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Articles

Some Plants Used in Turkey Ethnobotany Against Scorpion, Snake and Bee Biting

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Abstract

Each of the scorpion, snake, bee and some stinging insect species have active roles and benefits in the ecosystem, as well as harms such as stinging, biting and poisoning people. These creatures have different species from each other, and these differences are reflected in the venom characteristics, amount of venom and behavioral characteristics of aggression. As a matter of fact, allergic conditions resulting from bee stings and snake and scorpion bites can cause serious health problems and sometimes this process results in death. The rate of snake and scorpion bites and bee stings is not low in Turkey, and different traditional methods are applied in different parts of Turkey against poisoning by bee stings, snake and scorpion bites and poisoning, as can be seen in the relevant literature and especially in ethnobotanical studies. Alternative treatment methods against bee stings, scorpion and snake bites may have provided benefits when medical treatment opportunities were not as much as today, but clinically supporting the applications with this information will provide healthier and more precise results. This study introduces a series of herbs used as a treatment against bee, snake and scorpion stings in different regions of Turkey. We believe that plants can be used as herbal medicine and antidote to bee, snake and scorpion stings. The lack of natural, useful and effective remedies for the treatment of bites is leading to the expansion of research on effective and natural remedies for patients with bites.

Keywords: ethnobotany, plant, scorpion, snake, bee, biting, Turkey.

1. Introduction

People's use of plants in various ways and for various purposes is as old as human history. Natural medicinal and aromatic plants, which are found in nature as a source of healing, have been used and continue to be used in very different and very wide areas since the existence of humanity. In recent years, the side effects of drugs used for therapeutic purposes have affected people more, and concepts such as natural treatment, phytotherapy, ethnobotany, aromatherapy, alternative medicine, traditional treatment and their applications have started to take place more in our lives. Throughout human history, using medicinal plants has been a tradition, and rural groups have passed this knowledge down from generation to generation. Today, studies on the ethnobotanical science (folk medicine) about the parts of plants used among the people, their usage patterns and

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which plant is used for what purpose continue to be carried out by keeping up-to-date and there are many studies in the literature (Kilic, Bagci, 2013; Kilic, 2016; Ullah et al., 2018; Ahmad et al., 2022). In some regions, and especially in rural areas, traditional treatment practices have been passed down from generation to generation due to reasons such as difficult and expensive access to health services. With the influence of beliefs and cultures, such traditional practices are still valid alongside modern medical treatment practices, and this information is recorded with ethnobotanical studies (Majeed et al., 2021).

Since there are not many studies to enlighten people about our study subject, some misinformation based on tradition has emerged as a result of fear, hesitation and misunderstanding among the public against bee, insect, snake and scorpion stings. In some regions, traditional practices that are not beneficial or may have harmful effects on health continue to be used from the past to the present, due to the fact that it is difficult and expensive to access health services. This information transferred from generation to generation is perfectly integrated with cultural elements. For this reason, traditional practices used against stings can still maintain their validity in some regions alongside modern medical treatment practices. Traditional medicine and ethnobotanical knowledge for most diseases have herbal prescriptions. A very heavy change in beliefs has an important role in this. According to some part of the society, the fact that some of the human drug preparations have negative side effects, because of this the society pushes to use more traditional practices.

In many part of the world where scorpions, bees ans snakes are present, the human race has employed herbs to alleviate the symptoms of these animal stings. A search of the literature failed to turn up any compilation, assessment, or pertinent scientific examination of these plant taxa, despite the fact that they are mentioned in numerous publications that discuss the medicinal plants of a certain region. Scientific sources include studies investigating the therapeutic effects of the plant itself or its extract in different diseases; therefore, its beneficial and harmful aspects are discussed in scientific environments. However, experimental studies on alternative treatment methods with plants, aromatherapy, phytotherapy and the exact accuracy of the ethnobotanical use of plants, in which cases and in which doses they should be used, and their side effects are lacking, and the legal regulations on the subject are also insufficient. Therefore, the beneficial and harmful aspects of these plants and their extracts and extracts should be revealed with scientific and clinical applications. Some people in the society are of the opinion that natural plants and the preparations obtained from them have insignificant side effects or that they cannot have side effects and harms, and it is seen that the majority of them do not have enough information about the side effects. Therefore, it is important to increase the awareness level of individuals with information on the subject.

This study emphasized on the major role of herbal medicine for the treatment of snake, bee and scorpion bite. Also it is aimed to contribute to the relevant literature and studies on the subject by presenting some traditional applications and some plant taxa used against snake, scorpion bites and bee stings in some parts of Turkey by making use of related sources.

2. Materials and methods

In this study, relevant literature was used. Table 1 shows some plants used by the public against snake, scorpion bites, and bee or insect stings.

Table 1. Some plants used in scorpion, snake and bee stings and their usage characteristics

Taxon Name	Local Name	Used Part	Usage and usage form
Adiantum capillus-veneris	Porkafatma, İshalotu,Venüs saçı,	Leaf	Used against scorpion stings (Gelse, 2012)
Ajuga chamaepitys	Mayasılotu	Aerial parts	Used as an antidote to venomous animal bites (Köse et al., 2005)
			It is used against bee sting (Olgun, 2019; Çiçek, 2019). A raw onion is pressed on the wound to remove the venom from the

Taxon Name	Local Name	Used Part	Usage and usage form
Allium cepa	Soğan	Bulb	bee sting (Anonim, 1999). A head of onion is crushed in vinegar and tied on the sting (Aydıner, 2014). Dry onion juice is used to prevent itching in the bee sting area, or onion is cut transversely and its juicy inner part is pressed directly on the stinging point (Karaca, 2017).
Allium sativum	Sarmısak	Bulb	The plant is crushed and placed on the wound against snake bites, scorpion and bee stings (Bulut, Tuzlacı, 2015; Ugurlu, Secmen, 2008; Akbulut, Bayramoglu, 2013).
Allium ampelaprasum	Pırasa	Leaf	The crushed leaves of the plant are used against bee stings (Şenşafak, 2009)
Althaea officinalis	Hatmi	Leaf, Flower, Stem	Used against insect and fly bites (Güler et al., 2015). The hard paste prepared by adding cold water to the root powder is applied as a thick layer to cover the area stung by the bee (Shealy, 2015).
Anchusa azurea var. *azurea*	Sığırdili, Fısır, Sormuk	Flowering branches, Leaf, latex	Against snake bites and insect bites, it is drunk by making tea or the leaves are filtered and put on it (Polat et al., 2011; Tetik et al., 2013). Leaves are crushed and used as an antidote against snake bites and scorpion stings (Yapıcı et al., 2009; Tetik, 2011) or its milk is applied to the bite area (Sargin et al., 2015)
Anethum graveolens	Dereotu	Leaf	Against insect bites, the leaves are applied to the area as dried (Tuzlacı et al., 2010)
Arctium platylepis	Devetabanı	Leaf	It is used against snake bite by turning the leaves into pomade (Altundag, Ozturk, 2011)
Arum italicum	Kari, Yılan bıçağı, Yılancık,	Fruit, Seed, Leaf, Root	It is used against scorpion stings (Gelse, 2012). It is used for snake bite (Sarı et al., 2010).
Borago officinalis	Sığırdili, Zembil çiçeği	Root	Against snake bite, the roots are crushed and applied to the area (Şahin-Yiğit 2014).
Brassica oleracea	Lahana	Leaf	The juice of the leaf is squeezed and the water obtained is applied liberally to the injected area. This application prevents the dispersal of the venom, especially in honeybee and hornet stings (Karaca, 2017).
Bungea trifida	Belirtilmemiş	Aerial parts	The aerial parts of the fresh plant are crushed and used externally against snake and scorpion bites (Doğan, 2014).
Carlina vulgaris	Deve kengeri	Aerial parts	The decoction prepared from the above-ground parts is used against snake and scorpion bites (Doğan, 2014).

Taxon Name	Local Name	Used Part	Usage and usage form
Cedrus libani	Kamalak, Katran ağacı,	Tar	Used against snake bites and scorpion bites (Altundağ-Çakır, 2017)
Centaurea iberica	Çakır dikeni, Pamuk dikeni,	Leaf	Used against snake bites and scorpion bites (Sarper et al., 2009; Gelse, 2012, Çiçek, 2019).
Cichorium intybus	Hindiba Güneğik, Karakavuk	Aerial parts	Used against scorpion and bee stings (Özçelik, Balabanlı, 2005)
Cistus creticus	Pamuklar otu	Leaf	Against snake bites, the leaves are crushed and applied to the area (Tuzlacı, Eryaşar-Aymaz, 2001)
Citrus sinensis	Portakal	Fruit, Shell	It is mixed with honey and eaten against poisonous insect bites (Akan, Bakır-Sade, 2015; Bakır-Sade, 2014).
Citrus limon	Limon		Freshly squeezed lemon juice is used against the pain that occurs after a hornet sting (Karaca, 2017; Dursun et al., 2011). After removing the sting, 4 drops of lemon sprayed on the hornet sting reduces the risk of inflammation (Vuinec, 1990). It is not recommended to put lemon on the sting to relieve the pain after a honey bee sting (Irmak, 1963).
Crataegus monogyna	Geyik dikeni Yemişken dikeni, Alıç	Leaf	Used for insect bites (Ugulu, Baslar, 2010). It is used against snake bite (Kültür, 2007; Doğan, 2014). Against snake bites, the leaves are crushed and applied to the area (Tuzlacı, Eryaşar-Aymaz, 2001).
Cucumis sativus	Salatalık	Fruit	A slice is placed on the place stinged by the bee to prevent swelling (Anonim, 1999).
Eryngium campestre	Bereket dikeni, Yılan dikeni, Boğa dikeni,	Root	Roots are boiled in milk and used against scorpion stings (Gelse, 2012)
Euphorbia coniosperma	Sütleğen, Sütliğan,	Latex	It is applied to the area for snake bite (Sezik et al., 2011)
Euphorbia denticulata	Haşinik, Sütleğen	Latex	It is used against scorpion stings (Tetik et al., 2013). The milk of the plant is rubbed on the place where the bee stung (Akbıyık et al., 1990).
Euphorbia kotschyana	Sütleğen	Latex	The latex of the plant is applied to the area where the scorpion stings to get the venom in scorpion stings (Bağcı et al., 2016).
Euphorbia macroclada	Sütleğen, Haşil	Latex, Aerial parts	Against snake bites, insect and scorpion and bee stings; The latex and above-ground part are crushed and wrapped with a cloth (Tuzlacı, Şenkardeş, 2011; Yeşil, Akalın, 2009; Tetik, 2011).
			It is applied to the area against scorpion, insect and bee stings (Ertuğ et al., 2004;

Taxon Name	Local Name	Used Part	Usage and usage form
Ficus carica subsp. *carica*	İncir, yemiş	Latex	Akyol, Altan, 2013; Ertuğ et al., 2004). The milk-like liquid from the fig plant is applied to the sting of the bee (Bayatlı, 1989).
Foeniculum vulgare	Rezene	Fruit, Seed	Against scorpion stings; tea is brewed and drunk (Korkmaz, Karakurt, 2014)
Gundelia tournefortii	Kenger otu	Leaf	Used for insect bites (Ugulu, Baslar, 2010)
Helianthus annus	Günebakan, Ayçiçeği	Leaf	It is applied by making a porridge against insect bites (Kaval, 2011)
Heliotropium europaeian	Boz ot, Siğil otu, Akrep otu	Aerial parts	It is used against snake bites and scorpion stings (Ünsal et al., 2010; Köse et al., 2005).
Heliotropium hirsutissimum	Kuyruklu otu, Akrep otu	Aerial parts	Against scorpion stings, the plant is crushed and applied to the area (Arıcan et al., 2013).
Hypericum perforatum	Sarı kantaron, Binbirdelikotu	Flower	Used against snake bites and scorpion bites (Çömlekçioğlu, Karaman, 2008).
Juglans regia	Ceviz ağacı	Leaf, Fruit	Against bee stings, the leaves are boiled in water and then the area is wrapped with a cloth (Tuzlacı, Tolon, 2000). Fruits are used against scorpion stings (Kaval, 2011; Gelse, 2012; Olgun, 2019).
Laurus nobilis	Defne	Fresh branches	Against bee sting and snake bite, branches are put into water and applied to the area (Tuzlacı, Tolon, 2000).
Lycopersicum esculantum	Domates	Fruit	A cut piece of tomato is placed on the sting of the bee (Bayatlı, 1989). It is used against insect, scorpion and bee stings (Sarı et al., 2010; Bulut et al., 2014; Aslan, 2019).
Malva neglecta	Ebegümeci	Leaf and flower	Leaves and flowers are put on the place stung by the bee like a patch (Özer et al., 2001).
Mellilotus officinalis	Oğulotu	Leaf	Leaves are crushed and pressed to the area stung by the bee, possible inflammation is prevented (Karaca, 2017).
Mentha sp.	Su tanesi, Yarpuz,	Leaf	Used against snake bites and scorpion stings (Gelse, 2012; Şahin-Yiğit 2014). In order to eliminate the redness caused by bee stings, rubbing with mint is performed (Vuinec, 1990). After mint is crushed and made into porridge, it is placed on the sting (Aydıner, 2014). It is used for snake bites, insect and scorpion bites (Yaldız et al., 2010; Gül, 2014).
Morchella sp.	Kuzu göbeği mantarı	All parts	Used against scorpion stings (Sarı et al., 2010)
Morina persica	Boğa dikeni	Aerial parts, Root	Used against snake bite (Özdemir, Alpınar, 2015)

Taxon Name	Local Name	Used Part	Usage and usage form
Nerium oleander	Zakkum, Agu	Flower oil	It is used against stings (Güzel et al., 2015; Gelse, 2012).
Ocimum basilicum	Fesleğen, Reyhan	Aerial parts	It is stated that it reduces the effect of venom in bee stings (Yeşilyurt et al., 2017; Kaval, 2011). The fresh leaf is crushed and pressed on the place where the bee stings (Karaca, 2017; Şenşafak, 2009). This process reduces the effect of the venom against bee sting (Vuinec, 1990).
Petroselinum crispum	Maydanoz	Aerial parts	Parsley is pounded, mashed and wrapped around the bee sting (Coşkun, 2001). A few branches of parsley are chopped and applied on the wound in its watery form. In another method, fresh parsley is finely chopped, placed on a clean cloth and wrapped around the sting area in order to reduce the swelling and alleviate the pain (Anonim, 1999).
Phlomis armeniaca	Yayla çayı, Reyhan, Fesleğen,	Leaf, flower	Used in snake bites and insect bites (Gelse, 2012; Çiçek, 2019).
Pinus sylvestris	Sarıçam	Tar	Against snake bite, porridge is made and put on it (Altundag, Ozturk, 2011; Altundağ-Çakır, 2017).
Pinus sylvestris var. *hamata*	Çam	Corn	Used against snake bites (Tetik et al., 2013)
Plantago lanceolata	Sinir otu	Leaf	Applied by making porridge against snake bite, bee and insect stings (Ugulu, 2011; Kalankan et al., 2015).
Plantago major subsp. *intermedia*	Damar otu	Leaf	Against bee stings, the leaves are crushed and applied to the area (Bulut, Tuzlacı, 2015). In case of a bee sting, it is chewed to prevent itching and inflammation, and when it turns into mush, it is placed on the sting (Karaca, 2017).
Plantago major subsp. *major*	Kırkdamar Otu, Sinirli Ot, Damar Otu	Leaf	Against insect bites, the leaves are crushed and applied to the area (Kalankan et al., 2015). It is used against insect and bee stings (Polat et al., 2011; Doğanoğlu et al., 2006).
Punica granatum	Nar	Fruit shell	Used for insect bites (Ugulu, Baslar, 2010).
Pyrus amygdaliformis	Ahlat, Alat	Young shoots	Against scorpion and insect bites, it is crushed and applied to the area together with yogurt (Bulut, Tuzlacı, 2015).
Pyrus elaeagnifolia	Ahlat, Hermi, Yabani armut	Fruit	Used by making compote against poisonous animal bites (Korkmaz, Karakurt, 2014), and the sprouts are crushed and placed in the area (Çiçek, 2019).
Rumex sp.	Kuzukulağı	Aerial parts	After the bee stings, the bee's sting is removed first, and the stinger is rubbed with sorrel plant (Vuinec, 1990).

Taxon Name	Local Name	Used Part	Usage and usage form
Salvia multicaulis	Dağ çayı, Süt otu	Leaf	It is used against scorpion stings (Doğan, 2014).
Salvia sp.	Adaçayı	Leaf	The crushed leaves are used against bee stings (Şenşafak, 2009).
Sambucus ebulus	Sultanotu, mürver, Ademotu	Leafy branches	Decoction is performed against snake bite (Kültür, 2007). Used against scorpion stings (Koçyiğit, Özhatay, 2006).
Solanum tuberosum	Patates	Root	Peeled medium slices of raw potatoes or grated raw potato wraps are used to relieve swelling and redness after a bee sting (Karaca, 2017).
Sonchus asper	Eşek marulu, Dağ marulu,	Latex	Used for insect stings (Doğanoğlu et al., 2006).
Spinacia oleraceae	Ispanak	Leaf	Used for insect stings (Ugulu, Baslar, 2010).
Taraxacum officinale	Hindiba	Aerial parts	It is made into mush with hibiscus and vinegar and bound to the place where the bee stings (Aydıner, 2014).
Thymbra spicata var. *spicata*	Zahter	Aerial parts	Used against snake bite, scorpion and bee stings (Güzel et al., 2015).
Tea sinensis	Çay	Leaf	Used against bee stings due to its astringent effect (Shealy, 2015).
Thymus sp.	Kekik	Aerial parts	Used against snake bite (Ugulu, Baslar, 2010). After the thyme is crushed and made into porridge, it is placed on the sting (Aydıner, 2014).
Triticum aestivum	Buğday	Seed	It is boiled and applied to the place where the scorpion stings (Ertuğ, 2002).
Tussilago farfara	Öksürük otu, farfara otu	Flower	Used against insect bites (Tetik, 2011).
Urtica dioica	Isırgan	Leaf, root	Used against snake bite (Gelse, 2012). It is used against allergic reactions that may occur after bee stings (Shealy, 2015).
Verbena officinalis	Güvercin otu	Leaf, root	It is used against snake bites (Cakilcioglu et al., 2011).
Vicia faba	Bakla	Leaf	Used for insect bites (Ugulu, Baslar, 2010).
Vitex agnus-castus	Hayıt	Fruit, leaf, flower, seed	Used against bee stings (Baytop, 1999). In addition, the mixture obtained from beating the leaf and seed of this plant is also used against bee stings (Bayatlı, 1989).
Vitis vinifera	Asma, Koruk	Young shoot	It is used against insect bites (Kaval, 2011).

3. Results and discussion

Mankind has tried to treat some diseases with ethnobotany and phytotherapy, thanks to the experience gained from nature for a long time. Today, traditions around herbal medicine and the use of plants become widespread in most towns, villages and rural areas in Turkey. Medicinal aromatic plants and plants used in the treatment of bites and stings by animals such as scorpions, snakes and insects have become increasingly important in traditional and complementary

medicine practices. The relationship between plants and humans has been going on since the existence of humanity. People have benefited from natural plants in various ways for different purposes from the first ages to the present day. Plants are used in many different ways, and the use of plants has increased with traditional and complementary medicine and ethnobotanical methods of use, together with modern medical knowledge. The data presented in this article have been prepared by using sources such as alternative therapy, ethnobotany, phytotherapy, and medicinal plants. For this reason, some of the applications, plants, and articles covering these topics, which are commonly used in Turkey, are for general information purposes. It should not be forgotten that the descriptions and applications of traditional methods used against insect, snake and scorpion stings, and the effects of the relevant method may vary in each body. It should be kept in mind that this information may lose its currency and validity over time, and the information presented will never replace the diagnosis and medical treatment method and does not constitute a prescription. In order not to experience health problems that may arise from alternative treatment applications, it should be noted that before the application, expert opinion should be obtained, otherwise no one can be held responsible for the side effects that may occur. Traditional practices against bee, insect, snake and scorpion stings may have provided various benefits in rural conditions. However, it is not possible to accept any of the applications that lack scientific support and are unreliable, the amount of use and the duration of application are uncertain, as the correct treatment method alone. In this context, the positive and negative effects that can be seen after the use of alternative treatment methods, which are widely used in the society, should be known very well by the health professionals and all segments of the society. We do not have clear information on how long and in what quantities the traditional applications used against bee, insect, snake, scorpion stings and venom, which are quite common throughout Turkey, should be applied, their healing properties and health risks. For this reason, it is necessary to identify traditional practices that may be risky in terms of public health, and to increase social awareness and information about them.

4. Conlusion

This article lists a number of plant taxa that have been introduced in different parts of Turkey as a treatment and antidote against bee, snake and scorpion stings. Based on the knowledge of traditional and ethnoherbal medicine of Turkey, we believe that they can be used as medicine and herbal antidotes against bites. Existence of interest and knowledge in this science in different Turkish ethnic groups has led to the use of valuable methods for finding new medicinal plant taxa and herbal remedies against stings. The expansion of research on helpful and effective natural medications for patients with bites is a result of the lack of natural, practical, and effective medications for the treatment of bites.

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