Ethnoveterinary medicine in Turkey: a comprehensive review

Zeynep Büşra ERARSLAN, Şükran KÜLTÜR*
Department of Pharmaceutical Botany, Faculty of Pharmacy, İstanbul University, İstanbul, Turkey

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Abstract: Today, traditional societies throughout the world possess a wealth of ethnoveterinary knowledge, which they have accumulated during prolonged interaction with nature. Turkey has ample resources of ethnoveterinary medicines as evident from its rich floral diversity and traditional botanical knowledge from the past. This review aims to compile herbal remedies used in ethnoveterinary medicine in Turkey with comprehensive usage information and to compare our findings with pharmacological studies. The botanical, family, and local names; used parts; preparation methods; administration/dosage and duration of the treatment; and ailments treated/therapeutic effects were presented by screening ethnobotanical and ethnoveterinary studies. The most cited plant families, the medicinal plants, and the most common animal diseases were determined and presented in graphics. A total of 251 taxa belonging to 67 families were reported as being traditionally used to treat animal diseases in Turkey. Fabaceae (25 taxa), Asteraceae (24 taxa), Lamiaceae (19 taxa), Rosaceae (19 taxa), Apiaceae (9 taxa), Poaceae (8 taxa), and Solanaceae (7 taxa) were found as the most cited plant families. The most cited medicinal plants were Helleborus orientalis Lam. (9), Allium sativum L. (9), Juniperus oxycedrus L. subsp. oxycedrus var. oxycedrus (9), Berberis crapeinea DC. (8), Pinus brutia Ten. var. brutia (7), Sambucus ebulus L. (6), Cydonia oblonga Mill. (6), and Olea europaea L. (6), respectively. These plants are frequently used to cure various animal ailments such as dermatological, gastrointestinal, and parasitic diseases. The pharmacological studies of the said plant species were also gathered and reviewed to convey the efficacy of these plants in the treatment of animal diseases. Considering the traditional usage of the reported medicinal plants, more pharmacological studies are required for confirming the effectiveness of these herbal remedies.

Key words: Animal diseases, ethnoveterinary, traditional medicine, medicinal plants, Turkey

1. Introduction

Ever since ancient times, people have used natural resources such as plants, minerals, and animal products to treat many diseases in themselves and their animals. Millions of people in developing countries and rural societies prefer medicinal plants for primary healthcare [1]. Because of the belief that medicinal plants are cheaper and safer than conventional therapy, their popularity has increased even more in recent years. It is said that approximately 90% of the world's population continues to rely on traditional knowledge not only for personal healthcare but also for the treatment of animal conditions. Nowadays between 50,000 and 70,000 plant species are used for medicinal purposes all over the world [2,3]. Ethnoveterinary and ethnobotanical studies are known to be the most suitable ways to find out medicinal plants used in animal diseases.

The study of ethnosciences started in the middle of the last century and researchers began to use subdivisions in their scientific reports, such as ethnomedicine, ethnobotany, ethnoveterinary. Ethnobotany is defined as the study of existing cultures and their relationships with the animals in the environments surrounding them. Ethnozoological studies are necessary to detect and record herbal remedies that are essential for animal health. Hippocrates (5th century BC), Dioscorides (1st century AD), Avicenna (10th century AD), and Ibn al Baitar (12th century AD) are the best known medicinal researchers that used faunal resources in ancient times. However, few studies have been conducted on Anatolian ethnozoology in particular [4,5].

As a result of the relationship between humans and plants, which has been going on for centuries, ethnobotany was born and serious studies were conducted on it. Ethnobotanical studies not only document the interactions of mankind with plants, but also determine medicinal plants that have an important place in both human and animal health. The Anatolian lands, which hosted many civilizations, constitute a very rich research environment for studies about traditional veterinary medicine due to cultural richness and the abundance of faunal and floral elements [3,6,7]. The widespread use of medicinal plants in Turkey is related to the richness of the local flora, which

* Correspondence: s_kultur@istanbul.edu.tr

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includes more than 10,000 species of vascular plants with a nearly 31% endemism rate [8]. As is the case elsewhere in the world, the majority of Turkish people living in rural areas use plants for medicinal purposes. Since these practices are orally transmitted from generation to generation, they face the danger of extinction and thus this valuable heritage needs to be documented. The beginning of ethnobotanical studies in Turkey dates back to the early 19th century. In recent years, the extensive knowledge on traditional medicine has drawn the attention of many researchers in our country as well. According to the literature, it can be said that ethnobotanical studies in our country have mostly been conducted in the Central Anatolia Region and that the lowest number of studies have been performed in the Southeast Anatolia Region. Some of these studies include medicinal plants used in animal diseases [3,6,9].

Ethnoveterinary knowledge is the practice of local people in a given area to maintain the health and ensure the wellbeing of their domestic animals, and treat livestock ailments with their traditions, customs, and beliefs. Ethnoveterinary research focuses on systematic investigation and application of folk veterinary knowledge, theory, and practice [10,11]. Although historical records show that the relations of people with animals have existed for over 14,000 years, the recognition of traditional medicine for animals is a very recent one in scientific circles. Early studies in the field of folk veterinary beliefs and practices as the subject of scientific research began to emerge in the mid-1970s and gained momentum from the early 1980s. The term “ethnoveterinary” was introduced after the mid-1980s. Over the past 35 years, professionals from various fields have researched, evaluated, and documented the potential effectiveness of traditional animal health practices throughout the world. Traditional Turkish culture and history based on ancient Anatolian civilizations such as Hittite, Persian, Roman, Byzantine, Selçuk, and Ottoman are the foundations of Turkish folk medicine and ethnoveterinary medicine. Resources reveal that people’s association with animals started around 6000 BC with cattle in Anatolia. Much ethnoveterinary information on domestic animals is available from the past. For instance, De Materia Medica, the work of Dioscorides, is assumed to be one of the most important pharmaceutical books of antiquity and the first well-documented study on medicinal plants in Anatolia. Materia Medica, considered to be the oldest comprehensive document on Anatolian folk medicine, mentions 8 drugs (7 herbal) for veterinary purposes. Although the usage of medicinal plants in animal diseases is widespread, records are inadequate in many countries [12–14]. An increasing number of ethnoveterinary studies have very recently focused on the documentation of traditional ethnoveterinary knowledge in Turkey. Many of these studies have been conducted in the last decade [15–21]. Furthermore, ethnobotanical studies containing traditional knowledge of plants used in animal diseases provide information on the ethnoveterinary practices in Turkey [21–79].

Medicinal plants included in ethnobotanical and ethnoveterinary studies have become increasingly recognized as valuable sources for pharmacological studies. However, the most important problems encountered in herbal remedies are the lack of standardization of the active substance in the herbal preparations in terms of concentration and purity and the inability to control their side effects. More recently, the scientific evaluation of ethnobotanical knowledge has become much more common, particularly as a number of drug discovery studies have begun the regular screening of traditional herbal remedies [3,6,9].

Considering Turkey’s floral richness and abundance of traditional medicinal knowledge from the past, ethnoveterinary and ethnobotanical studies based on these features need to be compiled. It is of utmost importance to maintain traditional knowledge that is likely to be lost if it is not given enough importance. Documentation of the traditional practices through ethnobiological studies is also crucial for the conservation and utilization of biological resources. The main purpose of this study is to compile medicinal plants used in ethnobotanical medicine in Turkey with detailed usage information. Also included is an overview undertaken on the pharmacology, phytochemistry, and toxicity of plants to evaluate ethnobotanical claims and to identify gaps required to be filled by future studies, which could lead to new pharmaceuticals.

2. Methodology
2.1. Literature search
Ethnobotanical and ethnoveterinary studies carried out in different regions of Turkey from 1990 to 2018 were reviewed and medicinal plants used to treat animal diseases were determined. Relevant studies were searched in detail and were collected from books, doctorate dissertations and master’s theses, and scientific literature databases (PubMed, Scopus, Google Scholar, Web of Science, SciFinder, Springer, and Elsevier). Key words such as “ethnoveterinary”, “ethnobotany”, and “medicinal plants + animal diseases” for ethnoveterinary research and “Helleborus orientalis”, “Allium sativum”, “Juniperus oxycedrus”, “Sambucus ebulus”, “Pinus brutia var. brutia”, “Berberis crataegina”, “Cydonia oblonga”, and “Olea europaea” for pharmacological discussion were used to facilitate access to the related information. The scientific names of plants and plant families were verified using the International Plant Names Index (https://www.ipni.org/).
2.2. Data analyses
Specific information about medicinal plants such as botanical, family, and local names; used parts; preparation methods; administration/dosage and duration of the treatment; and ailments treated/therapeutic effects are presented in Table 1. Moreover, the most cited plant families, the most cited medicinal plants, and the most common animal diseases are presented in graphics (Figures 1–3).

3. Results and discussion
From the literature search, 7 ethnoveterinary and 59 ethnobotanical articles were obtained. A total of 37 pharmacology papers were referred to in order to evaluate the effectiveness of traditional usage of the most cited plants.

3.1. Evaluation of data
A total of 251 taxa belonging to 67 families were reported as being traditionally used to treat animal diseases in Turkey (Table 1). The bioactive compounds of families are given in Table 2. The first eight plant families with the highest number of plants used for ethnoveterinary purposes were determined as Fabaceae (25 taxa), Asteraceae (24 taxa), Lamiaceae (19 taxa), Rosaceae (19 taxa), Apiaceae (9 taxa), Poaceae (8 taxa), and Solanaceae (7 taxa) and findings are shown in Figure 1. The most popularly cited medicinal plants and their corresponding number of references were Helleborus orientalis Lam. (9), Allium sativum L. (9), Juniperus oxycedrus L. subsp. oxycedrus var. oxycedrus (9), Berberis crataegina DC. (8), Pinus brutia Ten. var. brutia (7), Sambucus ebulus L. (6), Cydonia oblonga Mill. (6), and Olea europaea L. (6), respectively (Figure 2). It was found that the leaves were the most frequently used part of the plant, accounting for 21%. Fruits were the second most frequently used part of the plant (14%). Following in this category are aerial parts (10%), roots (8%), flowers (6%), seeds (5%), unspecified parts (5%), tar (4%), stem (4%), branches (2%), bulb (2%), and rhizomes (1%). The averages of other parts including tuber, shoot, resin, spine, bud, latex, straw, tassel, molasses, stalk, bran, grain, cone, sauce, gum, gall, and pollen were less than 1%. They are given as one category (18%) in Figure 3. Decoction (12%) was the most frequently used preparation method, followed by infusion (9%), crushing (4%), mashing (3%), powdering (3%), and others (12%). In some studies, the preparation methods were not mentioned and the proportion of these unspecified methods was found to be 57%. Internal application (47%) was used more often than external application (34%); the rate of unspecified application was 19%. In addition, the most common animal diseases were categorized into the following sections: dermatological diseases (wounds, fistula, abscess, interdigital dermatitis, mange, sunstroke and sunburn, ringworm, trichophytosis, open sores, mouth sores, eczema, warts, dermatitis madidians, epidermolysis bullosa, snake bites, burns, bee stings), gastrointestinal diseases (abdominal distention, swelling, tummy, carminative, constipation, enteric, purgative, diarrhea, intestinal gas), parasitic diseases (leeches, antiparasitic, gastrointestinal parasites, endoparasites, anthelmintic, worms, antifungal, fleas andlice, tick, acaricide, babesiosis, papillomatosis, fasciiosis, malaria, foot-and-mouth disease), respiratory diseases (cough, cold, lung diseases, emphysema, distemper), reproductive diseases (for increasing fertility, for increasing egg production, mastitis, low birthrates, retained placenta, difficulty of birth, animal breeding, for increasing milk secretion), pain (analgiesic, pain reliever, stomachache, abdominal pain, liver pain, injuries), and foot-and-mouth disease and eye diseases (keratoconjunctivitis, keratitis, blindness, cataract). Dermatological diseases were the ailments treated by the highest number of plants, followed by gastrointestinal diseases (Figure 4).

3.2. Pharmacological studies
3.2.1. Helleborus orientalis Lam. (Ranunculaceae)
People benefit from leaves, roots, and rhizome for medicinal purposes. However, the preparation method of the plant has not been reported in many studies. Roots are the most frequently used part of the plant. Crushed roots of H. orientalis are added to fodder as an immunostimulant and inserted into the ears or tails of animal to treat colds [31,66]. Cut roots are inserted into the ear to cure animal weaknesses [78]. Rhizomes are also used externally for the treatment of mastitis, keratitis, and edema [28,45]. Roots are prepared by decoction to treat malaria [28]. While leaves are used externally as an antipyretic and analgesic [22] and for the treatment of joint ailments [31], they are used internally for the treatment of diarrhea and colds [29–31]. Rhizomes are also used for the treatment of diarrhea and colds, but the preparation and administration methods were not mentioned in the literature [30]. According to other records, rhizomes are inserted into a cow’s ear to treat colds [29] and they are added to fodder to treat diarrhea [29]. Moreover, they are administered externally against sunstroke [23]. There are few studies supporting the traditional use of the plant. It was reported that ethanol extracts of H. orientalis roots showed antiinflammatory activity in mice (carrageenan-induced hind paw edema model) and antinoceptive activity was observed using the p-benzoquinone-induced abdominal constriction test [80]. Moreover, leaf and flower extracts of H. orientalis showed potent antioxidant activity [81].

3.2.2. Allium sativum L. (Amaryllidaceae)
People use bulbs of A. sativum in the treatment of various animal diseases. Crushed bulbs are mixed with yogurt and applied to treat sunstroke and sunburn, ringworm, mange, interdigital dermatitis, constipation, and distemper
Table 1. Plants used in ethnoveterinary medicine in Turkey.

| Botanical and family names | Local names | Used parts | Preparation | Administration/ dosage and duration of treatment | Ailments treated/therapeutic effect | Refs. |
|----------------------------|-------------|------------|-------------|-----------------------------------------------|-----------------------------------|-------|
| **Acanthaceae**            |             |            |             |                                               |                                   |       |
| Acanthus hirsutus Boiss.   | Akdkiken    | -          | Int         | Cold                                          | [24]                              |       |
| Acanthus spinosus L.       | Karadiken   | Aer Dec    | Int         | Diarrhea                                      | [25]                              |       |
| **Adoxaceae**              |             |            |             |                                               |                                   |       |
| Sambucus ebulus L.         | Mürver otu, Mürver ağacı, Sultanotu, Yelligelin, Lor, Şahmelek | Fr, Fl, St | Int/Ext | Gastrointestinal diseases, respiratory diseases, dermal diseases and wounds | [15]                              |       |
|                           |             | L Cru Ext  |            | Inflamed wounds                              |                                   | [26]  |
|                           |             | Aer - Ext  |            | Inflammatory swellings                       |                                   | [27]  |
|                           |             | L Sm Ext   |            | Analgesic                                    |                                   | [27]  |
|                           |             | Aer Cru Ext|            | Mastitis                                     |                                   | [28]  |
|                           |             | St Cru Ext |            | Ticks                                        |                                   | [29]  |
|                           |             | L He Ext   |            | Chick diseases                               |                                   | [29]  |
|                           |             | L, St -    |            | Chick diseases, acaricide                    |                                   | [30]  |
| Sambucus nigra L.          | Mürver, Mürver çiçeği, Kara mürver | Ba Dec Int |            | Antifungal, antiparasitic                    | [26]                              |       |
|                           |             | L Cru Ext (Wrp) |        | Wounds                                       | [28]                              |       |
| **Amaranthaceae**          |             |            |             |                                               |                                   |       |
| Beta vulgaris L.           | Şeker pancarı | Ro Pow Ext |            | Open skin wounds                             | [16]                              |       |
|                           |             | L Pu - Ext |            | Constipation, increasing milk secretion      | [17]                              |       |
|                           |             | L - Ext    |            | Abscesses and wounds                         | [18]                              |       |
|                           |             | Ro - Ext   |            | Keratoconjunctivitis                         | [18]                              |       |
| **Amaryllidaceae**         |             |            |             |                                               |                                   |       |
| Allium cepa L.             | Soğan       | Bl -       | -           | Fistulas, wounds, difficulty of birth, retained placenta, appetizer | [17]                              |       |
|                           |             | - - Int    |            | Cold, abdominal distention                   | [24]                              |       |
|                           |             | Bl Ma Ext  |            | Open skin wounds, abscesses, interdigital dermatitis | [16,19]                        |       |
|                           |             | St Ma -    |            | Abscesses, crushing injury                   | [18]                              |       |
| Allium sativum L.          | Sarımsak    | Bl Cru (+ yogurt)/ Pou (+ salt/ lemon juice, vinegar) | Int/Ext | Sunstroke and sunburn, ringworm, mange, interdigital dermatitis | [16]                              |       |
|                           |             | - - Int    |            | Chicken diseases                             | [24]                              |       |
|                           |             | Bl - Int   |            | Poisoning                                    | [20,26,31]                        |       |
|                           |             | Bl Cru (+ yogurt) Int (dogs are bottle-fed)/Ext (pasted onto afflicted areas) |          | Constipation, distemper, mange               | [19]                              |       |
|                           |             | Bl - Ext   |            | Hip lameness, abscesses, sunstroke, poisoning, trichophytosis, babesiosis, mange, and leeches | [18]                              |       |
|                           |             | Bl + milk Prs Int (drink one big cup 2 × 1 for 2–3 days) |     | Carminative (relieve flatulence)             | [32]                              |       |
|                           |             | Bl Cru Ext  |            | Mange in ruminants                           | [21]                              |       |
|                           |             | Bl Pill Int |            | Babesiosis in ruminants                      | [21]                              |       |
| Allium sp.                 | Sarımsak, Yabani sarımsak | Bl - - |            | Hair loss, swelling, increasing fertility, appetizer in pigeons, opisthophotos, diarrhea in partridges | [17]                              |       |
| Family               | Species                        | Common Names                                      | Part(s) | Collection(s) | Disease(s)                                      | Reference |
|----------------------|--------------------------------|---------------------------------------------------|---------|---------------|-------------------------------------------------|-----------|
| Anacardiaceae        | Cotinus coggyria Scop.         | Sarı can, Tetra, Tetere                           | L       | Dec           | Wounds                                          | [28]      |
|                      |                                |                                                   | L       | Inf           | Eczema                                          | [33]      |
|                      | Pistacia terebinthus L.        | Menengić, Çeşmıcık, Yakası fistuk, Çıtırık, Çedene| St, Fr, Fl | Int | Gastrointestinal diseases, respiratory diseases | [15]      |
|                      |                                |                                                   | Gu      | Ext           | Broken foot, wounds                             | [17]      |
|                      | Rhus coriaria L.               | Sumak                                             | L, Br   | Pol           | Edema in legs                                   | [34]      |
|                      |                                |                                                   | Fr      | Inf           | Ringworm, open skin wounds                      | [16]      |
|                      |                                |                                                   | Fr      | Inf           | Foot-and-mouth disease                          | [18]      |
|                      | Rhus sp.                       | Sumak                                             | Fr      | -             | Diarrhea, foot-and-mouth disease                | [17]      |
| Apiaceae             | Conium maculatum L.            | Baldiran, Devetabun, Hıronduk, Yılan otu          | Aer     | Dec           | Malaria                                         | [28]      |
|                      | Coriandrum sativum L.          | Kişmiş, Aş otu, Kuzbere, Yumurcak, Karakimyon     | Fr      | -             | Gastrointestinal diseases, respiratory diseases | [15]      |
|                      | Daucus carota L.               | Yabanı havuç                                      | Fr      | -             | Parasitic diseases, reproductive diseases       | [15]      |
|                      | Ferula elaeochrysis Korovin    | Çakışr                                            | Ro, Fl, S, Fr | Dec, Pow, Inf, Ju, Spi, Che | Bovine and ovine animals’ sterility               | [35]      |
|                      |                                |                                                   | Ro      | -             | Parasitic diseases, reproductive diseases       | [15]      |
|                      | Ferulago trachycaulis Boiss.   | Yağla çığrısı                                     | -       | -             | Animal breeding                                 | [24]      |
|                      | Foeniculum vulgare Mill.       | Rezene, Yabanı anason                             | Fr, L, S, Ro | - | Gastrointestinal diseases, parasitic diseases | [15]      |
|                      |                                |                                                   | Aer     | -             | Flatulence                                      | [36]      |
|                      | Heracleum sphondylium subsp.   | Devesil, Devesil otu                              | Ro      | Cut           | Increasing milk production                      | [37]      |
|                      | ternatum (Velen.) Brummitt     |                                                   | Ro      | Cho           | Galactagogue (increasing milk secretion)        | [26]      |
|                      | Sanicula europaea L.           | Kadra, Tatahan çayırcı                            | Aer     | -             | Chick diseases                                  | [38]      |
| Apocynaceae          | Nerium oleander L.             | Zakkum, Ağış ağacı, Kan ağacı                     | L, Br   | Dec           | Scabies                                         | [34]      |
|                      |                                |                                                   | L       | -             | Reproductive diseases                           | [15]      |
|                      |                                |                                                   | -       | -             | Endoparasites, foot-and-mouth disease           | [24]      |
| Araceae              | Dracunculus vulgaris Schott    | Kara kabak, Yılanburçak, Yılan burçalığı, Yılançığı| Tb      | Cho (+ salt)  | Analgesic (relieve chronic pains and aches)     | [39]      |
|                      |                                |                                                   | Fr      | Fr e          | Carminative (relieve flatulence)               | [32]      |
|                      |                                |                                                   | Ro      | Dec           | Scorpion and snake bites                        | [40]      |
|                      |                                |                                                   | Ro      | -             | Abdominal pain                                  | [41]      |
|                      |                                |                                                   | Tb      | Dec (+ milk)  | Edema                                           | [42]      |
| Araliaceae           | Hedera helix L.                | Sarmaşık, Duvar sarmaşıği, Orman sarmaşıği       | Aer     | -             | Increasing milk secretion                       | [17]      |
|                      |                                |                                                   | L       | Dec           | Constipation                                    | [43]      |
| Asparagaceae         | Ornithogalum umbellatum L.     | Akryldız, Sunbala, Köpek soğanı, Tükrikuşu        | Ro      | -             | Dermal diseases and wounds                      | [15]      |
|                      |                                |                                                   |         | Ext           |                                                  |           |
|                      | Ruscus aculeatus L.            | Tavşan memesi                                     | Ro      | -             | Parasitic diseases, respiratory diseases, dermal diseases and wounds | [15]      |

Table 1. (Continued).
| Plant Name | Common Name | Family | Uses | Comments |
|------------|-------------|--------|------|----------|
| Ruscus hypoglossum L. | Yekese otu, Dilek, Tavşan elması | Ruscus | \( L. \) | Ye kesek otu, Dilcik, Tavşan elması, | [26] |
| | | Asteraceae | | | |
| Anthemis chia L. | Beyaz papatya, Eşek papatyası | Anthenis | Fl | Gastrointestinal diseases, dermal diseases, and wounds | [15] |
| | | | | | |
| Anthemis sp. | Papatya | Anthenis | Fl | | [17] |
| Arctium minus (Hill) Bernh. | Domuz pitrağı, Kabalak, Yılan otu, Yılançık | Arctium | L | | [27] |
| Arctium tomentosum Mill. | Durlavrat otu, Kelotu | Arctium | Ro, L, Fl | Dermal diseases and wounds | [15] |
| Arctium platylepis (Boiss. & Bal.) Sonn. ex Grossh. | Durlavrat otu, garahort, deve tabansı, çıle dağı | Arctium | L, Fl | | [44] |
| Artemisia absinthium L. | Yavşan otu, Pelin otu, Acı pelin, Mide otu, Acı yavşan | Artemisia | L, Fl | | [24] |
| Cardopatium corymbosum (L.) Pers. | Kuşkonmaz kökü, Diken, Kurtlu diken | Cardopatium | Ro | Mastitis | [45] |
| Carlina gummifera (L.) Less. | Deve dikeni | Carlina | Dec | | [17] |
| Centaurea benedicta (L.) L. | Mübarek ot, Mübarekdikeni, Bostan otu, Şevketotu | Centaurea | Fl | | [15] |
| Centaurea solstitialis L. subsp. solstitialis | Korugoz, Sarıdiken | Centaurea | Fl | | [15] |
| Cichorium intybus L. | Hindiba | Cichorium | Aër | | [46] |
| Cirsium simplex subsp. armenum (DC.) Petr. | Su dikeni, kör kenger | Cirsium | Aër | Mange | [44] |
| Cyanus segetum Hill | Gökbaş, Kökbaş | Cyanus | Cho | Fasciolosis in ruminants | [21] |
| Doronicum orientale Hoffm. | Acımık | Doronicum | Aër | Injuries (as a local antimicrobial) | [39] |
| Gundelia tournefortii L. | Kenur, Kengerotu | Gundelia | Ro, St | | [15] |
| Helianthus annuus L. | Ay çiçeği | Helianthus | S, Wh | | [47] |
| Lactuca alpina (L.) A.Gray | Sütliga | Lactuca | Aër | | [48] |
| Lactuca serriola L. | Çekme, Meyrilli, Keklikotu, Dikenlişekhelvas, Karakavuk, Sakızotu | Lactuca | Lt | | [15] |
| Matricaria chamomilla L. | Papatya | Matricaria | Aër | Reproductive diseases | [15] |
| | | | Fl | Tympant; pain | [18] |
| Petasites hybrida (L.) G.Gaertn., B.Mey. & Scherb. | Aykulaşi, Farafila, Kabakulakotu, Kabalak, Şemsiyeotu | Petasites | L | Inflamed wounds | [29] |
| Rhaponticum repens (L.) Hidalgo | Kekre | Rhaponticum | Fl | | [30] |
| Silybum marianum (L.) Gaertn. | Akkaz, Ala kenger, Deve dikenli | Silybum | St, S | Reproductive diseases | [15] |
| Tussilago sp. | Sülu Ot | Tussilago | Pd | | [48] |
| Tussilago farfara L. | Bandırma yaprağı, Oksürük otu, Kavalak, Sulandık otu | Tussilago | L | Inflamatory diseases | [27] |
| Berberidaceae | | | | | |
| Berberis crataegina DC. | Karamuk, Karamuk diken, Diken üzümü, Şam püremi | Berberis | Ro | | [49] |
| | | | Fr, Ro | Antiparasitic | [50] |
| | | | Fr, L | Respiratory diseases, reproductive diseases | [15] |
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**Table 1.** (Continued.)
| Table 1. (Continued). |
|------------------------|
| **Berberis vulgaris** L. | Karamuk | Ro - | Int | Jaundice | [52] |
| **Retulaceae** |
| **Alnus glutinosa** (L.) Gaertn. subsp. glutinosa | Sakalli kuzul ağacı, Ela, Boya ağacı | Ba Dec Ext | Diarrhea | [26] |
| **Boraginaceae** |
| **Anchusa azurea** Mill. | Siğirdili, Gurüz, Gurüz, Tort | L - | - | Wounds, pain reliever, digestive, digestion facilitator, Foot-and-mouth disease | [17] |
| **Brassicaceae** |
| **Brassica oleracea** L. | Lahana | Aer Dec Int | Diarrhea | [54] |
| **Capparaceae** |
| **Capparis spinosa** L. | Keber, Kapi, Kedi turnağ, Kuşkonmaz | Fl, Fr - | Int | Reproductive diseases | [15] |
| **Caryophyllaceae** |
| **Dipsacus laciniatus** L. | Eşek kengeri, FesçiTaağı, Karağan, Süzek, Tafran | Aer - | Int | Mouth sores (donkeys) | [29] |
| **Convolvulaceae** |
| **Cynanchum commutatum** | Çoban döşeği otu | L Ma Ext | Foot-and-mouth disease | [57] |
| **Cornaceae** |
| **Cornus mas** L. | Kiren, Kızılcık, Delice kiraz, Yabani kiraz | Fr Mar Ext | Foot-and-mouth disease | [57] |
| **Cucurbitaceae** |
| **Bryonia aspera** Steven ex. Ledeb. | At kuyruğu, Hoş devekoku | Wh Dec Int | Draining edema, urinary inflammation | [58] |
| **Citrullus lanatus** (Thunb.) Matsum. & Nakai | Karpuz | Pe - | - | Increasing milk secretion | [17] |
| **Cucumis sativus** L. | Salatalık | Fr - | - | Constipation, increasing milk secretion | [17] |
| **Cucurbita** sp. | Kabak | S - | - | Intestinal parasites | [17] |
Table 1. (Continued).

| Family           | Species                                      | Common Names               | Part(s) | Use(s)                                      | Reference |
|------------------|----------------------------------------------|----------------------------|----------|--------------------------------------------|-----------|
| Cucurbitaceae    | Cucurbita moschata Duchesne                  | Kabak                      | S        | Int                                        | [18]      |
|                  | Ecballium elaterium (L.) A. Rich.            | Eşek hıyarı, Acı dülük,    | Fr, Ro   | Int/Ext                                    | [15]      |
| Cupressaceae     | Cupressus sempervirens L.                    | Aracı, Andız                | Ta, -    | Int                                        | [59]      |
|                  |                                              |                            | -        | Ext (Wrp)                                  | [24]      |
| Juniperaceae     | Juniperus drupacea Labill.                   | Andız, Diken, Ayyı gliği,  | Fr, St   | Int                                        | [15]      |
|                  |                                              | Enek                       | -        | Int                                        | [24]      |
|                  |                                              |                            | Br, L    | Inf                                        | [43]      |
|                  | Juniperus excelsa M.Bieb.                    | Kara aracı                 | L        | Bur                                        | [58]      |
|                  |                                              |                            |          | Ext                                        |           |
|                  |                                              |                            |          |                                                 |           |
|                  | Juniperus oxycedrus L. subsp. oxycedrus      | Aracı, Katran ardsıcı      | Ta       | Int                                        | [39]      |
|                  |                                              |                            | Ta       | -                                          |           |
|                  |                                              |                            | Ta       | -                                          |           |
|                  |                                              |                            | Fr       | Dec                                        |           |
|                  |                                              |                            | Wd (Ta), Br | Dis (+ butter), Sm          | Open skin wounds, mange, papillomatosis | [16]      |
|                  |                                              |                            | C        | Cru                                        | Appetizer | [25]      |
|                  |                                              |                            | St, Br (Ta) | -                                      |           |
|                  |                                              |                            | Br       | Inf                                        |           |
|                  |                                              |                            | Br       | Inf                                        |           |
|                  |                                              |                            | Wd (Ta)  | -                                          | Ticks, mange in ruminants | [21]      |
|                  |                                              |                            | Wd (Ta)  | -                                          | Ticks, mange in ruminants | [21]      |
|                  |                                              |                            | Ta       | -                                          | Babesiosis, gastrointestinal parasites of ruminants | [21]      |
|                  |                                              |                            |          |                                              |           |
|                  |                                              |                            |          |                                              |           |
| Dennstaedtiaceae | Pteridium aquilinum (L.) Kuhn                | Ayınotu, Eğer otu, Eğrehti | Wh, Sm  | Ext                                        | Urinary diseases | [41]      |
|                  |                                              | otu, Kuzgın otu, Kuzgunotu | Rh, Dec | Int                                        | Analgesic  | [41]      |
| Equisetaceae     | Equisetum hyemale L.                         | Çam otu, Atkuyruğu, Kurt   | Aer      | Dec                                        | Int (3 - 4 times a day) | Bloody urination | [27]      |
|                  |                                              | başına                      |          |                                              |           |
| Ericaceae        | Erica arborea L.                             | Funda, Piren, Süpürge otu, | Fr       | Dec                                        | Mouth sores, foot wounds | [28]      |
|                  |                                              | Süpürge çalısı             |          |                                              |           |
| Euphorbiaceae    | Euphorbia glareosa Pall. ex M.Bieb.          | Sülü ot                    | Wh       | -                                          | Int (a big cup 2 × 1 for 2–3 days) | Endoparasites | [32]      |
|                  |                                              |                            |          |                                              |           |
|                  | Euphorbia kotschyan Fenzl                    | Sülük, Sütleğen            | -        | -                                          | Open sores, foot-and-mouth disease | [24]      |
|                  |                                              |                            |          |                                              |           |
|                  | Euphorbia macroclada Boiss.                  | Sütleğen otu               | Lt       | -                                          | Open skin wounds, papillomatosis | [16]      |
|                  |                                              |                            |          |                                              |           |
|                  | Euphorbia myrsinites L.                      | Sütleğen, Balk otu         | Aer      | Fre                                        | Int (a big cup 2 × 1 for 2–3 days) | Endoparasites | [32]      |
|                  |                                              |                            |          |                                              |           |
|                  | Ricinus communis L.                          | Bostan kenesi, Domuz       | S        | -                                          | Int (Fd) | Purgative | [33]      |
|                  |                                              | kenesi, Hitmaş, Japon       |          |                                              |           |
| Fabaceae         | Anagryis foetida L.                          | Keçi gevişi, Emicek otu,   | L, Br    | -                                          | Int      | Swelling  | [40]      |
|                  |                                              | Iyicik, Keçi ibişi, Kokar  |          |                                              |           |
|                  |                                              | çalı                         |          |                                              |           |

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| Family          | Species                        | Common Names                      | Part(s) | Tissues | Condition(s)                          | Reference |
|-----------------|--------------------------------|-----------------------------------|---------|---------|---------------------------------------|-----------|
| None            | Astracantha tmolea (Boiss.) Podl. | Geven, sakız geven                | Res     | Che     | Abdominal pain                        | [35]      |
| None            | Astragalus sp.                  | Keven, Geven                      | Spi     | -       | Papillomatosis                         | [16]      |
| Leguminosae     | Geratonia siblica L.            | Keçibeynüzü, Balliba, Ballibeynüzü, Harrup | Lt      | -       | Papillomatosis                         | [16]      |
| None            | Cicer sp.                       | Nohut                             | Fr      | -       | Sound thickening in partridges         | [17]      |
| None            | Colutea ciliaca Boiss. & Balansa | Sinameklı                         | L       | Inf     | Constipation                           | [18]      |
| None            | Glycyrrhiza glabra L.           | Meyan                             | Ro      | -       | Gastrointestinal diseases, respiratory diseases | [15]      |
| Fabaceae        | Lathyrus sativus L.             | Burçak                            | -       | -       | Animal breeding                        | [24]      |
| Fabaceae        | Lathyrus sp.                    | Cülbant, Cülban                   | Aer     | -       | Vitamin deficiency, difficulty of birth, increasing milk secretion | [17]      |
| None            | Lens culinaris Medik.           | Mercimek                          | -       | -       | Cold                                   | [24]      |
| None            | Lens sp.                       | Mercimek                          | Str     | -       | Swelling, diarrhea, appetizer          | [17]      |
| None            | Lotus aegaeus (Griseb.) Boiss.  | Nobodak                           | Aer     | Cru     | Injuries (as a local antimicrobial)    | [39]      |
| None            | Lupinus albus L.                | Termiğe                           | S       | Inf     | Feas and lice in ruminants            | [21]      |
| None            | Medicago sativa L.              | Kaba yonca, Çevrinççe             | Aer     | -       | Gastrointestinal diseases, dermal diseases and wounds | [15]      |
| None            | Medicago sp.                    | Yonca                             | Wh      | -       | Swelling, difficulty of birth, retained placenta, increasing milk secretion | [17]      |
| None            | Melilotus sp.                   | Boy otu                           | Aer     | -       | Epidermolysis bullosa                  | [17]      |
| None            | Ononis spinosa L.               | Kayışkıran otu, Oğlumuz, Yaltak diken, Yandak diken | Wh     | -       | Urinary retention                      | [61]      |
| None            | Phaseolus vulgaris L.           | Fasulye                           | Fr, Aer | -       | Wounds, fracture, increasing milk secretion | [17]      |
| None            | Trifolium sp.                   | Yonca                             | L       | -       | Swelling, difficulty of birth, retained placenta, increasing milk secretion | [17]      |
| None            | Trifolium trichocephalam M.Bieb. | Uç kulak otu, yonca, dirfil, tirfil | Aer     | -       | Increasing milk secretion              | [44]      |
| None            | Trigonella sp.                  | Oğlanlar boyu                      | Aer     | -       | Epidermolysis bullosa                  | [17]      |
| None            | Vicia faba L.                   | Bakla                             | S, Fl   | Int/Ext | Gastrointestinal diseases, dermal diseases and wounds, parasitic diseases | [15]      |
| None            | Vicia sativa subsp. nigra var. | Eşek şişçası                        | L       | -       | Increasing milk secretion              | [48]      |
| None            | Vicia sp.                       | Fig, Kıştı, Burçak, Yabanı bakla, Fit | Aer     | -       | Swelling, vitamin deficiency, difficulty of birth, retained placenta, appetite, increasing milk secretion | [17]      |
| None            | Vigna radiata (L.) R.Wilczek    | Maş fasulyesi                      | Fr      | -       | Increasing milk secretion, muscle builder in partridges | [17]      |
| Fagaceae        | Quercus sp.                     | Meşe                              | L, As   | -       | Wounds, diarrhea                       | [17]      |
| Fagaceae        | Quercus cocifera L.             | Kara çalı, Poumar, Pelit           | St (Ba) | Dec     | Diarrhea                               | [25]      |
| Fagaceae        | Quercus infectoria G. Olivier   | Mazı, Pelit, Meşe mazısı, Gerpelit, Meşe | Gl     | -       | Diarrhea, hemostatic                   | [62]      |
| Fagaceae        | Quercus pubescens Willd.        | Meşe, Tüyülü meşe                 | Ba      | Pow     | Open skin wounds, mange                | [16]      |
| Fagaceae        |                                 | Wöl (ash)                         | Wöl     | Bur     | Open skin wounds, mange                | [16]      |
| Fagaceae        |                                 | St                                | St      | Inf     | Open skin wounds, abscesses, diarrhea  | [18]      |
Table 1. (Continued).

| Geraniaceae               | Pelargonium endlicherianum Fenzl Solucan ota, İtr | Aer | Int | Intestinal parasites [20] |
|---------------------------|---------------------------------------------------|-----|-----|--------------------------|
| Hypericaceae              | Hypericum perforatum L. Kantaron, Sars Kantaron, Binbirdelikotu | FL, L | Int | Gastrointestinal diseases, respiratory diseases, dermal diseases and wounds [15] |
|                           |                                                   | FLb | Inf | Ext (1 × 1) Mastitis [32] |
|                           |                                                   | FLb | Ole | Ext | Wound [41] |
|                           |                                                   | FL  | Mc  | Ext | Wounds [63] |
| Hypericum androsaemum L. Libarga, Püren Fr | - | Int | Against parasites [64] |
| Hypericum capitatum Choisy Arinta sor | Aer | - | - | Pain relief [65] |
| Hypericum capitatum var. latum N.Robson Arinta sor | Aer | - | - | Pain relief [65] |
| Hypericum retusum Aucher ex Jaub. & Spach Behtof | Aer | - | - | Pain relief [65] |
| Hypericum triquetrifolium Turra Behtof | Aer | - | - | Pain relief [65] |
| Juglandaceae              | Juglans regia L. Ceviz, Hingiç, Koz, Yandak | L  | Dec | Int (4 cups 2×1 for 3 days) Analgesic [26] |
|                           |                                                   | Imfr | Cru | Ext | Wounds [66] |
|                           |                                                   | L  | - | Ext | Wounds (as an antiseptic) [67] |
|                           |                                                   | Per (inner part) | - | - | Diarrhea, cough, beautifies the sound of partridge [17] |
| Lamiaceae                 | Lavandula stoechas L. Karabaş otu | Aer | - | Int/Ext | Respiratory diseases, dermal diseases and wounds [15] |
|                           | Melissa officinalis L. Oğul otu, Turunca | FL, L | - | Int | Gastrointestinal diseases, reproductive diseases, oral diseases [15] |
|                           | Mentha sp. Filiskin, Yarpuz, Nane | Aer | - | Int/Ext | Parasitic diseases, reproductive diseases, respiratory diseases [15] |
|                           |                                                   | L  | - | - | Diarrhea [17] |
|                           | Ocimum basilicum L. Feslegen, Inhan, Peslan, Reyhan | L, S | - | Int | Parasitic diseases, respiratory diseases [15] |
|                           | Origanum majorana L. Guy otu, Mercanköşk, Akkekik | FL | - | Int/Ext | Dermal diseases and wounds [15] |
|                           | Origanum onites L. Kekik, Deli kekik, Eskek kekigi, Tulu kekik, Karabaş kekik | Leb, Aer | Inf | Ext | Mouth sores, foot-and-mouth disease [20,40] |
|                           | Origanum sylex L. Güvey otu, Bayır çayı, Kekik | Aeri | - | Ext | Wounds [68] |
|                           | Origanum syriacum subsp. bevanii (Holmes) Greuter & Burdet Eşek kekigi, eşek pekkeği, güve kekigi, boz kekik, sahilin kekik | Aeri, FLb Inf, Ju, Oil, Pow, Spi | Int/Ext | Indigestion pains [35] |
|                           | Phlomis pungens Willd. var. firta Velen. Ayr kulaği, Calba | Aer | - | Int | Diarrhea [39] |
|                           | Rosmarinus officinalis L. Biberiye, Beyaz püren, Kış dili | FL, L | - | Int | Gastrointestinal diseases, reproductive diseases, dermal diseases and wounds [15] |
|                           | Salvia officinalis L. Ada çayı, Dişotu, Misk adaçayı, Ayr kulaği | L | Dec | Ext | Cataract [20] |
|                           | Salvia pratensis L. Boz ot | L, FL | - | Int (Fd) Appetizer [43] |
### Table 1. (Continued).  

| Species/Genus                      | Common Name(s)                                      | Part(s) Used | Internal Use | External Use | Main Uses                                                                 | Reference(s) |
|-----------------------------------|-----------------------------------------------------|--------------|--------------|--------------|---------------------------------------------------------------------------|--------------|
| *Salvia tomentosa* Mill.          | Salba, Boz salba, Borçãglã Yaki otu                 | Aer          | Inf          | Int          | Urinary system diseases                                                   | [25]          |
| *Salvia virgata* Jacq.            | Fatmana otu, Ylançãk                                 | L            | -            | Int/Ext      | Gastrointestinal diseases, dermal diseases and wounds, oral diseases     | [15]          |
| *Satureja cyanifolia* Ten.        | Yayla kekãgi, Kara kekik                            | -            | -            | Int          | Cough, cold, viral diseases                                              | [24]          |
| *Teucrium polium* L.              | Aca yarvãn, Ak sedef otu, Siraca otu, Yarvãn otu,  | L, Flb       | Dec          | Ext          | Wounds                                                                   | [69]          |
|                                   | Bodurmahmut                                         | Fl           | -            | Int          | Gastrointestinal diseases                                                | [15]          |
|                                   |                                                     | Aer          | Inf          | Int          | Analgesic                                                                | [41]          |
| *Thymbra spicata* L.              | Zahter, Kara kekik                                  | St, L        | -            | Int/Ext      | Gastrointestinal diseases, dermal diseases and wounds                    | [15]          |
| *Thymus cherlerioides* Vis. var.  | Geven dikeni, Dikenli kekik                          | -            | -            | Int          | Cold                                                                      | [24]          |
| *Thymus ciliacus* Botas. & Balansa | Kekik, Yer kekãgi, Kãlcãk kekãgi                   | Aer          | -            | Ext          | Parasitic diseases, dermal diseases and wounds                            | [15]          |
| *Vitis agnus-castus* L.           | Hayat, Acã ayat, Beþparmak otu                      | S, L, Fl, Aer| -            | -            | Diuretic, diarrhea, abdominal pain, stomach diseases                    | [70]          |
|                                   |                                                     | St, Fr       | -            | Int          | Reproductive diseases                                                    | [15]          |
|                                   |                                                     | S            | Dec          | Int          | Pain reliever (horses)                                                   | [40]          |
|                                   |                                                     | Fr           | Cru          | Int          | Constipation                                                             | [42]          |
| **Lauraceae**                     |                                                     |              |              |              |                                                                          |              |
| *Laurus nobilis* L.               | Akdeniz defnesi, Hardal, Defne, Çobãklãk, Tanel, Tenhal | Fr, L        | Dec          | Ext          | Parasitic diseases in animals                                            | [71]          |
|                                   |                                                     | Fr, L        | -            | Int/Ext      | Dermal diseases and wounds                                               | [15]          |
|                                   |                                                     | L            | Dec          | Int          | Poisoning                                                                | [31]          |
|                                   |                                                     | Fr, L        | -            | Ext          | Pain reliever, insect repellent                                          | [67]          |
| **Linaceae**                      |                                                     |              |              |              |                                                                          |              |
| *Linum nodiflorum* L.             | Yahab keten                                         | S            | -            | Int/Ext      | Gastrointestinal diseases, dermal diseases and wounds                    | [15]          |
| *Linum usitatissimum* L.          | Keten                                               | S (oil)      | -            | Ext          | Sunstroke and sunburn, ringworm, mange                                    | [16]          |
|                                   |                                                     | S (oil)      | -            | Ext          | Abscesses                                                                | [19]          |
|                                   |                                                     | S (oil)      | -            | Ext          | Hypodermosis, ticks, fleas and lice, burns                               | [18]          |
|                                   |                                                     | S (oil)      | -            | Ext          | Fleas and lice, ticks, mange in ruminants                                | [21]          |
| **Lythraceae**                    |                                                     |              |              |              |                                                                          |              |
| *Lawsonia inermis* L.             | Kina                                                | L            | Pow          | Ext          | Ringworm                                                                 | [16]          |
|                                   |                                                     | L            | Pow          | Ext (dog)    | Fleas and lice                                                           | [19]          |
|                                   |                                                     | L            | -            | Ext          | Trichophytosis                                                           | [18]          |
| *Punica granatum* L.              | Nar açãci, Nar                                      | St, Fr, Fl   | -            | Int/Ext      | Parasitic diseases                                                      | [15]          |
| **Malvaceae**                     |                                                     |              |              |              |                                                                          |              |
| *Malva neglecta* Wallr.           | Kücãk ebegümeci, Çoban çoreqgi                      | Aer          | -            | Int/Ext      | Reproductive diseases, dermal diseases and wounds                       | [15]          |
|                                   |                                                     | L            | -            | -            | Wounds, diarrhea                                                         | [17]          |
|                                   |                                                     | Aer          | (+ whole meal flour) | Int          | Chick diseases                                                           | [44]          |
| *Malva sylvestris* L.             | Ebegümeci, Develik, Ebecik, Ebelik                   | Fl, L        | -            | Int          | Gastrointestinal diseases, respiratory diseases                          | [15]          |
|                                   |                                                     | Aer          | Plas         | Ext          | Lumbarago                                                                | [20]          |
|                                   |                                                     | L            | Ma           | -            | Abscess, bee stings                                                     | [18]          |
| Plant Family               | Common Names                           | Parts Used | Use                  | Effect                                                                 |
|---------------------------|----------------------------------------|------------|----------------------|------------------------------------------------------------------------|
| **Ficus carica L.**       | Incir, Yemiş                           | Lt         | Ext                  | Papillomatosis                                                         |
| **Ficus platyphyllos**    | Ihlamur, yaz ihlamuru                 | St (Ba)    | Ext                  | Bone fractures                                                         |
| **Morus nigra L.**        | Karadut, Gara dut                      | Fr         | Int                  | Respiratory diseases, oral diseases, parasitic diseases              |
| **Moraceae**              |                                        | Mo, Fr, Wh, L |                     | Swelling, poisoning, diarrhea, retained placenta, cough, pain reliever, mastitis, difficulty of birth, increasing milk secretion, constipation, appetizer, fistulas, wounds, breast diseases, good development, anemia of partridge |
| **Myrtaceae**             |                                        | Fr, L      | Int                  | Respiratory diseases, reproductive diseases                           |
| **Myrtus communis L.**    | Hambeles, Mersin, Murt                 | Fr         | Int                  | Animal weakness                                                        |
| **Nitriaceae**            |                                        | Fr         | Int                  | Diarrhea                                                              |
| **Oleaceae**              |                                        | Fr (oil)   | Ext                  | Sunstroke and sunburn, mange                                           |
| **Jasminum fruticans L.** | Oğuz gözü, Boruk, Borumak, Kapna, Yahani yasemin | Br         | Int                  | Parasitic diseases                                                    |
| **Olea europaea L.**      | Sitin, Zeytin                          | Fr (oil)   | Ext                  | Swelling, constipation, mastitis and breast lumps                      |
| **Phillyrea latifolia L.**| Kuru pınar, Pınar, Pınar, Kesme        | L (juice)  | Ext                  | Eye diseases                                                          |
| **Orchis italica Poir.**  | Tavşan topuğu, Topbaş, Dağ salebi      | Ro         | Int                  | Gastrointestinal diseases                                              |
| **Papaveraceae**          |                                        | Fr (oil)   | Int/Ext              | Abscess, burn, tympano, constipation                                  |
| **Peganum harmala**       | Üzerlik otu, Süzerlik, Yuvezlik         | Aer        | Dec                  | Eye diseases                                                           |
| **Peganum harmala**       | Üzerlik otu, Süzerlik, Yuvezlik         | Aer Dec    | Int                  | Diarrhea                                                              |
| **Phillyrea latifolia L.**| Kuru pınar, Pınar, Pınar, Kesme        | L (juice)  | Ext                  | Eye diseases (keratitis)                                               |
| **Orchidaceae**           |                                        | L         | Cru, Che             | Eye diseases                                                          |
| **Orchis italica Poir.**  | Tavşan topoğlu, Topbaş, Dağ salebi      | Ro         | Int                  | Gastrointestinal diseases                                              |
| **Papaveraceae**          |                                        | Fr (oil)   | Int/Ext              | Abscess, burn, tympano, constipation                                  |
| **Peganum harmala**       | Üzerlik otu, Süzerlik, Yuvezlik         | Aer Dec    | Int                  | Diarrhea                                                              |
| **Phillyrea latifolia L.**| Kuru pınar, Pınar, Pınar, Kesme        | L (juice)  | Ext                  | Eye diseases                                                          |

**Table 1. (Continued).**
Table 1. (Continued).

| Plant Species | Common Name (Language) | Plant Family | Application | Duration | Use | Comments |
|---------------|------------------------|--------------|-------------|----------|-----|----------|
| Papaver somniferum L. | Afyon, Haşhaş | | Fr, S | - | Int | Gastrointestinal diseases, respiratory diseases [15] |
| | | | Fr | Dec | Int | Analgesic [25] |
| | | | Imfr | - | Int | Diarrhea [25] |
| Papaver rhoes L. | Gelincik, Gelin eli, Gelin elmas, Alvala | | Fr, S | - | Int/Ext | Dermal diseases and wounds, gastrointestinal diseases [15] |

**Pedaliaceae**

| Sesamum indicum L. | Küncü, Susam | | S | - | Ext | Ringworm [16] |
| | | | S | - | - | Muscle builder in partridge [17] |

**Pinaceae**

| Cedrus libani A.Rich. | Katran, Ardıç | | Ta (+ butter and milk) | Ext | | Scabies [34] |
| | | | Ta | - | Ext | Pain of fractures, foot-and-mouth disease rheumatism [34] |
| | | | Ta | - | Ext (Wrp) | Cold, mange, fungal infections, mastitis, poisoning [24] |
| Pinus brutia Ten. var. brutia | Andız çam, Kızıl çam, Pür çam, Şam | | Res (+ hot water) | Ext | | Wounds, cuts [32,74] |
| | | | Res | - | Ext | Wounds [61] |
| | | | - | - | Ext (Wrp) | Cold, enteric disorders, low birthrate, endoparasites [24] |
| | | | Ta | - | Ext | Fistulas [20] |
| | | | Ta (pine) | Oi | Ext | Ticks [32] |
| | | | L | Dec | Ext | After pains [42] |
| | | | Ta | - | Ext | Wounds [36] |
| Pinus nigra J.F.Arnold | Gu (pine) | | Gu (pine) | - | Ext | Dermatitis madidans, open skin wounds, interdigital dermatitis [16] |
| | | | Res | Pow | Ext | Cracked nipples, sunstroke and sunburn, open skin wounds, interdigital dermatitis, ringworm [16] |
| | | | Wd (Ta) | Dis | Ext | Open skin wounds [16] |
| | | | Gu | - | - | Fracture [17] |
| | | | Ta | - | Ext | Open skin wounds, mange, fracture [19] |
| | | | Gu, Res, Ta | - | Ext | Foot-and-mouth disease, abscess, trichophytosis, burn, wounds [18] |
| Pinus nigra subsp. pallasiana (Lamb.) Holmboe | Çam, İşam, Gara şam | | L | Cru | Ext | Dog or wolf bites [75] |
| | | | St (Ta) | Imp | Int | Ticks [39] |
| | | | Ta (+ flour to form pills) | Int | | Treat worms [34] |
| | | | Ta | - | Ext (Wrp) | Cold, enteric disorders, low birthrate, endoparasites [24] |
| Pinus pinea L. | Fıstik çam, Küner, Küner çam | | St (Ba) | Ma (+ unsalted butter) | Ext | Wounds [76] |
| Pinus sylvestris var. hamata Steven | Çam, Sarı çam | | Ta | - | Ext | Insect repellent, wounds [57] |

**Plantaginaceae**

| Linaria vulgaris Mill. | Kara nevruz, nevruz otu | Aer | - | Int | Intestinal parasites [20] |
| Plantago sp. | Sinirli ot, Bağa, Pel heves otu, Peli heves, Damalca | Aer | - | - | Abscess/fistula, wounds [17] |
### Table 1. (Continued).

| Plantago lanceolata L. | Damarlıca, Yılandılı, Sinılıot, Çıbanotu | L, Pou (Ju) | Ext | Against parasites [77] |
|------------------------|------------------------------------------|-------------|-----|-------------------------|
|                         | Ma                                        | Ext         | Open skin wounds [16] |
|                         | -                                         | Int/Ext     | Dermal diseases and wounds, parasitic diseases, respiratory diseases [15] |
|                         | Ma                                        | -           | Abscesses [18] |

#### Platanaceae

| Platanus orientalis L. | Ak kavak, Çınar, Kavak | L, Fl, Fr, S, Bd, Po | Inf, Dec, Pow | Int | Runny nose, pains [35] |
|------------------------|------------------------|----------------------|---------------|-----|------------------------|
|                         | Fr, S                  | Pow                  | Int           | In case of convulsions [35] |
|                         | Fr                     | Dec                  | Int           | Diarrhea [25] |
|                         | Fr (+ wheat and straw) | Int                   | Cough [41] |

#### Poaceae

| Avena sativa L. | Yulaf | Aer, Fr | - | Ext | Carminative (relieve flatulence) [26] |
|-----------------|-------|---------|---|-----|--------------------------------------|
| Gynodon dactylon (L.) Pers. | Ayrık otu | Aer | - | - | Increasing milk secretion [17] |

#### Hordeum sp.

| Çavdar otu, Deli çavdar otu, Arpa | Aer, Bn | - | - | Mastitis, breast lump, difficulty of birth, increasing milk secretion [17] |
|-----------------------------------|---------|---|---|-----------------------------------|
| Fr                                | -       | Ext | Int | Pain reliever [40] |

#### Hordeum vulgare L.

| Arpa | Gr | Dec | Int (Fd) | Distemper [19] |
|------|----|-----|----------|----------------|
| Gr   | -  | Int | Strangles, emphysema [18] |

#### Oryza sp.

| Pirinç | Gr | Dec | Int (dogs are fed) | Diarrhea [19] |

#### Triticum sp.

| Buğday | Aer, Bn | - | - | Mastitis, breast lumps, difficulty of birth, retained placenta, increasing egg production [17] |
|--------|---------|---|---|----------------------------------|

#### Zea mays L.

| Msır, Lazut | Fr, Fl, Tas | - | - | Increasing milk secretion [17] |
|-------------|-------------|---|---|--------------------------------|
| Tas         | Inf         | Int | Diarrhea, urinary retention [18,26] |

#### Polygonaceae

| Rheum ribes L. | Işgin, Rives, AŞkın, Işkin, Revam, Uğsun | Ro | Pol | Int | Diarrhea [77] |
|----------------|------------------------------------------|----|-----|-----|----------------|
| St, Ro         | -                                        | -  | Int | Wounds, foot-and-mouth disease, intestinal parasites [17] |
| Aer, Ro        | Dec                                      | Int | Diarrhea [20] |

#### Rumex pulcher L.

| Çarşaf, Efelek, Efelek, Labada, Lapaza, Mancar, Mancarotu, Pancarotu, Yapalak | Fr | - | Int (Fd) | Cough, illness [29] |
|------------------------------------------------------------------------------|----|---|----------|-------------------|
| Fr                                                                           | -  | - | Cough    [30] |

#### Rumex acetosella L.

| Kızılkulago, Tırşok, Tırşık, Ebenezisi | L, Fr | - | Int | Gastrointestinal diseases, parasitic diseases [15] |
|----------------------------------------|-------|---|-----|----------------------------------|
| Aer                                    | -     | - | Abscess/fistula, wounds, diarrhea, cough, breast diseases [17] |

#### Portulacaceae

| Portulaca oleracea L. | Semizotu, Pirpirim | L | - | Int | Gastrointestinal diseases [15] |
|-----------------------|-------------------|----|---|-----|--------------------------------|
| Aer                   | -                 | -  | Int | Diarrhea, epidermolysis bullosa, hairworm, retained placenta, increasing milk secretion [17] |

#### Ranunculaceae

| Delphinium staphisagria L. | Bit otu | St | Inc | Ext | Fleas and lice in ruminants [21] |

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Table 1. (Continued).

| Plant Name | Common Names | Usage | Condition | Reference |
|------------|--------------|-------|-----------|-----------|
| **Helleborus orientalis** Lam. | Bohça, Bohçaotu, Çöpleme, Çöpotu, Zambak kökü, Babatire | L, Rh - Ext (behind the ear); L, Int | Sunstroke | [22] |
| | | Rh - Ext | Joint ailments | [31] |
| | | L - Ext (Wrp) | Cold | [31] |
| | | Ro - Ext (Inserted in ear/tail for 24 h) | Cold | [31] |
| | | L - Int | Diarrhea | [31] |
| | | Ro - Inserted to ear skin (for 24 h) | Mastitis, keratitis | [45] |
| | | Ro Dec - | Malaria | [28] |
| | | Ro - Ext | Edema, aphrodisiac | [28] |
| | | L, Rh - Int (Fd) | Diarrhea | [29] |
| | | Rh - Ext (Insert in cow's ear) | Cold | [29] |
| | | Ro Cut Ext (Drilled into the ear kept for 12 hours) | Animal weaknesses | [78] |
| | | Ro Cru Ext (Insert in ear for 2 hours) | Cold | [66] |
| | | Ro Cru Int (Fd) | Immunostimulant | [66] |
| | | L, Rh - Int | Diarrhea, cold | [30] |
| **Helleborus sp.** | Bohça, Bohçaotu, Çöpleme, Çöpotu, Zambak kökü, Babatire | Stk - Ext (Punc) | Edema | [18] |
| **Nigella sativa** L. | Çörek otu, Kara çörek | S - Int | Reproductive diseases | [15] |
| | | Oil - Int | Bruises-sprains, abdominal pain | [24] |

**Rhamnaceae**

| Plant Name | Common Names | Usage | Condition | Reference |
|------------|--------------|-------|-----------|-----------|
| **Frangula alnus** Mill. | Zigar Otu, Ciğar | L - Int (Fd) | Increasing milk secretion | [48] |
| **Paliurus spinosa** Mill. | Çakır diken, Çaltı, Karaçalık, Kışla diken | Fr Dec (+ root of Asphodelus aestivus) - Int | Mastitis | [45] |
| **Rosaceae** | | | | |
| **Agrimonia eupatoria** L. | Fitkotu, Kızl otu, Kızıl yaprak | Aer - Int/Ext | Gastrointestinal diseases, dermal diseases, wounds | [15] |
| **Alchemilla sp.** | Kurtayağı, Dokuzepe, Paraoatu, Fındıkotu, Sarçıcak | Fl, L Fre Int (Fd) | Increasing milk secretion | [48] |
| **Crataegus monogyna** Jacq. | Alıç, Kızçakık, Arıc çağına, Kız elması, Yemişen, Yemişken çalısı | Fr, Fl, L - Int/Ext | Gastrointestinal diseases, reproductive diseases | [15] |
| | | Spi - Ext | Snake bite | [33] |
| **Crataegus sp.** | Alıç | Fr - - | Constipation | [17] |
| **Cydonia oblonga** Mill. | Ayva | S Cru Ext | Cracked nipples | [16] |
| | | Fr, S - Int/Ext | Gastrointestinal diseases, respiratory diseases | [15] |
| | | L - - | Diarrhea | [17] |
| | | L Inf Int | Distemper | [19] |
| | | Fr (Pe) Inf - | Diarrhea | [18] |
| | | L Inf Int | Diarrhea | [41] |
| **Malus sp.** | Elma | Fr (vinegar) - - | Difficulty of birth, retained placenta, increasing milk secretion, endoparasites of pigeon | [17] |
Table 1. (Continued).

| Plant | Common Name | Parts Used | Form | Use | Comments |
|-------|-------------|------------|------|-----|----------|
| *Malus pumila* Mill. | Elma | Fr (vinegar) | - | Ext | Mange, dermatitis madidans, open skin wounds, papillomatosis [16] |
| | | Fr (vinegar) | - | Int/Ext | Wart, breast edema, snake bite, bee sting, and leeches [18] |
| *Mespilus germanica* L. | Muşmula, Başboyuk, Döngel | L | Dec | Int | Diarrhea [54] |
| | | St Ba | Dec | Int | Anthelmintic [31] |
| *Potentilla recta* L. | Su parmakotu, Başparmakotu | Ro | - | Int | Oral diseases [15] |
| *Prunus avium* (L.) L. | Kiraz | Stk | - | - | Diarrhea [17] |
| | | Fr Stk, Br | Dec | - | Diarrhea [48] |
| | | Fr Stk | Inf | Int | Intestinal diseases [41] |
| *Prunus divaricata* Ledeb. | Dağ eriği | Fr | Dec | Ext | Wound-healing [79] |
| | | Fr | Inf | Int | Gastrointestinal parasites of ruminants [21] |
| *Prunus sp.* | Erik | Fr | - | - | Constipation [17] |
| *Prunus armeniaca* L. | Kayısı, Eşbabiye | Fr | - | - | Abscess/fistula, constipation, mastitis, swelling [17] |
| *Prunus persica* (L.) Batsch | Şeftali | L | (+ olive) | Ext | Wounds, skin diseases [22] |
| | | L | Inf | Ext | Open skin wounds [16] |
| | | L | - | - | Wounds [17] |
| *Prunus spinosa* L. | Aşır çalısı, Çakal eriği, Dağ eriği | Aer | Ma | Ext | Wounds [61] |
| *Pyracantha coccinea* M.Roem. | Yemişen, Ateş dikeni, Ehem büyük, Karaçalı, Kirkat, Tavşan elması | L | Dec | Int (drink a cup a day) | Diarrhea [45] |
| *Pyrus elaeagnifolia* Pall. subsp. elaeagnifolia | Ahlat | L | Dec | Int | Against swelling [72] |
| *Rosa canina* L. | Gül burnu, Gül elması, Kuşburnu | Fr, Ro | Dec | Int | Diarrhea [50] |
| | | Fr | - | Int | Gastrointestinal diseases [15] |
| *Rubus ulmifolius* Schott | Boğurtlen | L | - | - | Wounds [17] |

**Rubiaceae**

| Plant | Common Name | Parts Used | Form | Use | Comments |
|-------|-------------|------------|------|-----|----------|
| *Coffeea arabica* L. | Kahve | Fr | - | Int | Diarrhea [18] |
| *Galium verum* L. | Boyalık, Yoğurtotu, İplicik | Aer | - | Int/Ext | Respiratory diseases, reproductive diseases, dermal diseases and wounds [15] |
| *Rubia tinctorum* L. | Kızıl boya, Kızıl boya, Kızıl kök | Ro | - | Int | Gastrointestinal diseases [15] |

**Rutaceae**

| Plant | Common Name | Parts Used | Form | Use | Comments |
|-------|-------------|------------|------|-----|----------|
| *Citrus limon* (L.) Osbeck | Limon | Fr | - | Ext | Open skin wounds, mange [16] |
| | | Fr | - | - | Cough, appetizer [17] |
| | | - | - | Int | Poisoning, hypocalcemia, blindness [24] |
| | | Fr | - | Ext | Keratoconjunctivitis, mange, endoparasites [18] |

**Salicaceae**

| Plant | Common Name | Parts Used | Form | Use | Comments |
|-------|-------------|------------|------|-----|----------|
| *Populus sp.* | Kavak | L | - | - | Increasing milk secretion [17] |
| *Salix sp.* | Soğüt | L | - | - | Constipation, increase milk secretion [17] |
| *Salix alba* L. | Soğüt ağacı, Aksoğüt, Germajo | L | Inf | Int | Diarrhea [19] |
| | | L | Inf | - | Diarrhea [18] |
| | | L | Inf | Ext | Ticks in ruminants [21] |
| | | Br | Inf | Int | Gastrointestinal parasites of ruminants [21] |
| | | St (Ba) | Pow | Int | Tympamy [45] |
| Family               | Species                                  | Common Names                        | St, L, Fr, Wh, St, L, Fl | Int, Ext, Inf | Conditions                                      | References |
|----------------------|------------------------------------------|--------------------------------------|--------------------------|---------------|------------------------------------------------|------------|
| Santalaceae          | Viscum album                             | Armut otu, Çam otu, Okse otu, Gökçe, Çabu | St, L, Fr -             | Int           | Respiratory diseases                            | [15]       |
|                      | Viscum album subsp. austriacum (Wiesb.)  | Gövelekh, Okse otu                   | L Br Cho Int             |               | Gastrointestinal parasites of ruminants        | [21]       |
| Aesculus hippocastanum L. | Atkestanesi, Kestane otu                | Fr Pow -                             |                          |               | Pain reliever                                   | [48]       |
| Scrophulariaceae     | Verbascum asperoides Hub.-Mor.           | Maçyanik, Yalanki                    | L, Fl Pow Ext            | Injuries, antiparasitic                          | [50]       |
|                      | Verbascum cheiranthifolium Boiss.        | Sığırkuyruğu, Borakulak              | Aer - Int                | Against parasites                                | [46]       |
|                      | Verbascum pycnostachyum Boiss. & Heldr.  | Ayrkulağı, Sığırkulağı                | L Dec Int                | Diarrhea                                          | [25]       |
|                      | Verbascum armenum Boiss. & Kotschy       | Deligezer                            | Aer - Int                | Against parasites                                | [46]       |
|                      | Verbascum phlomoides L.                  | Sığırkuyruğu                          | Fl Dec Int               | Wounds                                            | [63]       |
|                      | Verbascum speciosum Schrad.              | Majak, Ayi kulağı, Zelbe, Sığır kuyruğu | Aer Dec Int             | Worms                                             | [44]       |
| Solanaceae           | Atropa belladonna L.                      | Güzel avrat otu                      | Ro, L - Int             | Gastrointestinal diseases, respiratory diseases  | [15]       |
|                      | Capsicum annumus L.                      | Kırmızı biber                         | Fr - -                   | Increasing egg production in chickens            | [17]       |
|                      |                                        |                                      | Fr - Ext                 | Keratoconjunctivitis                              | [19]       |
|                      |                                        |                                      | Fr - Int                 | Rhinitis, chicken plague                          | [18]       |
|                      |                                        |                                      | Fr Inf Int               | Gastrointestinal parasites of ruminants          | [21]       |
| Datura stramonium L. |                                           |                                     | Fl, L, S -              | Gastrointestinal diseases, respiratory diseases  | [15]       |
| Mandragora officinalis Mill. | Adem otu, At elması, Köpek elması, Yer elması | L - Int                          |                   | Gastrointestinal diseases                        | [15]       |
| Nicotiana sp.        | Tütün                                    | L - -                                |                          | Toothache                                         | [17]       |
| Nicotiana tabacum L. | Tütün                                    | L Inf Ext                            |                          | Mange                                             | [16]       |
|                      |                                        | Gr Inf Ext                            |                          | Fleas and lice, mange in ruminants              | [21]       |
| Solanum lycopersicum L. | Domates                                  | Fr (sauce) -                         |                          | Wounds, foot-and-mouth disease                   | [17]       |
| Theaceae             | Camellia sinensis (L.) Kantze            | Çay                                   | L Inf -                  | Diarrhea                                          | [19]       |
|                      | Camellia sp.                             | Çay                                   | L Inf -                  | Keratoconjunctivitis, Foot-and-mouth disease     | [18]       |
|                      | Thymelaeaceae                            |                                       |                          |                                                   |            |
| Daphne gnidioides Jaub. & Spach |                           | Ciğlıkic, Ezeltiere, İlgilcik, lycicik, Havaza | - - Int                  | Cold, tympany, anthrax                            | [24]       |
References - Ref; Aerial parts - Aer; Ashes - As; Bran - Bn; Bud - Bd; Bark - Ba; Branch - Br; Bulb - Bl; Cone - C; Flower - Fl; Flowering branch - Flb; Fruit - Fr; Gall - Gl; Grain - Gr; Gum - Gu; Immature fruit - Imfr; Juice - Ju; Latex - L; Leaf - L; Leafy branch - Leb; Molasses - Mo; Pericarp - Per; Peel - Pe; Pedicel - Pd; Pollen - Po; Resin - Res; Rhizome - Rh; Root - Ro; Seed - S; Shoot - Sh; Spine - Spi; Stalk - Stk; Stem - St; Straw - Str; Tassel - Tas; Tar - Ta; Tuber - Tb; Whole plant - Wh; Wood - Wd; Added in fodder - Fd; Burned - Bur; Chewing - Che; Crushed - Cru; Chopping - Cho; Decoction - Dec; Distilled - Dis; Fresh - Fre; Heated - He; Incense - Inc; Into pellets - Inp; Infusion - Inf; Maceration - Mc; Marmalade - Mar; Mash - Ma; Ointment - Oi; Oleate - Ole; Peeled - Pel; Pickle - Pic; Plaster - Plas; Poultice - Pol; Pounded - Pou; Powdered - Pow; Pulp - Pu; Puncture - Punc; Exposed to smoke - Sm; Spice - Spi; External use - Ext; Internal use - Int; Wrapped in a cloth - Wrp.

Table 1. (Continued).

| Daphne oleoides Schreb. | Exenterne, Elenterne, Boyunduruk otu | L | - | Int | Relieve any chronic pain | [39] |
|-------------------------|--------------------------------------|---|---|---|--------------------------|------|
| Ulmaceae                |                                      |   |   |   |                         |      |
| Ulmus canescens Melville| Karangiç                              | Ba| Dec| Ext| Wounds                  | [26] |
| Ulmus minor Mill.       | Karaağaç                              | Ro| Dec| Ext| Wounds                  | [28] |
| Urticaceae              |                                      |   |   |   |                         |      |
| Urtica dioica L.        | Isırgan                               | L, Ro| - | - | Abscess/fistula, wounds | [17] |
| Urtica urens L.         | Isırgan otu, Küçük isırgan otu, Tatlı isırgan | St, Ro, S| - | Int/Ext | Reproductive diseases, dermal diseases and wounds | [15] |
| Vitaceae                |                                      |   |   |   |                         |      |
| Vitis sp.               | Asma, Uzüm, Tevek                     | L, Mo| - | - |                         | [17] |
| Vitis vinifera L.       | Üzüm                                  | Fr (Mo)| - | Ext | Wounds, swelling, poisoning, pain reliever, foot-and-mouth disease, retained placenta, difficulty of birth, breast diseases | [16] |
| Xanthorrhoeaceae        |                                      |   |   |   |                         |      |
| Asphodelus aestival Brot.| Hıdırellez kamçısı, Hint, Cırıç, Çırıcıkmak | Ro| Dec| Ext | Dermal diseases | [73] |
| Asphodelus sp.           | Cırıç otu                             | Ro, Sh, L| - | - | Broken foot | [17] |

[16,19]. Pressed bulbs with milk are used internally to relieve flatulence [32]. For ruminants, crushed bulbs are applied externally to treat mange and bulbs in pills are applied internally in the treatment of babesiosis. Moreover, bulbs are used internally for poisoning and externally for hip lameness, abscess, sunstroke, poisoning, trichophytosis, babesiosis, mange, and leeches. However, the preparation method for bulbs was not recorded [18,20,26,31]. Methanol extract of the bulbs of A. sativum was evaluated for its in vitro anthelmintic activity against Haemonchus contortus and positive results were obtained [82]. Also, an earlier report was published supporting the anthelmintic activity of this plant [83]. The ethanol extract of A. sativum showed various inhibition levels against Staphylococcus aureus and Salmonella enteritidis [84]. The chemical content of allicin is particularly responsible for the antibacterial effect [85]. An aqueous extract of A. sativum has been shown to possess antimicrobial activity by inhibition of bacteria, yeasts, fungi, and rotavirus strains [86]. In vitro virucidal activities of allicin and other thiosulfimates were also found [87]. Bozin et al. [88] investigated the antioxidant potential of A. sativum by testing the extract of the whole plant with various methods and concluded that the phenolic and flavonoid contents are thought to be responsible for the antioxidant activity. Another study revealed that extracts of bulbs of A. sativum confirmed their ethnoveterinary usage by demonstrating antioxidant, antimicrobial, and insecticidal activity [89]. Venugopal and Venugopal [90] showed the antidermatophytic activity of the aqueous extract of A. sativum. According to Stoll and Seebeck [91], this plant has antibacterial, anthelmintic, and antiprotozoal activities, besides its diuretic and carminative effects. A. sativum oil exhibited an inhibitory effect on trypsin and
Figure 1. The most cited plant families with the numbers of medicinal plants.

Figure 2. The most cited plants in ethnoveterinary medicine.

Figure 3. Plant parts used for ethnoveterinary purposes ranked by frequency of use.
Table 2. Bioactive compounds of plant families [3,119].

| Family        | Bioactive compounds                                                                 | Family        | Bioactive compounds                                                                 |
|---------------|-----------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------|
| Acanthaceae   | Alkaloids, glycosides, lignans, triterpenoid saponins, sterols, fatty acids, and coumaric acid derivatives | Lauraceae     | Volatile oil, fatty oil, sesquiterpene lactones, isoquinoline alkaloids            |
| Adoxaceae     | Iridoides, flavonoids, volatile oil, caffeic acid derivatives                      | Linaceae      | Lignans, tannins, volatile oil, fatty oil, mucilages, cyanogenic glycosides        |
| Amaranthaceae | Triterpene saponins, flavonoids, steroids, terpenoids                              | Lythraceae    | Tannins, alkaloids                                                                  |
| Amaryllidaceae| Essential oils, alliins, flavonoids, steroid saponins                             | Malvaceae     | Flavonoids, mucilages, anthocyanins                                               |
| Anacardiaceae | Resins, volatile oil, triterpenes, tannins                                       | Moraceae      | Flavonoids, pectins, sugars, furanocoumarins, mucilages                            |
| Apiaceae      | Volatile oil, coumarins, terpenes and sesquiterpenes, triterpenoid saponins, acetylenic compounds | Myrtaceae     | Volatile oil, tannins, acylphloroglucinols                                         |
| Apocynaceae   | Indole alkaloids, cardiac steroids, pregnane glycosides                            | Nitrariaceae  | Alkaloids                                                                          |
| Araceae       | Anthocyanines, mucilages, lectins                                                 | Oleaceae      | Iridoide monoterpenes, triterpenes, flavonoids, chalcones                          |
| Araliaceae    | Triterpene saponins, volatile oils, steroids, flavonoids                           | Orchidaceae   | Mucilages, starch                                                                  |
| Asparagaceae  | Steroid saponins, benzofuranes                                                    | Papaveraceae  | Isoquinoline alkaloids, anthocyanins, mucilages                                     |
| Asteraceae    | Flavonoids, terpenoids, alkaloids, tannins, volatile oil, inulin                  | Pedaliaceae   | Fatty oil, steroids, lignans                                                        |
| Berberidaceae | Isoquinoline alkaloids, anthocyanins                                              | Pinaceae      | Volatile oil, resins, terpenic acids                                               |
| Betulaceae    | Tannins, flavonoids, triterpenes, steroids                                        | Plantaginaceae| Iridoide monoterpenes, mucilages, flavonoids, tannins, saponins, hydroxycomarins  |
| Boraginaceae  | Alkaloids, mucilage, tannins                                                      | Platanaceae   | Flavonoids                                                                          |
| Brassicaceae  | Fatty oil, sterols, glucosinolates, phenyl propane derivatives, cardiac steroids   | Poaceae       | Mucilages, volatile oil, sugar alcohols, silicic acid, steroid saponins, flavonoids |
| Cannabaceae   | Cannabinoids, flavonoids, volatile oil                                            | Polygonaceae  | Anthracene derivatives, tannins, flavonoids, glycosides                             |
| Capparaceae   | Alkaloids, flavonoids, steroids, terpenoids                                       | Portulacaceae | Flavonoids, alkaloids, terpenoids                                                   |
| Caprifoliaceae| Anthocyanins, iridoide monoterpenes, caffeic acid derivatives                     | Ranunculaceae | Alkaloids, cardiac and cyanogenic glycosides                                        |
| Caryophyllaceae| Anthocyanins, saponins                                                            | Rhamnaceae    | Anthraquinones, saponin                                                            |
| Cistaceae     | Tannins, glycosides, flavonoids, anthocyanins                                    | Rosaceae      | Volatile oil, tannins, terpenes, flavonoids, cyanogenic glycosides, catechins       |
| Convolvulaceae| Cardiac glycosides, tannins, saponins                                             | Rubiaceae     | Alkaloids, iridoids, flavonoids, anthracene derivatives                             |
| Cornaceae     | Iridoids, tannins, triterpenes                                                    | Rutaceae      | Alkaloids, volatile oil, flavonoids, coumarins                                      |
| Cucurbitaceae | Steroids, fatty oil, cucurbitacins, triterpenes                                   | Salicaceae    | Glycosides, tannins, flavonoids                                                    |
chymotrypsin, the pancreatic digestive enzymes, and it stimulated an intestinal digestive enzyme, lipase [92].

3.2.3. Juniperus oxycedrus L. subsp. oxycedrus var. oxycedrus (Cupressaceae)

Branches and tar are frequently cited parts of J. oxycedrus subsp. oxycedrus for the treatment of animal ailments. They are mainly used to treat parasitic and skin diseases. Tar is applied externally for the treatment of open skin wounds, mange, papillomatosis, ticks, and lice [16,18,21]. It is also used internally to treat ticks, colds, babesiosis, gastrointestinal parasites, and fasciolosis [21,39,49]. While infusion of branches is used internally against gastrointestinal parasites of ruminants, it is applied externally against fleas and lice [21]. People benefit from decoction of fruit by internal use to treat cough [52]. Crushed cones are used as an appetizer by internal use [25]. In a study comparing the wound-healing effects of some plants from the family Cupressaceae, essential oil of J. oxycedrus subsp. oxycedrus showed strong wound-healing and anti-inflammatory effects [93]. Antimicrobial activity with antibacterial and antifungal effects of the methanol extract of J. oxycedrus was displayed [94].
Furthermore, Kozan et al. [95] revealed that the ethanolic extract of leaves and fruits of *J. oxycedrus* has remarkable in vivo anthelmintic activity.

3.2.4. *Berberis crataegina* DC. (Berberidaceae)

*B. crataegina* is another plant species mainly used in parasitic diseases. Infusion of roots is regarded as efficient in the treatment of cough, gastrointestinal parasites, fasciolosis, and worms by indigenous peoples [18,21,51]. Decoction of roots is used internally as an anthelmintic and antiparasitic. It is also used against dysuria [34,49,50]. Leaves and fruits are used for the treatment of respiratory diseases and reproductive diseases [15]. The usage of the plant to treat endoparasites, liver pain, and mastitis was recorded but information about used parts and preparation methods was not given in an ethno-botanical study [24]. An experimental study indicated that *B. crataegina* roots have antiinflammatory, antinoceptive, and antipyretic activity owing to berberine, berbamnine, and palmatine, which are the main alkaloids [96]. The antiinflammatory, analgesic, and antipyretic effects of roots were studied in a different study and findings supporting traditional use were achieved [97]. Moreover, the methanolic extract of fruits and aerial parts exhibited significant antioxidant activity in diverse studies [98,99].

3.2.5. *Pinus brutia* Ten. var. *brutia* (Pinaceae)

Resin of *P. brutia* var. *brutia* is used externally for the treatment of wounds and cuts of animals [32,61,74]. Tar is applied externally to treat festulas, ticks, and wounds [20,32,36]. Decoction of leaves is used for pains [42]. The usage of the plant to treat colds, enteric disorders, low birthrate, and endoparasites was mentioned but information about used parts and preparation methods was not given in the study [24]. Dığrak et al. [100] investigated the antibacterial activity of the various extracts of the bark, resin, and cones of *P. brutia* var. *brutia* by disk diffusion method. In another study, the antimicrobial activity of tar obtained from the stems and the roots was evaluated and results showed that the crude extract of the tar had the most effective activity [101]. Essential oils obtained from resins of *P. brutia* var. *brutia* revealed in vitro antimicrobial, antioxidant, phytotoxic, and insecticidal activities [102]. On the other hand, according to Süntar et al. [103], essential oils of the cones and needles showed weak wound-healing effects in their investigation. These reports confirm the traditional utilization of tar and resin of *P. brutia* var. *brutia* for dermal and parasitic diseases.

3.2.6. *Sambucus ebulus* L. (Adoxaceae)

*S. ebulus* is commonly used against parasitic and dermal diseases of animals in Turkey. Aerial parts are traditionally used to treat mastitis and inflammatory swellings [27,28]. The fruit, flower, and stem are also reported as herbal medicines for gastrointestinal diseases, respiratory diseases, dermal diseases, and wounds [15]. Leaves are prepared by different methods. Crushed leaves are used externally to treat inflamed wounds [26], and heated leaves are applied externally for chick diseases [29]. To relieve pain, animals are exposed to the smoke of the leaves [27]. Leaves and stem are also used for the treatment of chick diseases and as acaricide [30]. Studies proving these effects have been conducted by many researchers. In one of these studies, the anti-inflammatory activity of leaves and roots of *S. ebulus* was demonstrated, and the antioxidant activity of flowers was investigated in another study [104,105]. In addition, herbaceous parts of *S. ebulus* were studied in terms of anti-*Helicobacter pylori* activity by using the agar dilution method [106], and wound-healing effects of the methanolic extract of leaves were found [107].

3.2.7. *Cydonia oblonga* Mill. (Rosaceae)

Fruits, leaves, and seeds of *C. oblonga* are generally used against gastrointestinal and respiratory diseases. However, its antidiarrheal activity is the best known effect in folk medicine. Infusion of leaves is administered internally to treat diarrhea and distemper [17,19,41]. Infusion of fruit peel is used to treat diarrhea [18]. Crushed seeds are used externally for the treatment of cracked nipples [16]. Furthermore, fruit and seeds are traditionally used to treat gastrointestinal diseases and respiratory diseases [15]. Regarding antidiarrheal activity, the aqueous and methanolic extracts of seeds were investigated, and the seed extract was found to contain effective compounds for constipation cases. The bronchodilator activity of the seed extract has also been demonstrated [108]. The antibacterial and antifungal activities of fruits and seed extract have been proven in many studies [109–111]. Leaves and peels were observed to have anti-inflammatory effects by some researchers [112,113].

3.2.8. *Olea europaea* L. (Oleaceae)

Last but not least, *O. europaea* is one of the most cited herbs in ethnoveterinary medicine. This plant has a very broad spectrum of usage. Olive oil obtained from its fruits is used externally to treat sunstroke, sunburn, and mange [16]. It is offered as a drink for constipation in animals [19]. It is also used for the treatment of abscesses, burns, tympany, swelling, mastitis, and breast lumps [17,18]. For the treatment of gastrointestinal diseases and reproductive diseases, people also benefit from the leaves of the plant by internal use [15]. Poisoning, abdominal distention, and colds are other ailments in which *O. europaea* is used [24]. Many studies have been performed on the antioxidant, antimicrobial, antibacterial, antifungal, and antiparasitic properties of this plant. The leaves and olive oil have particularly shown these effects [114–116].

3.3. Toxicology

Some plants contain toxic components that adversely affect animal health. Overdose or side effects of these plants can
be dangerous. Therefore, particular attention should be paid to the use of them and dose adjustment should be done well. Examples of the most common toxic effects are given below.

All parts of Nerium oleander are toxic, and ingestion of clippings from the plant is a common cause of poisoning in animals. Among the reasons for toxicity are several cardiac glycosides. It also has a negative effect on the central and peripheral nervous systems. Massive doses (30–60 g) of the leaves may kill an animal within 1 h. Members of the family Araceae contain insoluble calcium oxalate crystals that cause pain and irritation during chewing. Some taxa of Chenopodium and Rumex also have oxalate crystals in their leaves and stems. Hypocalcemia is the most common side effect of calcium oxalates. Isocupressic acid, which is found in Juniperus spp., Pinus spp., and Cupressus spp., may cause premature parturition or abortion in late-term cows following internal administration. Toxic quinones and furanocoumarins are associated with the families Apiaceae, Hypericaceae, and Polygonaceae. These compounds induce photosensitization when plants are eaten in large quantities by animals. The triterpenoid saponins are quite common in Caryophyllaceae and Araliaceae. In most cases, the usage of Hedera helix can lead to transient diarrhea and vomiting. Moreover, severe vomiting and diarrhea have been observed in animals consuming Sambucus ebulus. Beta vulgaris causes nitrate poisoning, especially in sheep and horses. Brassica spp. contains S-methyl cysteine sulfoxide, which significantly reduces the number of red blood cells and packed cell volume. Diterpenic esters present in Euphorbia spp. directly irritate the skin, mucous membranes, and gastrointestinal tract on contact. The sap is toxic in both fresh and dried plants. Blistering can cause salvation, irritation of the upper gastrointestinal tract, and diarrhea. β-Amino propionitrile exists in green parts and seeds of some Lathyrus spp. The early clinical signs of poisoning in animals include labored breathing and depression, followed by coma and death within a day or sometimes several days later. Diterpenoid alkaloids that are toxic to animals are found in the family Ranunculaceae (mostly in some Delphinium spp. and Aconitum spp.). Poisoning with Helleborus species is similar to Digitalis poisoning. It is characterized by effects on the cardiovascular and nervous system. Gastrointestinal tract disorders are also observed. For horses, 1 kg of H. niger leaf is lethal. In horses and cattle, severe poisoning occurs with 8–10 g of roots, and in sheep and goats with 4–12 g of roots. Tropane alkaloids, found in members of the family Solanaceae, are responsible for parasympatholytic action in animals. Dry mucous membranes, gastrointestinal atony and tympany, tachycardia, and convulsions may occur at low doses. Melilotus spp. and Daphne spp. contain significant amounts of coumarin, which cause severe pain, vomiting, and collapse. Pyrrolizidine alkaloids have been identified in the family Asteraceae (Tussilago farfara, Senecio spp.). It possesses carcinogenic and mutagenic properties that may result in death [117,118].

4. Conclusion
Despite modern innovations and the development of synthetic drugs, the use of plants in ethnoveterinary medicine by local people is still continuing. Traditional herbal medicines are a common alternative in the treatment of animal diseases. However, there is insufficient evidence to conclude that traditional use of plants is beneficial to animal diseases. In this study, it was seen that most plants could be used in more than one animal disease and also various parts of the plants may be therapeutically effective. We determined the eight most popularly cited medicinal plants. Many of them are poorly studied in terms of pharmacological activity. No clinical studies have been carried out. Our study shows that Helleborus orientalis, Allium sativum, and Juniperus oxycedrus subsp. oxycedrus var. oxycedrus are the most cited medicinal plants for the treatment of animal diseases. Although H. orientalis is used to treat various animal diseases, pharmacological studies have focused solely on the antiinflammatory, antinociceptive, and antioxidant activity of the plant. Further pharmacological studies are therefore needed, particularly studies evaluating the antidiarrheal and immunostimulant activity of this species. Internal administration of plant was recorded in some ethnobotanical studies. Due to the toxic effect of this plant, further evaluation and classification of its safety is important. Clinical studies should be performed to evaluate the anthelmintic and antimicrobial properties of A. sativum. Our review also indicates that the most prevalent usage of plants is for wound-healing and people have usually preferred ethnoveterinary practices for dermatological diseases. Future research to clarify the wound-healing effects of medicinal plants is required. Considering the traditional usage of the reported medicinal plants, advanced in vitro and in vivo studies and clinical trials are recommended for confirming the efficacy and safety of these herbal remedies. Our data emphasize the efficacy of plants used in veterinary medicine. Thus, we hope that this review will contribute to the development of new plant-derived drugs for the treatment of animal diseases.

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