Indian Journal of Traditional Knowledge
Vol 24(10), October 2025, pp 955-965
DOI: 10.56042/ijtk.v24i10.14842

Ethnobotanical knowledge of Artuklu district (Mardin) Türkiye high school students

Murat KILIÇ

Department of Horticulture, Kızıltepe Faculty of Agricultural Sciences and Technologies, Mardin Artuklu University, 47200 Mardin, Artuklu, Türkiye

E-mail: muratkilic04@gamil.com

Received 02 December 2024; revised 13 September 2025; accepted 06 October 2025

Documentation of traditional ethnobotanical knowledge from past to present is valuable in terms of sustainability and use of natural resources and should be done before this rich heritage is lost. Therefore, this study aims to determine the knowledge of students about plants used ethnobotanically in their living environments and to transfer this valuable information to future generations by recording it. The research was conducted with 213 students in a total of 8 high schools, 4 of which are located in the Artuklu district center and 4 high schools in 4 large rural neighborhoods where students from almost every rural neighborhood are educated. Structured and semi-structured face-to-face survey interviews were conducted to collect information about ethnobotanical uses of plants. According to the information received from the high school students, it was determined that 48 taxa belonging to 27 families were used by the local people for medicinal and food purposes. The most frequently used families were Apiaceae, Asteraceae, Brassicaceae, Fabaceae, Rosaceae and Lamiaceae. The highest usage values (UV) were recorded in *Malva neglecta* (0.37), *Gundelia tournefortii* (0.32), *Centaurea hyalolepis* (0.24), *Lepidium draba* (0.24) and *Portulaca oleracea* (0.23). It was observed that students living in the rural areas of the district had more knowledge about wild plants than students living in the district center. However, it was also seen that having knowledge about plants with ethnobotanical use and understanding the importance of this knowledge was not sufficient for the continuity of traditional knowledge.

Keywords: Artuklu, Ethnobotany, High school, Local knowledge, Turkey, Türkiye, Use value

IPC Code: Int Cl.[25]: A61K 36/00

Increased education in science, conservation, and/or the culturally specific, custom-framed knowledge, is one of the main strategies for conserving traditional knowledge[1,2]. Additionally, many researchers have noted that age and ethnobotanical knowledge are strongly positively correlated[2,3]. Furthermore, Reyes-García *et al.*[2] reported that their results, which showed a favorable association between school years and degree of traditional knowledge, support the use of the educational system to spread folk knowledge. Traditional knowledge studies, in which students work in groups to learn from one another, lend credence to this viewpoint.

Turkey's multi-cultural society is a result of its geographic location in Anatolia, which is regarded as the cradle of civilizations. From the perspective of traditional knowledge, Turkey is rich in diversity. Nonetheless, Turkey is not exempt from the widespread issue of the challenges associated with preserving traditional knowledge and passing it on to future generations. In addition, although research on this subject has increased in Turkey and Mardin[4,5] in recent years, it is far from being sufficient.

The Artuklu district of Mardin province, which was selected as the study area, has a very important place in world culture. Artuklu is one of the few cities in the world that has been able to carry its culture and architecture to the present day. This region is home to not only different cultures, but also communities of people from different religions. In addition to Turkish, Kurdish and Arabic languages are also spoken in the region. The wild vegetation of the region is being replaced by shopping malls and retirement complexes with their own playgrounds and other facilities. This trend is one of the main reasons for the loss of biodiversity in places like Artuklu. As a result of the decrease and loss of this diversity, our children will have little or no knowledge about the plants in their living spaces tomorrow. This situation is also valid for plants with ethnobotanical use. It is very important for high school students living and studying in this region to be aware of the diversity in their social environment and to know the plants that have ethnobotanical use, to share this with their families and receive information from them, and to pass this knowledge on to the

future. In this respect, the reason for choosing this district is that it hosts very different cultures, has a rich plant diversity, and that no study has been conducted to date to measure students' ethnobotanical knowledge.

The aim of this study is thus to determine the current level of knowledge and the conceptualization of plants used ethnobotanically in students' social environments. This study will contribute to the development of teaching strategies for the preservation of traditional knowledge and its transfer to future generations.

Literature review

Students' ethnobotanical knowledge in Türkiye and some countries

Literature review measuring the ethnobotany or plant identification knowledge of students in Turkey. 155 high school students participated in a study for assessing the knowledge of students on the medicinal use of ethnobotanical plants in Izmir province, and it was seen that the plants belonging to the families Lamiaceae (5 species), Liliaceae (2), Moraceae (2), Rosaceae (2) were widely used by the local people[6]. In a study conducted in Trabzon province, tests, surveys and interviews were applied to the 9th grade students in order to determine their awareness levels about the plants in their immediate environment, and it was observed that the many students did not know the names of many plants in their immediate environment in their responses to the plant photographs and therefore their recognition levels were low[7]. In 2010-2011, 115 students were asked to identify 57 plants they could see the most in the 8th grade of Başgedikler 60th Yıl Boarding Primary Regional School in Kars province, and all of them could correctly identify *Polygonum* sp., *Urtica dioica*, *Allium cepa*, *Zea mays* plants though most of them did not know their benefits[8]. In order to determine the awareness of high school students living in the Midyat region on ethnobotany, a survey was conducted with 144 students studying at Söğütlü Anatolian High school and Şenköy Anatolian High school dueing 2023-2024 academic year, and it was observed that out of the 23 most used plants, the students were more familiar with *Vitis vinifera*, *Triticum aestivum*, *Anthemis* sp., *Ficus carica*, *Alcea* sp., *Teucrium polium* and that these plants were used as food and beverages[9]. It was also concluded that the students' awareness of scientific studies on plants was at a good level, but their awareness of the ethnobotany branch was at a low level.

Ethnobotanical studies conducted across different regions of Türkiye reveal a rich diversity of plant species, shaped by the unique ecological and cultural characteristics of each area. As a result, local communities tend to utilize different plants, leading to variations in the plant families and species commonly reported in the literature. In regional studies, although certain plant families are frequently cited, notable differences often emerge in the most commonly used species within those families. These differences can largely be explained by the abundance and accessibility of particular plants in the local environment, as communities often rely on the most readily available species for medicinal and nutritional purposes[4,5]. The findings of the present study are consistent with previous research, further supporting the idea that individuals living in the same region influence each other through shared knowledge and practices related to plant use.

Similar studies have also been conducted in other countries measuring students' ethnobotanical knowledge. In a study conducted to collect information on the uses of medicinal plants among students in some elementary grades of a small community on the western shores of Lake Como (Northern Italy), 24 medicinal species were reported to be used[10]. In another study aimed at raising awareness of Dominican and Latino health traditions, students received training in botanical identification, plant collection, ethnobotanical interviewing, and data management. As a result, they gained proficiency in these areas and developed a greater appreciation of Dominican medicinal plant knowledge[11]. Similarly, a 2011 survey of 9th-grade students at the "Decisão" Primary School in Pombal (Brazil) identified 27 species from 19 plant families, with Lamiaceae, Fabaceae, and Anacardiaceae being the most represented. The most commonly used plant parts were roots, bark, fruits, and flowers, and the main preparation methods were teas, juices, and syrups. These remedies were primarily used to treat flu, inflammation, headaches, kidney pain, fever, diarrhea, and painful urination[12].

Although the specific plants and families vary across countries, these studies show that students generally lack knowledge of local plant species. However, educational programs can significantly improve their awareness. This lack of knowledge is often due to factors such as the widespread use of social media, the limited presence of knowledgeable

elders, and the decreasing availability of medicinal plants in their environments. These challenges contribute to the erosion of ethnobotanical knowledge and hinder its transmission to future generations.

Materıals and Methods

Study area

Artuklu District, spread over an area of 860 km^2 situated between 37°33'59"-37°06'20" N and 40°33'19"-41°04'21" E. geographical limits. It is located in the center of Mardin province in Southeastern Anatolia Region's southeast, and borders the Upper Mesopotamia basin that stretches from the mountainous area. The district adjoins Savur to the north, Yeşilli, Ömerli, and Nusaybin districts to the east, the Syrian State boundary to the south, and Kızıltepe and Mazıdağı districts to the west (Fig. 1). The Mesopotamian region between the Euphrates and Tigris rivers has hosted many civilizations throughout history. Artuklu, an ancient settlement in Upper Mesopotamia, was founded on a mountain summit and was under the control of various civilizations (Assyrian, Sumerian, Babylonian, Persian, Byzantine, Seljuks, Artuqids, and Ottomans) since 4500 BC[13].

The district's territory consists of a mountainous part that covers approximately 370 km^2 (43%) in the northern region, extending east-west and forming a large mass at an average height of 600 meters above the plain. The altitude exceeds 1000 meters in some parts[13]. This situation causes an increase in plant diversity. In order to investigate the ethnobotanical use of this diversity and its awareness by students, surveys were conducted with 213 students studying in 8 high schools, including 4 high schools in the Artuklu district center (Artuklu Imam Hatip, Mardin Anatolian, Mardin Science, Artuklu Vocational and Technical Anatolian) and 4 large rural high school where students from almost every rural neighborhood are educated (Fehim Adak Vocational and Technical Anatolian, Gökçe Multi-Program, Kabala Multi-Program, Ortaköy Multi-Program) (Fig. 2).

Data collection and sampling techniques

In order to determine the participants of this study, face-to-face interviews were conducted with students studying in five different high schools in Mardin, Turkey in 2021, and a structured and semi-structured questionnaire was applied. Of the 213 students who participated in the survey, data was obtained from only 155 students who had knowledge about the ethnobotanical use of plants. Following the interviews, 155 male and female students who reported using herbal remedies at least once and having (more or less) knowledge of ethnobotanical plants were chosen to participate in the study. Ninety-seven male and fifty-eight female high school students participated in the study. The pupils were between the ages of 14 and 19.

Information including various data such as local names, ailments and diseases treated, plant parts used for food, and preparation methods were obtained from the students through individual and face-to-face interviews. All of the information provided by the students was recorded at the conclusion of the semi-structured and structured interviews. Identification of plants mentioned in the surveys was done by using common names and comparing with pictures to verify that it was the same plant, and books and scientific articles were used as references as appropriate material on medicinal and food plants. Popular names of plants and reported indications are listed without corrections, as described by the surveyed persons[14-21]. Their knowledge about ethnobotanical plants and their uses, their thoughts about the sources and benefits of this information were carefully examined and summarized in tables.

Use value

The use value (UV) demonstrates the relative importance of plants known locally. It was calculated using the formula: UV=ΣUi/N. Where Ui is the number of uses mentioned by each informant for a given species and N is the total number of informants[22,23]. A high UV indicates the potential importance of the plant species reported.

Fig. 1 — Location of the study area (Artuklu, Mardin-Türkiye) (https://tr.wikipedia.org)

Results and Discussion

Students' traditional knowledge about ethnobotany

The present study in Mardin revealed that 48 taxa belonging to 27 familes of ethnobotanical plants are used by the local people for medical, food and other purposes (Table 1). Together with pertinent details like the family, local name, mode of application, plant parts used, etc., these are tabulated and categorized according to their botanical names.

A closer look at the families revealed that the Asteraceae family has the most species (7 species), followed by the Fabaceae (4), Brassicaceae (4),

Fig. 2 — View from some of the high schools surveyed, (a) Gökçe Multi-Program Anatolian High school, (b) Kabala Multi-Program Anatolian High school, (c) Fehim Adak Vocational Technical Anatolian High school, (d) Ortaköy Multi-Program Anatolian High school

Table 1 — The list of plants used in ethnobotanical and other uses in questionnaires conducted in high schools in Artuklu (Mardin-Türkiye)

No	Family	Plant species	Local name of Artuklu	Plant part(s) used	Preparations	Ethnobotanical use	Administration	Ui (N: 155)	UV
1	Amaryllidaceae	*Allium orientale* Boiss.	Sirim, Surüm (K)	Aerial parts	Fresh	Brain tumor diseases Immune booster Stomach ache Eat raw As food	Peroral	6	0.04
2	Anacardiaceae	*Pistacia khinjuk* Stocks.	Kennêr (K), Bıttım, bıtım (A)	Fruit, seed	Soap Dried Fresh	Skin disease Hair fall Laxative Appetizer	Peroral	8	0.05
3		*Rhus coriaria* L.	Sumak (T), Sımak (K), Sımmak (A)	Fruit, seed	Dried	Spice	Peroral	6	0.04
4	Apiaceae	*Coriandrum sativum* L.	Kişniş (T)	Fruit, seed	Dried	Antiemetic Head ache Spice	Peroral	4	0.03

(Contd.)

Table 1 — The list of plants used in ethnobotanical and other uses in questionnaires conducted in high schools in Artuklu (Mardin-Türkiye) — (Contd.)

No	Family	Plant species	Local name of Artuklu	Plant part(s) used	Preparations	Ethnobotanical use	Administration	Ui (N: 155)	UV
6		*Scandix pecten-veneris* L.	Hırfraf (A)	Leaf	Fresh	Salad	Peroral	5	0.03
7	Araceae	**Biarum carduchorum* (Schott) Engl.	Kardin, kardi, tırşgardi (K), Zıbebuebıd, zıbbıdeebıd, zıbebuebid (A)	Leaf	Decoction Boiled	Cancer Diabetes Wrap meal Soup	Peroral	8	0.05
8	Asparagaceae	*Ornithogalum narbonense* L.	Sersipik (K)	Corm, aerial parts	Fresh	As food Eat raw	Peroral	3	0.02
9	Asteraceae	*Achillea aleppica* DC.	Isfaysara (A)	Aerial parts, leaf, inflorescence	Infusion	Stomach ache	Peroral	7	0.05
10		*Anthemis cotula* L.	Papatya (T), Papatya, Beybun, beybuniç (K) Beybuniç, beybunıç, beybuniçi, beybünüç (A)	Aerial parts, inflorescence	Infusion	Common cold Cough Flu Stomach ache Head ache Sedative Bronchitis	Peroral	19	0.12
11		*Centaurea hyalolepis* Boiss.	Strizerk, sitrizerk, strizerg, stırızek, hıstrizerk (K), Şevketıl kelbe, şevkitil kelbi, şevkıtıl kebli, şevkit kelbi, şevkıt kebi (A)	Base leaf	Decoction Roasted	Cancer treatment Stomach ache Immune booster As food	Peroral	37	0.24
12		*Gundelia tournefortii* L.	Kenger, kengel (T), Kereng, kerenk, keleng, gereng, ğerenk (K), Harşaf, harşef, harçef, herşef (A)	Root	Decoction, roasted Roasted Decoction	Anemia Diabetes Wart Treatment Flu Sore throat As food Head ache Stomach ache	Peroral	50	0.32
13		*Notobasis syriaca* (L.) Cass.	Kivar, kelbeş (K), Kelbeş (A)	Stem	Fresh	As food Eat raw	Peroral	3	0.02
14		*Vicia narbonensis* L.	Bakıl, Şolık (K), Bekıli, keşun (A)	Seed	Fresh	Immune booster Stomach ache Eat raw	Peroral	19	0.12
15	Fagaceae	*Quercus brantii* Lindl.	Dara beru, beru, bêru (K), Ballot, balot (A)	Seed	Fresh	Stomach ache Appetizer Diabetes	Peroral	6	0.04
16	Hypericaceae	**Hypericum triquetrifolium* Turra	Batov, botav (K), Aran (A)	Aerial parts	Decoction	Diabetes Cardiac diseases Head ache Wounds and cuts	Peroral	5	0.03
17	Iridaceae	*Crocus cancellatus* subsp. *damascenus* (Herb.) B. Mathew	Pivok (K), Hilhileyi, helheleye, ıhleyye, ihleye (A)	Bulb	Fresh	Immune booster Eat raw Salad	Peroral	16	0.10

(Contd.)

Table 1 — The list of plants used in ethnobotanical and other uses in questionnaires conducted in high schools in Artuklu (Mardin-Türkiye) — (Contd.)

No	Family	Plant species	Local name of Artuklu	Plant part(s) used	Preparations	Ethnobotanical use	Administration	Ui (N: 155)	UV
18	Juglandaceae	*Juglans regia* L.	Ceviz (T)	Seed	Fresh	Snack	Peroral	5	0.03
19	Lamiaceae	*Mentha* x *piperita* L.	Nane (T), Punk, pundik, pundık (K), Nınhe, nınaa, ninha, nıhe, nine, mınhe (A)	Leaf	Decoction Infusion Fresh Dried Juice	Flu, throat ache Common cold Head ache Flavoring Spice Mental health	Peroral	23	0.15
20		*Teucrium polium* L.	Pujda (K), Câdê, cede, cîdi, cidi, cıdi, cıdiy, cidiri, ciidiri, cıgdi, cixdi (A)	Aerial parts, flower	Infusion Fresh	Stomach ache Diarrhea cutter Diabetes Icterus gravis Flu Gas pains (baby) Stomach ache	Peroral	29	0.19
21		*Thymbra spicata* L.	Cehter, cahteri (K), Zahter (A)	Aerial parts, leaf	Dried Decoction Dried	Shortness of breath and respiratory distress Bronchitis Flu Cough Cholesterol lowering Spice	Peroral	9	0.06
22	Malvaceae	*Alcea setosa* (Boiss.) Alef.	Hatmi çiçeği, hatimi çiçeği (T), Hıtmiye, hiro (K), Hıtmi, xitmiyye (A)	Flower	Decoction (with milk) Infusion	Cough Flu Common cold Breast softener Asthma Bladder infection	Peroral	19	0.12
23		*Malva neglecta* Wallr.	Ebe gümeci (T), Tolık, tolik, talık, dolık, golık, toğlık (K), Ğıbbezê, ğibbes, ğıbbez, gıbez, gıbbez, hıbaz, hıbbas, hıbbes, hıboz, hibbos, xıbbes, xıbez, xibes (A)	Leaf	Fresh Boiled Infusion Roasted Decoction	Salad As food Gynaecological diseases Footache Hair fall Liver Anti-inflammatory Pastry As food Stomach ache	Peroral	58	0.37
24	Moraceae	*Ficus carica* L.	İncir (T)	Fruit	Fresh Latex	Stomach ache Callus	Peroral Externally	4	0.03
25	Nitrariaceae	*Peganum harmala* L.	Harmel, Hermel (K), Hermel (A)	Fruit, seed, aerial parts,	Incense Burn Decoction	To protect against evil eye and magic Shortness of breath	Externally	13	0.08
26	Platanaceae	*Platanus orientalis* L.	Çınar (T, K)	Leaf	Infusion	Renal lithiasis	Peroral	4	0.03
27	Polygonaceae	*Rumex acetosella* L.	Kuzu kulağı (T), Tırşok, tirşoh (K), Hımmayza, hameyza (A)	Leaf	Fresh	Body resistance Salad	Peroral	11	0.07

(Contd.)

Table 1 — The list of plants used in ethnobotanical and other uses in questionnaires conducted in high schools in Artuklu (Mardin-Türkiye) — (Contd.)

No	Family	Plant species	Local name of Artuklu	Plant part(s) used	Preparations	Ethnobotanical use	Administration	Ui (N: 155)	UV
28	Portulacaceae	*Portulaca oleracea* L.	Semizotu (T), Parpar, pırpar, pırpere (K), Pırperê, pırpere, pirperi (A)	Leaf, aerial parts	Fresh Roasted Decoction	Throat ache Diabetes Common cold Salad Pastry Tzatziki Stomach ache	Peroral	36	0.23
29	Ranunculaceae	*Nigella arvensis* L.	Çörek out (T), Habbıt bereke (A)	Seed	Fresh Dried	Intestinal diseases Eye treatment Diabetes Asthma Head ache Spice	Peroral	8	0.05
30	Rosaceae	*Crataegus azarolus* L.	Guhij, guhij, guij, guhiş (K), Izaran, ızalan, izaran, iyzaran (A),	Fruit Leaf	Decoction Fresh Infusion	Diabetes Heart diseases Cough Eat raw Nephrite Renal lithiasis	Peroral	21	0.14
31		*Prunus mahaleb* L.	Mahlep (T), Kênnır, Kenêr (K), Mahlep, mehlep (A)	Seed, fruit	Fresh Dried Decoction	Stomachache Diabetes Gas pains Muffin Headache Pastry Respiratory disease	Peroral	30	0.19
32		*Rosa canina* L.	Gül (T)	Leaf Flower, seed	Decoction Infusion Fresh	Asthma, Flu Common cold Eat raw, Jam	Peroral	5	0.03
33		*Rubus sanctus* Schreb.	Irk ılleyk, ıllek (A)	Flower, fruit, seed	Fresh	Eat raw	Peroral	6	0.04
34	Urticaceae	*Urtica dioica* L.	Isırgan otu (T), Gezgezok, gezgezog, gezgezık, gezgezk, gezgez (K), Gezgezk, gezgez, hezgızok (A)	Aerial parts Leaf	Decoction, infusion Mash Decoction	Cancer Anti-inflammatory Cardiac disease As food Rheumatism Hair fall	Peroral External	22	0.14

A: Arabic, K: Kurdish, T: Turkish * Has harmful effects

Rosaceae (4), Apiaceae (3), and Lamiaceae (3). Two species each are represented in the Anacardiaceae and Malvaceae families. Each of the other 19 families was represented by one species (Fig. 3).

When results of this study were compared with previous studies on the ethnobotanical uses of plants in the region, the following results were obtained: Rosaceae (10 species), Asteraceae (9), Lamiaceae (6), Cucurbitaceae (6), Solanaceae (4), Malvaceae (4), Fabaceae (4)[20]; Asteraceae (15), Lamiaceae (11), Fabaceae (9), Rosaceae (6)[4]; Asteraceae (10), Rosaceae (7), Fabaceae (6), Lamiaceae (4)[24];

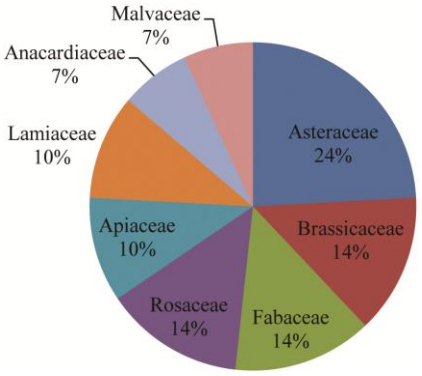

Fig. 3 — The most common families

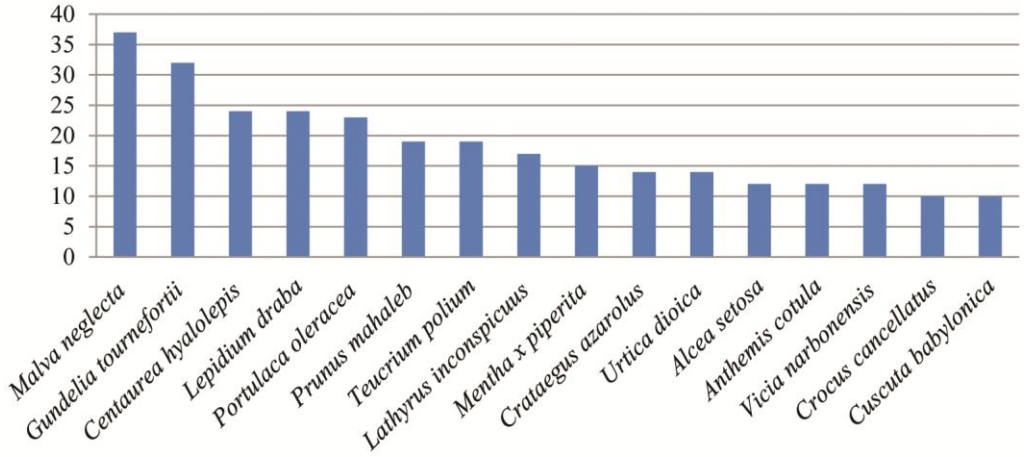

Fig. 4 — Use Value (UV>10) of the most relevant species

Asteraceae (19), Brassicaceae (10), Fabaceae (9), Rosaceae (9), Apiaceae (7)[14]; Asteraceae (26), Fabaceae (24), Lamiaceae (16), Rosaceae (15), Apiaceae (10), Amaryllidaceae (9), Poaceae (7), Brassicaceae (6), Papaveraceae (6), Malvaceae (6)[15]; Asteraceae (17), Lamiaceae (10), Fabaceae (7), Rosaceae (6)[15]; Fabaceaea (21), Lamiaceae (11), Asteraceae (10), Brassicaceae (10)[25] and there were reported to be widely used by local people in Mardin.

The findings of this study and the others cited indicate that students are more adept at identifying plant species, particularly those belonging to the Asteraceae family. Students' greater familiarity with members of the Asteraceae family may be due to the fact that members of this family, particularly *Gundelia tournefortii*, *Centaurea hyalolepis*, and *Anthemis cotula* widely occur and used among the Artuklu people against common diseases such as Common cold, cough, diabetes, flu, stomach ache and are also consumed abundantly as food. In addition, *Malva neglecta*, *Lepidium draba*, *Portulaca oleracea*, *Prunus mahalep*, *Teucrium polium*, *Lathyrus inconspicuus*, *Mentha* x *piperita*, *Crataegus azarolus*, *Urtica dioica*, *Alcea setosa*, *Vicia narbonensis*, *Crocus cancellatus*, *Cuscuta babylonica* species are other important plants known by the students (Fig. 4). According to the students, while diverse portions of different plant species are utilized as food and in traditional medicine to treat various ailments, leaves are the part that is most commonly employed (25%) (Table 2). Medicinal plants can be used and applied in many ways depending on the ailment. Locals have occasionally made medication using other ingredients like milk and olive oil. The decoction and infusion of edible portions of medicinal plants is the most widely utilized technique in phytotherapy applications. The most common techniques for making folk medicine were decoction and infusion, according to an analysis of other investigations carried out in the surrounding area[4,5,24,25]. The participants of this study stated that they used both decoction and infusion methods for many herbal preparations. This result shows that the students participating in the study had difficulty distinguishing between decoction and infusion. In terms of food use, plants are generally consumed as roasted or boiled, while some plants are used as spices. Roasting and boiling are not done alone; especially onion and eggs are used in roasting, while bulgur and tomato paste are used in boiling.

Table 2 — Plant parts used by local people in the study area

Part of plant	Number	Number %
Leaves	18	25
Aerial parts	17	23.6
Seed	15	20.8
Fruit	9	12.5
Flower	6	8.3
Root	3	4.2
Stem	2	2.7
Bulb	1	1.4
Corm	1	1.4

Plant uses

Two major uses were recorded: medicinal (40 taxa) and food (33 taxa) uses. In addition, plants used as spices and appetizers are also mentioned (Table 1). Students reported using different plant parts for ethnobotanical purposes: leaves 18 (25%), aerial parts 17 (23.6%), seeds 15 (20.8%), fruits 9 (12.5%), flowers 6 (8.3%), roots 3 (4.2%), stems 3 (2.7%), bulb 1 (1.4%), and corm 1 (1.4%) (Table 2).

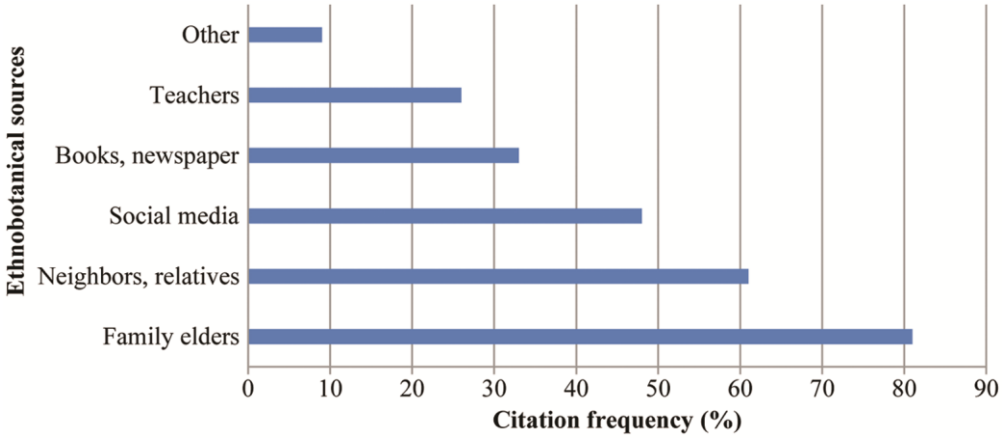

Fig. 5 — Participants' ethnobotanical knowledge sources

Use of ethnobotanical plants and their cultural contributions

According to the information provided by students, *Hypericum triquetrifolium* and *Biarum carduchorum* plants, which have ethnobotanical uses, have harmful effects when used unconsciously. For example, excessive use of *H. triquetrifolium* can negatively affect the eyes, while in the case of *B. carduchorum*, when used raw without any procedure, temporary speech impairment is observed.

Furrher, local names of some plants with ethnobotanical use can be the same in Turkish, Kurdish and Arabic. This is an indication that people from different cultures who have lived together peacefully for thousands of years have been influenced by each other. For example, the species *Urtica dioica* is called "gezgez" or "gezgezk" in Kurdish, while the local people of Arab origin use the same names. The local name of the *Portulaca oleracea* plant is expressed as "pırpere" by the local people of Kurdish and Arab origin. The plant *Lepidium draba* has many local names, while it is especially expressed as "kınnebre" by the local people of Kurdish and Arab origin. The species *Peganum harmala* can be pronounced as "hermel" in Kurdish and Arabic. Additionally, in Kurdish and Turkish, the *Platanus orientalis* plant is pronounced as "çınar" and the *Anthemis cotula* plant is pronounced as "papatya" (Table 1).

Ethnobotanical information resources

Students reported ethnobotanical information sources of the uses of wild plants in the region. Figure 5 shows the students' ethnobotanical information sources. For most participants, the main sources of ethnobotanical information were their elders (81.0% citations) indicating an oral tradition and their neighbors or relatives (61.0%). Part of the data collected in the study was based on information from social media (48.0%), which is popular among the younger generation. Less obvious sources of ethnobotanical information were books and newspapers (33.0%), which were accessible and useful for remembering and completing existing knowledge. Students also used information from other sources, defined as information from their teachers (26.0%) and people familiar with plants (9.0%).

In order to preserve local community ethnobotanical knowledge, documenting it or passing it on to others is essential. 32% of students reported that they usually share their knowledge with family members, close acquaintances, neighbors, and friends. This is not a sufficient rate to transfer knowledge to the next generations. Therefore, it would be appropriate to identify and plan school-family interactions (e.g., meetings between students and key informants) that help preserve the memory of traditional plant cultivation practices and foster intergenerational communication[10]. In addition, activities aimed at increasing children's interest in flora and natural history can last two hours each week[26].

Conclusion

The results of the study revealed that the students did not know the majority of the plants in their immediate environment at the desired level. Especially plants such as *Gundelia tournefortii*, *Centaurea hyalolepis*, *Anthemis cotula*, *Malva neglecta*, *Lepidium draba*, *Portulaca oleracea*, *Prunus mahalep*, and *Teucrium polium*, which they frequently see and use in their environment, were not mentioned by many students. In line with these results, it is recommended that the information

taught under the biodiversity unit of the curriculum should not be given only in the classroom, with a teaching style where the student is passive, and that students' awareness of both the plants in their environment and biodiversity in general should be increased by making trips to the botanical garden and the surrounding area, and by using the available resources in the immediate environment.

In addition, the young generation should be empowered to create their own sustainable future based on both internal and external resources and understand the importance of traditional knowledge and its vital role in helping human societies adapt and remain resilient. Therefore, it is critical to collect additional data on traditional and introduced practices of plants and the ways in which this medicinal knowledge is shared across society. This will help provide basic and targeted information for educational initiatives aimed at preserving the biocultural diversity of the region.

Acknowledgements

The author would like to express his gratitude to the participants who helped with this study.

Conflict of Interest

The author declares that there is no conflict of interest.

Author Contributions

The author is responsible for designing, fieldwork, data analysis, drafting of the article and providing final version for publication.

Informed Consent

Students were informed about the aims of this study and prior informed consent obtained for the publication of their images.

Ethical Statement

There is no ethical violation in this study.

Data Availability

The data supporting the findings of this study are presented within the article.

References

1 Karr J R & Thomas T, Economics, ecology, and environmental quality, *Ecol Appl*, 6 (1) (1996) 31-32.

2 Reyes-García V, Vadez V, Byron E, Apaza L, Leonard W R, *et al.*, Market economy and the loss of folk knowledge of plant uses: estimates from the Tsimané of the Bolivian Amazon, *Curr Anthropol*, 46 (2005) 251-256. https://doi.org/10.1086/432777

3 Redford K H & Stearman A M, Forest-dwelling native Amazonians and the conservation of biodiversity: interests in common or in collision?, *Conserv Biol*, 7 (2) (1993) 248-255.

4 Akgul A, Akgul A, Senol S G, Yildirim H, Secmen O, *et al*., An ethnobotanical study in Midyat (Turkey), a city on the silk road where cultures meet, *J Ethnobiol Ethnomed*, 14 (2018) 12. https://doi.org/10.1186/s13002-017-0201-8.

5 Kılıç M, Yıldız K & Kılıç F M, Traditional uses of medicinal plants in Artuklu, Turkey, *Hum Ecol*, 48 (5) (2020) 619-632. https://doi.org/10.1007/s10745-020-00180-2

6 Ugulu I & Aydın H, Research on students' traditional knowledge about medicinal plants: Case study of high schools in Izmir, Turkey, *J Appl Pharm Sci*, 01 (09) (2011) 43-46.

7 Civelek S, Secondary School 9th Grade Students' Levels of the Plant Identification in Their Environment: A Case from Trabzon. MSc thesis, Karadeniz Technical University, Trabzon, Türkiye, 2012.

8 Demirezen S, İlköğretim Öğrencilerinin Yakın Çevresindeki Biyolojik Zenginliklerinin Farkındalıkları (Kars İli Örneği). MSc thesis, Kafkas University, Kars, Türkiye, 2012.

9 Yorulmaz A, Awareness of High School Students About The Ethnobotanik of Mardin/Midyat Region (Söğütlü Köyü). MSc thesis, Necmettin Erbakan University, Konya, Türkiye, 2024.

10 Bruschi P, Sugni M, Moretti A, Signorini M A & Fico G, Children's versus adult's knowledge of medicinal plants: an ethnobotanical study in Tremezzina (Como, Lombardy, Italy), *Revista Brasileira de Farmacognosia*, 29 (5) (2019) 644-655. https://doi.org/10.1016/j.bjp.2019.04.009

11 Henderson F, Vandebroek I, Balick M J & Kennelly E J, Ethnobotanical research skills for students of underrepresented minorities in STEM disciplines, *Ethnobot Res Appl*, 10 (2012) 389-402.

12 Soares Sousa L C F, da Silva Sousa J E, da Silva Sousa J, Wanderley J A C & Borges M G B, Ethnobotany knowledge of public school students in thecity of Pombal – Pb, *Revista Verde*, 6 (3) (2011) 139-145.

13 Mardin Artuklu Municipality Strategic Plan, General Situation of Artuklu District, Available online: http://www.sp.gov.tr/upload/xSPStratejikPlan/files/6n2TQ+Artuklu_Belediyesi_20-24_SP.pdf (accessed on 11 October 2019).

14 Ayaz N, Wild plants in Mardin city, MSc thesis, Bitlis Eren University, Bitlis, Türkiye, 2020.

15 Eksik C, Ethnobotanic Study of Some Villages of Artuklu, Ömerli and Yeşilli Districts in Mardin Province, MSc thesis, Harran University, Şanlıurfa, Türkiye, 2020.

16 Davis P H, *Flora of Turkey and the East Aegean Islands*, (Edinburgh University Press), 1965-1985, Vol.1-9.

17 Davis P H, Mill R R & Tan K, *Flora of Turkey and the East Aegean Islands* (*Supplement*), (Edinburgh University Press), 1988, Vol. 10.

18 Güner A, Aslan S, Ekim T, Vural M & Babaç M T, *The checklist of Flora of Turkey (Vascular Plants)*, Flora Araştırmaları Derneği ve Nezahat Gökyiğit Botanik Bahçesi Yayını (in Turkish), 2012.

19 Akgül A, Ethnobotany at Midyat (Mardin). Msc thesis, Van Yüzüncü Yıl University, Van, Türkiye, 2008.

20 Arasan Ş, Plants Used in Folkloric Medicine in Savur (Mardin) Area and Their Application Areas. MSc thesis, Yüzüncü Yıl University, Van, Türkiye, 2014.

21 Kılıç M, An Ethnobotanical Survey on Plants Growing in Artuklu (Mardin) Region PhD. thesis, Manisa Celal Bayar University, Manisa, Türkiye, 2019.

22 Trotter R T & Logan M H, Informant Consensus: A New Approach for Identifying Potentially Effective Medicinal Plants, In: *Plants in Indigenous Medicine and Diet, Behavioural Approaches*, Etkin N L (Ed), (Redgrave Publishing Company, Bedfore Hills, New York), 1986.

23 Tardio J & Pardo-de-Santayana M, Cultural importance indices: A comparative analysis based on the useful wild plants of Southern Cantabria (Northern Spain), *Econ Bot*, 62 (2008) 24-39.

24 Yeşil Y, Çelik M & Yılmaz B, Wild edible plants in Yeşilli (Mardin-Turkey), a multicultural area, *J Ethnobiol Ethnomed*, 15 (2019) 52. https://doi.org/10.1186/s13002-019-0327-y

25 Kılıç M, Yıldız K & Kılıç F M, Traditional uses of wild plants in Mardin central district and attached villages (Turkey), *Indian J Tradit Know*, 20 (3) (2021) 784-798. doi:10.56042/ijtk.v20i3.31160

26 Cooper C L, Botanical knowledge of a group of South Carolina elementary school students, *Ethnobot Res Appl*, 6 (2008) 121-127. https://ethnobotanyjournal.org/index.php/era/article/view/166