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Some Diuretic Plants in Traditional Medicine of Turkey (A Review)

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Abstract

Ethnobotanic is a branch of botanic science that examines human-plant relationships, and it is one of the sciences that deals with the purposes of which people use plants and has attracted more attention in recent years. Recording of ethnobotanical information; it is important that this information is not lost in time, such as those concerned, relevant disciplines and national economy and cultural wealth. This work is a small review research some plants used as diuretic in Turkey. Besides synthetic diuretic drug used in Turkey, herbal methods still remain to be used. Because of some side effects of drugs, herbal medicines used commonly in Turkey and in the world.

The fact that 75 % of natural compounds of herbal origin used in the treatment were discovered as a result of researching traditional folk remedies. For this reason traditional medicine applications, researches and issues remains up-to-date as always. In this study, some plants (186 taxa) which were used as diuretic in traditional medicine of Turkey to contribute related studies. The main families according to the number of taxa are as follows; Asteraceae 21 taxa, Fabaceae 19 taxa, Rosaceae 18 taxa, Lamiaceae 13 taxa and others. In addition 42 plant taxa were detected from Çelikhan (Adıyaman-Turkey) provinces which have potential diuretic property.

Keywords: diuretic plants, ethnobotany, Turkey, traditional medicine.

1. Introduction

Ethnobotanic can be described as examining human-plant relationships or “the way local people use plants to meet their needs”. Ethnobotany has actually started with human history, since the beginning of human history, plants have been made by people for food, medicine, various tools and equipment, paint, fuel, substance has been used for different purposes such as feed (Ghorbani, 2004). These important ethnobotanic informations unfortunately has been lost, because it has not been recorded in time and correctly. It is important to record this information, which takes centuries and is very valuable to be obtained and to transfer it to the next generations, in terms of relevance of the information, related disciplines, national economy and cultural wealth. Japan there is more demand for herbal preparations as official drug. Humans use many plant taxa in food and medicine; these plant species contribute significantly to food and health, especially in developing countries. It is also estimated that the traditional and modern medicine uses more than 50000 plant taxa. The availability of natural resources threatens the revenue from the wild harvest, health and welfare of the people who depend on them (Macía, 2005). By definition, diuretic drugs are bring about an increase in urinary volume as well as in the electrolyte output. Due to this they are used to regulate both volume and

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composition of the milieu intérieur in different affections like high blood pressure, heart failure, nephrotic syndromes among other indications.

Herbal medicines are currently in demand and their popularity is rising day by day. The use of natural medicinal and aromatic plants is becoming popular due to toxicity and adverse effects of allopathic drugs. This led to sudden increase in the number of herbal drug manufactures (Verma, Singh, 2008). In modern day to day practice diuretics can be used as a first line therapy in hypertensive patients. Herbal medicines are in great demand in the developed as well as in the developing countries for primary health care because of their wide biological and medicinal activities, higher safety margins and lesser costs. However, the number of studies about diuretic plants are limited and we recommend that further studies to be conducted to confirm reported activities. Such evidence is needed to provide scientific confidence to development of future medicines and treatments and treatment guidelines.

This review research is about some plant taxa used as diuretics in Turkey ethnobotany and some potential diuretic plants of Çelikhan (Adıyaman-Turkey) provinces. This study is expected to contribute to the literature on the subject.

2. Materials and methods

In this study, the literature and the plant species determine around Çelikhan (Adıyaman) were used. The family name, scientific name, local name, used part and usage patterns of the detected plants are presented in Table 1. Within the scope of this study, 186 taxa were determined from the literature. When plant taxa are systematically evaluated; Asteraceae 21 taxa, Fabaceae 19 taxa, Rosaceae 18 taxa, and Lamiaceae 13 taxa were the first rank of the determined plants on family basis. The plants in general; fruits, aboveground parts, leaves, seeds and other parts are used. The general use of plants is in the form of infusion and decoction. In addition as a result of field studies from Çelikhan (Adıyaman-Turkey) provinces in the 2019–2020 years 42 plant taxa (have potential diuretic effects) were collected from their habitat, dried herbarium technics, identified and being preserved in Adıyaman University, Pharmacy Faculty herbarium.

Table 1. Plants used as diuretic in Turkey ethnobotany

Family	Botanical name	Local name	Part used	Usage
Pinaceae	<i>Juniperus oxycedrus</i>	Ardıç	Fruits	Fruits are drunk like water decoction tea (Köse et al., 2005)
Urticaceae	<i>Urtica dioica</i>	Isırgan	Seeds and Fresh leaves	Tea is made (Koçyiğit, Özhatay, 2006)
Asparagaceae	<i>Asparagus officinalis</i>	Kuşkonmaz	Root	Decoction is used (Kara, 2006)
Fabaceae	<i>Glycyrrhiza glabra</i>	Meyan	Root	Decoction is used (Kara, 2006)
Brassicaceae	<i>Armoracia rusticana</i>	Bayır turpu	Leaves and roots	The roots are boiled, the leaves are boiled (Kara, 2006)
Malvaceae	<i>Malva neglecta</i>	Ebegümece	Herba	Boil and drink water (Elçi et al., 2006)
Poaceae	<i>Zea mays</i>	Mısır	Styluses	Used in decoction (Tuzlacı, Tolon., 2001)
Equisetaceae	<i>Equisetum telmateia</i>	Kırkkilit otu	Herba	Used in decoction (Tuzlacı, Tolon., 2001)
Brassicaceae	<i>Raphanus sativus</i>	Kara turp	Root	It is ground and eaten raw (Pirenoi et al., 2005)
Cucurbitaceae	<i>Cucurbita maxima</i>	Kabak	Fresh fruits	Cooked. Externally rubbed into the navel (Pirenoi et al., 2005)
Poaceae	<i>Hordeum vulgare</i>	Arpa	Seeds	Decoction (Pirenoi et al., 2005)
Rosaceae	<i>Prunus armeniaca</i>	Kayısı	Dried fruits	Decoction (Pirenoi et al., 2005)
Caprifoliaceae	<i>Sambucus nigra</i>	Kara mürver	Flowers, leaves and roots	Decoction (Koçyiğit, Özhatay, 2006)
Caprifoliaceae	<i>Sambucus ebulus</i>	Mürver	Flowers, leaves and roots	Decoction (Ecevit and Özhatay, 2006)
Poaceae	<i>Cynodon dactylon</i>	Ayrık otu	Herba	Decoction (Koçyiğit, Özhatay, 2006)

Cucurbitaceae	<i>Ecballium elaterium</i>	Acıkelek	Fruits	It is used by squeezing fruit juice (Koçyiğit, Özhatay, 2006)
Equisetaceae	<i>Equisetum ramosissimum</i>	Kilitotu	Herba	Decoction (Koçyiğit, Özhatay, 2006)
Lamiaceae	<i>Mentha longifolia</i>	Eşek nanesi	Herba	Infusion (Koçyiğit, Özhatay, 2006)
Rhamnaceae	<i>Paliurus spinachiristi</i>	Karaçalı	Fruits and roots	Decoction (Koçyiğit, Özhatay, 2006)
Platanaceae	<i>Platanus orientalis</i>	Çınar	Fruits	Infusion (Koçyiğit, Özhatay, 2006)
Rosaceae	<i>Sorbus aucuparia</i>	Üvez	Fruits	Fruits are eaten (Koçyiğit, Özhatay, 2006)
Boraginaceae	<i>Anchusa pusilla</i>	Şığırdili	Roots	Decoction (Sezik et al., 1992)
Rosaceae	<i>Mespilus germanica</i>	Muşmula	Leaves and fruits	Leaves decoction fruits are eaten (Sezik et al., 1992)
Rosaceae	<i>Origanum vulgare</i>	Mercanköşk	Leaf	Infusion (Sezik et al., 1992)
Rosaceae	<i>Prunus avivum</i>	Kiraz çöpü	Fruit stalks	Decoction (Fujita et al., 1995)
Brassicaceae	<i>Cardaria draba</i>	Diğnik	Flowers	Infusion (Tuzlacı, Erol, 1999)
Rosaceae	<i>Cerasus avium</i>	Kiraz	Fruit stalks	Decoction (Tuzlacı, Erol, 1999)
Asteraceae	<i>Doronicum orientale</i>	Doğu kaplanotu	Leaf	Decoction (Tuzlacı, Erol, 1999)
Rosaceae	<i>Rubus sanctus</i>	Böğürtlen	Fruits	Eaten (Tuzlacı, Erol, 1999)
Poaceae	<i>Sorghum halepense</i>	Kanyaşı	Rhizomes	Decoction or infusion (Tuzlacı, Erol, 1999)
Aspleniaceae	<i>Asplenium adiantum-nigrum</i>	Karabacak	Leaf and herba	Decoction (Tuzlacı, Eryaşar, 2001)
Ericaceae	<i>Erica arborea</i>	Funda	Flower brackets	Decoction (Tuzlacı, Eryaşar, 2001)
Apiaceae	<i>Petroselinum crispum</i>	Maydonoz	Herba	Decoction (Goziim, Ünsal, 2004)
Rosaceae	<i>Cerasus vulgaris</i>	Vişne	Cherry stems	Fruit is eaten, syrup and jam are made (Bağcı et al., 2006)
Rosaceae	<i>Rubus canescens</i>	Böğürtlen	Root and leaves	The root part is boiled. The leaves are crushed and porridge is made (Bağcı et al., 2006)
Apiaceae	<i>Foeniculum vulgare</i>	Rezene	Seeds, leaves and roots	Seed is popped. Leaf and root are boiled (Bağcı et al., 2006)
Caryophyllaceae	<i>Vaccaria pyramidata</i>	İnek sabun otu	Roots are used	Drink two glasses a day in decoction (6 %) (Çakılciöğlü et al., 2007)
Anacardiaceae	<i>Pistacia terebinthus</i> subsp. <i>palaestina</i>	Menengiç	Dried ripe fruits	Coffee is made or eaten (Çakılciöğlü et al., 2007)
Rosaceae	<i>Crataegus monogyna</i> subsp. <i>monogyna</i>	Alıç	Flowers	Tea is made from flowers (Çakılciöğlü et al., 2007)
Convolvulaceae	<i>Convolvulus arvensis</i>	Tarla sarmaşığı	Flowers	Infusion (Kültür, 2007)
Lamiaceae	<i>Teucrium chamaedrys</i> subsp. <i>chamaedrys</i>	Kısacık mahmut	Leaves	Decoction (Kültür, 2007)
Fabaceae	<i>Ononis spinosa</i>	Kayışkıran	Roots	Decoction (Kültür, 2007)
Zygophyllaceae	<i>Tribulus terrestris</i>	Çoban çökerten, Demir hindi	Flowers	Decoction (Kültür, 2007)
Ericaceae	<i>Calluna vulgaris</i>	Süprüge otu	Leaves and flowers	Decoction (Yeşilada, 2008)
Geraniaceae	<i>Geranium pratense</i>	Çayır Turnagagası	Flowers	Infusion (Yeşilada, 2008)
Asteraceae	<i>Achillea millefolium</i> subsp. <i>millefolium</i>	Civan perçemi	Flowers and leaves	Infusion (Ugulu et al., 2009)

Asteraceae	<i>Cichorium intybus</i>	Hindiba	Its roots and flowers	Decoction (Ugulu et al., 2009)
Asteraceae	<i>Scolymus hispanicus</i>	Şevketibostan	Seeds	Decoction (Ugulu et al., 2009)
Asteraceae	<i>Tussilago farfara</i>	Öksürük otu	Leaf	Decoction (Ugulu et al., 2009)
Boraginaceae	<i>Borago officinalis</i>	Hodan	Flowers and leaves	Infusion (Ugulu et al., 2009)
Brassicaceae	<i>Lepidium sativum</i>	Tere	Leaves	Infusion (Ugulu et al., 2009)
Caryophyllaceae	<i>Saponaria officinalis</i>	Sabun otu	Leaves	Decoction (Ugulu et al., 2009)
Fabaceae	<i>Lupinus angustifolius</i>	Yahudi baklası	Fruits	Fruits are consumed by boiling in water (Ugulu et al., 2009)
Fabaceae	<i>Spartium junceum</i>	Katırtırnağı	Leaves	Decoction (Ugulu et al., 2009)
Lamiaceae	<i>Lamium album</i>	Balhbaba	Leaves	Decoction (Ugulu et al., 2009)
Lamiaceae	<i>Thymus vulgaris</i>	Kekik	Flowers and leaves	Essential oil is used (Ugulu et al., 2009)
Rosaceae	<i>Rubus idaeus</i>	Ağaç çileği, Ahududu	Fresh fruits	Fresh fruits are eaten (Ugulu et al., 2009)
Ulmaceae	<i>Celtis australis</i>	Çitlembik	Leaves	Decoction (Ugulu et al., 2009)
Violaceae	<i>Viola tricolor</i>	Hercai meneke	Flowers	Infusion (Ugulu et al., 2009)
Rosaceae	<i>Pyrus elaeagnifolia</i> subsp. <i>elaeagnifolia</i>	Yaban armudu	Fruits	Infusion (Çakılcıoğlu, Türkoğlu, 2009)
Primulaceae	<i>Cyclamen coum</i>	Siklamen	Tubers	Decoction (Yaldız et al., 2010)
Thymelaeaceae	<i>Daphne pontica</i>	Karadeniz defnesi	Leaves	Decoction (Yaldız et al., 2010)
Asteraceae	<i>Achillea aleppica</i> subsp. <i>aleppica</i>	Yılan çiçeği	Flowers and leaves	Infusion and decoction (Çakılcıoğlu, Türkoğlu, 2010)
Asteraceae	<i>Bellis perennis</i>	Koyungözü papatya	Flowers	Decoction (Çakılcıoğlu, Türkoğlu, 2010)
Asteraceae	<i>Scorzonera semicana</i>	Yemlik	Flowers and leaves	Infusion and decoction (Çakılcıoğlu, Türkoğlu, 2010)
Boraginaceae	<i>Echium italicum</i>	Engerek otu	Flowers and leaves	Decoction (Çakılcıoğlu, Türkoğlu, 2010)
Asteraceae	<i>Achillea biebersteinii</i>	Ormaderen	Capitulate	Decoction (Altundağ, Öztürk, 2011)
Rosaceae	<i>Agrimonia eupatoria</i>	Koyunotu	Roots	Decoction (Altundağ, Öztürk, 2011)
Lamiaceae	<i>Ajuga chamaepitys</i>	Mayasıl otu	Above ground	Decoction (Altundağ, Öztürk, 2011)
Malvaceae	<i>Alcea setosa</i>	Hatmi	Leaves	Infusion (Altundağ, Öztürk, 2011)
Rosaceae	<i>Alchemilla pseudocartalinica</i>	Yıldıznişanı	Leaves	Infusion (Altundağ, Öztürk, 2011)
Resedaceae	<i>Reseda lutea</i> var. <i>lutea</i>	Muhabbet çiçeği	Roots	Decoction (Çakılcıoğlu, Türkoğlu, 2010)
Rosaceae	<i>Agrimonia eupatoria</i>	Koyun otu	Leaves and flowers	Infusion (Çakılcıoğlu, Türkoğlu, 2010)
Rubiaceae	<i>Galium aparine</i>	Yapışkan otu	Leaves and flowers	Decoction (Çakılcıoğlu, Türkoğlu, 2010)
Rosaceae	<i>Pyrus elaeagnifolia</i> subsp. <i>elaeagnifolia</i>	Yaban armudu	Fruits	Infusion (Çakılcıoğlu, Türkoğlu, 2010)
Poaceae	<i>Arundo donax</i>	Kargı	Rhizome	Decoction (Gücel and Arundo, 2010)
Brassicaceae	<i>Capsella bursa-pastoris</i>	Çoban çantası	Flowers and leaves	The juice of the leaf is squeezed and drunk (Toksoy et al., 2010)
Juglandaceae	<i>Juglans regia</i>	Ceviz	Leaves	Infusion (Toksoy et al., 2010)
Lamiaceae	<i>Ocimum basilicum</i>	Reyhan	Leaves and flowers	Infusion (Toksoy et al., 2010)

Lamiaceae	<i>Lavandula angustifolia</i>	Lavanta	Flowers	Infusion (Toksoy et al., 2010)
Fabaceae	<i>Cerationa siliqua</i>	Keçiboynuzu	Leaves	Decoction (Toksoy et al., 2010)
Fabaceae	<i>Glycyrrhiza glabra</i>	Meyan	Herba and roots	Powder and infusion (Toksoy et al., 2010)
Myristicaceae	<i>Myristica fragrans</i>	Hindistan cevi	Seeds	Powder and decoction (Toksoy et al., 2010)
Pedaliaceae	<i>Sesamum indicum</i>	Susam	Fixed oil	Powder and decoction (Toksoy et al., 2010)
Rosaceae	<i>Rosa canina</i>	Kuşburnu	Fruits and leaves	Infusion (Toksoy et al., 2010)
Ranunculaceae	<i>Nigella sativa</i>	Çörekotu	Seeds	Infusion and powder (Toksoy et al., 2010)
Hypolepidaceae	<i>Pteridium aquilinum</i>	Eğrelti	Roots	Infusion (Bulut, 2011)
Polygonaceae	<i>Rumex crispus</i>	Labada	Leaves	Infusion (Bulut, 2011)
Lamiaceae	<i>Salvia cryptantha</i>	Sarı şabla	Leaves and flowers	Infusion (Tuzlacı, 2011)
Liliaceae	<i>Allium scorodoprassum</i>	İt soğanı	Onions	It is eaten raw or cooked (Altundağ, Öztürk, 2011)
Ranunculaceae	<i>Anemone albana</i> subsp. <i>armena</i>	Dağ lalesi	Leaves	Infusion (Altundağ, Öztürk, 2011)
Asteraceae	<i>Anthemis nobilis</i>	Sarı papatya	Flowers	Infusion (Altundağ, Öztürk, 2011)
Asteraceae	<i>Artemisia abrotanum</i>	Pelin	Above ground	Infusion (Altundağ, Öztürk, 2011)
Asteraceae	<i>Artemisia chamaemellifolia</i>	Yavşan	Flowers and herba	Decoction (Altundağ, Öztürk, 2011)
Brassicaceae	<i>Barbarea vulgaris</i>	Su teresi	Leaves	Infusion (Altundağ, Öztürk, 2011)
Chenopodiaceae	<i>Chenopodium album</i> subsp. <i>album</i> var. <i>album</i>	Unluca	Above ground	Decoction (Altundağ, Öztürk, 2011)
Cyperaceae	<i>Cyperus rotundus</i>	Topalak	Roots	Infusion (Altundağ, Öztürk, 2011)
Fabaceae	<i>Glycyrrhiza echinata</i>	Dikenli meyan	Rhizome	Decoction (Altundağ, Öztürk, 2011)
Asteraceae	<i>Helichrysum plicatum</i> subsp. <i>plicatum</i>	Herdem taze	Above ground	Infusion (Altundağ, Öztürk, 2011)
Fabaceae	<i>Lotus corniculatus</i> subsp. <i>corniculatus</i>	Gazelboynuzu	Above ground	Decoction (Altundağ, Öztürk, 2011)
Asteraceae	<i>Achillea millefolium</i> subsp. <i>pannonica</i>	Civanperçemi	Aerial parts	Decoction (Kılıç, 2016)
Dipsacaceae	<i>Scabiosa argentea</i>	Uyuz otu	Roots	Decoction (Çakilcioglu, Türkoğlu, 2010)
Fabaceae	<i>Ononis spinosa</i> subsp. <i>leiosperma</i>	Kayıskıran	Roots	Decoction (Çakilcioglu, Türkoğlu, 2010)
Poaceae	<i>Agropyron repens</i>	Ayrık otu	Rhizome	Decoction (Çakilcioglu, Türkoğlu, 2010)
Poaceae	<i>Avena sativa</i>	Yulaf	Rhizome	Decoction (Çakilcioglu, Türkoğlu, 2010)
Polygonaceae	<i>Polygonum cognatum</i>	Madımak	Leaves	Infusion (Çakilcioglu, Türkoğlu, 2010)
Rhamnaceae	<i>Rhamnus catharticus</i>	Cehri	Peeled shells	Decoction (Altundağ, Öztürk, 2011)

Rosaceae	<i>Sanguisorba minor</i> subsp. <i>minor</i>	Çayır düğmesi	Above ground	Decoction (Altundağ, Öztürk., 2011)
Asteraceae	<i>Tanacetum balsamita</i>	Marsuvan otu	Above ground	Infusion (Kızılarslan, Özhatay, 2012)
Ranunculaceae	<i>Thalictrum minus</i> var. <i>minus</i>	Karakatran otu	Above ground	Porridge is used (Kızılarslan, Özhatay, 2012)
Zygophyllaceae	<i>Tribulus terrestris</i>	Deveçökerten	Above ground	Decoction (Kızılarslan, Özhatay, 2012)
Papaveraceae	<i>Chelidonium majus</i>	Temreotu	Latex and air particles	Infusion (Kızılarslan, Özhatay, 2012)
Asteraceae	<i>Filago vulgaris</i>	Kuzaotu	Aerial parts	Decoction (Kızılarslan, Özhatay, 2012)
Asteraceae	<i>Petasites hybridus</i>	Ayikulagi	Leaves	It is used in the form of heating (Kızılarslan, Özhatay, 2012)
Rosaceae	<i>Prunus spinosa</i> subsp. <i>dasyhylla</i>	Çakalerigi,	Fruits	Eaten raw (Kızılarslan, Özhatay, 2012)
Apiaceae	<i>Torilis arvensis</i> subsp. <i>arvensis</i>	Derecikotu	Aerial parts	Porridge is used (Kızılarslan, Özhatay, 2012)
Hypericaceae	<i>Hypericum perforatum</i>	Kantaron	Flowers	It is used by applying infusion and oil externally to the skin (Kızılarslan, Özhatay, 2012)
Cornaceae	<i>Cornus mas</i>	Kızılık kirazı	Fruits	Decoction (Demirci, Özhatay, 2012)
Berberidaceae	<i>Berberis vulgaris</i>	Karamuk	Fruits	Eaten raw (Tetik et al., 2013)
Boraginaceae	<i>Anchusa azurea</i> var. <i>azurea</i>	Fısır, sormuk	Leaves	Infusion (Tetik et al., 2013)
Caryophyllaceae	<i>Telephium imperati</i> subsp. <i>orientale</i>	Zulzula	Leaves	Porridge is used (Tetik et al., 2013)
Geraniaceae	<i>Erodium cicutarium</i>	Çoban değneği	Aerial parts	Infusion (Tetik et al., 2013)
Plantaginaceae	<i>Plantago major</i> subsp. <i>major</i>	Cevahız, doğnik	Leaves	Decoction (Tetik et al., 2013)
Violaceae	<i>Viola odorata</i>	Kokulu menekşe	Flower and leaves	Infusion (Tetik et al., 2013)
Caryophyllaceae	<i>Gypsophila arrostii</i> var. <i>nebulosa</i>	Çöven	Roots and rhizome	Infusion (Akbulut, Bayramoğlu, 2013)
Ericaceae	<i>Erica arborea</i>	Funda	Flowers	Infusion (Akbulut, Bayramoğlu, 2013)
Fabaceae	<i>Ceratonia siliqua</i>	Keçiboynuzu	Fruits	Decoction (Akbulut, Bayramoğlu, 2013)
Lamiaceae	<i>Rosmarinus officinalis</i>	Biberiye	Leaves	Infusion (Akbulut, Bayramoğlu, 2013)
Liliaceae	<i>Colchicum speciosum</i>	Acı çiğdem	Seeds and onions	Consumed fresh (Akbulut, Bayramoğlu, 2013)
Oleaceae	<i>Olea europaea</i>	Zeytin	Leaves	Infusion (Akbulut, Bayramoğlu, 2013)
Papilionaceae	<i>Anagyris foetida</i>	Keçi gevişi	Fruits	It is eaten raw (Arıcan, Genç Ecevit, 2013)
Capparaceae	<i>Capparis spinosa</i>	Kebere	Bud and fruits	Pickled gherkins (Arıcan, Genç Ecevit, 2013)
Chenopodiaceae	<i>Chenopodium album</i> subsp. <i>album</i>	Selmi, Silmastık	Aerial parts	Boiled (Polat et al., 2013)
Equisetaceae	<i>Equisetum ramosissimum</i>	-	Aerial parts	Decoction (Polat et al., 2013)
Adiantaceae	<i>Adiantum capillus-veneris</i>	İshalotu	Aerial parts	Infusion (Kilic, Bağcı, 2013)
Brassicaceae	<i>Nasturtium officinale</i>	Su teresi	Aerial parts	Cooked (Kilic, Bağcı, 2013)
Dipsacaceae	<i>Scabiosa argentea</i>	Uyuz otu	Aerial parts	Decoction (Kilic, Bağcı, 2013)

Fabaceae	<i>Melilotus officinalis</i>	Yonca	Aerial parts	Decoction (Kilic, Bağcı, 2013)
Poaceae	<i>Panicum miliaceum</i>	Darı	Leaves	Decoction (Akaydın et al., 2013)
Fabaceae	<i>Lathyrus digitatus</i>	Efenk otu	Aerial parts	Decoction (Akyol, Altan, 2013)
Rubiaceae	<i>Galium aparine</i>	Yoğurt otu	Above ground	As an infusion and ointment (Gül, 2014)
Lamiaceae	<i>Mentha pulegium</i>	Filiskin, yarpuz	Leaves	Infusion (Ugulu et al., 2009)
Liliaceae	<i>Asphodelus aestivus</i>	Çiriş otu	Tubers	Infusion (Ugulu et al., 2009)
Malvaceae	<i>Althaea officinalis</i>	Hatmi	Leaves	Decoction (Ugulu et al., 2009)
Malvaceae	<i>Malva sylvestris</i>	Ebegümeçi	Leaves	Infusion (Ugulu et al., 2009)
Myrtaceae	<i>Eugenia caryophyllata</i>	Karanfil ağacı	Buds	Infusion [(Ugulu et al., 2009)
Solanaceae	<i>Physalis alkekengi</i>	Güvey feneri	Fruits	Infusion (Gül, 2014)
Ericaceae	<i>Rhododendron ponticum</i>	Mor çiçekli orman gülü	Leaves	Decoction (Gül, 2014)
Tiliaceae	<i>Tilia rubra</i>	Ihlamur	Flowers and leaves	Infusion and decoction (Gül, 2014)
Fabaceae	<i>Lupinus albus</i>	Acı bakla	Flowers and seeds	Decoction (Hergence, 2015)
Ericaceae	<i>Arctostaphylos uva-ursi</i>	Ayı üzümü	Leaves and fruits	Decoction (Hergence, 2015)
Adoxaceae	<i>Viburnum opulus</i>	Gilaburu	Fruits	Juice is removed (Korkmaz et al., 2015)
Lythraceae	<i>Punica granatum</i>	Nar	Flowers	Infusion (Korkmaz et al., 2015)
Zingiberaceae	<i>Curcuma longa</i>	Zerdeçal	Roots and rhizome	Paste and infusion (Korkmaz et al., 2015)
Zingiberaceae	<i>Zingiber officinale</i>	Zencefil	Root and leaves	Paste and infusion (Korkmaz et al., 2015)
Cucurbitaceae	<i>Cucumis melo</i>	Kavun	Fruit and seeds	Fruit kernels are crushed (Akan, Sade Bakır, 2015)
Fabaceae	<i>Cassia angustifolia</i>	Sinameki	Leaves	Decoction (Akan, Sade Bakır, 2015)
Verbenaceae	<i>Vitex agnus-castus</i>	Hayıt	Flowers and leaves	Decoction (Akan, Sade Bakır, 2015)
Boraginaceae	<i>Trachystemon orientalis</i>	Galdirek	Aerial parts	Infusion (Polat et al., 2015)
Fabaceae	<i>Lathyrus sativus</i>	Burçak, mürdümük	Seeds	Infusion (Özdemir, Alpınar., 2015)
Lamiaceae	<i>Marrubium globosum</i>	Amel otu	Aerial parts	Infusion (Özdemir, Alpınar., 2015)
Zygophyllaceae	<i>Peganum harmala</i>	Üzerlik	Seeds and roots	Decoction (Özdemir, Alpınar., 2015)
Asteraceae	<i>Cyanus segetum</i>	Dağ karanfili	Flowers and leaves	Infusion (Sargin et al., 2015)
Asteraceae	<i>Onopordum myriacanthum</i>	Eşek kengeri	Aerial parts	Infusion (Sargin et al., 2015)
Papaveraceae	<i>Papaver argemone</i>	Gelincik	Leaf, seed, Flower	Infusion (Sargin et al., 2015)
Asteraceae	<i>Senecio vulgaris</i>	Kanarya otu	Air particles, seeds	Infusion (Sargin et al., 2015)
Caprifoliaceae	<i>Lonicera etrusca</i> var. <i>etrusca</i>	Hammeli	Leaves and fruits	Infusion (Güler et al., 2015)
Adiantaceae	<i>Adiantum capillus-veneris</i>	Ishalotu	Aerial parts	Infusion (Kılıç, Bağcı, 2013)
Euphorbiaceae	<i>Mercurialis annua</i>	Sultan otu	Fruits	Infusion (Güler et al., 2015)
Fabaceae	<i>Cicer arietinum</i>	Nohut	Fruits	Eat (Güler et al., 2015)
Fabaceae	<i>Vicia faba</i>	Bakla	Fruits	Eat (Güler et al., 2015)
Vitaceae	<i>Vitis vinifera</i>	Üzüm	Fruits	Eat (Güler et al., 2015)

Solanaceae	<i>Capsicum annuum</i>	Kırmızı biber	Fruits	It is eaten dried (Akgül et al., 2016)
Iridaceae	<i>Crocus sativus</i>	Safran	Flowers	Infusion (Akgül et al., 2016)
Lamiaceae	<i>Satureja</i> sp.	Kekik	Flowers and dried leaves	Infusion (Akgül et al., 2016)
Lauraceae	<i>Persea gratissima</i>	Avokado	Leaf	Decoction (Korkmaz et al., 2016)
Fabaceae	<i>Onobrychis stenostachya</i>	Körülgen	Above ground	Decoction (Altundağ, Öztürk., 2011)
Fabaceae	<i>Onobrychis transcaucasica</i>	Gorulgan	Above ground	Decoction (Altundağ, Öztürk., 2011)
Fabaceae	<i>Ononis spinosa</i> subsp. <i>leiosperma</i>	Kayıskıran	Above ground	Decoction (Altundağ, Öztürk., 2011)
Portulacaceae	<i>Portulaca oleracea</i>	Semizotu	Above ground	Decoction (Altundağ, Öztürk., 2011)
Brassicaceae	<i>Raphanus raphanistrum</i>	Turp	Above ground	It is eaten raw (Altundağ, Öztürk., 2011)
Lamiaceae	<i>Stachys lavandulifolia</i> var. <i>lavandulifolia</i>	Hava parçacıkları	Air particles	Decoction (Bulut et al., 2016)
Caryophyllaceae	<i>Silene vulgaris</i>	Yapışkan otu	Leaf	Decoction (Akdag, Dogu, 2016)
Liliaceae	<i>Muscari macrocarpum</i>	Dağ sümbülü	Onions	Decoction (Kayıran et al., 2017)
Asparagaceae	<i>Ornithogalum narbonense</i>	Akbaldır	Leaf	Decoction (Kayıran et al., 2017)
Liliaceae	<i>Urgenia maritima</i>	Ada soğanı	Onions	Decoction (Kayıran et al., 2017)

3. Results and discussion

Many indigenous drugs have been claimed to have diuretic effect in traditional medicine or in ethnobotany, but they were not properly investigated. Naturally occurring diuretics plant taxa are more safe and efficacious. Several plant derived chemical entities have proved to be more efficacious and safe. It remains for the modern scientists to give scientific validation for the plants claimed for therapeutic activity to make use of herbal potential in a more productive way. In this review paper, validation of these plant taxa which were classical literature as diuretic, and further, they are economically feasible, safe and efficacious and will be beneficial for further studies and clinical trials.

In this study, 186 plant taxa were identified from the literature of Turkey traditional medicine. In addition, as a result of field studies from Çelikhan (Adıyaman-Turkey) provinces in the 2019–2020 years 42 plant taxa which potential diuretic effects like plant taxa in Table 1 (*Juniperus oxycedrus* subsp. *oxycedrus*, *Malva neglecta*, *Zea mays*, *Hordeum vulgare*, *Prunus armeniaca*, *Equisetum ramosissimum*, *Mentha longifolia* var. *longifolia*, *Platanus orientalis*, *Rubus sanctus*, *Rubus canescens*, *Vaccaria pyramidata*, *Crataegus monogyna* subsp. *monogyna*, *Convolvulus arvensis*, *Teucrium chamaedrys* subsp. *chamaedrys*, *Achillea millefolium* subsp. *millefolium*, *Cichorium intybus*, *Saponaria officinalis*, *Lamium album*, *Althaea officinalis*, *Pyrus elaeagnifolia* subsp. *elaegnifolia*, *Helichrysum plicatum* subsp. *plicatum*, *Bellis perennis*, *Echium italicum*, *Rumex crispus*, *Reseda lutea* var. *lutea*, *Capsella bursa-pastoris*, *Juglans regia*, *Rosa canina*, *Anthemis nobilis*, *Ononis spinosa* subsp. *leiosperma*, *Portulaca oleracea*, *Sanguisorba minor* subsp. *minor*, *Anchusa azurea* var. *azurea*, *Plantago major* subsp. *major*, *Viola odorata*, *Chenopodium album* subsp. *album*, *Adiantum capillus-veneris*, *Melilotus officinalis*, *Vitis vinifera*, *Stachys lavandulifolia* var. *lavandulifolia*, *Silene vulgaris* var. *vulgaris*, *Ornithogalum narbonense*).

Due to the active substances they contain, these plants used for diuretic purposes should be careful both in terms of usage, dosage and preparation. It is necessary to pay attention to the way plants are collected from nature and the time of harvest, as well as the cultivation of cultivated plants. It is possible that the livestock activities carried out in the region with the unconscious and large collection of plants will narrow the living space of many taxa and affect the number of individuals. By comparing the traditional knowledge obtained with ethnobotanical researches with the existing scientific literature, more universal and more effective results can be obtained.

4. Conclusion

Many indigenous drugs have been claimed to have diuretic effect in traditional medicine and ethnobotany but they were not properly investigated. Naturally occurring diuretics and potential diuretic plants are more safe and efficacious. It remains for the modern scientists to give scientific validation for the herbs claimed for therapeutic activity to make use of herbal potential in a more productive way. This brief review study shows the richness potential diuretic plants of Turkey and Çelikhan (Adıyaman-Turkey) provinces. It can be concluded that in their habitats there are so many plants which possess potent diuretic activity. Herbal medications are free from or very low side effects unlike the allopathic medicines. The current review provides an overview of knowledge adjoining the plant taxa used as diuretics.

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