphrates River, Habur River, Culap River, Belih River, Hacı Hıdır Dam Lake, Soydan Dam Lake, Atatürk Dam Lake, Birecik Dam Lake and Karkamış Dam Lake. The highest point of the province is the extinct volcanic mass of Karacadağ (1919 m). Other high peaks are Tektek Mountains (747 m), Susuz Mountain (812 m), Nemrut Mountain (800 m) and Arat Mountain (714 m) (Ünlü, 2014). The natural vegetation is generally steppe. The sparse grass communities that flourish with spring rains turn yellow and disappear in the summer due to severe drought and heat. Tree communities are generally seen along streams. In addition, tree communities such as oak, hawthorn, and acorn are encountered in places around Karacadağ and Halfeti. In Tektek Mountains, there are wild pistachio trees in a wide area (Akan et al., 2004)

The main material of the study consists of woody plants distributed in the natural flora of Şanlıurfa. Şanlıurfa is located in the C7 grid system. In this context, plant samples were collected from natural habitats in Şanlıurfa between 2014-2017. The researcher number was given to plant samples. The Flora of Turkey (Davis, 1965-1985; Davis et al., 1988; Güner et al., 2000; Güner and Ekim, 2014; Güner et al., 2018) were used in the identification of the plants. The plant specimens evaluated within the scope of the study are kept in the Harran University Herbarium (HARRAN).

3. Results

This study was conducted between 2014 and 2017 and woody plants consisting of 19 genera and 24 taxa belonging to 13 families growing naturally in some towns of Şanlıurfa province were examined.

The list of woody plants obtained from the study area is given alphabetically at the family level, and the web address 'https://bizimbitkiler.org.tr/list.html' was used for the Turkish names (Güner et al., 2012) (Tablo 1).

Tablo 1. Woody plants Determined in some districts of Şanlıurfa Province.

Family	Taxon name	Turkish name	Location	Date of collection	Voucher No
Anacardiaceae	<i>Pistacia khinjuk</i> Stocks	Bıttım	Birecik, Arat village, 760 m	26.11.2014	Aslan 5008
Anacardiaceae	<i>Pistacia terebinthus</i> L. subsp. <i>palaestina</i> (Boiss.) Engler	Menengiç	Haliliye, Tektek mountains, 550-800 m; Hamurkesen village, 500 m.	24.10.2016	Aslan 5011
Anacardiaceae	<i>Rhus coriaria</i> L.	Sumak	Birecik, Mezra district, 450 m; Hilvan, Korçik mountain, 700 m.	24.10.2016	Aslan 5019
Apocynaceae	<i>Nerium oleander</i> L.	Zakkum	Birecik, Mezra-Adacık village 5 km, 415 m.	04.11.2016	Aslan 2001
Elaeagnaceae	<i>Elaeagnus angustifolia</i> L.	İğde	Birecik, south of Zeytinbahçe, 440 m.	05.06.2016	Aslan 5106
Ephedraceae	<i>Ephedra campylopoda</i> C.A. Meyer	Deniz üzümü	Mezra village, Köprü mountain, 350 m.	16.11.2015	Aslan 5015
Fabaceae	<i>Cercis siliquastrum</i> L. subsp. <i>hebecarpa</i> (Bornm.) Yalt.	Erguvan	Birecik, Zeytinbahçe	14.10.2016	Aslan 1025
Fagaceae	<i>Quercus brantii</i> Lindley	Kara Meşe	Karaköprü, above Aşık village, 700-800 m; Hilvan, Korçik mountain, 600 - 700 m.	09.11.2014	Aslan 5020
Lythraceae	<i>Punica granatum</i> L.	Nar	Birecik, Mezra town, 360 m.	01.10.2016	Aslan 5109
Moraceae	<i>Ficus carica</i> L. subsp. <i>carica</i> (All.) Schinz & Thell.	İncir	Birecik, Zeytinbahçe, 400 - 450 m; Karakız village, 470 m;	13.11.2016	Aslan 5014
Moraceae	<i>Ficus carica</i> L. subsp. <i>rupestris</i> (Hauskn.) Browicz.	İt İnciri	Birecik, Mezra-Akarçay, 450 m.; Hilvan, Korçik mountain, 600 - 700 m.	10.11.2016	Aslan 5023
Rhamnaceae	<i>Paliurus spina-christi</i> Miller	Karaçalı	Birecik, Zeytinbahçe, 450 m.	05.08.2016	Aslan 5108
Rosaceae	<i>Amygdalus arabica</i> Oliv.	Arap bademi	Birecik, East of Zeytinbahçe, 400 m; Between Ziyaret hill and Abdallı 625 m.;	27.05.2015	Aslan 5107
Rosaceae	<i>Amygdalus communis</i> L.	Badem	Birecik, Mezra village, 460 m; Hilvan, Korçik Mountain, 600-700 m.	30.05.2015	Aslan 5003
Rosaceae	<i>Cerasus mahaleb</i> (L.) Miller	Mahlep	Hilvan, Korçik mountain, 600-700 m.	25.04.2016	Aslan 5013

Rosaceae	<i>Cerasus microcarpa</i> (C. A. Meyer) Boiss. subsp. <i>tortuosa</i> (Boiss. et Hausskn.) Browicz	Dağ Kirazı	Haliliye, Tektek mountains	30.05.2017	Aslan 5110
Rosaceae	<i>Crataegus monogyna</i> Jacq subsp. <i>monogyna</i>	Yemişen	Above Almaşar village, 740 m; Hilvan, Korçik mountain, 700 m.	09.11.2015	Aslan 1022
Rosaceae	<i>Pyrus communis</i> L.	Armut	Hilvan, Korçik mountain, 600 m.	09.11.2015	Aslan 5009
Rosaceae	<i>Rosa canina</i> L.	Kuşburnu	Karaköprü, Kırkpınar Village, 850 m.	09.11.2016	Aslan 5111
Rosaceae	<i>Rubus sanctus</i> Schreber	Böğürtlen	Birecik, Mezra village, 360 m; Karakız village, 470 m.	27.05.2017	Aslan 5004
Salicaceae	<i>Salix acmophylla</i> Boiss.	Acem Söğüdü	Karaköprü, Kırkpınar village, 500-850 m.	01.08.2015	Aslan 5115
Tamaricaceae	<i>Tamarix smyrnensis</i> Bunge	İlgın	Haliliye, Osmanbey campus, 495 m; Birecik, Mezra	10.08.2016	Aslan 5113
Ulmaceae	<i>Celtis caucasica</i> Willd.	Çitlenbik	Haliliye, Osmanbey campus, 530 m.	10.08.2016	Aslan 5117
Ulmaceae	<i>Celtis tournefortii</i> Lam.	Dardağan	Birecik, south of Zeytinbahçe, 450 m, Eyyübiye, Direkli hills, 550 m.	10.09.2015	Aslan 5121

4. Discussion

In this study, woody plants naturally growing in Şanlıurfa were studied. The study is carried out between 2014 and 2017 years. As a result of this study, 24 taxa belonging to 19 genera and 13 families were determined.

Among the families identified, the Rosaceae family contains the most taxa, with 8 taxa. This is followed by the Anacardiaceae family with 3 taxa, the Moraceae and Ulmaceae families with 2 taxa, and the other families with 1 taxa. The woody plants obtained from the study area is given at family level and with genera and taxa level with the Figure 2.

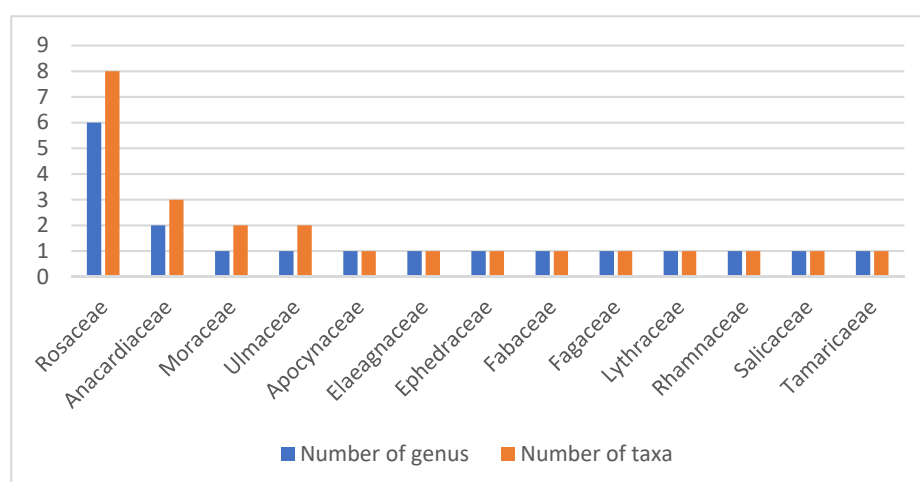


Figure 2. Number of genera and taxa at family level of woody plants determined in the study area.

The woody plants obtained from the study area is given at the family level with the average elevation (Figure 3). According to this, among the woody plants that spread naturally in Şanlıurfa, the family with the highest average height of growth is the Rhamnaceae family, which includes the *Paliurus spina-christi* Miller taxon. With an average altitude of 700 m, the Fagaceae family, which includes the taxon *Quercus brantii* Lindley,

ranks second, while the Rosaceae family, which contains 8 taxa, is at an altitude of approximately 577 m. and the Anacardiaceae family, which contains 3 taxa, continues to exist at an average altitude of approximately 586 m. The Ephedraceae, Lythraceae and Fabaceae families, which have the lowest average altitude in the study area, seen between 350 m and 390 m. The distribution of woody plants obtained from the study area to local locations and the taxon numbers of this distribution are given (Figure 4).

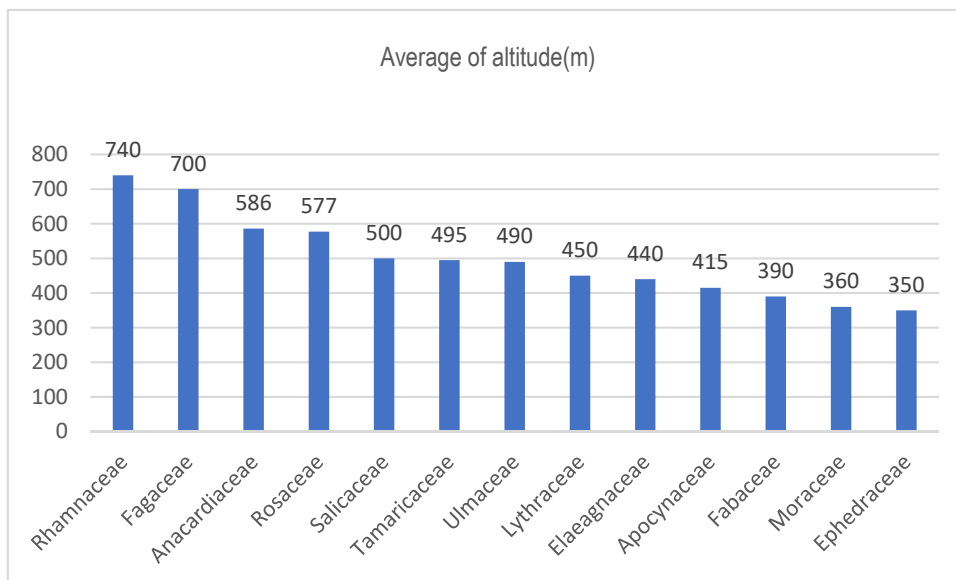


Figure 3. Average heights of growing areas on a family basis.

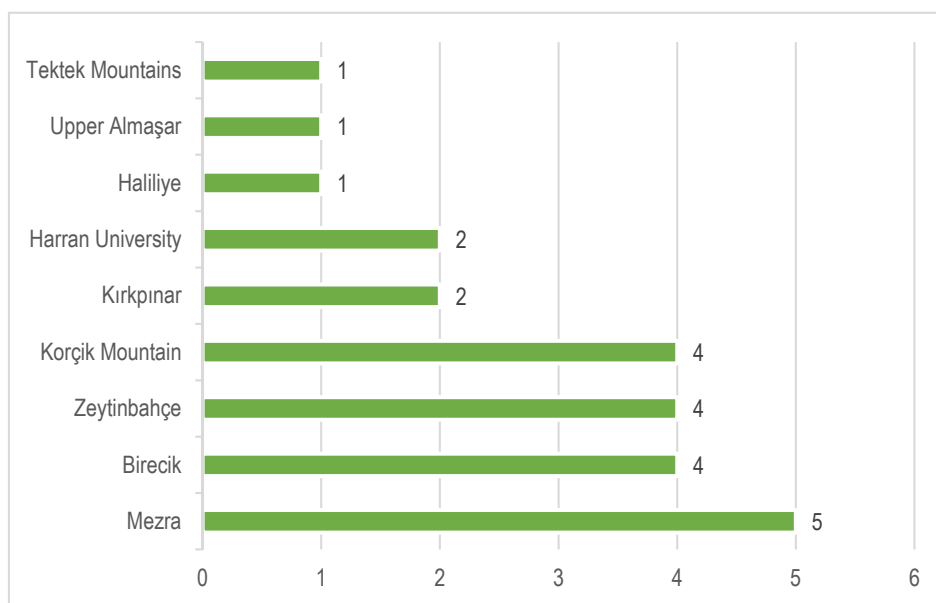


Figure 4. The distribution of woody plants obtained from the study area.

When the distribution of natural woody vegetation of Şanlıurfa is examined, it is seen that the diversity and distribution of taxa is highest in the rural area of Mezra town, the natural woody plant distribution in Birecik district and Korçık mountain is higher than in the central regions and the low number of taxa is in the central districts.

As a general, all the taxa are distributed on steppe vegetation. Some of them are on the roadside, such as *Rhus coriaria*. *Salix acmophylla* and *Tamarix smymensis* are usually on the dried river banks.

Şanlıurfa is the poorest province in the Southeastern Anatolia Region in terms of forest resources. Our research area (Şanlıurfa) is located in the Iran-Turan phytogeographic region, where steppe vegetation dominates and the Iran-Turan phytogeographic region elements are in the first place. The dominant vegetation in Şanlıurfa is steppe. Forest vegetation is generally encountered along streams (*Populus* L. (poplar), *Salix* L. (willow)). In addition, forest remnants such as *Quercus* L. (oak), *Crataegus* L. (hawthorn) are also encountered. *Pistacia khinjuk* Stocks (wild pistachio tree) are located in a large area (Akan and Ayaz, 2016). *Juglans regia* L., *Vitis vinifera* L., *Morus nigra* L., *Ficus carica* L., and *Pistacia vera* L. are some woody plants cultivated in the region. There is a total of 8,948 hectares of forest area in the province, of which 4,543 hectares are degraded forest and 4,405 hectares are normal forest area (<https://www.ogm.gov.tr/sanlıurfaobm>) (Figure 5).

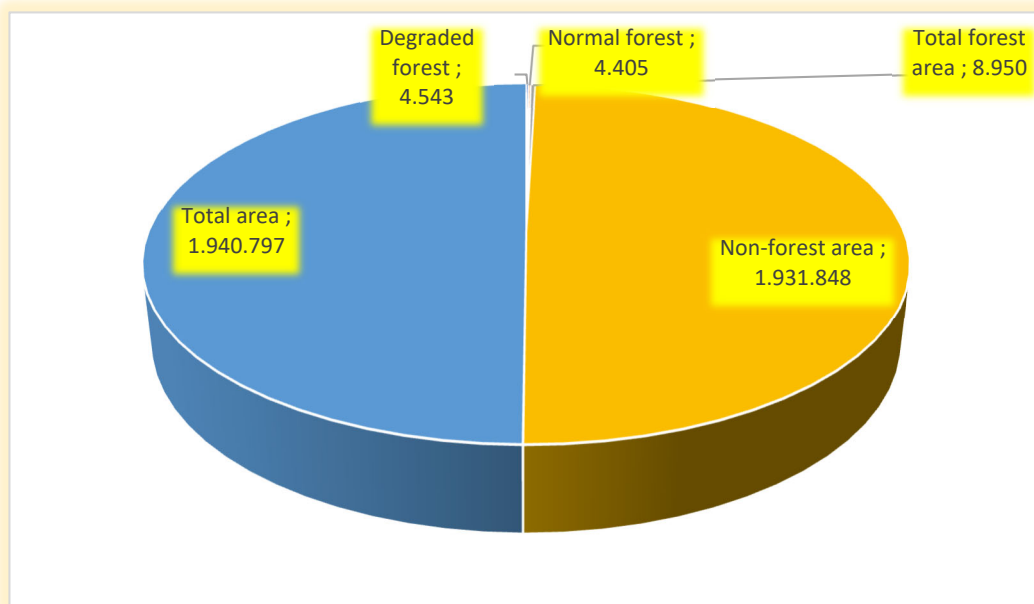


Figure 5. The amount of forest areas in Şanlıurfa province.

5. Conclusions

The geographical and climatic characteristics of Şanlıurfa play a decisive role in the diversity of woody plant species. The fact that the vegetation in the region is mostly composed of steppe species indicates the prevalence of sparse grass communities that are revived by spring rains and decrease in summer due to drought and heat. However, various tree species are also seen on stream banks and in mountainous areas. For example, while the diversity of woody plants is high in the rural area of Mezra town and on Korçik Mountain, it was observed that the number of taxa is lower in the central regions.

A comparison of other studies conducted on the Şanlıurfa flora is given below (Table 2).

Table 2. A comparison of other studies on the Şanlıurfa flora.

Studies / Numbers	This study	Kaşmer Flora (Akan et al., 2005)	Gölpınar Flora (Akan and Ayaz, 2016)	Kalecik Flora (Aydoğdu and Akan, 2005)	Karacadağ Flora (Ertekin, 2002)
The number taxa of woody plants	24	7	16	8	10

This research provides important information about the biodiversity of the region by revealing the natural flora structure of Şanlıurfa. The data obtained are guiding not only for the protection of the natural vegetation in the region, but also for the sustainable management of this diversity. In particular, the protection of these woody plants distributed in the natural environment and the sustainable provision of their functions

within the ecosystem are important for the continuity of biodiversity. In this context, it is thought that the study will contribute to future research and regional conservation strategies.

Conflicts of Interests

Authors declare that there is no conflict of interests

Financial Disclosure

Author declare no financial support.

Statement contribution of the authors

This study's experimentation, analysis and writing, etc. all steps were made by the authors.

Acknowledgements: We would like to thank to local people for sharing their knowledge with us.

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