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Articles

Biochemical and Bacteriological Examination of Some Selected Sliced Fruits

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Abstract

Because of their articulated traits in the preferment of the health of patrons, diets encompassing fruits are exceedingly indorsed. Throughout harvest and/or post-harvest, fruits come in interaction with water, soil, dust, and so many other forms of management. This eventually exposes these fruits to a lot of microorganisms, some of which can be pathogenetic. The current study analysed the bacteriological content of some selected sliced fruits (pineapple, Pawpaw and watermelon) sold in Azare, Bauchi State, Nigeria. The samples were subjected to a variety of physiochemical, microbial and biochemical tests which include determination of temperature and pH, gram staining, catalase, coagulase, indole, and urease tests. Results showed the percentage frequency of the isolated bacteria to be; 26.5 %, 35.2 %, 14.7 %, 23.5 %, for E. *coli, Pseudomonas* spp, *Staphylococcus* spp, and *Bacillus* spp respectively. The most occurring bacterium observed in this study was *Pseudomonas* spp with the occurrence rate of 35.2 % while *Staphylococcus spp and Bacillus spp* had the least occurrence rates of 5.0 % and 8.0 % respectively.

Keywords: physiochemical, bacteriological, catalase, coagulase, indole, urease.

1. Introduction

Because of their expressed attributes in promotion of the health of consumers, diets containing fruits are highly recommended (Igiehon et al., 2020). Fruits contain a significantly high concentrations of minerals, vitamins, phytochemicals and lots of electrolytes (Amao, 2018).

Consumption of sufficient amounts of fruits lowers blood cholesterol levels, controls blood pressure, reduces the risk of some heart diseases, and prevents some kinds of cancer (Wang et al., 2014).

During harvest and/or post-harvest, fruits come in contact with water, soil, dust, and so many other forms of handling (Ramaswamy, 2015). This ultimately expose these fruits to a lot of microorganisms, some of which can be pathogenetic (Castro-Ibáñez et al., 2017). A lot of fruits are commonly sold as cut or sliced fruits to entice the consumers. These vended or ready-to-eat fruits, may include watermelons, pineapple and pawpaw and, cucumbers, mangoes, oranges, etc. They are usually displayed at strategic places or carried around by hawkers to be sold to buyers for

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immediate consumption without necessarily rinsing or washing them because they have already been prepared and packaged in small polythene bags (Alegbeleye et al., 2018). Because of their accessibility, convenience, and relatively cheaper prices than whole fruits, these ready to eat or vended fruits have become ubiquitous (Vidhya Ganesh, 2013).

Consequently, they have progressively developed into staples owing to the current modernization, industrialization, economic downturn, materialism, and absence of abundant time to prepare a suitable meal in most homes (Satterthwaite et al., 2010). This trend has been seen to signal a great risk to consumer health because it is difficult to ascertain the hygienic processes the fruits are subjected to after harvesting, during processing, and before packaging (Alegbeleye et al., 2018). The processing is usually done lacking appropriate stowing environments, thereby exposing these fruits to heat, flies, cockroaches, rodents, dust, pathogens, dirt, and other environmental pollutants (DuFour, 1995; Alegbeleye et al., 2018).

Moreover, these fruits are vended by uninformed retailers or local hawkers who have petite or no familiarity with food hygiene, nutrition, and pathogens (García, Heredia, 2017).

Usually, non-pathogenic microflora is the common flora found in fruits, the epidermal layer resists the penetration of microorganisms (Eisenstein, 2020). These protection by the epidermal layer is removed by cutting and slicing, hence microbes could easily invade the internal tissues (Ramaswamy, 2015), consequently, snowballing the risk of food intoxication caused by pathogens such as fungi, parasites, viruses, and bacteria in consumers (Hailu et al., 2014).

To eradicate this delinquent, numerous valuations have been carried out to study the microbial contaminants of some of these vended fruits. Nonetheless, it is essential to further appraise and reconnoiter the microbial qualities of some of these vended fruits in order to fashion consciousness of the peril accompanying their consumption. To a great extent, this will assist to lower the outbreak of diseases, severe health crises, and death.

2. Materials and methods

Study area

The study area is in Bauchi State, Nigeria. The city is located between latitudes (9° 3'and 12° 3'N and longitudes 8° 50' and 11° E) which has covered the total area of 49,119 km² (18,965 square meter) representing about 5.3 % of Nigeria's total land mass.

Sample Collection

A total of 15 samples consisting 5 each of pineapple, Pawpaw (Carica papaya) and Watermelon were randomly bought from different selling outlets in Wuntin Dada market Bauchi with sterile gloves. Each sample was kept in a sterile low density polythene bag and labelled. All samples were transported to the laboratory in special boxes for analysis within 1-2 hours of collection.

Determination of Temperature and pH

The temperature of the samples was determined using a liquid-in-glass thermometer. 10 ml of the sample was dispensed into a beaker. The pH was determined with the standardized pH meter.

Bacteriological Analysis of the Samples

The total bacterial count was determined for each of the fifteen (15) sliced samples of watermelon, pineapple and pawpaw that were collected randomly from five (5) different vendors within Wuntin Dada Markets using microscopic examinations and standard biochemical tests.

Preparation of Media:

The media were in commercial dehydrated forms and were prepared according to the manufacturer's instructions.

Isolation and Enumeration of Bacteria from Samples:

A sterile knife was aseptically used to cut a portion from each of the watermelon, pineapple and pawpaw samples, after which 100 grams of each sample was weighed using a weighing, balance and was transferred into a blender. 110 ml of sterile distilled water was added and aseptically blended at the speed of 15,000 to 20,000/rpm for 3 minutes. The homogenates were further mixed by shaking and 1.0 ml was pipetted into a test tube containing 9.0 ml of distilled water and was diluted serially to obtain the desired appropriate dilutions (10^1 to 10^5). Then, 1.0 ml of each dilution of the homogenates was pipetted and introduced into each of the correspondingly labelled petri dishes in duplicates.

5 ml of nutrient agar was poured into each petri dish within 15 minutes of the time of original dilution. The sample dilution and the nutrient agar medium was mixed thoroughly by swirling and allowed to solidify.

The inoculated plates were invertedly incubated at 37±0.5°C for 24-48 hours after which all plates with 30-300 colonies were counted, recorded and expressed as colony forming units per mile (cfu/ml) of the sliced watermelon, pineapple and pawpaw samples analyzed. Discrete colonies were streaked onto fresh agar to obtain pure cultures of the different isolates. Isolates were maintained on nutrient agar slants and stored at 4°C for further tests. These procedures were repeated on five different occasions for each of the samples and the average values recorded.

Identification of Isolates

Following repeated sub-culturing, pure cultures of the different isolates were obtained, characterized and identified using biochemical tests.

Gram staining

A smear was prepared on a clean, grease-free glass microscope slide and allowed to air dry. The slide was then flooded with crystal violet for one minute, rinsed with distilled water. Lugol's iodine was then poured on it and also left for 30 seconds after which the slide was rinsed with distilled water. Acetone was used to decolorize and was washed immediately and counterstained with safranin 0 for 30 seconds. The stain was washed off with distilled water and allowed to air dry. The stained smear was examined under oil immersion objective 100 X.

Catalase test

Two drops of 3 % hydrogen peroxide were placed on a clean, grease-free microscope glass slide after which a loopful of the organism colony was added. A positive test was indicated by evolution of bubbles while in a negative test no bubbling and frothing was seen.

Coagulase test

A smear of the culture colony was mixed with human plasma with a sterile wire loop. The slide was held up and rocked back and forth for one minute. Clumping of cells were apparent in the bacterial suspension mixed with plasma for coagulase positive.

Indole test

The organism was grown in 5 ml of peptone water after 24 hours of incubation, Kovacs iodine reagent was added and shaken gently. A positive reaction was indicated by the development a red colour in the reagent layer above the broth within one minute, while the yellow colour was retained for negative reaction.

Urease test

Urease medium was inoculated with test bacteria colony and incubated at 37°C for 24 hours. The development of a bright pink or red colour indicated a positive reaction.

Motility test

The stabbing technique was used with test tubes containing sterile semi-solid nutrient agar. A sterile needle was used to pick up each isolate colony from their pure cultures. Each test tube was stabbed to a depth 1-2 cm short of the bottom of the tubes with the needle that had been rubbed with each isolate. The line of inoculation was not sharply defined and the rest of the medium was somewhat cloudy for motile organisms, while growth was restricted to the line of inoculation and it became sharply defined for the non-motile organisms.

3. Results

Table 1. Frequency of Occurrence of Bacterial Isolates from the Sliced Pineapple watermelon and Pawpaw Samples

Bacterial Isolated	Frequency of Occurrence	% of Occurrence
E. coli	9	26.5
Pseudomonas spp	12	35.2
Staphylococcus spp	5	14.7
Bacilluspp	8	23.5
Total	34	100 %

Table 2. Biochemical and Morphological Characterization of Recovered Bacterial Isolate

Gram reaction	Indole	CGL	CAT	MOT	URS	Isolate
-ve rods in pairs	+	+	+	+	-	*E. coli*
-ve rods in chain	-	-	+	+	-	*Pseudomonas spp.*
+ve long rods	+	-	+	+	-	*Bacillus spp.*
-ve cocci in cluster	+	+	+	-	-	*Staphylococcus spp.*

Key: CGL = Coagulase; CAT = Catalase; URS =Urease; MOT = Motility; Test; +ve = Positive; -ve = Negative.

4. Discussion

The relatively high bacterial count detected in this study might be attributed to environmental factors such which includes exposure of fruits (sliced pineapple pawpaw or watermelon) to air, dust, type of water used in processing, and personal hygiene of the handlers, similar reasons were identified by García and Heredia (2017) and Castro-Ibáñez et al. (2018). The presence of these organisms can be linked to a number of factors; such as improper handling and processing, use of contaminated water during washing, cross-contamination from the fruits and vegetables or the use of dirty processing utensils like knives and trays, other studies agree completely with these findings of Alegbeleye et al, (2018) and those of Eisenstein (2020). The frequency of isolation of *Staphylococcus* spp. may be explained by the fact that human beings, i.e. processors or vendors, carry these organisms on/in several parts of their bodies and also in the nasal passages and on the skin surfaces as also swotted by Igiehon (2020). This organism can be introduced into the fresh sliced Pineapple, Pawpaw and Watermelon during handling, processing or vending and may lead to staphylococcal food poisoning, gastroenteritis.

The high level of *Escherichia coli* indicated a feacal contamination and water pollution respectively which implicated the processing and rinsing water as possible sources of contamination. This might cause bloody diarrhea and gastroenteritis in individuals who consumes such contaminated pineapple.

The low level of isolation of *Staphylococcus spp* is surprising. Generally, *Staphylococcus* spp. is salt-loving bacteria as expressed by Wang et al. (2014).

The presence of *Bacillus* spp. agrees with the report of Satterthwaite et al. (2010) that Bacillus spp. is the major spoilage organism in juices and causes emetic syndromes (which is characterized by acute-onset nausea and vomiting), and diarrheal syndromes.

5. Conclusion

It obvious that sliced Pineapple, Pawpaw and Watermelon are one of the most popular fruits that people rush to purchase not only for its low price but for it nutritional benefits. Microorganism encountered in this study were as a result of contamination from one source or the other which include; air, improper handling, unclean water and utensils used in the processing and personal hygiene.

The bacteria isolated are of public health importance which may cause diseases such as gastroenteritis, bacteremia.

The above findings therefore demonstrated the need for adequate evaluation of the physiochemical (including pH) characteristics of the Pineapple Pawpaw and Watermelon being sold to the populace in order to ensure safety and healthy eating.

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A Review: Some Plants Used for Hemorrhoids in Turkey Traditional Medicine

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Abstract

The origin of the word hemorrhoid comes from Latin. It is formed by combining the words hem (blood) and roos (flow). Hippocrates is probably the first to use the name of hemorrhoids. Famous doctor revealed that hemorrhoidal bleeding comes from anal veins. The history of hemorrhoid disease draws a simultaneous appearance with the history of humanity. Anal pathologies have found a wide place in papyri written between 1700-1500 BC. Topical treatment is recommended for all anal diseases without specifying the type in the so-called Edwin Smith papyri. In these papiruses it has been reported that the slurry prepared by boiling ground acacia leaves in these papyrus is placed in the anus and a linen pad is placed on the patient, and the patient will recover quickly. When the studies on ethnobotany in Turkey are examined, it will be seen that the people use some plants to treat hemorrhoids with traditional methods. This paper consists of 231 plant taxa which are used for treatment hemorrhoids in the Turkey ethnobotany or traditional medicine. It is expected that this study will contribute to other studies on the subject.

Keywords: Ethnobotany, hemorrhoids, plant, traditional medicine, Turkey.

1. Introduction

Hemorrhoids, which manifests itself with symptoms such as itching, bleeding and discomfort in the anal region, is a health problem that also affects the quality of life. Hemorrhoids is a disease known as "Mayasıl" or "Basur" among the people. It is a problem that occurs with the enlargement and growth of the veins in the makat region. Bundling of the veins in the anus area can also identify hemorrhoids. In advanced stages of hemorrhoids, the enlarged veins may emerge from the anus by forming varicose veins. Hemorrhoids is a problem seen in at least half of the population. Until the 18th century, there were not enough publications on hemorrhoids in the literature. Since the 18th century, an intensification has been observed in the publications on hemorrhoids. We see that 19th century surgeons have different approaches in the treatment of hemorrhoids (Ellesmore, Windsor, 2001; Parks, 1955). Ligation, which is the most frequently used method in the treatment of hemorrhoids, was first reported by Joseph Mathews at the end of the 19th century (Mathews, 1899). We also see some non-surgical applications in the 19th century. In the following years, Lord, who found the anal canal resting pressure to be high in people with hemorrhoids, explained her belief that this pressure was the main cause of hemorrhoids disease (Lord, 1969). Another method brought to the agenda for the treatment of hemorrhoids in the second half of the 20th century is cryotherapy (Lewis, 1972). Coagulation with infrared rays, which is another non-surgical treatment used in the treatment of hemorrhoid disease, was first described by Neiger in 1979 (Neiger, 1979).

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The first publication on laser therapy in hemorrhoid disease was made by Sankar and Joffe in 1987 (Sankar, Joffe, 1987). Another method that has been used in the treatment of hemorrhoid disease in recent years is hemorrhoid artery ligation. There is not enough literature yet for the results of hemorrhoidal artery ligation, which was first applied by Morinaga et al. in 1995 (Morinaga et al., 1995). According to studies, more than 3/4 of people complain of hemorrhoids at some point in their life, about half of 50 years old require treatment for this reason. The prevalence of hemorrhoid disease in the population is between 4-36 %, and it is more common in men (Janicke, Pundt, 1996).

In this review study, it is aimed to contribute to the literature on the subject by presenting some plants used in the treatment of hemorrhoids with traditional methods by the local people in Turkey. This paper considers not only the value of an integrative traditional approach to treatments for hemorrhoids, but also understanding phytotherapeutic mechanisms, traditional application methods and hemorrhoids inducing properties of plant taxa.

2. Materials and methods

This research was carried out by thorough searching of different ethnobotany research articles of Turkey. As a result of this study, 231 taxa were determined from the literature survey and showed in Table 1.

3. Results

Table 1 was arranged by specifying the family of the plant, the local name, the part of the plant used and the way of use, based on the region where the plants are used.

Table 1. Some plants used for hemorrhoids in Turkey ethnobotany

Family	Taxa	Local Name	Used Part	Usage
Amaranthaceae	*Amaranthus retroflexus*	Selmik, Hoşguran, Alimo	Leaf, brach, Aboveground	Infusion (Kilic, Bagci, 2013; Polat et al., 2015)
Anacardiaceae	*Rhus coriaria*	Sumak, Sımak, Tetir, Tetre, Mavru, Debbağ sumağı, Derici sumağı	Fruit, Stem, Leaf	Decoction (Cakilcioglu et al., 2011; Kaval, 2011; Olgun, 2019)
Anacardiaceae	*Cotinus coggyria*	Tetre, Tetra, Tetere, Tetra otu	Leaf	Infusion or Decoction (Tuzlacı et al., 2010; Kilic, Bagci, 2013; Kültür, 2007; Ecevit, Özhatay, 2006)
Anacardiaceae	*Pistacia terebinthus* subsp. *terebinthus*	Kokorağaç, Menengiç ağacı	Leaf	Decoction (Kültür, 2007)
Apiaceae	*Eryngium campestre*	Şeker dikeni	Root, branch	Fresh roots are eaten (Sarper et al., 2009; Sarper et al., 2009), Decoction (Bulut et al., 2014)
Apiaceae	*Eryngium billardieri*	Boğa dikeni, Hıyarok, Kerbes, Boğa dikeni, Esek dikeni, Tusi, Turi	Root	Decoction (Özgen et al., 2012; Bulut et al., 2014; Kaval, 2011)

Apiaceae	*Caucalis platycarpus*	Kara pıtrak	Aboveground	Decoction (Kargıoğlu et al., 2010; Bulut et al., 2014)
Apiaceae	*Ferula orientalis*	Heliz-Kevk, Çağsır, Kırkor, Helizan, Kasni, Çaksır	Root	Decoction (Kilic, Bagci, 2013; Sezik et al., 2001)
Apiaceae	*Opopanax hispidus*	Unspecified	Leaf	Grind and eaten (Bulut et al., 2014)
Apiaceae	*Malabaila secacul*	Unspecified	Leaf	Grind and eaten (Bulut et al., 2014)
Apiaceae	*Daucus carota*	Kokar ot, Mayasıl otu	Aboveground	Infusion (Bulut, Tuzlacı, 2015; Bulut et al., 2014)
Apiaceae	*Heracleum sphondylium* subsp. *ternatum*	Devesil	Root	Unspecified (Özhatay et al., 2006)
Apiaceae	*Heracleum platytaenium*	Ayıkulağı, Ayıgöbeği, Tavşan otu, Su pıtırağı	Leaf	Infusion (Sargin et al., 2015)
Apiaceae	*Prangos uechtritzii*	Unspecified	Aboveground	It is boiled in vinegar and rubbed into the area (Bulut et al., 2014)
Apiaceae	*Petroselinum crispum*	Maydanoz	Leaf, Root, Aboveground	Decoction (Çakılcıoğlu,Türkoğlu, 2013; Bulut et al., 2014)
Apiaceae	*Anethum graveolens*	Dere otu	Abovegroun, Root	Decoction (Güneş, Özhatay,2011; Bulut et al., 2014)
Apocynaceae	*Nerium oleander*	Zakkum	Flower	It is applied to the area with butter (Güzel et al., 2015)
Araceae	*Arum* sp.	Yılan bıçağı, Tirşik pancarı, Yılan purçalağı	Fruit	Swallow 3 times a day with water (Akaydın et al., 2013)
Araceae	*Arum balansanum*	Kabarcık, Gabarcık, Kabarcık otu	Fruit	Puree is eaten (Sargın, 2015)
Araceae	*Arum dioscoridis*	Kabarcık	Fruit	Puree is eaten (Sargın, 2015) Infusion (Güzel et al., 2015)
Araceae	*Dracunculus vulgaris*	Yılan bıçağı, Yılan kamçısı, Yılan kılıcı, Yılan burçağı,	Tuber, Fruit, Aboveground, Seed	Decoction (Tuzlacı, et al., 2001; Bulut, Tuzlacı, 2015; Sargin et al., 2015; Akyol, Altan, 2013) It is kneaded with honey (Ugurlu, Secmen, 2008), Eaten (Polat, Satıl, 2012)
		Yılan yastığı, Yılancık, Yılan	Flower, Tuber, Fruit	Decoction. It is cut into slices and

Araceae	*Arum italicum*	kılıcı, Tırşik, Yılan soğanı, Yılan zehiri		applied to the area (Ecevit, Özhatay, 2006) Hungry swallowed (Kızılarslan, Özhatay, 2012) Unspecified (Özhatay et al., 2006)
Araceae	*Arum maculatum*	Yılan otu, Yılan yastığı, Yılan burçağı	Leaf, Tuber, Fruit	Infusion (Tetik et al., 2013) Decoction (Kültür, 2007) Swallowed (Tuzlacı, 2004) Unspecified (Özhatay et al., 2006)
Araceae	*Arum detruncatum* subsp. *detruncatum*	Yılan ekmeği, Yılan yastığı	Bulb	Eaten (Özdemir, Alpınar, 2015)
Araceae	*Arum elongatum* subsp. *detruncatum*	Gabarcık	Fruit, Tuber, oil	Eaten (Bağcı et al., 2016) Decoction+ honey (Tuzlacı et al., 2001)
Araceae	*Arum elongatum* subsp. *elongatum*	Basur otu	Root, Tuber	It is consumed in the form of capsules by grinding (Arı et al., 2015)
Araceae	*Arum rupicola*	Kabarcık, Kabarcık otu, Gabarcık otu,	Fruit	Puree is eaten (Sargın, 2015)
Asparagaceae	*Hyacinthus orientalis* subps. *chionophilus*	Unspecified	Leaf	Unspecified (Demirci et al., 2017)
Aspleniaceae	*Asplenium adiantum-nigrum*	Mayasıl otu	Leaf	Infusion (Bulut, Tuzlacı, 2015)
Asteraceae	*Achillea wilhelmsii*	Civanperçemi	Aboveground Flower, Leaf	Infusion or Decoction (Altundag, Ozturk, 2011), (Cakilcioglu et al., 2011; Tetik et al., 2013; Bağcı et al., 2016; Ertuğ, 2002)
Asteraceae	*Achillea aleppica* var. *zederbaueri*	Yılan çiçeği	Flower, Leaf	It is grind and placed on the area (Özdemir, Alpınar, 2015)
Asteraceae	*Cirsium arvense*	Çakırdikeni	Root, Leaf	Fresh, Decoction (Altundag, Ozturk, 2011)
Asteraceae	*Onopordum acanthium*	Kenger, Kinger heron	Seed	Decoction (Polat et al., 2011)
Asteraceae	*Onopordum bracteatum*	Kangal	Root	Infusion (Altundag, Ozturk, 2011)
Asteraceae	*Scolymus hispanicus*	Suluca diken Şevketibostan	Root Seed	Eaten (Kargıoğlu et al., 2010) Decoction (Ugulu et

				al., 2009)
Asteraceae	*Picris strigosa*	Senameki	Root	In porridge (Altundag, Ozturk, 2011)
Asteraceae	*Anthemis coelopoda* var. *bourgaei*	Papatya, Akçabaş, Yavşan, Akbabatça, Kelemli, Akbaşotu	Flower	Decoction (Olgun, 2019)
Asteraceae	*Achillea biebersteinii*	Sarı Flower, Waşzerık, Vılıka çeker, Wılazerd, Pazıma	Flower	Infusion (Tetik et al., 2013) It is grind and mixed with honey and eaten. (Özgen et al., 2012)
Asteraceae	*Crepis vesicaria*	Papatya	Capitulum	Unspecified (Özhatay et al., 2006)
Asteraceae	*Achillea millefolium*	Herezan, Civanperçemi Ayvadana, Dişotu	Leaf, Flower, Aboveground	Decoction (Çakılcıoğlu, Türkoğlu, 2013; (Kültür, 2007) Infusion (Çakılcıoğlu, 2010; Akbulut, Bayramoglu, 2013) Unspecified (Özhatay et al., 2006)
Asteraceae	*Achillea schischkinii*	Civanperçemi	Flower, Leaf	Decoction or Infusion (Tetik et al., 2013) (Toksoy et al., 2010)
Asteraceae	*Carduus nutans* subsp. *leiophyllus*	Çakır dikeni, Deve dikeni, Eşekdikeni, Eşek gengeri	Aboveground	Unspecified (Özhatay et al., 2006) Decoction (Kültür, 2007)
Asteraceae	*Achillea crithmifolia*	Civanperçemi, Mayasıl otu	Aboveground	Infusion (Tuzlacı et al., 2010)
Asteraceae	*Achillea nigrescens*	Civanperçemi	Aboveground	Decoction (Polat et al., 2015)
Asteraceae	*Achillea setacea*	Ayvadani, Mayasılotu	Flower	Unspecified (Özhatay et al., 2006)
Asteraceae	*Bellis perennis*	Koyungözü, Papatya, Çuçake mest	Flower, capitulum	Decoction, Infusion (Tetik et al., 2013). Capitulums are placed in water to sit in (Gelse, 2012)
Asteraceae	*Cichorium intybus*	Hindiba, Sakızotu, Mavihindiba, Karakavuk, Acı marul, Çitlek otu, Sakızlık otu.	Aboveground, Latex Flower	Infusion (Tetik et al., 2013) Unspecified (Koçyiğit, Özhatay, 2006) Decoction (Kızılarslan, Özhatay, 2012; Özgen et al., 2012; Kaval, 2011) Infusion with cucumber peel (Tetik, 2011)
Asteraceae	*Helianthus*	Yerelması, Sevka ağı, Sevik,	Tuber	Eaten (Sezik et al., 2001)

	tuberosus	Seva bine herde, Say binerd		Decoction (Kaval, 2011; Olgun, 2019)
Asteraceae	*Gundelia tournefortii* var. *tournefortii*	Kenger	Fruit, Seed	Roasted and eaten (Arı et al., 2015) Eaten (Şahin, Yiğit, 2014)
Asteraceae	*Tripleurospermum oreades*	Papatya, Oşoş	Aboveground	Decoction (Özgen et al., 2012)
Asteraceae	*Carduus acanthoides* subsp. *acanthoides*	Küçük kenger	Aboveground	Unspecified (Özhatay et al., 2006)
Asteraceae	*Lactuca serriola*	Hindiba, kaju	Aboveground	Infusion (Tetik et al., 2013)
Asteraceae	*Inula anatolica*	Basur otu	Flower	Decoction (Arı et al., 2015)
Asteraceae	*Anthemis austriaca*	Papatya, Akçabas, Yavsan, Akbabatça,	Flower	Decoction (Kaval, 2011)
Asteraceae	*Artemisia absinthium*	Mayasılotu, Acı yavşan, Pelin otu, Doğu horasani	Leaf + Flower, Aboveground	Decoction, applied to the area (Özüdoğru et al., 2011) Infusion + honey (Gül, 2014)
Asteraceae	*Artemisia austriaca*	Yavşan	Aboveground	Decoction (Özgen et al., 2012)
Asteraceae	*Cnicus benedictus*	Şevketi bostan, Akdiken, Mayasıl otu	Aboveground	Infusion (Polat, Satıl, 2012)
Asteraceae	*Matricaria chamomilla* var. *recutita*	Papatya	Capitulum	Infusion (Tuzlacı et al., 2010)
Asteraceae	*Achillea nobilis* L. subsp. *neilreichii*	Mayasıl otu	Capitulum	Infusion (Bulut, Tuzlacı, 2015)
Asteraceae	*Anthemis altissima*	Papatya	Flower	Infusion (Akbulut, Bayramoglu, 2013)
Asteraceae	*Achillea nobilis* subsp. *sipylea*	Kabe fesleğeni, Mayasıl otu	Aboveground	Infusion (Bulut, Tuzlacı, 2015)
Asteraceae	*Anthemis nobilis*	Papatya	Flower	Infusion (Akbulut, Bayramoglu, 2013)
Asteraceae	*Crepis zacintha*	Mayasılotu	Aboveground	Decoction (Kültür, 2007)
Berberidaceae	*Berberis integerrima*	Kızambuk, Kızambık	Shoot	Decoction (Özgen et al., 2012)
Berberidaceae	*Leontice leontopetalum* subsp. *leontopetalum*	Patlangaç	Tuber	Unspecified (Uysal et al., 2010)
Berberidaceae	*Berberis crataegina*	Zirinç, Karamuk, Kadıntuzluğu	Root	Decoction (Altundag, Ozturk, 2011; Şahin, Yiğit, 2014)

				Infusion (Yeşil, Akalın, 2009)
Berberidaceae	*Berberis vulgaris*	Sarı çalı, Karamuk	Fruit	Eaten as raw (Cakilcioglu et al., 2011; Tetik et al., 2013) (Kilic, Bagci, 2013)
Betulaceae	*Alnus glutinosa*	Kızılıağaç	Seed, branch, Flower	Decoction (Polat et al., 2015; Ecevit et al., 2006) Unspecified (Özhatay et al., 2006)
Boraginaceae	*Onosma sericeum*	Havacıva	Root	Decoction, Pomad (Tetik et al., 2013)
Boraginaceae	*Onosma armeniacum*	Havacıva	Root	In the form of a suppository or decoction (Özgen et al., 2012)
Boraginaceae	*Alkanna tinctoria* subsp. *glandulosa*	Havacıva otu	Root	Decoction (Arı et al., 2015)
Brassicaceae	*Capsella bursa-pastoris*	Çoban çantası, Pıronek, Puronek, Iciril gasfur	Aboveground, Leaf	Infusion, in porridge (Tetik et al., 2013) (Ugulu, 2011; Polat et al., 2013; Ugulu et al., 2009), Unspecified (Güzel et al., 2015)
Brassicaceae	*Lepidium latifolium*	Nojdar, Zarende	Leaf	Unspecified (Uce, Tunçtürk, 2014)
Cactaceae	*Opuntia ficus-indica*	Eşek inciri, Dikenli incir, Frenk yemişi	Leaf	It is heated and placed on the area (Akaydın et al., 2013)
Capparaceae	*Capparis spinosa*	Keber, Kapari, Kedi tırnağı, Gebere	Fruit, bud	Decoction (Altundag, Ozturk, 2011) (Sargın, 2015) Eaten (Şahin, Yiğit, 2014)
Capparaceae	*Capparis ovata*	Kapari, Kebere, Devedikeni, Gebre otu, Keditırnağı, Gebre otu, Kapari	Fruit	Eaten (Gelse, 2012)
Capparaceae	*Capparis orientalis*	Kapari, Kedi tırnağı, Gebere	Bud, Fruit	Infusion (Sargın, 2015)
Caprifoliaceae	*Sambucus ebulus*	Bezirgan, sultan otu, Bıyırgan, Ademotu, Piran, Mülver, Mürver	Fruit Aboveground	Decoction (Tuzlacı et al., 2001; Kültür, 2007) Unspecified (Koçyiğit, Özhatay, 2006; Özhatay et al., 2006) It is kept in olive oil and applied to the area (Kızılarslan, Özhatay,

				2012) Eaten (Sağıroğlu et al., 2012)
Caprifoliaceae	*Sambucus nigra*	Mürver, Mürver çiçeği, Mürver ağacı, Mülver, Köpek üzümü	Seed, Fruit	Infusion (Kültür, 2007) Decoction (Sargin et al., 2015) Applied by grinding (Güler et al., 2015)
Caprifoliaceae	*Viburnum lantana*	Germeşe		Eaten or Decoction (Özgen et al., 2012)
Caryophyllaceae	*Telephium impertai*	Mayasılotu	Aboveground, Leaf	Decoction (Altundag, Ozturk, 2011) (Tetik et al., 2013)
Caryophyllaceae	*Dianthus zonatus* var. *aristatus*	Basur otu	Flower	Decoction (Arı et al., 2015)
Chenopodiaceae	*Beta corolliflora*	Kızılca, Şeker pancarı	Root	Decoction (Altundag, Ozturk., 2011)
Chenopodiaceae	*Chenopodium album* subsp. *album* var. *album*	Sılmık	Aboveground	Decoction (Doğan, 2014)
Combretaceae	*Terminalia chebula*	Kara Halile	Fruit	Unspecified (Altay et al., 2015)
Combretaceae	*Terminalia citrina*	Kara Halile	Fruit	Unspecified (Altay et al., 2015)
Compositae	*Anthemis tinctoria* var. *tinctoria*	Sarı papatya	Aboveground, Flower	Decoction (Kültür, 2007) Unspecified (Özhatay et al., 2006) Infusion (Akbulut, Bayramoglu, 2013)
Crassulaceae	*Sedum album*	Damkoruğu	Aboveground	Crushed, pomade (Ugulu, 2011; Ugulu et al., 2009)
Cruciferae	*Cardamine raphanifolia* Pourr.	Mayasıl otu, Kuş lahanası	Aboveground	Eaten (Sağıroğlu et al., 2012)
Cucurbitaceae	*Ecballium elaterium*	Acı kavun, Acı dülek, Cırtatan Şeytan keli, Şeytan keleği, Delihışır Otu, Şeytan kavunu, Acı kelek	Fruit, Root, fruit juice	It is applied by crushing (Kültür, 2007), Rubbed with olive oil (Polat, Satıl, 2012), Drinking (Tuzlacı, Eryaşar-Aymaz, 2001), Unspecified (Kalankan et al., 2015; Güzel et al., 2015), Eaten (Sezik et al., 2001)
Cucurbitaceae	*Momordica charantia*	Kudret narı	Fruit, Leaf	It is infused with olive oil for a few days. Eat hungry in the morning (Akaydın et al., 2013; Sargın, 2015)
Cupressaceae	*Juniperus*	Ardıç, Andız, Çitandız, Katran	Fruit	Decoction (Altundag, Ozturk, 2011)

	excelsa	ağacı		Unspecified (Altındağ-Çakır, 2017)
Cupressaceae	*Juniperus oxycedrus* subsp. *oxycedrus*	Ardıç, Diken ardıcı,Andıç,Ardıçkatranı, Ardıç üzümü, Çıtımık, Gıli gıli, Katran ardıcı	Seed, Fruit, Leaf	Decoction (Sezik et al., 2001) Eaten (Ugurlu, Secmen, 2008) Unspecified (Altındağ-Çakır, 2017; Özhatay et al., 2006) Pomad (Polat, Satıl, 2012)
Cupressaceae	*Juniperus drupacea*	Andız, Ardıç, Ardıçgiliği, Ayıgiliği, Dikenli andız, Pıt andız	Bud, cone	Unspecified (Altındağ, Çakır, 2017) Decoction (Demirci, Özhatay, 2012)
Cupressaceae	*Juniperus communis* subsp. *alpina*	Çeçem gagası	Fruit	Eaten (Özgen et al., 2012)
Cupressaceae	*Cupressus sempervirens*	Ardıç, Katran ardıcı	Cone	Decoction (Polat, Satıl, 2012)
Dioscoreaceae	*Tamus communis* L. subsp. *cretica*	Tilki üzümü, Yandıran	Root	Eaten in small pieces (Tuzlacı et al., 2001)
Equisetaceae	*Equisetum arvense*	Ulama otu	Aboveground	Decoction (Özüdoğru et al., 2011)
Equisetaceae	*Equisetum telmateia*	At kuyruğu, suotu, eklemotu, kırkkilit, minare otu, tilki kuyruğu	Aboveground	Unspecified (Özhatay et al., 2006)
Ericaceae	*Arbutus unedo*	Davulga, yemişen	Leaf	Decoction (Tuzlacı et al., 2001)
Euphorbiaceae	*Euphorbia macroclada* Boiss.	Sütleyen	Latex	Spread (Çakılcıoğlu, Türkoğlu, 2013)
Euphorbiaceae	*Euphorbia cheiradenia*	Sütleğen, Sütlüce, Sülük otu, Silan, Sütümüshil	Latex	Eaten (Gelse, 2012)
Euphorbiaceae	*Ricinus communis*	Hint yağı bitkisi	Seed oil	Unspecified (Süzgeç et al., 2012)
Fabaceae	*Lotus corniculatus*	Gazalboynuzu	Aboveground	Decoction (Altundag, Ozturk, 2011)
Fabaceae	*Trifolium ambiguum*	Alma otu	Aboveground	Decoction (Altundag, Ozturk, 2011)
Fabaceae	*Acacia karroo*	Akasya, Akasya ağacı	Branch, bud	The buds are sucked, the branches are put in the area as ash (Sargın, 2015)
Fabaceae	*Glycyrrhiza glabra* var. *glandulifera*	Payam, Mekik Rootü, Meyan, Piyan	Root	Decoction (Sezik et al., 2001; Kaval, 2011)
Fabaceae	*Glycyrrhiza echinata*	Acı meyan	Root	Decoction (Güzel et al., 2015)

Fagaceae	*Quercus cerris* var. *cerris*	Meşe, Kızılmeşe	Branch, Leaf, Fruit	Decoction (Arı et al., 2015) Infusion (Tetik et al., 2013)
Fagaceae	*Quercus* sp.	Mese palamudu, Pelit, mese kozası,	Leaf	Eaten with honey Decoction (Akgül et al., 2016)
Fagaceae	*Castanea sativa*	Kestane	Fruit, Cortex	Infusion (Güler et al., 2015)
Fagaceae	*Quercus petraea*	Balu, Bali, Mazer, Welg, Meşe	Fruit	Infusion (Polat et al., 2013) Eaten (Doğan, 2014)
Fagaceae	*Quercus libani*	Balu, Bali, Azgiller, Welg, Meşe	Fruit Leaf, cortex	Heated (Polat et al., 2013) Decoction (Sezik et al., 2001) (Olgun, 2019) Eaten (Doğan, 2014)
Fagaceae	*Quercus Infectoria* subsp. *boissieri*	Dara mazıyr	Acorn	Grind and eaten with yoghurt (Olgun, 2019)
Fagaceae	*Quercus pubescens*	Bozmeşe	Leaf, Cortex	Decoction (Sezik et al., 2001)
Fumariaceae	*Fumaria asepala*	Şahtere	Fruit, Leaf	Decoction (Cakilcioglu et al., 2011)
Fumariaceae	*Fumaria officinalis*	Şahtere	Aboveground	Decoction (Güneş, Özhatay, 2011)
Gentianaceae	*Centaurium erythraea* subsp. *erythraea*	Kırmızı kantaron, Afyonotu	Flower, Aboveground	Infusion (Tuzlacı, Eryaşar-Aymaz, 2001) Eaten (Kızılarslan, Özhatay, 2012)
Geranıaceae	*Erodium cicutarium* subsp. *cicutarium*	Potot	Aboveground	Decoction (Özgen et al., 2012)
Hamamelidaceae	*Hamamelis virginiana*	Adi Cadı Fındığı	Leaf	Unspecified (Süzgeç et al., 2012)
Hypericaceae	*Hypericum montbretii*	Çay otu	Aboveground	Decoction (Altundag, Ozturk, 2011)
Hypericaceae	*Hypericum lydium*	Mayasılotu	Aboveground	Decoction (Sezik et al., 2001)
Hypericaceae	*Hypericum orientale*	Kırmızı kantaron, Mayasılotu	Aboveground	Infusion (Özdemir, Alpınar, 2015)
Hypericaceae	*Hypericum perforatum*	Binbirdelikotu, Kantaron, Sarı kantaron, Yakı otu, Dişice, Koramanotu,	Aboveground , Seed, Flower	Decoction (Tuzlacı et al., 2001; Sezik et al., 2001), Infusion (Kilic, Bagci, 2013) Unspecified (Koçyiğit, Özhatay, 2006; Özhatay et al., 2006)
Hypericaceae	*Hypericum scabrum*	Sancı otu, Mayasıl otu, Sarı kantaron Koyunkıran, Yara otu, Mide	Flower, Leaf, Aboveground, Fruit	Decoction (Sezik et al., 2001) Infusion (Tuzlacı, Şenkardeş, 2011; Yeşil, Akalın, 2009;

		otu		Özdemir, Alpınar, 2015) Pomad (Tetik et al., 2013)
Hypericaceae	*Hypericum capitatum* var. *capitatum*	Kılıç otu	Flower	Unspecified (Aslan, 2019)
Juglandaceae	*Juglans regia*	Ceviz, Goz, Guaz, Koz, Güz, Kuz, Yondak, Guz, Ceviz ağacı	Leaf, Fruit, branch	Decoction (Tetik et al., 2013), Eaten fresh (Çakılcıoğlu, Türkoğlu, 2013; Kültür, 2007; Güler et al., 2015), Evaporation (Bulut, Tuzlacı, 2015), Infusion (Polat et al., 2013), Fruits swalloved (Tetik, 2011)
Lamiaceae	*Salvia cryptantha*	Ada çayı, Ballık otu, Kokulu ot, Sarı şabla	Aboveground	Infusion (Tuzlacı, Şenkardeş, 2011)
Labiatae	*Ajuga orientalis*	Mayasıl otu	Aboveground	Dried and decoction (Güneş, Özhatay, 2011)
Lamiaceae	*Teucrium polium*	Mayasıl otu, Merven, Kısamahmut Otu, Parihavşan, Kekik, Keselmehmut.	Aboveground	Infusion, Applied directly or Decoction (Bulut, 2011; Tuzlacı et al., 2010; Kalankan et al., 2015; Yeşil, Akalın, 2009; Arı et al., 2015; Kaval, 2011)
Lamiaceae	*Ajuga chamaeptys*	Mayasıl otu Basurotu	Flower, Aboveground	Infusion (Kilic, Bagci, 2013) Decoction (Güzel et al., 2015)
Lamiaceae	*Thymus leucostomus* var.*leucostomus*	Kekik	Aboveground	Infusion (Sarper et al., 2009; Sarper et al., 2009)
Lamiaceae	*Salvia virgata*	Bares, Dağ çayı, Yılancık, Ellik otu, Ballıbaba, Katırtırnağı	Aboveground	Decoction (Kaval, 2011)
Lamiaceae	*Rosmarinus officinalis*	Biberiye	Unspecified	Unspecified (Ugulu, Baslar, 2010)
Lamiaceae	*Lamium album*	Ballıbaba	Leaf	Pomad (Ugulu et al., 2009)
Lamiaceae	*Thymbra spicata*	Zahter	Leaf	Decoction (Ugulu et al., 2009)
Lamiaceae	*Mentha longifolia*	Yarpuz, Püng, Punk, Dere nanesi,Tüylü nane, İt nanesi, Yabani nane, Pune	Aboveground	Infusion or Decoction (Güneş, Özhatay, 2011; (Özüdoğru et al., 2011; Yeşil, Akalın, 2009; Özgen et al., 2012) Eaten (Sezik et al., 2001; Gelse, 2012) Decoction (Akaydın et al., 2013)
Lamiaceae	*Teucrium parviflorum*	Dağ kekiği	Aboveground	Decoction (Altundag, Ozturk, 2011)

Lamiaceae	*Teucrium chamaedrys*	Basur otu, Mayasıl otu, Acı ot, Çayeqwe, Kısa mahmut	Aboveground, Leaf	Infusion (Özdemir, Alpınar, 2015), Grind and eaten with honey (Özgen et al., 2012). Decoction (Gelse, 2012) Infusion (Demirci, Özhatay, 2012). Decoction (Ecevit-Genç, Özhatay, 2006)
Lamiaceae	*Mentha spicata* subsp. *spicata*	Nane, Pune, Narpız, Pune, Punı	Leaf, Aboveground	Decoction (Cakilcioglu et al., 2011) (Tetik et al., 2013)
Lamiaceae	*Marrubium parviflorum*	Bozotu	Aboveground	Unspecified (Özüdoğru et al., 2011)
Lamiaceae	*Ocimum bacilicum*	Fesleğen, Reyhan	Leaf, Flower, Seed	Dried (Akgül et al., 2016)
Lamiaceae	*Origanum vulgare*	Kekik otu, Keklik otu, Anık, Onıx, Anıx, Kekik	Leaf,	Infusion (Tuzlacı, Eryaşar-Aymaz, 2001) Decoction (Çakılcıoğlu, Türkoğlu, 2013)
Lamiaceae	*Teucrium flavum*	Mayasıl otu, Egzaman otu	Aboveground	Decoction (Tuzlacı, Eryaşar-Aymaz, 2001) Infusion (Kalankan et al., 2015)
Lamiaceae	*Thymus longicaulis*	Taş kekiği	Aboveground	Decoction (Tuzlacı et al., 2001)
Lamiaceae	*Thymus fallax*	Kekik otu	Aboveground	Decoction (Özgen et al., 2012)
Lamiaceae	*Thymus haussknechtii*	Dağkekiği, Kekik	Leaf	Decoction (Çakılcıoğlu, Türkoğlu, 2013)
Lamiaceae	*Teucrium lamiifolium* subsp. *lamiifolium*	Mayasıl Otu	Aboveground	Infusion (Kalankan et al., 2015)
Lamiaceae	*Sideritis bilgeriana*	Boz şabla, Kekikçayı, Yaylaçayı	Aboveground	Infusion (Özdemir, Alpınar, 2015)
Lauraceae	*Laurus nobilis*	Defne	Leaf	Infusion (Ugulu et al., 2009) Decoction (Güzel et al., 2015)
Liliaceae	*Hyacinthus orientalis*	Sümbül	Leaf	Grind and aplication area (Altundag, Ozturk, 2011)
Liliaceae	*Allium sativum*	Sarımsak	Underground parts	Unspecified (Tuzlacı, Eryaşar-Aymaz, 2001), Cooked in ashes, porridge is made (Çakılcıoğlu, Türkoğlu, 2013). Pieces are rubs the area (Sezik et al., 2001)
Liliaceae	*Allium cepa*	Soğan	Tuber	Decoction (Çakılcıoğlu, Türkoğlu, 2013)

				Crushed by heating (Kültür, 2007)
Liliaceae	*Allium porrum*	Pırasa	Whole part	It is boiled with milk and applied to the area (Sezik et al., 2001; Koşar et al., 2005)
Liliaceae	*Asphodelus aestivus*	Hıdırellez kamçısı, Nünü, Çiriş otu	Tuber, Root	Decoction (Tuzlacı, Eryaşar-Aymaz, 2001; Bulut, Tuzlacı, 2015) Infusion (Ugulu et al., 2009)
Linaceae	*Linum usitatissimum*	Keten, Kirbas Seedu, Siyelek, Bezir, Bızıktan	Seed	Infusion (Ugulu et al., 2009) Unspecified (Şahin-Yiğit, 2014)
Loranthaceae	*Viscum album* L.	Ökse otu, Çöpleme	Leaf, Fruit, Whole part	Decoction (Altundag, Ozturk, 2011; Yeşil, Akalın, 2009)
Loranthaceae	*Arceuthobium oxycedri*	Parda burcu, Çakirga burcu, Ardiç burcu, Andiz güvelegi	Whole part	Unspecified (Kupeli et al., 2007)
Malvaceae	*Malva sylvestris*	Ebe gümeci, Xemazek, Gömeçotu	Flower, Leaf, Aboveground	Infusion or Decoction (Bulut, 2011) (Tuzlacı, Şenkardeş, 2011; Tuzlacı et al., 2010; Korkmaz et al., 2016)
Malvaceae	*Malva neglecta*	Ebegümeci, Ebem kömenci, Dolluk, toltolik, Doğnuk, Hiru, Xemazek, Veraruejık, Tollık, Ebemkömeci,	Branch, Leaf, Seed, Whole part, Root	Decoction or Infusion (Altay et al., 2015; Tetik et al., 2013; Sarper et al., 2009; Kilic, Bagci, 2013; Yesilada, 2008), Applied directly by crushing (Yeşil, Akalın, 2009) It is made into porridge with olive oil or eaten (Özgen et al., 2012)
Malvaceae	*Tilia argentea*	Gümüşi ıhlamur	Unspecified	Unspecified (Yesilada, 2008)
Malvaceae	*Hibiscus trionum*	Bamya	Seed	The seed is roasted and ground into powder, mixed with 2 tablespoons of honey and taken twice a day. (Akaydın et al., 2013)
Malvaceae	*Althaea hohenackeri*	Hero, Hiro, Gül hatmi, Fatma gülü	Root	Decoction (Kaval, 2011)
Malvaceae	*Alcea apterocarpa*	Hatmi (Hıra otu)	Flower	Boiled and applied to the area (Aslan, 2019)
Meliaceae	*Melia azedarach* L.	Tespih agacı	Fruit	Boiled and eaten with chickpeas (Güzel et al., 2015)

Moraceae	*Ficus carica* subsp. *carica*	İncir, İncir ağacı	Leaf Fruit	Infusion (Tuzlacı et al., 2010), Crushed and mixed with honey (Tuzlacı et al., 2001), eaten (Çakılcıoğlu, Türkoğlu, 2013) Decoction (Polat et al., 2015)
Moraceae	*Morus nigra*	Dut, Kara dut	Fruit, branch	Eaten hungry (Çakılcıoğlu, Türkoğlu, 2013) Peeled, sliced and eaten (Ecevit, Özhatay, 2006)
Oleaceae	*Fraxinus ornus* subsp. *ornus*	Dışbudak	Root bark	Decoction + sugar (Tuzlacı et al., 2010)
Orchidaceae	*Orchis* sp.	Salep	Tuber	Decoction (Ugulu et al., 2009)
Papaveraceae	*Papaver rhoeas*	Gelincik, Borcanka, Gelincikotu	Flower, Whole part	Decoction (Ecevit et al., 2006) Unspecified (Özhatay et al., 2006)
Papaveraceae	*Chelidonium majus*	Kırlangıç otu	Aboveground	Infusion (Arı et al., 2015)
Papaveraceae	*Glaucium leiocarpum*	Ala böğündürme	Aboveground	It is grind and applied to the area with honey (Sargın, 2015)
Pinaceae	*Pinus pinea*	Çam fıstığı, Fıstık çamı, Küner çamı	Seed, Root	Unspecified (Altındağ-Çakır, 2017)
Plantaginaceae	*Plantago major* subsp. *major*	Bağa yaprağı, Sinir otu, Babadeşen, Marşal otu, Kırkdamak otu, Siyil otu	Leaf Seed	Decoction (Altundag, Ozturk, 2011) (Cakilcioglu et al., 2011), Infusion (Polat et al., 2015). It is applied to the area by crushing (Akyol, Altan, 2013), ground and applied to the area with honey (Sezik et al., 2001), Eaten (Sağıroğlu et al., 2012)
Plantaginaceae	*Plantago media*	Sinirotu, Sinirli ot	Leaf	Pomad (Korkmaz et al., 2016)
Plantaginaceae	*Plantago lanceolata*	Sinirli ot, Sinirotu, Bobvitsa, Damarotu, Kesikotu,	Seed, Leaf	Crushed and eaten (Ecevit-Genç, Özhatay, 2006) Unspecified (Özhatay et al., 2006) Crushed and eaten with honey (Kaval, 2011)
Poaceae	*Zea mays*	Mısır, Germuk, Lazut, Darı, püskülü, Lazuk, Mısır püskülü	Stilus, Flower, Leaf	Decoction (Altundag, Ozturk, 2011) Infusion (Kaval, 2011; Olgun, 2019)

Poaceae	*Cynodon dactylon*	Aynkotu, Beygirotu	Whole part	Decoction (Kızılarslan, Özhatay, 2012)
Polygonaceae	*Rheum ribes*	Işgın, Eşgin, Revas, Uskun, Rıbes, Iskın, Esgin, Rıbis	Root, buds, Aboveground	Decoction or infusion (Tetik et al., 2013; Özgen et al., 2012; Kaval, 2011; Gelse, 2012)
Polygonaceae	*Rumex crispus*	Evelik, Kuzu kulağı	Leaf, Seed	Decoction (Özgen et al., 2012)
Polygonaceae	*Polygonum lapathifolium*	Dereotu, Dere biberi, Deve sürdeği	Aboveground	Decoction (Kültür, 2007) Unspecified (Özhatay et al., 2006)
Polygonaceae	*Polygonum arenastrum*	Nanecük, Madımak, Kurtpençesi, Yesil su biberi	Aboveground	Decoction (Gelse, 2012)
Polygonaceae	*Rumex obtusifolius* subsp. *subalpinus*	Lapaza	Seed	Infusion (Sağıroğlu et al., 2012)
Polygonaceae	*Polygonum equisetiforme*	Dereotu	Whole part	Unspecified (Özhatay et al., 2006)
Polygonaceae	*Rumex patientia*	At eveliği	Leaf	Infusion (Altundag, Ozturk, 2011)
Polygonaceae	*Rumex acetosella*	Kuzukulağı	Leaf	Decoction (Cakilcioglu et al., 2011)
Portulacaceae	*Portulaca oleracea*	Porpine, Parpar, Semizotu, Madımak,Perpar Pirpirim	Aboveground, Leaf	Infusion (Sargın, 2015) Mash (Kaval, 2011; Gelse, 2012; Olgun, 2019)
Punicaceae	*Punica granatum* L.	Nar	Fruit	Decoction (Çakılcıoğlu, Türkoğlu, 2013)
Ranunculaceae	*Caltha polypetala*	Lilipar	Flower	Decoction, drink the soup (Güneş, Özhatay, 2011)
Ranunculaceae	*Ranunculus ficaria* subsp. *ficariiformis*	SarıFlower, Düğün çiçeği, Mayıs çiçeği, Altın tabak, Basur otu	Flower, Aboveground	Infusion (Arı et al., 2015) It is grind and applied to the area. (Güzel et al., 2015)
Resedaceae	*Reseda lutea* var. *lutea*	Eşek gerdanası, Eşek otu	Aboveground, Fruit	Infusion (Özdemir, Alpınar, 2015) Decoction (Doğan, 2014)
Rhamnaceae	*Frangula alnus*	Barut ağacı, Erkek akdiken	Barks	Unspecified (23)
Rhamnaceae	*Paliurus spina-christi*	Karaçalı,Pane	Fruit, Root	Unspecified (Koçyiğit, Özhatay, 2006)
Rosaceae	*Mespilus germanica*	Döngel, Muşmula, Dut	Leaf	Decoction (Bulut, 2011)
Rosaceae	*Amygdalus communis*	Badem	Fruit	It is powdered and mixed with olive oil (Çakılcıoğlu, Türkoğlu, 2013)

Rosaceae	*Rosa canina*	Kuşburnu,Sıtma gülü, İt gülü,Yabani gül, Öküz gözü, Öküz götü, Köpek gülü, Gözkıvıştran,	Root, Fruit, Flower	Decoction or Infusion (Tetik et al., 2013; Demirci, Özhatay, 2012; Sargın, 2015), Eaten (Yeşil, Akalın, 2009; Sezik et al., 2001; Arı et al., 2015)
Rosaceae	*Rosa pimpinellifolia*	Koyungözü	Root, Fruit	Decoction (Altundag, Ozturk, 2011)
Rosaceae	*Cotoneaster nummularia*	Koyun gözü	Fruit	Eaten (Özgen et al., 2012)
Rosaceae	*Lauracerasus officinalis*	Kastanicça karamişi	Whole part	Eaten (Sağıroğlu et al., 2012)
Rosaceae	*Rosa gallica*	Kuşburnu	Root, Fruit	Decoction (Özgen et al., 2012)
Rosaceae	*Rosa pimpinellifolia*	Koyun gözü	Fruit	Eaten (Özgen et al., 2012)
Rosaceae	*Laurocerasus officinalis*	Taflan, Karayemiş	Fruit Seed	Unspecified (Koçyiğit, Özhatay, 2006; Erdemoglu et al., 2003)
Rosaceae	*Rosa sempervirens*	Gülbüzük, İtburnu, Kuşburnu, Sıtmagülü	Fruit	Decoction+ sugar (Tuzlacı, Eryaşar-Aymaz, 2001)
Rosaceae	*Rosa dumalis* subsp. *boissieri*	Kuşburnu, Sungulor, Yabani gül, Purç, İt gülü, İtburnu	Root, Fruit, Leaf	Decoction (Özgen et al., 2012; Olgun, 2019)
Rosaceae	*Sorbus aucuparia*	Üvez	Fruit	Eaten (Kültür, 2007) Unspecified (Özhatay et al., 2006)
Rosaceae	*Rubus canescens* var. *canescens*	Karantı, Karamuk	Root Fruit	Decoction (Tuzlacı, Eryaşar-Aymaz, 2001) (Gelse, 2012) Infusion (Polat et al., 2015)
Rosaceae	*Rubus sanctus*	Böğürtlen, Gül üzüm, Tuntırk, Truresk, Karamık, Karantı, Tilki otu	Fruit, Leaf, Flower, Root	Crushed, Infusion Decoction (Tetik et al., 2013; Ugulu, 2011; Kalankan et al., 2015; Kilic, Bagci, 2013; Güzel et al., 2015)
Rosaceae	*Rubus caesius*	Fuska dikeni, Pamuk dikeni, Zincer üzümü, Böğürtlen	Root, Leaf	Drink the soup (Sağıroğlu et al., 2012) Decoction (Kaval, 2011)
Rosaceae	*Crataegus meyeri*	Alıç	Leaf	Infusion (Tetik et al., 2013)
Rosaceae	*Crataegus orientalis*	Alıç	Flower, buds	Infusion (Çakılcıoğlu, Türkoğlu, 2013) Decoction (Sezik et al., 2001)
Rosaceae	*Cydonia oblonga*	Ayva	Leaf	Decoction (Tetik et al., 2013)

				Infusion (Ecevit-Genç, Özhatay, 2006)
Rosaceae	*Sarcopoterium spinosum*	Çeti	Seed	Rubs the area (Ertuğ, 2002)
Rosaceae	*Cydonia vulgaris*	Ayva	Leaf	Infusion (Çakılcıoğlu, Türkoğlu, 2013)
Rosaceae	*Prunus armeniaca*	Kayısı	Fruit	Eaten as hungry (Çakılcıoğlu, Türkoğlu, 2013)
Rosaceae	*Fragaria vesca*	Dağ çileği	Branch, Fruit, Root	Decoction (Bulut et al., 2014)
Sapındaceae	*Aesculus hippocastanum* L.	At kestanesi	Fruit	Unspecified (Altay et al., 2015) Decoction (Ugulu et al., 2009)
Scrophulariaceae	*Verbascum lasianthum*	Sığırkuyruğu, Boçey gayo	Flower, Leaf,	Infusion (Tuzlacı, Şenkardeş, 2011; Çakılcıoğlu, Türkoğlu, 2013)
Scrophulariaceae	*Verbascum dudleyanum*	Sığır kuyruğu	Flower, Leaf	Decoction with sugar (Güneş, Özhatay, 2011)
Scrophulariaceae	*Verbascum speciosum*	Ayilahanasi, Kabalak	Flower, Root	Infusion (Kızılarslan, Özhatay, 2012)
Scrophulariaceae	*Verbascum cherianthifolium* var. *cataonicum*	Sığır kuyruğu	Leaf	Porridge is made (Özgen et al., 2012)
Solanaceae	*Solanum melongena*	Patlıcan	Whole part, Fruit stalk	It is cooked on embers and applied to the area (Çakılcıoğlu, Türkoğlu, 2013)
Solanaceae	*Datura stramonium*	Afyonotu, Eşekdikeni, Eşekotu	Seed	Eaten hungry (Kızılarslan, Özhatay, 2012)
Styracaceae	*Styrax officinalis* L.	Ayı fındığı, Ayva yaprağı, Tespihağacı	Unspecified	Infusion (Şahin-Yiğit, 2014)
Thymelaeaceae	*Daphne sericea*	Tavuk çiçegi	Leaf	It is ground, mixed with oil and rubbed into the area (Güzel et al., 2015)
Urticaceae	*Urtica dioica*	Isırgan, Isırganotu, Derzinek, Gerzinık, Gerzunek, Gezok,	Aboveground, Leaf, whole part, Seed	Infusion or decoction (Bulut, 2011; Akaydın et al., 2013; Bulut, Tuzlacı, 2015; Yeşil, Akalın, 2009; Güzel et al., 2015), Boiled with milk and rubs the area (Sezik et al., 2001), Seed+honey eaten hungry (Kaval, 2011)
Urticaceae	*Urtica urens*	Isırgan, Isırganotu	Aboveground, seed, leaf	Cooking (Bulut, 2011) Infusion (Kalankan et al., 2015) Unspecified (Özhatay

				et al., 2006)
Verbenaceae	*Vitex agnus-castus* L.	Hayıt	Fruit	Decoction (Kargıoğlu et al., 2010)
Vitaceae	*Vitis sylvestris*	Asma, üzüm	Fruit, Leaf	Decoction, Chewing (Kilic, Bagci, 2013)
Vitaceae	*Vitis vinifera* L.	Öküzgözü, Üzüm, Asma, Koruk, Yabani asma, Çakal üzümü, Tri	Leaf, Seed, Fruit	Infusion (Çakılcıoğlu, Türkoğlu, 2013) Eaten (Sezik et al., 2001) Decoction (Kaval, 2011)
Zygophyllaceae	*Peganum harmala*	Üzerlik, Üzerlik Seedu	Root, seed, whole part, fruit	Decoction (Ugulu et al., 2009) Eaten with honey (Akgül et al., 2016), Roasted, mixed with olive oil and applied to the area. (Çakılcıoğlu, Türkoğlu, 2013), Eaten (Özdemir, Alpınar, 2015) Seed+oil, pomad (Güler et al., 2015)
Zygophyllaceae	*Tribulus terrestris*	Pıtırak, Çoban çökerten, Demir dikeni, Gwerçal	Fruit, Flower	Decoction Infusion (Cakilcioglu et al., 2011; Tetik et al., 2013; Polat et al., 2013) Apply flower oil (Arı et al., 2015)

4. Discussion

Since the beginning of civilization, people have used plants, especially medicinal and aromatics. Ethnobotanical data obtained from cultural, empirical, or complementary medical usage of plants may be worth investigating for new therapeutic research possibilities. The use of traditional medicines, such as plants and plant extracts, in hemorrhoids therapy varies according to the different cultural traditions. Recently the practice of herbal medicine has been declining in many places; this may in future lead to the loss of important information about the plant taxa used by local people (Harsha et al., 2002). The demand for herbal medicines and natural plants are increasing due to their lack of side effects. Therefore, necessary studies should be carried out quickly, to not lost this important information. In the literature, there are few studies used plants on hemorrhoids, so it is aimed to contribute to the subject with this review study. World Health Organization defines a medicinal plant as any plant that contains substances that can be used for therapeutic purposes or that are precursors for the manufacture of valuable pharmaceuticals in different organs (WHO, 1976).

In a study, a total of 143 plant taxa belonging to 58 families were found to be useful for the treatment of hemorrhoids (Mike et al., 2010). In this study, a total of 231 plant taxa have been documented for their therapeutic and traditional herbal care against hemorrhoids disease, as enlisted in Table 1. The plant parts used ranged from fruit, root, flower, shoot, leaf, stem, bark, seed, and whole plant. The most uses are infusion and decocsion. Details about plants, their families, usage patterns and used parts are shown in Table 1. It is important to develop strong collaboration between medicinal plant researchers, ethnobotanists, traditional medicine practitioners, and industrialists. Plant conservation is critical because it ensures the supply of plants for traditional herbalists, healers, and herb sellers. Traditional medicine and ethnobotany activities have the advantage of being less expensive and more widely available.

5. Conclusion

Traditional medicine and ethnobotany is the most ancient method of curing diseases.

In the present review research we identified 231 plants used traditional by the people of some part of Turkey to cure hemorrhoids disorder. Further extensive ethnobotanical, traditional and ethnopharmacological research may lead to the determine of plant taxa and compounds for hemorrhoids cure.

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Some Plants Used for Asthma and Bronchitis in Turkey Traditional Medicine (Review)

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Abstract

Medicinal and aromatic plants are being used for the treatment of various respiratory ailments by the local peoples since earliest times. Many people in underdeveloped countries rely on their indigenous flora to heal a variety of diseases, including those that impact the respiratory system.

Around the world, respiratory disease is a prevalent and significant source of illness and death. Respiratory disorders are a common illness in Turkey. As such respiratory disorders (asthma and bronchitis) are still causing several deaths each year, so phytochemical and pharmacological studies are important in this case. In traditional medicine people rely upon the indigenous and medicinal plant resources to cure different respiratory disorders. It is also important to increase access to traditional medicine, especially in rural areas. Threatened plant taxa, especially endemics need special attention for traditional herbal medicine to be exploited sustainably.

In this research we remarked the diversity and importance of medicinal plants used to treat asthma and bronchitis disorders in the traditional health care system of Turkey with some plant taxa. The primary objective of this review was to assemble some available ethno-medicinal data of plants used for asthma and bronchitis, in Turkey. This paper consists of 170 plant taxa which are used for treatment asthma and bronchitis ailments in Turkey ethnobotany or traditional medicine.

Keywords: Ethnobotany, asthma, bronchitis, respiratory diseases, traditional medicine, Turkey.

1. Introduction

More than 4,200,127 plant taxa growing on planet earth, about 34,000 to 65,000 plants taxa are used as medicinal plants (Hasan et al., 2007). The people has witnessed growing scientific and commercial interests in medicinal-aromatic plants and plant-based products mainly due to their immense economic potential and widespread cultural acceptability. Phytotherapeutic compounds have been used for disease control since ancient times, but their use has skyrocketed in the recent decade (Ali, Jahangir, 2001).

Respiratory diseases, are a major public health burden worldwide. The latest WHO statistics (2007) estimate that more than 250 million people worldwide have asthma, more than 200 million people have chronic obstructive pulmonary disease and millions of people are affected by allergies. Each year, more than 200,000 people die of asthma. The prevalence of these diseases is increasing

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and there is a continued need for new, improved and effective treatment strategies (Nature Immunology Reviews, 2008).

Respiratory disorders are common in Turkey due to climatic conditions, limited health care facilities and etc. Te people depend on the indigenous medicinal and aromatic plant resources to treat various respiratory disorders. In many regions of the world, herbal medicines for the treatment of respiratory diseases are commonplace. Traditional medicine has been an important source of products for developing countries in treating common infections and respiratory diseases. The Word Health Organization estimates that 80 % of world population use herbal medicines for some aspects of primary health care (Shinwari et al., 2006)

Many parts of Turkey, there has been a growth in the research of remedial plants and their folk usage during the last few decades. This is frequently ascribed to the high expense of health care and limited access to facilities. In the recent years numbers of information are documented on the use of remedial plant taxa in indigenous healing system either by ethnic people or rural communities of Turkey increasing. The knowledge of ethno pharmacology and its holistic approach supported by experience can serve as a fuel for the discovery of new, safe and afordable medicines.

The current review study focused on the documenting of plant taxa used to treat asthma and bronchitis ailments in some part of Turkey. The knowledge of the uses of some plants as a source of medicine in asthma and bronchitis related diseases is very common among the local people. This review study carried out to document the plant taxa used against asthma and bronchitis disorders to contribute related literatures.

2. Materials and methods

This research was carried out by thorough searching of different ethnobotany researches of Turkey. As a result of this study, 170 taxa were determined from the literature survey and showed in Table 1.

3. Results

Many plants are utilized by the population in Turkey to treat various ailments. The use of this folk medicine, which is made from these plants, has been passed down down the generations. Ethnobotanical investigations carried out by traditional methods of treatment are recorded and this information is aimed to contribute to the development of the drug.

Table 1 was arranged by specifying the family of the plant, the local name, the part of the plant used and the way of use, based on the region where the plants are used.

Table 1. Some plants used for asthma and bronchitis ailments in Turkey ethnobotany

Traditional Use	Botanical Name and Family	Family	Local Name	Plant Part Used	Preparation
Asthma, Bronchitis	*Abies cilicica* (Ant.&Kotschy) Carr. subsp. *cilicica*	Pinaceae	Köknar, Göknar, Köknar sakızı, Gatran	Cone, Resin	Unspecified (Altındağ-Çakır, 2017)
Asthma	*Abies nordmanniana* subsp. equi-trojani	Pinaceae	Unspecified	Cones	İnfusion (Bulut, Tuzlacı, 2009)
Asthma	*Acacia longifolia* Willd.	Fabaceae	Akasya	Flowers	Infusion (Güler et al., 2015)
Shortness of breath, Asthma	*Achillea biebersteinii* Afan.	Asteraceae	Ormaderen, Civanperçemi	Capitulum, Leaf, Flower	Decoction (Altundag, Ozturk, 2011; Arı et al., 2015)
Asthma, Bronchitis	Achillea tenuifolia Lam.	Asteraceae	Çoban kirpiği	Leaves	İnfusion (Altundag, Ozturk, 2011)
Asthma	*Achillea vermicularis* Trin.	Asteraceae	Mevijan	Capitulum	Decoction (Bulut et al., 2016)
Asthma	*Alcea apterocarpa* (Fenzl) Boiss.	Malvaceae	Hiro	Corolla	Unspecified (Akan et al., 2013)
Asthma, Bronchitis	*Alcea calvertii* Boiss.	Malvaceae	Hatmi çiçeği, Gülhatmi	Flowers	İnfusion (Korkmaz, Karakurt, 2014)
Asthma	*Alcea dissecta* (Baker) Zoh.	Malvaceae	Govik	Leaves	Poultice (Altundag, Ozturk, 2011)

Bronchitis	*Alcea pallida* Waldst.&Kit.	Malvaceae	Hatmi, Hiro,Hiri	Flowers	İnfusion (Tetik et al., 2013; Polat et al., 2013)
Asthma	*Alcea rosea* L.	Malvaceae	Hatmi, Karafatma	Flowers, Leaves	Infusion (Bulut, 2011)
Asthma, Bronchitis	*Alchemilla crinita* Buser	Rosaceae	Aslanpençesi, Tati	Aerial part	İnfusion (Polat et al., 2015)
Asthma	*Alhagi pseudalhagi* (M.Bieb.) Desv.	Fabaceae	Hurnif	Fruits, Aerial part	Unspecified (Akan et al., 2013)
Bronchitis	*Allium cepa* L.	Liliaceae	Kahar,Kar	Bulb	Mash (Polat et al., 2013)
Asthma	*Althaea armeniaca* Ten.	Malvaceae	Hiro	Flowers	Unspecified (Akan et al., 2013)
Bronchitis	*Althaea officinalis* L.	Malvaceae	Hatmi	Flowers	Infusion (Polat et al., 2011)
Asthma, Bronchitis	*Althea officinalis* L.	Malvaceae	Hatmi çiçeği, Hıra	Flower	Decoction (Çömlekçioğlu, Karaman, 2008)
Asthma	*Ammi visnaga* (L.) Lam.	Umbelliferae	Diş otu, Dişlik, Kürdan otu, Kırdan otu	Leaves, Flowers, Shoots	Unspecied (Doğanoğlu et al., 2006)
Shortness of breath	*Amygdalus communis* L.	Rosaceae	Badem	Fruits	The oil obtained by crushing and filtering (Akyol, Altan, 2013)
Shortness of breath, Asthma	*Angelica sylvestris* L.	Apiaceae	Melek otu	Whole plant, Leaves	İnfusion (Korkmaz, Karakurt, 2014) Decoction (Çömlekçioğlu, Karaman, 2008)
Asthma, Bronchitis	*Anthemis cretica* L. subsp. *anatolica* (Boiss.) Grierson	Asteraceae	Papatya	Flowers	Decoction or İnfusion (Yeşilyurt et al., 2017)
Asthma	*Anthemis fumariifolia* Boiss.	Compositae	Papatya Yoğurt çiçeği	Capitula	İnfusion (Tuzlacı, Şenkardeş, 2011)
Shortness of breath	*Anthemis tinctoria* L. var. *pallida* DC.	Asteraceae	Papatya	Flowers	Boiled for 5 min and drink as tea (Özüdoğru et al., 2011)
Shortness of breath, Asthma	*Anthemis wallii* Hub.-Mor. et Reese	Asteraceae	Papatya	Flowers	Infusion (Arı et al., 2015)
Shortness of breath	*Apium graveolens* L.	Apiaceae	Kereviz tohumu	Fruits	It is consumed by mixing 1 kg of honey with 200 g of celery seeds. (Akan, Bakır-Sade, 2015)
Bronchitis, Asthma	*Arceuthobium oxycedrii* (DC.) M. Bieb.	Loranthaceae	Ardıç çayı, Parda burcu, Çakirga burcu, Ardic¸ burcu, Andiz burcu, Andiz güveleği	Whole plant	Boiled in water and dried on wood. (Özüdoğru et al., 2011) Unspecified (Kupeli et al., 2008)
Asthma	*Artemisia absinthium* L.	Asteraceae	Pelin	Whole plant	Decoction (Altundag, Ozturk, 2011)
Shortness of breath, Bronchitis	*Artemisia* sp.	Asteraceae	Pelin, Pelin otu	Leaves, Aerial part	Unspecified (Sarı et al., 2010)
Shortness of breath	*Arum detruncatum* C.A. Mey. ex Schott subsp. *detruncatum*	Araceae	Livik	Leaves	Eat after roasted with onion and minced meat in oil (Özüdoğru et al., 2011)
Asthma	*Asplenium adiantum-nigrum* L.	Aspleniaceae	Taş eğreltisi, Karabacak	Whole plant	Decoction (Tuzlacı, Eryaşar-Aymaz, 2001)
Asthma	*Astragalus lycius* Boiss.	Leguminosae	Unspecified	Flowering parts	İnfusion (Tuzlacı, Şenkardeş, 2011)
Asthma, Bronchitis	*Astragalus microcephalus* Willd.	Fabaceae	Geven	Corpus, Leaves	İnfusion (Korkmaz, Karakurt, 2014)

Asthma, Bronchitis	*Avena barbata* Pott ex Link.	Gramineae	Yabani yulaf, Yabani burçak	Leaves, Flowers, Shoots	Unspecied (Doğanoğlu et al., 2006)
Asthma	*Ballota nigra* L. subsp. *anatolica* P.H.Davis	Lamiaceae	Balotu, Ballık otu	Whole plant	Decoction (Tuzlacı, Tolon, 2000)
Asthma, Bronchitis	*Beta trigyna* Waldst & Kit.	Chenopodiaceae	Efelek, Efelik	Flowering branch	Decoction is taken orally (Ezer, Arısan, 2006)
Asthma, Bronchitis	*Brassica oleracea* L.	Brassicaceae	Lahana	Leaves	Infusion (Güler et al., 2015)
Bronchitis	*Capsella bursa-pastoris* (L.) Medik.	Brassicaceae	Çoban torbası, Kedi tırnağı, Çoban çadırı	Aerial parts, Fruits	Eaten, before breakfast, (with honey) (Ecevit-Genç, Özhatay, 2006)
Asthma, Shortness of breath	*Castanea sativa* Miller	Fagaceae	Kestane ağacı	Flowers	Honey obtained from flowers and eaten (Tuzlacı, Tolon, 2000) Unspecified (Sarı et al., 2010)
Asthma	*Centaurea depressa* Bieb.	Asteraceae	Göybaş	Whole plant	Decoction (Altundag, Ozturk, 2011)
Asthma	*Centaurea iberica* Trev.ex Şprengel	Asteraceae	Cakır diken	Capitulum	Decoction (Tuzlacı, Tolon, 2000)
Asthma	*Centaurium erythraea* Rafn.	Gentianaceae	Kırmızı kantaron, Mor kantaron	Aerial parts	Decoction (Kültür, 2007)
Asthma	*Cerasus avium* (L.) Moench	Rosaceae	Kiraz	Fruit stalks	Infusion (Tetik, 2011)
Asthma, Bronchitis	*Ceratonia siliqua* L.	Fabaceae	Harnup	Fruits	Pounded fruits are boiled in water and daily 1-2 cups of decoction are drunk (Akaydın et al., 2013) It is boiled and drunk (Korkmaz, Karakurt, 2014)
Asthma	*Ceterach officinarum* D.C.	Aspleniaceae	Altinotu	Leaves	Infusion (Tuzlacı, Eryaşar-Aymaz, 2001)
Bronchitis	*Chelidonum majus* L.	Papaveraceae	Kırlangıçotu	Leaves	Infusion (Ugulu et al., 2009)
Shortness of breath	*Chrysanthemum coronarium* L.	Asteraceae	Papatya	Leaves	Decoction is consumed as tea (Akaydın et al., 2013; Akaydın et al., 2013a)
Asthma	*Cichorium intybus* L.	Asteraceae	Hindiba	Roots, Whole plant	Decoction (Altundag, Ozturk, 2011)
Bronchitis	*Cirsium arvense* (L.) Scop. subsp. *vestitum* (Wimm. & Grab.) Petr.	Asteraceae	Çakırdikeni	Roots	Decoction or Fresh eaten (Altundag, Ozturk, 2011)
Asthma, Bronchitis, Shortness of breath	*Citrus sinensis* L.	Rutaceae	Portakal	Fruits	It is mixed with honey and consumed (Akan, Bakır-Sade, 2015)
Asthma	*Cotinus coggyria* Scop.	Anacardiaceae	Tetra	Leaves	Infusion (Ecevit-Genç, Özhatay, 2006)
Asthma	*Crataegus meyeri* Pojark.	Rosaceae	Alıç	Flowers	Infusion (Tetik et al., 2013; Tetik, 2011)
Asthma	*Crataegus monogyna* Jacq. subsp. *monogyna*	Rosaceae	Alıç, Yemişgen, Yemişken dikeni, Alişan çalısı, Cadı dikeni	Leaves, Flowers, Young shoots	Infusion (Tuzlacı, Şenkardeş, 2011) Decoction (Kültür, 2007)
Asthma	*Crataegus szovitsii* Pojark.	Rosaceae	Sinz, Sez,Risok, Roğık	Flowers, Fruits	Decoction or Infusion (Polat et al., 2013)

Asthma	*Cyclotrichium nivenum* (Boiss.) Manden.&Scheng.	Lamiaceae	Nane otu	Aerial parts, Leaves	İnfusion (Tetik et al., 2013)
Asthma	*Cyclotrichium niveum* (Boiss.) Manden. & Scheng.	Lamiaceae	Nane otu	Whole plant	Infusion (Tetik, 2011)
Bronchitis	*Cydonia oblonga* Miller	Rosaceae	Ayva	Leaves	Decoction prepared with 15-20 pieces of leaves and 1 glass of this extract drunk 3 times a day (Akaydın et al., 2013; Akaydın et al., 2013a) Decoction (Tuzlacı, Tolon, 2000) Decoction or infusion (Kültür, 2007) Mixed with gülhatmi flowers (Althea rosea) and decocted, as tea (Sezik et al., 2001)
Asthma	*Cynodon dactylon* (L.) Pers var. *villosus* Regel	Gramineae	Ayrık otu	Roots	İnfusion (Tuzlacı, Şenkardeş, 2011)
Bronchitis, Asthma	*Cynodon dactylon* (L.) Pers. var. *dactylo*n	Poaceae	Aynkotu, Beygirotu	Whole plant	Decoction (Kızılarslan, Özhatay, 2012)
Asthma	*Datura stramonium* L.	Solanacae	Şeytan elması, Boru çiçeği, Tatula, Diken elması, Datula	Leaves	Used in the form of cigarettes (Yaldız et al., 2010; Gül, 2014; Polat, Satıl, 2012; Uzun et al., 2004; Koçyiğit, Özhatay, 2006) Chewed (Ecevit-Genç, Özhatay, 2006)
Shortness of breath	*Elaeagnus angustifolia* L.	Elaegnaceae	İğde	Flower	Decoction (Çömlekçioğlu, Karaman, 2008)
Shortness of breath	*Equisetum arvense* L.	Equisetaceae	Kırkilt otu, At kuğruğu, Eklem otu, Zemberek otu	Leaves, Aerial part	Unspecified (Sarı et al., 2010)
Asthma	*Erica arborea* L.	Ericaceae	Püren, Piren otu	Flowering branches	Infusion (Polat, Satıl, 2012)
Bronchitis	*Eriobotrya japonica* (Thunb.) Lindl.	Rosaceae	Yeni dünya	Flowers, Leaves	A glass of decoction prepared with a handful of flowers and leaves is drunk twice daily. (Akaydın et al., 2013)
Asthma	*Eucalyptus camaldulensis* Dehnh.	Myrtaceae	Okaliptüs, Gelendost, Galiptoz	Leaves	Infusion (Ertuğ, 2002)
Asthma, Bronchitis	*Eucalyptus globulus* Labill.	Myrtaceae	Okaliptus	Leaves	Infusion (Korkmaz, Karakurt, 2014)
Asthma	*Ficus carica* L. subsp. *carica*	Moraceae	İncir ağacı	Leaves	Decoction (Tuzlacı, Tolon, 2000)
Bronchitis	*Foeniculum vulgare* Miller	Apiaceae	Rezene, Arapsaçı	Seeds	Decoction (Ugulu et al., 2009)
Bronchitis	*Gentiana gelida* Bieb	Gentianaceae	Unspecified	Stems, Flowers	Decoction (Güneş, Özhatay, 2011)
Bronchitis, Asthma	*Glycyrrhiza echinata* L.	Fabaceae	Dikenli meyan	Rhizoma	Decoction (Altundag, Ozturk, 2011)
Bronchitis, Asthma	*Glycyrrhiza glabra* L. var. *glabra*	Fabaceae	Meyan	Roots	Decoction (Altundag, Ozturk, 2011; Özüdoğru et al., 2011)
Shortness of breath	*Helianthus annus* L.	Asteraceae	Ayçiçeği	Flower petals	Unspecified (Sarı et al., 2010)

Asthma	*Helichrysum graveolens* (Bieb.)	Asteraceae	Yayla çiçeği, Arı çiçeği	Flowering branch	Decoction is taken on an empty stomach (Ezer, Arısan, 2006)
Asthma, Bronchitis	*Heracleum trachyloma* Fisch &Mey.	Apiaceae	Helelg, Lerg	Leaves	Decoction (Polat et al., 2013)
Asthma	*Hibiscus sabdariffa* L.	Malvaceae	Habiskus, Medine gülü	Sepals	İnfusion (Akan, Bakır-Sade, 2015)
Bronchitis	*Hibiscus syriacus*	Malvaceae	Agaç hatmi	Flowers	Infusion (Akbulut, Bayramoglu, 2013)
Asthma, Bronchitis	*Hibiscus trionum* L.	Malvaceae	Bamya	Seeds	A tea glass of seeds are roasted and powdered, mixed with 2 tablespoonful of honey, and taken twice daily (Akaydın et al., 2013; Akaydın et al., 2013a)
Asthma	*Hypericum perforatum* L.	Guttiferae	Kantaron, Kantaron çayı, Sarı kantaron, Kantaryon, Sarıcayüz, Kantül, Kesik otu, Mide otu, Kalp otu	Aerial parts	Infusion (Kültür, 2007)
Asthma	*Inula crithmoides* L.	Asteraceae	Andız kökü, Andız otu	Resin, Fruits, Leaves	Add 100 g of andiz root with 1.5 lt of water and drink 3 tea glasses in the morning on an empty stomach (Akan, Bakır-Sade, 2015; Akan, Bakır-Sade, 2015)
Shortness of breath	*Inula helenium* L.	Asteraceae	Andız otu	Seed	Decoction (Çömlekçioğlu, Karaman, 2008)
Bronchitis	*Jasminium fruticans*	Oleaceae	Yasemin	Flowers	Infusion (Akbulut, Bayramoglu, 2013)
Asthma, Bronchitis	*Juglans regia* L.	Juglandaceae	Ceviz ağacı, Kuz, Yondak, Guz	The soft structure inside the bark of the tree	Decoction (Olgun, 2019)
Asthma, Bronchitis	*Juniperus drupacea* Labill.	Cupressaceae	Andız, Ardıç, Andız gıliği	Cone, Fruits, Seeds	Unspecified (Altındağ-Çakır, 2017)
Asthma	*Juniperus excelsa* Bieb.	Cupressaceae	Ardıç	Fruits	Decoction (Akaydın et al., 2013; Tuzlacı, Şenkardeş, 2011)
Asthma	*Juniperus excelsa* Bieb. subsp. *excelsa*	Cupressaceae	Ardıç	Leafy branches, Fruits, Seeds	Take a bath with boiled water (Özçelik, Balabanlı, 2005)
Bronchitis, Asthma	*Juniperus oxycedrus* L. subsp. *oxycedrus*	Cupressaceae	Gilik, Kokarardıç, Ardıç	Fruits, Cone	Fresh fruit is eaten or dried fruit is decocted. (Özüdoğru et al., 2011; Sezik et al., 2001) Concentrated jam prepared is taken internally with milk everymorning (Koçyiğit, Özhatay, 2006) Chew in the mouth, inhalation (Kılıç, 2016)
Bronchitis	*Laurocerasus*	Rosaceae	Karamiş,	Leaves	Applied over chest after

	officinalis Roemer		Karayemiş		heating with honey (Kızılarslan, Özhatay, 2012)
Asthma, Bronchitis	*Laurus nobilis* L.	Lauraceae	Defne	Leaves	Infusion (Ecevit-Genç, Özhatay, 2006; Uzun et al., 2004)
Bronchitis	*Linum usitatissimum* L.	Liliaceae	Keten	Seeds	Decoction (Polat, Satıl, 2012) Roasted and crushed (Ugulu et al., 2009)
Bronchitis	*Linum* sp.	Linaceae	Keten tohumu	Seeds	Grinded and Chewed (Akgül et al., 2016)
Bronchitis	*Lysimachia verticillaris* Sprengel	Primulaceae	Unspecified	Aerial part	Decoction (Kızılarslan, Özhatay, 2012)
Asthma	*Malus sylvestris* Miller subsp. *orientalis* (A. Uglitzkich) Browicz var. *orientalis*	Rosaceae	Elma	Fruits	Peeled pericarps of apple fruit (1 kg) are boiled in water and daily 3-4 spoonfuls are taken orally. (Akaydın et al., 2013; Akaydın et al., 2013a) The middle part of an apple is removed and filled with black pepper and covered again with a piece of the removed part and cooked inside embers, then applied on throat while hot (Sezik et al., 2001)
Asthma	*Malva neglecta* L.	Malvaceae	Ebem kömeci	Aerial part, Leaves	İnfusion (Polat et al., 2015)
Asthma	*Malva nicaeensis* All.	Malvaceae	Ebegümeci	Flowers	Decoction (Tuzlacı, Tolon, 2000)
Asthma, Bronchitis	*Malva sylvestris* L.	Malvaceae	Ebegümeci, Gömeçotu	Aerial parts Flower, Fruit	Infusion or Decoction (Kültür, 2007; Bağcı et al., 2006; Koçyiğit, Özhatay, 2006)
Asthma	*Marribium vulgare* L.	Lamiaceae	Boz otu, Kukaş otu, Köpek otu, Gihia kuçuga	Leaves	Add a handful of gray grass to 2-3 liters water and drink it as tea on an empty stomach (Akan, Bakır-Sade, 2015; Akan, Bakır-Sade, 2015)
Bronchitis	*Matricaria chamomilla* L. var. *recutita* (L.)	Asteraceae	Papatya	Capitulum	Infusion (Tuzlacı, Eryaşar-Aymaz, 2001) (Kültür, 2007) Unspecified (Sarı et al., 2010)
Shortness of breath	*Medicago orbicularis* (L.) Bart.	Leguminosae	Düğmelik	Seeds	Infusion (Akyol, Altan, 2013)
Asthma,	*Melissa officinalis* L.	Labiatae	Ogul otu, Yalancı ısırgan, Limon nanesi	Aerial parts	Infusion + Sugar (Tuzlacı, Tolon, 2000) Infusion (Gül, 2014) (Kültür, 2007) Crushed+honey (Tuzlacı, Eryaşar-Aymaz, 2001) Unspecified (Sarı et al., 2010)
Asthma	*Mentha longifolia* (L.) Hudson subsp. *typhoides* (Briq.) Harley var. *typhoides*	Lamiaceae	Pünge	Leaves	Infusion (Bulut et al., 2016)

Bronchitis, Asthma	*Mentha longifolia* (L.) Hudson subsp. *longifolia*	Lamiaceae	Yarpuz	Whole plant	Infusion or decoction (Altundag, Ozturk, 2011)
Shortness of breath, Asthma	*Mentha piperita* L.	Lamiaceae	Nane	Leaves, Flowering branches	Decoction (Akan, Bakır-Sade, 2015)
Asthma, Bronchitis	*Mentha pulegium* L.	Lamiaceae	Narpuz, Narpız	Flowering branches	Infusion (Ertuğ, 2002)
Asthma	*Mespilus germanica* L.	Rosaceae	Döngel, Muşmula	Leaves	Infusion (Bulut, 2011)
Asthma, Bronchitis	*Nepeta* sp.	Lamiaceae	Yabani nane, Su nanesi, Yarpuz, Çayır nanesi, Narpıs	Aerial part	Unspecified (Sarı et al., 2010)
Shortness of breath	*Nigella sativa* L.	Ranunculaceae	Çörek otu	Seed	The plant's seed is consumed directly. Also, it is mixed into the honey (Arı et al., 2015)
Shortness of breath	*Olea europea* L. var. *europea*	Oleaceae	Zeytin	Leaves	32 pcs olive leaves are boiled in water (Akyol, Altan, 2013)
Asthma	*Onosma isauricum* Boiss. et Heldr.	Boraginaceae	Ada çayı	Aerial parts	Infusion (Tuzlacı, Şenkardeş, 2011)
Bronchitis	*Orchis* sp. L.	Orchidaceae	Salep	Leaves	Decoction (Ugulu et al., 2009)
Asthma, Bronchitis	*Paliurus spina-christi* Miller.	Rhamnaceae	Karaçalı	Fruits	Decoction (Polat et al., 2011; Korkmaz, Karakurt, 2014; Ecevit-Genç, Özhatay, 2006)
Shortness of breath, Bronchitis	*Papaver macrostomum* Boiss. & Huet ex Boiss.	Papaveraceae	Gelincik	Seeds	The seeds are mixed with honey and eaten on an empty stomach (Yeşilyurt et. al., 2017)
Bronchitis	*Papaver lateritium*	Papaveraceae	Gelincik	Flowers	Infusion or Syrup (Akbulut, Bayramoglu, 2013)
Asthma	*Papaver orientale* L. var. *parviflora* Busch	Papaveraceae	Haşhaş	Leaves	Infusion (Altundag, Ozturk, 2011)
Bronchitis	*Papaver rhoeas* L.	Papaveraceae	Gelincik, Gelincikotu, Borcanka	Petals	Syrup (Kültür, 2007)
Asthma, Bronchitis	*Peganum harmala* L.	Nitrariaceae	Üzerlik otu, Nazar otu	Seeds	The paste is made and eaten. Eaten raw (Korkmaz, Karakurt, 2014)
Bronchitis, Asthma	*Phlomis armeniaca* Willd.	Labiatae	Ada çayı, Çöl çayı	Aerial parts, Whole plant	İnfusion (Tuzlacı, Şenkardeş, 2011; Altundag, Ozturk, 2011)
Asthma, Bronchitis	*Pimpinella anisetum* Boiss.	Apiaceae	Anason	Whole plant	Infusion (Korkmaz, Karakurt, 2014)
Bronchitis, Asthma	*Pimpinella olivieroides* Boiss. &Hausskn.	Apiaceae	Maydanoz	Roots	İnfusion (Tetik et al., 2013) (Tetik, 2011)
Bronchitis, Asthma	*Pinus brutia* Ten.	Pinaceae	Çam, Kızıl çam	Leaves, Fruits, Fresh Shoots	Leaves: One glass of decoction prepared with a handful of leaves is drunk daily on an empty stomach Fruits: Cones boiled with sugar to obtain a thick syrup and 2dessertspoonful of this syrup taken orally daily (Akaydın et al., 2013;

					Akaydın et al., 2013a) İnfusion (Arıcan et al., 2013) Decoction (Ugulu et al., 2009) Drink the juice obtained by boiling the fresh shoots (Özçelik, Balabanlı, 2005)
Asthma, Bronchitis	*Pinus nigra* Arn.	Pinaceae	Çam	Branches, Cone	Decoction or İnfusion (Polat et al., 2015)
Asthma, Bronchitis	*Pinus pinea* L.	Pinaceae	Fıstık çamı, Küner çamı	Branches, Fresh shoot	Infusion (Polat, Satıl, 2012; Ertuğ, 2002)
Asthma	*Pinus sylvestris* L.	Pinaceae	Çam	Buds	Decoction (Tuzlacı et al., 2010)
Chronic bronchitis, Asthma, Shortness of breath	*Pistacia terebinthus* L. subsp. *palaestina*	Anacardiaceae	Menengiç, Melengiç, Çitlenbik	Fruits	Chronic bronchitis: Fruits are eaten 2 or 3 times a day. Asthma: Smoked as a cigarette (Ünsal et al., 2010; Akan, Bakır-Sade, 2015) Crushed (Tuzlacı, Eryaşar-Aymaz, 2001) 10-15 pcs seeds are boiled (Akyol, Altan, 2013)
Shortness of breath, Asthma	*Pistacia terebinthus* L.	Anacardiaceae	Menengiç	Fruits, Gum	Unspecified (Akan, Bakır-Sade, 2015)
Asthma, Bronchitis	*Plantago lanceolata* L.	Plantaginaceae	Sinirli ot, Ateş yaprağı, Boğa yaprağı, Kırkdamar otu, Damar otu, Sinir otu	Aerial parts, Roots, Leaves	Infusion (Akgül et al., 2016; Kalankan et al., 2015) Boiling with water up to half; taken three times a day (Saçlı, Kalın, 2001) Decoction (Ugulu et al., 2009) Cutting (+honey) (Kültür, 2007)
Asthma	*Plantago major* L. (Plantaginaceae)		Sinir otu, Sinirli ot	Leaves	Infusion (Polat et al., 2011)
Bronchitis	*Plantago major* L. subsp. *majör*.	Plantaginaceae	Kırkdamar otu, Sinirli ot, Damar otu	Leaves	Infusion (Kalankan et al., 2015)
Bronchitis	*Primula vulgaris* Huds.	Primulaceae	Çuha çiçeği	Flowers	İnfusion (Ugulu et al., 2009)
Asthma	*Prunus spinosa* L. subsp. *dasyphylla* (Schur) Domin	Rosaceae	Güvem	Fruits	During 40 days eaten before meals (Ecevit-Genç, Özhatay, 2006)
Shortness of breath	*Punica granatum* L. (Punicaceae)		Nar	Flower	Decoction (Çömlekçioğlu, Karaman, 2008)
Bronchitis	*Robinia pseudoacacia* L.	Fabaceae	Katırtırnağı	Flowers	Infusion (Tuzlacı et al., 2010)
Asthma	*Robinia pseudoacacia* L.	Fabaceae	Salkım söğüt, Akasya	Flowers	Decoction (Ecevit-Genç, Özhatay, 2006)
Asthma, Bronchitis	*Rosa canina* L.	Rosaceae	Kopek gülü, Kuşburnu, Dikenbaşı, Öküzgötü, Yabani gül	Fruits	Decoction (Tuzlacı, Tolon, 2000) (Altundag, Ozturk, 2011; Tuzlacı et al., 2010; Kızılarslan, Özhatay, 2012; Tuzlacı, Eryaşar-Aymaz, 2001; Ugulu et al., 2009; Sezik et al., 2001;

					Yeşilyurt et. al., 2017) Boiled in water and drunken (Sarper et al., 2009; Sarper et al., 2009a) İnfusion (Güneş, Özhatay, 2011) Crushed (with lemon) (Ecevit-Genç, Özhatay, 2006)
Bronchitis	*Rosa sempervirens* L.	Rosaceae	Gülbüzük, İtburnu, Kuşburnu, Sıtmagülü	Fruits	Decoction (Tuzlacı, Eryaşar-Aymaz, 2001)
Asthma, Bronchitis	*Rosmarinus officinalis* L.	Lamiaceae	Kuşdili, Biberiye	Aerial Parts	Decoction (Ugulu et al., 2009)
Bronchitis	*Rubus discolor* Weihe & Nees	Rosaceae	Çoban kösteği, Böğürtlen, Kapina, Karamama, Karamuk	Roots	Decoction (Ecevit-Genç, Özhatay, 2006)
Asthma, Bronchitis	*Rubus sanctus* Schreber	Rosaceae	Dırık, Dırkel, Tiri, Böğürtlen, Karama	Flowers, Roots, Leaves	Infusion (Polat et al., 2013) Decoction (Ecevit-Genç, Özhatay, 2006)
Asthma	*Rumex crispus* L.	Polygonaceae	Evelik	Leaves	Decoction (Altundag, Ozturk, 2011)
Bronchitis	*Salix babylonica* L.	Salicaceae	Salkım söğüt	Leaves	Decoction + sugar (Tuzlacı, Tolon, 2000)
Asthma	*Salvia cryptantha* Montbret et Aucher ex Bentham	Labiatae	Ada çayı Ballık otu Kokulu ot Sarı şabla	Flowers	Infusion (Tuzlacı, Şenkardeş, 2011)
Bronchitis	*Salvia officinalis* L.	Lamiaceae	Adaçayı	Leaves	Decoction (Ugulu et al., 2009)
Bronchitis	*Salvia tomentosa* Miller.	Lamiaceae	Adaçayı, Bozşabla, Şabla, Mezar otu, Moskof çayı	Leaves	Infusion (Tuzlacı, Eryaşar-Aymaz, 2001)
Asthma	*Sambucus ebulus* L.	Caprifoliaceae	Mürver, Memer, Sultan otu, Mülver, Karabubu	Flowers	Infusion (Ecevit-Genç, Özhatay, 2006)
Bronchitis, Asthma, Shortness of breath	*Sambucus nigra* L.	Caprifoliaceae	Mülver, Mürver, Patırık, Mürver çiçeği, Mürver ağacı, Patpatik, Sultan otu	Flowers, Fruits	Infusion (Bulut, 2011; Yoğunlu, 2011; Altundag, Ozturk, 2011) (Kültür, 2007) Decoction (Kültür, 2007) Eaten (Yeşilyurt et al., 2017)
Bronchitis	*Sideritis scardica* L. subsp. *scardica*	Labiatae	Kuyruklu adaayı, Kırçayı, Taşlık çayı, Başak çayı, Adaçayı	Aerial parts	Decoction (Kültür, 2007)
Bronchitis	*Tanacetum chiliophyllum* (Fisch. et C. A. Mey) Sch. Bip.	Compositae	Bronşit otu	Whole plant	Decoction with drink one glass of it every morning and evening (Güneş, Özhatay, 2011)
Asthma	*Teucrium polium* L.	Lamiaceae	Kısamahmut otu, Dalak otu	Aerial parts	Infusion (Kalankan et al., 2015)
Asthma	*Thalictrum minus* L.	Ranunculaceae	Astım otu	Leaves, Stems	Boiling and vapour inhalation (Güneş, Özhatay, 2011)
Asthma	*Thymus leucostomus*	Lamiaceae	Paryavşan,	Aerial part	Dried plant is mixed

	Hausskn. & Velen. var.leucostom*us*		Kekik		with honey (Sarper et al., 2009; Sarper et al., 2009)
Asthma, Bronchitis	*Thymus leucotrichus* var. *leucotrichus* Maire & Petitmengin	Lamiaceae	Kekik	Leaves, Flowers	Infusion (Korkmaz, Karakurt, 2014)
Asthma	*Thymus longicaulis* C.Presl subsp. *longicaulis* var. *subisophyllus* (Borbas) Jalas	Lamiaceae	Kekik otu	Whole plant	Decoction (Tuzlacı, Tolon, 2000)
Asthma	*Thymus sipyleus* Boiss. subsp. *rosulans* (Borbás) Jalas	Labiatae	Kekik	Aerial parts	Infusion (Tuzlacı, Şenkardeş, 2011)
Shortness of breath	*Thymus sipyleus* Boiss. subsp. *sipyleus* var. *sipyleus*	Lamiaceae	Beyaz kekik	Flowers	Infusion (Arı et al., 2015)
Asthma, Bronchitis	*Thymus vulgaris* L.	Lamiaceae	Kekik	Aerial Parts	Decoction (Ugulu et al., 2009)
Asthma	*Tilia argentea*	Malvaceae	Unspecified	Flowers	İnfusion (Bulut, Tuzlacı, 2009)
Bronchitis	*Tilia platyphyllos* Scop.	Tiliaceae	Ihlamur	Leaves	Drunk as a tea (Sağıroğlu et al., 2012)
Asthma	*Tilia rubra* DC. subsp. *caucasica*	Tiliaceae	Kafkas ıhlamuru, Kırmızı ıhlamur	Flowers, Leaves	Decoction (Gül, 2014) Infusion (Korkmaz, Karakurt, 2014)
Asthma	*Tribulus terrestris* L.	Zygophyllaceae	Gwerçal, Gerçal	Fruits, Leaves	Infusion (Polat et al., 2013)
Asthma	*Trifolium pratense* L. var. *pratense*	Fabaceae	Yonca	Flowers, Leaves	Decoction or İnfusion (Cakilcioglu et al., 2011)
Bronchitis	*Trigonella foenum-graecum* L.	Fabaceae	Çemenotu, Boyotu	Seeds	Decoction (Ugulu et al., 2009)
Asthma	*Tripleurospermum transcaucasicum* (Manden.) Pobed.	Asteraceae	Papatya	Aerial parts	Infusion (Tetik et al., 2013; Tetik, 2011)
Asthma, Bronchitis	*Tussilago farfara* L.	Asteraceae	Öksürük otu, Devetabanı, Aslanpençesi,	Flowers, Leaves	Infusion (Polat et al., 2015; Korkmaz, Karakurt, 2014; Kılıç, 2016; Tetik, 2011)
Asthma	*Ulmus minor* Miller subsp. *minor*	Ulmaceae	Karaağaç	Roots	Decoction (Altundag, Ozturk, 2011)
Asthma, Bronchitis	*Urtica dioica* L.	Urticaceae	Isırgan, Dalağan, Sığran, Sırgan	Whole plant, Aeral part, Seeds, Leaves	Decoction (Tuzlacı, Tolon, 2000; Güneş, Özhatay, 2011; Polat et al., 2015; Ugulu et al., 2009; Koçyiğit, Özhatay, 2006) Daily 2 cups of decoction are consumed as tea. (Akaydın et al., 2013) Eaten, crushed seeds with honey (Kızılarslan, Özhatay, 2012) (Sağıroğlu et al., 2012)
Asthma, Bronchitis	*Verbascum armenum* Boiss. et Kotschy	Scrophulariaceae	Sığır kuyruğu	Branches, Corpus, Flowers	İnfusion (Korkmaz, Karakurt, 2014)
Shortness of breath	*Verbascum cheirianthifolium* Boiss. var. *cheirianthifolium*	Scrophulariaceae	Yalağı, Korek, Sığır kuyruğu	Flowers	Decoction (Özüdoğru et al., 2011)
Asthma, Bronchitis	*Verbascum lasianthum* Boiss	Scrophulariaceae	Sığırkuyruğu	Flower	Infusion (Kalankan et al., 2015)

Asthma, Shortness of breath	*Viscum album* L. subsp. *albüm*.	Loranthaceae	Ökse otu, Çekem otu, Gökçe,	Whole plant, Fruits, Branches	İnfusion (Akan, Bakır-Sade, 2015) Decoction (Özüdoğru et al., 2011; Ecevit-Genç, Özhatay, 2006; Akan, Bakır-Sade, 2015)
Asthma	*Viscum album* L.	Santalaceae	Çekum, Purçük, Armut pürçüğü	Whole plant	Decoction (Polat et al., 2015)
Asthma, Bronchitis	*Zingiber officinale* Roscoe	Zingiberaceae	Zencefil	Roots, Leaves	It is made into a paste or the tea is drunk (Korkmaz, Karakurt, 2014)
Asthma, Bronchitis	*Zizyphus jujuba* Miller	Rhamnaceae	Hünnap	Fruits	Decoction (Polat, Satıl, 2012; Ugulu et al., 2009)

4. Discussion

In this review, we described the some medicinal plants used in some part of Turkey to treat asthma and bronchitis disorders.

In a study, 384 plant taxa species used to treat respiratory disorders in Pakistan has been documented; cough was the disorder treated by the highest number of species (214) followed by asthma (150), cold (57) and bronchitis (56) (Alamgeer et al., 2018). In another study, a total of 87 plant taxa from 39 families, were reported in the study area for respiratory treatments; approximately 32 % of the plants have been reported as cough remedies (Oduola-Lawal et al., 2015). In some studies, we come across plants used in respiratory system disorders among the people (Kılıç, 2016; Kılıç, Bagci, 2013).

In this study, a total of 170 plant taxa have been documented for herbal care against asthma and bronchitis diseases. Details about these plants, their families, usage patterns and used parts are shown in Table 1.

5. Conclusion

We hope that the information presented in this study can be a source for the development of asthma and bronchitis drugs. In addition, we hope that this review will help you better comprehend and utilize particular herbs to help asthma and bronchitis patients.

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