



An ethnobotanical survey from Bingol (Turkey)

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ABSTRACT: In this study, 71 plant taxa belonging to 28 families that are used as different purposes are documented in six villages (Aşağıköy, Ortaköy, Yelesen, Şaban, Dikme, Çiriş) of Bingol (Turkey) in 2013-2015 years, for the first time. The most encountered plant families were Asteraceae (16 taxa), Lamiaceae (13 taxa) and Rosaceae (6 taxa). Infusion and decoction were the most frequently prepared formulation. The most frequently mentioned indications were disorders of the colds and flu, respiratory system, diabetes diseases and eaten raw. *Malva neglecta*, *Achillea biebersteinii*, *Satureja hortensis*, *Rosa canina* and *Urtica dioica* were the plants most used by the local people in studied villages.

Keywords: Ethnobotany, Traditional medicine, Bingol-Turkey

INTRODUCTION

Ethnobotany is the research of relationships between the man and plants. Another defining, ethnobotany is a study of the association, interaction and interrelationships of the human societies with the surrounding flora. From the ancient times, the native people will be searching for wild plants in nature to supply their various needs, especially treat diseases. So, no doubt plants are important sources for many needs (especially drugs) of humanity. Thousands of natural wild plant taxa have therapeutic values and used to treat various diseases. Almost, 80% of the people in developing countries depend on the plant resources for their health care. People of studied villages, have large knowledge about the medicinal and aromatic plants and this knowledge is not documented. Documentation of this traditional knowledge is a very important task for future generations and for future studies; also for the conservation and utilization of biological resources (1). Indigenous people of studied villages have a rich knowledge of their long experience through the practice of many years. In addition, in the present world, traditional botanical knowledge and ethnobotanical studies are playing an important role in biological investigation, economy, practical uses and experience of different ethnic groups. In Turkey, there are many ethnic communities of different lifestyle and culture. Peoples in cities, especially in rural areas uses surrounding plants for their primary healthcare along with other necessities, which are based on their traditional knowledge and dynamic cultural heritage. Humans always use of plants, not just as a source of nutrition, but also for fuel, medicines, clothing, chemical production and other purposes. "Turkey is one of the most floristically rich countries in the world with astonishing plant diversity which has a very extraordinary rich flora and a great knowledge of folkloric medicines and consequently represents a potential resource for such studies" (2). Turkey's flora rich and diverse with 13,181 plant taxa and 32% of endemism (3).

In Turkey, in the modern sense first researches about medicinal plants were began 1933 onwards. East of Turkey has a rich flora, due to its variable climate and high number of ecological zones; this diversity in flora provides a rich source of medicinal, aromatic, economic and endemic plants, which has long been utilized by Anatolian cultures. Majority of the East Anatolian Turkish people living in rural areas uses plants for many different purposes. In recent years, the ethnobotanic studies have attracted attention of the researchers (4-7). "Ethnopharmacology has played a significant role in the progress of conventional medicine and is likely to become increasingly important in the years to come. A cooperative approach by ethnobotanists, ethnopharmacologists, physicians and phytochemists is thereby essential to spur the progress of medicinal plants research" (8). Most of the knowledge about aromatic and medicinal plants is passed on from one generation to the next, the increasing human population in the late decades and unawareness of the people on this issue has led to harm biodiversity of medicinal and aromatic plants. For this reason, present study made an attempt on exploring and documenting the ethnomedicinal uses of plant taxa and uses of plant parts by people of Aşağıköy, Ortaköy, Yelesen, Şaban, Dikme and Çiriş villages (Bingöl) in the Eastern Region of Turkey. This is the first attempt to investigate and document the ethnobotanical practices by the people of this region; which have a rich flora (9).

MATERIALS AND METHODS

Bingöl belongs to the Iran-Turan Plant Geography Region and falls within the B8 grid square according to the Grid classification system developed by Davis (1965-1985). Aşağıköy, Ortaköy, Yelesen, Şaban, Dikme and Çiriş villages are located south-west of Bingöl and bounded to the Bingöl center (Fig. 1). The field work was carried out over a period of 3 years (2013-2015) and more than twenty field surveys were conducted between 2013-2015. During this research 6 villages have been visited, about 180 plant taxa used for local people were collected and to 75 local people are interviewed. The information for these plants, such as used parts, their usages, methods of preparation, administration dosage and duration treatments have been recorded. Ethnomedicinal data were collected through conversation with traditional healers and herbal practitioners as well as elderly man and women of the studied villages. The collected information was recorded in the ethnobotanical field notebook along with important medicinal uses. The information collected regarding the medicinal uses of plants and herbs were documented (Table 1). Total respondents people are 62 (Aşağıköy 15, Ortaköy 6, Yelesen 14, Şaban 10, Dikme 11, Çiriş 6 informants); between 30-40 years (5 woman, 10 man), 40-60 years (10 woman, 25 man), Over 60 years (4 woman, 8 man). Interviews were made on the busy hours of the common areas (fields, street, farms, gardens, house etc.) of villages. The Zazaki groups are of the major ethnic group in the region. The medicinal plant species were collected from the study area and identified using, "Flora of Turkey and the East Aegean Islands" (10,11). The names of plant families were listed in alphabetic order (Table 1). Scientific names of plant species were identified according to the 'Author of Plant Names' (12). Plant herbarium samples were deposited department of park and garden plants of Bingöl University and herbarium of Yıldırımli from Ankara.

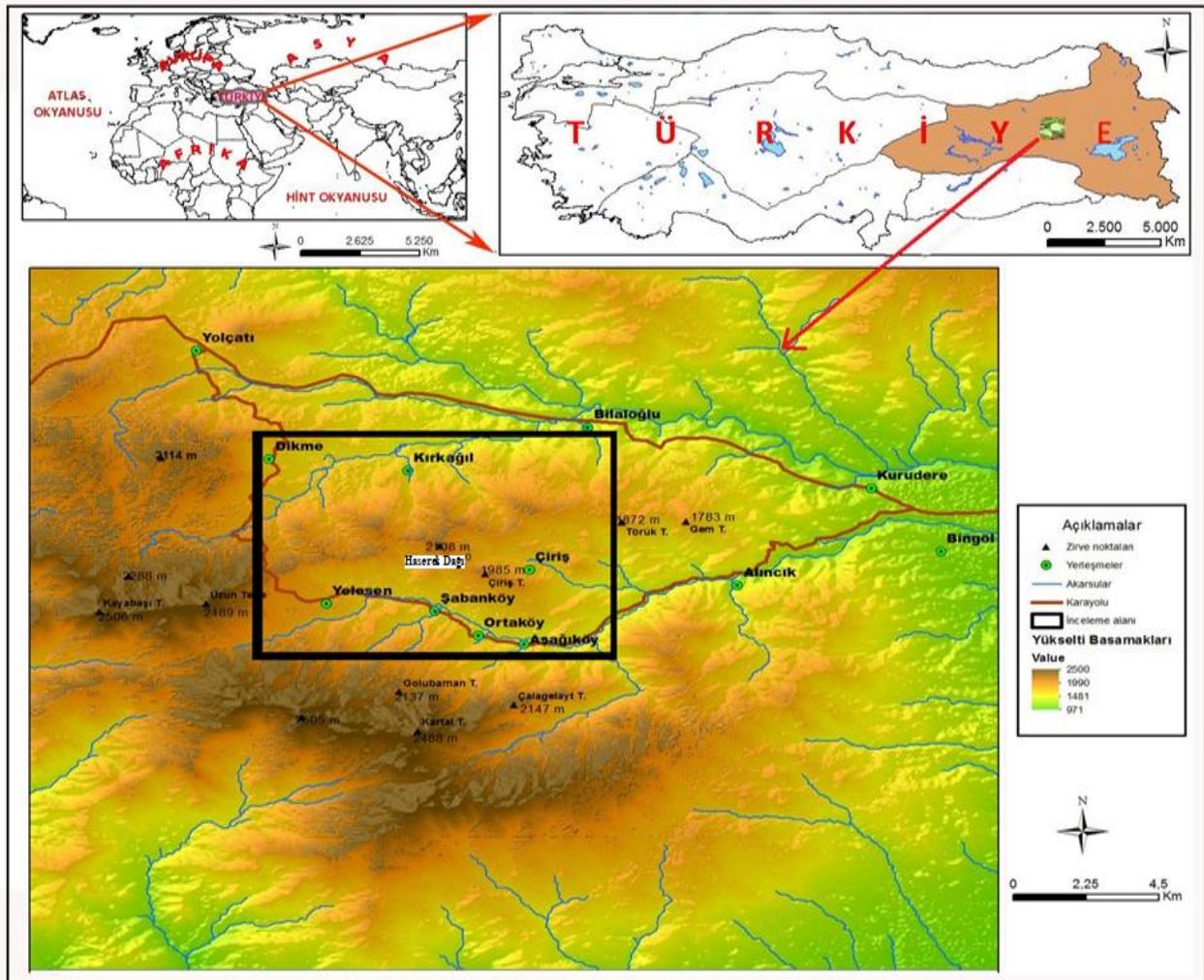


Fig. 1. Geographical location of the study area (9).



Family	Plant taxa (Collect number)	Turkish Vernacular name	Used plant part	Preparations	Uses
Acanthaceae	<i>Acanthus dioscoridis</i> var. <i>dioscoridis</i> , ÖK 5772	Ayı pençesi, Ayıkulağı	Leaves	Decoction	For skin diseases
Amaranthaceae	<i>Amaranthus retroflexus</i> ÖK 5441	Selmik, horozibiği	Leaves	Infusion	Stomach disease
Amaranthaceae	<i>Chenopodium album</i> subsp. <i>album</i> var. <i>album</i> , ÖK 5241	Sirken	Aerial parts	Decoction, leaves	Colds and flu, used in cooking
Apiaceae	<i>Heracleum persicum</i> , ÖK 5879	Öğrekotu	Leaves	Decoction	Food
Asclepiadaceae	<i>Vincetoxicum canescens</i> subsp. <i>canescens</i> , ÖK 5113	Zilasur, zehirotu	Aerial parts	Decoction	Fungal diseases
Asteraceae	<i>Achillea biebersteinii</i> , ÖK 5639	Civanperçemi	Aerial parts	Infusion	Cold, for hemorrhoids, stomach-ache, menstruation pain
Asteraceae	<i>Achillea millefolium</i> subsp. <i>pannonica</i> , ÖK 4966	Civanperçemi	Flowers, Aerial parts	Decoction, Infusion	Ulcer, diuretic, Kidney stones
Asteraceae	<i>Anthemis cotula</i> , ÖK 4983	Papatya	Flowers	Infusion	Colds and flu, sedative
Asteraceae	<i>Anthemis tinctoria</i> var. <i>tinctoria</i> , ÖK 5884	Sarı papatya	Flowers	Infusion	Colds, stomach-ache
Asteraceae	<i>Carduus pycnocephalus</i> subsp. <i>albidus</i> , ÖK 4731	Eşek dikeneni	Stem	Raw	Stem edible peel
Asteraceae	<i>Achillea wilhelmsii</i> , ÖK 4943	Civanperçemi	Leaves, flowers	Infusion	Stomachache
Asteraceae	<i>Centaurea depressa</i> , ÖK 5122	Peygamberçiçeği	Capitulum	Decoction	Hemorrhoid
Asteraceae	<i>Cichorium inthybus</i> , ÖK 4987	Hindiba, keklik otu	Latex	Compress	Wound healing
Asteraceae	<i>Cnicus benedictus</i> var. <i>benedictus</i> , ÖK 5187	Top diken	Leaves, aerial parts	Decoction, Infusion	Diabetes
Asteraceae	<i>Echinops orientalis</i> , ÖK 5931	Eşek kengeri, topuz	Raw	Dried flowers axis	Eating
Asteraceae	<i>Gundelia tournefortii</i> var. <i>armata</i> , ÖK 5689	Kenger	Aerial parts, latex	Raw	Chew and animal feed
Asteraceae	<i>Helichyrsom arenarium</i> , ÖK 4911	Ölmez çiçek	Flowers	Decoction	Kidney stones
Asteraceae	<i>Scorzonera mollis</i> subsp. <i>szowitzii</i> , ÖK 4625	Tekesakalı	Root and leaves	Raw	Food
Asteraceae	<i>Senecio vernalis</i> , ÖK 5172	Kanaryaotu	Flowers	Infusion	To eliminate intestinal gas
Asteraceae	<i>Tragopogon longirostis</i> var. <i>longirostis</i> , ÖK 4694	Yemlik	Root, latex	External, raw	Eating, wound healings
Asteraceae	<i>Tussilago farfara</i> , ÖK 5482	Öksürük otu	Leaves	Infusion	Cold and bronchitis treatment
Boraginaceae	<i>Cerithe minor</i> subsp. <i>auriculata</i> , ÖK 5264	Alacakız	Leaves	Decoction	Rheumatism
Boraginaceae	<i>Heliotropium circinatum</i> , ÖK 4782	Bambulotu	Flowers	Decoction, Infusion	Kidney Stones
Boraginaceae	<i>Anchusa azurea</i> var. <i>azurea</i> , ÖK 5128	Sığırdili	Leaves	Decoction, Infusion	Food, diuretic, stomach-ache
Brassicaceae	<i>Capsella bursa-pastoris</i> , ÖK 5601	Çobançantası	Aerial parts	Raw, Decoction,	Food, diabetes, kidney pain
Brassicaceae	<i>Arabis caucasica</i> subsp. <i>caucasica</i> ,	Kazteresi	Aerial parts	Infusion	Digestive



ae	ÖK 5511				
Cupressaceae	<i>Juniperus oxycedrus</i> subsp. <i>oxycedrus</i> , ÖK 4919	Ardıç	Cone	Chew in the mouth, inhalation	Mouth sores, fuel, asthma
Caryophyllaceae	<i>Saponaria prostrata</i> subsp. <i>anatolica</i> , ÖK 4764	Sabunotu	Leaves	Decoction	Expectorant
Caryophyllaceae	<i>Silene compacta</i> , ÖK 4999	Kanlıbasıraotu	Leaves	Compress	Wound healing
Caryophyllaceae	<i>Silene vulgaris</i> var. <i>vulgaris</i> , ÖK 5251	Ecibücü	Leaves	Decoction	Diarrhea, Digestive
Caryophyllaceae	<i>Vaccaria pyramidata</i> var. <i>grandiflora</i> , ÖK 5881	Ekinebesi	Flowers	Infusion	Constipation treatment
Convolvulaceae	<i>Convolvulus betonicifolius</i> subsp. <i>peduncularis</i> , ÖK 4944	Tarla sarmaşığı	Aerial parts, leaves	Raw, Infusion	Hemorrhoid, animal feed
Equisetaceae	<i>Equisetum ramosissimum</i> , ÖK 5683	Eğrelti, Atkuyruğu	Aerial parts	Decoction, Infusion	Kidney stones, diuretic
Euphorbiaceae	<i>Euphorbia denticulata</i> , ÖK 5104	Sütleşen	Latex	Latex is used externally	Wound healing
Euphorbiaceae	<i>Euphorbia macroclada</i> , ÖK 4872	Sütleşen	Latex	Latex is used externally	Fungal treatment
Fabaceae	<i>Ebenus haussknechtii</i> , ÖK 5672	Morgeven	Flowers	Infusion	Kidney aches
Fabaceae	<i>Lathyrus vinealis</i> , ÖK 5267	Mürdümük	Seeds	Raw	Eaten raw
Fagaceae	<i>Quercus petraea</i> subsp. <i>pinnatifloba</i> , ÖK 5572	Meşe	Aerial parts	Whole plant	Used as fuel
Hypericaceae	<i>Hypericum perforatum</i> , ÖK 3309	Kantaron, Binbirdelik otu	Aerial parts, flowers	Decoction, Infusion	Abdominal ache, digestive, hemorrhoids
Hypericaceae	<i>Hypericum scabrum</i> , ÖK 5686	Kantaron, yara otu, mideotu	Aerial parts	Decoction, Infusion	Gastrointestinal disorders, relaxation, insomnia
Iridaceae	<i>Gladiolus atroviolaceus</i> , ÖK 5726	Kılıçotu	Rhizome	Raw	The plant is eaten raw
Juglandaceae	<i>Juglans regia</i> , ÖK 5648	Ceviz	Leaves, fruits	Infusion, raw	High Cholesterol, the fruit is eaten raw
Lamiaceae	<i>Lallemantia iberica</i> , ÖK 4624	Ajdarbaşı	Aerial parts	Infusion	Stomachache, kidney stones
Lamiaceae	<i>Marrubium astracanicum</i> subsp. <i>astracanicum</i> , ÖK 5843	Bozotu	Aerial parts	Infusion	Antipyretic, cold
Lamiaceae	<i>Mentha longifolia</i> subsp. <i>typhoides</i> var. <i>typhoides</i> , ÖK 5878	Nane	Aerial parts, leaves	Raw, Infusion, Decoction	Cold and flu, used as a spice, stomachache, sedative
Lamiaceae	<i>Nepeta nuda</i> subsp. <i>lydia</i> , ÖK 5760	Kedinanesi	Aerial parts, leaves	Infusion	Common cold, used as tea
Lamiaceae	<i>Origanum acutidens</i> , ÖK 5231	Mercanköşk	Aerial parts, flowers	Infusion, raw	Additive in soaps and meals, Abdominal ache,
Lamiaceae	<i>Origanum vulgare</i> subsp. <i>gracile</i> , ÖK 5026	Mercanköşk	Aerial parts	Infusion	Cough, diabetes, stomach disorders
Lamiaceae	<i>Prunella vulgaris</i> , ÖK 5204	Acfesleşen, dağçayı	Aerial parts	Infusion, raw	Wound healing, Abdominal ache
Lamiaceae	<i>Salvia verticillata</i> subsp. <i>verticillata</i> , ÖK 4708	Adaçayı	Leaves	Infusion	Common cold
Lamiaceae	<i>Salvia multicaulis</i> , ÖK 5527	Adaçayı	Aerial parts,	Infusion, Decoction	Diabetes
Lamiaceae	<i>Satureja hortensis</i> , ÖK 5933	Kayakekiği	Aerial parts,	Infusion, Decoction, Raw	Sedative, used soap and meals, increase the body resistance
Lamiaceae	<i>Teucrium parviflorum</i> , ÖK 5023	Koyunotu	Aerial parts,	Infusion	lowering blood pressure
Lamiaceae	<i>Teucrium polium</i> , ÖK 4685	Kısamahmut	erial parts,	Infusion,	Cold, abdominal ache, diabetes

				Decoction	
Lamiaceae	<i>Thymus kotschyanus</i> var. <i>kotschyanus</i> , ÖK 4992	Kekik	Aerial parts, leaves	Infusion, raw	Cold, used as spices in soaps and salads
Malvaceae	<i>Malva neglecta</i> , ÖK 4847	Ebegümece, Ebemgümeç	Aerial parts	Decoction, external	Wounds and cuts, abscessed diseases, rheumatism
Malvaceae	<i>Alcea calvertii</i> , ÖK 5890	Hatmi	Leaves	Externally	Wounds and cuts
Moraceae	<i>Ficus carica</i> subsp. <i>carica</i> , ÖK 5019	İncir	Latex	Externally	Wounds and cuts
Moraceae	<i>Morus nigra</i> , ÖK 4757	Karadut	Fruits	Raw	Eaten raw
Plantaginaceae	<i>Plantago major</i> subsp. <i>intermedia</i> , ÖK 5790	Sinirotu	Leaves	Externally, raw	Wound cuts, leaves eaten after cook
Polygonaceae	<i>Rumex acetosella</i> , ÖK 4848	Kuzukulağı	Fresh leaves	Eaten raw	Digestive
Portulacaceae	<i>Portulaca oleracea</i> , ÖK 5941	Semizotu	Aerial parts	Cooking	Used in salads and eating after cook
Rosaceae	<i>Crataegus monogyna</i> subsp. <i>monogyna</i> , ÖK 5806	Aliç	Fruits	Eaten raw	Eaten raw
Rosaceae	<i>Malus sylvestris</i> subsp. <i>mitis</i> , ÖK 5598	Elma	Fruits	Eaten raw	Eaten raw
Rosaceae	<i>Potentilla reptans</i> , ÖK 4712	Başparmakotu	Aerial parts	Decoction	Wound healing
Rosaceae	<i>Amygdalus communis</i> , ÖK 4865	Badem	Fruits	Eaten raw	Eaten raw
Rosaceae	<i>Rosa canina</i> , ÖK 5285	Kuşburnu	Fruits	Decoction	Common cold
Rosaceae	<i>Pyrus elaeagnifolia</i> subsp. <i>elaeagnifolia</i> , ÖK 4866	Armut	Fruits	Eaten raw	Eaten raw
Solanaceae	<i>Hyoscyamus niger</i> , ÖK 4891	Banotu	Aerial parts	Compress	Wound healing
Urticaceae	<i>Urtica dioica</i> , ÖK 5608	Isırganotu	Aerial parts	Infusion, raw	Used in cooking, lowering blood pressure
Xanthorrhoeaceae	<i>Eremurus spectabilis</i> , ÖK 5602	Çiriş otu	Fresh leaves	Raw	Eaten raw, meal is done

Table 1. Used plants in the study area

RESULTS AND DISCUSSION

In this study, 71 plant taxa belonging to 63 genera and 28 families were recorded used for medicinal, food and others purposes (Table 1). The most encountered plant families were Asteraceae (16 taxa), Lamiaceae (13 taxa), Rosaceae (6 taxa); other families are Caryophyllaceae (4), Boraginaceae (3), Brassicaceae (2), Euphorbiaceae (2), Fabaceae (2), Amaranthaceae (2), Moraceae (2), Hypericaceae (2), Malvaceae (2), Acanthaceae (1), Apiaceae (1), Asclepiadaceae (1), Cupressaceae (1), Convolvulaceae (1), Equisetaceae (1), Fagaceae (1), Iridaceae (1), Juglandaceae (1), Plantaginaceae (1), Polygonaceae (1), Portulacaceae (1), Solanaceae (1), Urticaceae (1) and Xanthorrhoeaceae (1), families distribution ratio of study area are seen in Figure 2.

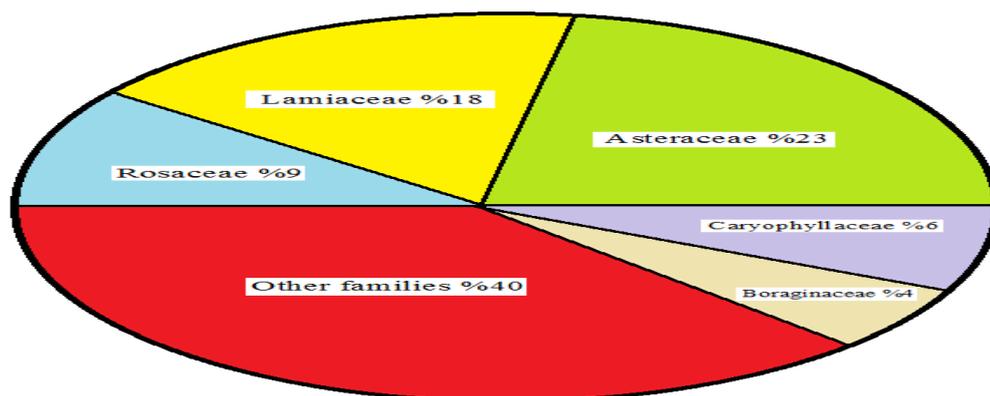




Fig. 2. Distribution ratio families of study area

In our survey, the most frequently used plant parts were, aerial parts, leaves, flowers and others. Current state shows that people are conscious about plants uses and each part of plant could be different effects. Infusion and decoction are generally the preparation method of choice, the other preparation methods cooked, as fresh, latex, raw and which are used by the tribal peoples against about cited diseases in Table 1. People in the study area are used wild plants different purposes, most frequently for the threatment of kidney stones, colds and flu, abdominal ache, stomachache, food, skin diseases, constipation, cough and diabetes diseases. *Mentha longifolia*, *Malva neglecta*, *Hypericum perforatum*, *Rosa canina* and *Thymus kotschyanus*, *Achillea biebersteinii*, *Urtica dioica* were the plants most used by the local people in research area. The used plants are presented in Table 1, followed by plant family name, botanical name with collected numbers, Turkish vernaculare name, the used plant parts, preparations and uses are given. The uses of plant taxa are were recorded for the first time in the research area. Representatives from the genus *Achillea*, *Heracleum*, *Mentha*, *Malva*, *Plantago*, *Thymus*, *Salvia* and *Urtica* were thereby reported by almost 80% of the informants that used these species in preparations. In the research area, local people were found to use 71 plants from 28 families for different purposes; in the literature amajority of these plants are also used different purposes (13). By drying of these plants, local people use them for infusions or decoctions during the whole seasons of the year. "Elderly population is in majority in our field of study and they have more information about herbs compared to the younger ones. Herbal treatment has become a tradition for the residents of the study region. People residing in the region through long years are more knowledgeable about herbs than the ones residing for few years. Womens know more about herbs than men and most commonly used parts of the plants were the leaves, flowers and aerial parts" (6). Comparison of the data obtained in this study from the plants growing in Aşağıköy, Ortaköy, Yelesen, Şaban, Dikme and Çiriş villages with the experimental data obtained from ethnobotany studies proved most of the ethnobotanical usages (4). Literature review showed that curative plants of studied villages are used in different parts of the world and Turkey in the treatment of the same or similar diseases. If a plant is used to treat the same disease in different places across the world and country, its pharmacologic effect could be accepted. It would be beneficial to conduct pharmacologic studies on such plants, like some plants in Table 1. Therefore, it is suggested that such ethnobotanical studies have significant contributions to indigenious ethnobotanical knowledge as well as the studies of the sourcing of raw materials for the development of commercial pharmaceuticals. Natural vegetation in the studied area is threatened by such factors; erosion, unsustainable picking of plants to generate income and especially grazing. Steps should be taken immediately to ensure the inclusion of relevant flora within conservation designations. This study identified not only the wild plants collected for medical purposes by local people of studied villages from Bingol in the Eastern Anatolia Region, but also different uses of these plants. It is tried to generate a source for persons studying in ethnobotany, pharmacology and chemistry sciences by comparing knowledge gained from traditionally used herbs with previous laboratory studies. In the literature there are some laboratory studies with the plants in Table 1 (14,15). When Dr.Kilic studied flora of studied area ⁹, he also interwieved some people in the research area to get information about uses of plant different purposes; threfore this ethnobotanic study appeared. Most of the villages people rely upon surrounding plant wealth for their health-care, food and other life accessories.

In conclusion, ethnobotanical studies not only provide insights into the past man and plant relations and also give abundant data for advancement on numerous fronts such a food, medicine and culture. Globalization and advanced in technology impacts have brought many changes in the life of humankind. Peasantry are also changing their lifestyles according to the globalization. The old generations of the villages have an enormous knowledge about the useful plants and this knowledge is transmitted orally from one generation to another generation. Unfortunately, the younger generation is not interested to know this traditional from their ancestors. Hence, there is an urgent need for documenting their folklore and traditional knowledge becomes unattainable and extinct. The present generation should mainly focus on this task and collect the information from these groups and preserve for future generations and future study. With this ethnobotanical investigation generated important information recorded and documented fort the first time; that might be useful for health-care programme, economic agricultural policy development, alternative food programme, and development of essential drugs for Eastern Anatolian Region.

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