

## Wild plants from open markets on both sides of the Bulgarian-Turkish border

Yunus Dogan<sup>1\*</sup> & Anely Nedelcheva<sup>2</sup>

<sup>1</sup>Buca Faculty of Education, Dokuz Eylul University, 35150 Izmir, Turkey; <sup>2</sup>Faculty of Biology, Sofia University "St. Kliment Ohridski", 1164 Sofia, Bulgaria

\*E-mail: yunus.dogan@deu.edu.tr

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Open markets are an integral part of urban areas that provide a means for intense sharing of knowledge and practices about plants among people from different social groups and different cultural and geographical origins. This study focuses on the diversity of wild plants found in open markets in urban areas on both sides of the Bulgarian-Turkish border, sold as food and plants for prevention, treatment and healing. Information was collected from open markets by free-listed observations and semi-structured interviews in border regions of Southern and South-eastern Bulgaria (Bg) and North-western Turkey (Tr). The present investigation was carried out through 2011-2013. A total of 41 wild plants belonging to 20 families were documented. In this study, two main groups of wild plants were outlined: medicinal and edible, sold mostly as fresh fruits, dry fruits, fresh aerial parts, preserved foods and mono-component herbal teas. The specific use of plants in the border sub-regions can be outlined as follows: as edible greens (Tr), as edible fruits (Bg), as ready-prepared herbal mixtures (Bg), as fresh herbs (Tr). *Urtica urens* (Tr) is a culturally distinctive plant as well as use of edible greens mixture (Tr) and use of the wild fruits for healthy and traditional food (Tr). Approximately 17% of the plants were common and widely reported on both sides of the border: such as *Urtica dioica*, *Rumex patientia*, *Rumex acetosella*, *Cotinus coggygria*, *Hypericum perforatum*, *Sideritis scardica* (endemic), *Rosa canina* and *Tilia* spp.

**Keywords:** Wild edible, Medicinal plants, Ethnobotany, Open markets, Bulgaria, Turkey

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Open markets in urban areas nowadays are refuges for traditional knowledge and places for disseminating new knowledge and practices about wild plants, mostly edible and medicinal plants. They show the modern dynamic by which traditional ethnobotanical knowledge is transmitted in the context of contemporary processes of development within different societies. Data on plant diversity in open markets in this region can be found in some historical sources such as travellers' itineraries of the Balkans, which basically provide data on agricultural products and agrarian crops (14<sup>th</sup>–19<sup>th</sup> century)<sup>1</sup>. Some data on the selling of wild plants can be found in botanical works about useful plants in the middle of 20<sup>th</sup> century. Several previous studies have described traditional knowledge about plants in the Bulgarian or Turkish border area and their uses in daily life such as food, spices, medicine, ornamental plants and resources for traditional handicrafts, and have focused on different areas in the Balkans, including Bulgaria and Turkey<sup>1-11</sup>. Part of a series of intensive studies in

Turkey on traditional knowledge about useful plants includes articles about North-western Turkey: the Edirne region<sup>12</sup>, Kırklareli Province<sup>13-15</sup>, the Istanbul area: Silivri<sup>16</sup>, Catalca<sup>17,18</sup>, Yalova province<sup>19</sup>, and Sile<sup>20</sup>. Different studies have shown the importance of information collected from local markets and its value as ethnobotanical data. For instance, a study of wild edible plants from the Izmir area by Dogan *et al.*<sup>21</sup> established more than 46 wild edible plant species in local markets. A study by Luczaj *et al.*<sup>22</sup> focused on herbal mixtures based on plants sold in open markets in Dalmatia (Croatia).

At the same time, modern ethnobotany has addressed, with particular interest, areas with a multicultural and multiethnic presence, especially in the Balkans<sup>11,23-25</sup>.

For these reasons, both sides of the Bulgarian-Turkish border were selected for the study area. Two communities (Bulgarian and Turks) are formed as a result of imposed transborder migration. Some of the Bulgarians are refugees and emigrants from Eastern and Western Thrace. At the other side, some of the Turks are emigrants from Bulgaria and settlers in

\*Corresponding author

Turkey from the mid-20<sup>th</sup> century up to now. Cultural heritage in similar regions is a very dynamic phenomenon. This study aims to document the diversity of wild medicinal plants sold in open markets in urban areas on both sides of the Bulgarian-Turkish border and understand their role for the local people in disease *prevention, treatment and healing*, as well as their cultural *significance*.

### Methodology

The present investigation was carried out in border regions of Southern and South-eastern Bulgaria (Bg) (Haskovo, Dimitrovgrad and Burgas) and North-western Turkey (Tr) (Edirne, Kirklareli, Demirkoy), referred to in this study as “sub-regions”. The present investigation was carried out through 2011–2013 (Fig. 1).

We studied eight open markets in 6 cities of varying size and population Bulgaria: Haskovo (1), Dimitrovgrad (1), Burgas (1) and Turkey: Edirne (2), Kirklareli (2), Demirkoy (1). Geographically Malko Turnovo is small town included in border region. The open market in Malko Turnovo is not really functional, despite the presence in the urban area of some buildings designed for this purpose.

Information was collected from open markets by free-listed observations and semi-structured interviews. Information was collected about local names, part(s) uses, local medicinal and food uses of all wild food and wild medicinal plants. The age of the informants was between 45 and 70 yrs.

Taxonomic identification and plant nomenclature followed Flora Europaea<sup>26</sup>, the Angiosperm Phylogeny Group III system<sup>27</sup> and The Plant List database<sup>28</sup>. Voucher specimens, plant samples and photos are stored in the author’s personal Ethnobotanical collection (AMN) in the Department of Botany, Sofia University.

### Results and discussion

A total of 41 wild plants belonging to 20 families were documented, Bg: 29 and Tr: 28, respectively (Table 1). In this list, the dominant plants were representatives of the families Rosaceae, Lamiaceae and Asteraceae, which were equally represented with 8 taxa each. 39% of the taxa are common to both regions (overlapping) (Fig. 2). Approximately 17% of the plants were common and widely reported on both sides of the border: such as *Urtica dioica*, *Rumex* spp., *Cotinus coggygria*, *Hypericum perforatum*, *Sideritis scardica* (endemic), *Rosa canina* and *Tilia* spp.



Fig. 1—Map of the study area

The plants documented in most (6 or 5) of the open markets were *Rosa canina*, *Cotinus coggygria*, *Hypericum perforatum*, *Sideritis scardica*, *Thymus* spp. and *Urtica dioica*. The second group of plants was sold in approximately half of the visited open markets *Rumex patientia* and *Satureja* spp. In two of the markets (one from the Bg-side and one from the Tr-side) *Cornus mas*, *Matricaria chamomilla*, *Melissa officinalis* and *Rumex acetosella* were found.

The recorded plants were sold mostly as fresh fruits (4), dry fruits (4), fresh aerial parts (7, mostly as edible greens), preserved foods (2) and mono-component herbal teas (25).

In this study, two main groups of wild plants were outlined: medicinal and edible. Wild medicinal plants prevailed significantly, with 34 taxa belonging to 16 families (Bg: 25, Tr: 23). A total of 15 wild edible plants were documented from 8 families (Bg: 8, Tr: 12) (Fig. 3). Plants that are sold as medicinal and edible include *Cornus mas*\*, *Rosa canina*\*, *Urtica dioica*\*, *Malus sylvestris*, *Malva sylvestris*, *Prunus spinosa*, *Vaccinium vitis-idea* (Bg: 4, Tr: 6). They represented 17.1% of all documented taxa. The first three plants are common to both regions (\*). These species are associated with the preparation of some traditional health foods: jelly and compote of cornels (against diarrhoea), hip jam (vitamin food, for constipation), and soups and main dishes from nettles (for their supportive action in cases of anaemia and general weakness).

Logically, open markets in urban areas with a large population are places for the sale of more wild plants (Fig. 4). The important factor here is the character of the area of the administrative district that covers every open market and the social structure of the population.

Table 1—Wild plants documented in the open markets on the study area

Taxa/Family	Bulgarian	Turkish	Used parts	Bulgaria				Turkey		
				B	H	DI	E	K	DE	
<i>Achillea clypeolata</i> Sm./Asteraceae	Жълт равнец	Yılan çiçeği	Aboveground, dry	x						
<i>Achillea millefolium</i> L./Asteraceae	Бял равнец	Sıvanperçemi	Aboveground, dry	x					x	
<i>Artemisia santonicum</i> L./Asteraceae	Сантонинов пелин	Deniz yavşan	Aboveground, dry	x						
<i>Sentaurium erythraea</i> Rafn./Gentianaceae	Червен кантаргон	Kırmızı kantaron	Aboveground, dry	x						
<i>Cornus mas</i> L./Cornaceae	Дрян	Kızılçik	Fruit, fresh/dry	x	+		x	+		
<i>Cotinus coggygia</i> Scop./Anacardiaceae	Смрадлика, тетра	Boyaacı sumacı	Leaf, dry	x		x	x		x	
<i>Crataegus monogyna</i> Jacq./Rosaceae	Глог	Alic	Fruit, fresh/dry	x						x
<i>Elytrigia repens</i> (L.) Gould/Poaceae	Плъзящ пирей	Ayrıkotu	Aboveground, dry						x	
<i>Equisetum arvense</i> L./Equisetaceae	Полски хвощ	Atkıruğu	Aboveground, dry						x	
<i>Galium verum</i> L./Rubiaceae	Еньовче	Sarı yoğurtotu	Aboveground, dry	x						
<i>Helichrysum arenarium</i> (L.) Moench/Asteraceae	Жълт смил	Altınotu	Aboveground, dry	x						
<i>Hypericum perforatum</i> L./Hypericaceae	Жълт кантаргон	Sarı kantaron	Aboveground, dry	x		x	x		x	
<i>Lavandula angustifolia</i> Mill./Lamiaceae	Лавандула	Lavanta	Flowers, dry	x						
<i>Malva sylvestris</i> (L.) Mill./Rosaceae	Киселица	Yabani elma	Fruit, dry						x	+
<i>Malva sylvestris</i> L./Malvaceae	Горски слез	Ebegümeci	Aboveground, dry				+		+x	
<i>Matricaria chamomilla</i> L./Asteraceae	Лайка	Parayata	Flowers, dry	x					x	
<i>Melissa officinalis</i> L./Lamiaceae	Магочина	Oğulotu	Aboveground, fresh/dry	x					x	
<i>Mentha</i> spp./Lamiaceae	Менга	Nane	Aboveground, dry	x						
<i>Mespilus germanica</i> L./Rosaceae	Мушмула	Muşmula	Pseudo fruits, fresh	+			x			
<i>Onopordum acanthium</i> L./Asteraceae	Магарешки бодил	Eşek dikeni	Flowers (capitula), dry	x						x
<i>Origanum vulgare</i> L./Lamiaceae	Риган	Yabani mercanköşk	Aboveground, dry	x			x		x	
<i>Papaver rhoeas</i> L./Papaveraceae	Полски мак	Gelincik	Basal leaves (rosette), fresh				+		+	
<i>Plantago major</i> L./Plantaginaceae	Жилволек	Sinirliot	Leaf, dry							x
<i>Portulaca oleracea</i> L./Portulacaceae	Тученица	Semizota	Aboveground, fresh						+	

(Contd.)

Table 1—Wild plants documented in the open markets on the study area (Contd.)

Taxa/Family	Bulgarian	Turkish	Used parts	Bulgaria				Turkey						
				B	H	DI	E	K	K	E	DE			
<i>Prunus spinosa</i> L./Rosaceae	Трънка	Çakaleriği	Fruit, fresh				x				x		x	
<i>Rhus elaeagnifolia</i> Pall./Rosaceae	Дива круша	Ahlat	Fruit, fresh/edible											+
<i>Rosa canina</i> L./Rosaceae	Шипка	Kuşburnu	Pseudo fruits, fresh/dry	x	+	x	x	x	x	x	x	x	x	+
<i>Rumex acetosella</i> L./Polygonaceae	Киселец	Kuzukulağı	Leaf, fresh	+					+					
<i>Rumex patientia</i> L./Polygonaceae	Лапад	Labada, Evelik	Leaf, fresh	+	+	+			+					
<i>Satureja</i> spp./Lamiaceae	Чубрица	Istiranca kekigi	Aboveground, dry	x	x	x							x	
<i>Sideritis scardica</i> Griseb./Lamiaceae, AMN 13-35	Мурсалски чай	Kuyruklu adacayı	Aboveground, dry	x	x	x	x	x	x	x	x	x	x	
<i>Silybum marianum</i> (L.) Gaertn./Asteraceae	Бял трън	Devedikeni	Achenes, dry											x
<i>Thalictrum aquilegifolium</i> L./Ranunculaceae, AMN 13-34	Обичниче, демир бозан	Çaуrsedefi	Leaf, dry			x				x				
<i>Thymus</i> spp./Lamiaceae	Мащерка	Kekik	Aboveground, dry	x							x		x	
<i>Tilia</i> spp./Malvaceae	Липа	Ihlamur	Inflorescence with bracts, dry	x	x	x				x			x	
<i>Trigonella foenum-graecum</i> L./Fabaceae, AMN 13-22	Сминдух	Çemenotu	Aboveground, dry	x										
<i>Urtica dioica</i> L./Urticaceae, AMN 12-6	Коприва	Isrgan	Aboveground, fresh	x	+	x	+	x	+	+	+	+	x	+
<i>Urtica urens</i> L./Urticaceae, AMN 12-4	Гръцка коприва	Bahce isirgani	Aboveground, fresh											
<i>Vaccinium myrtillus</i> L./Ericaceae	Синя боровинка	Yaban mersini	Fruits, fresh	+										
<i>Vaccinium vitis-idaea</i> L./Ericaceae	Червена боровинка	Yaban mersini	Fruits, fresh	x	+	+								
<i>Viscum album</i> L./Santalaceae	Бял имел	Ökseotu	Aboveground, dry											x
Green mixtures			Fresh											
Herbal teas mixtures			Dry	x		x		x						

x: Medicinal plants; +: Edible plants; Local markets: Bulgaria; B: Burgas, H: Haskovo, DI: Dimitrovgrad, Turkey; E: Edirne, K: Kırklareli, DE: Demirkoy

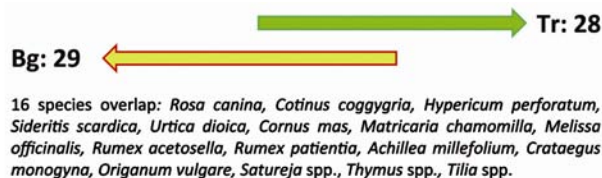


Fig. 2—Similarities in plants sold on both sides of the study area

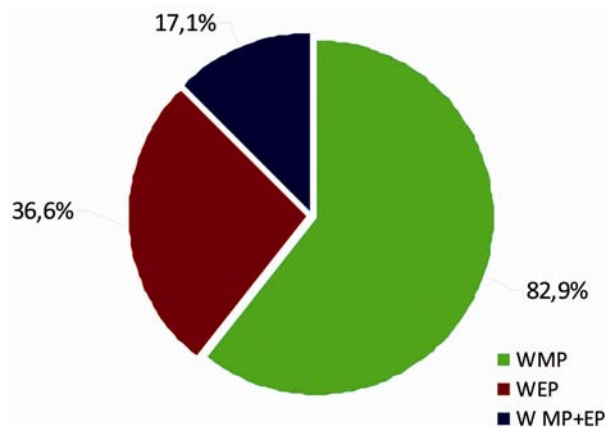


Fig. 3—Types of registered wild plants sold in the open markets: wild medicinal plants (WMP), wild edible plants (WEP), wild medicinal and edible plant (W MP+EP)

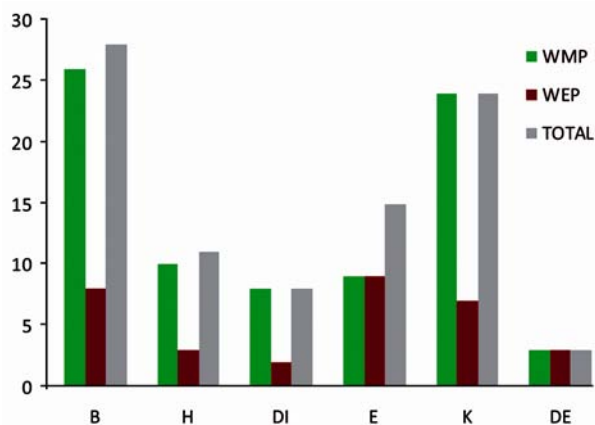


Fig. 4—Number of documented taxa in the open markets in the study area

Local markets: Bulgaria; B: Burgas, H: Haskovo, DI: Dimitrovgrad. Turkey; E: Edirne, K: Kirklareli, DE: Demirkoy. WMP: wild medicinal plants, WEP: wild edible plants

**Medicinal plants**

A total of 34 wild medicinal plants belonging to 16 families were documented (Bg: 25, Tr: 23), which were sold mostly dry as mono-component herbal teas. The plants were used, in descending order, as antiseptics, to treat skin diseases, for stomach problems, cough, cold, asthma and against diabetes.

For some of the plants, there were differences in the method and the purpose of use between the two sub-regions, and also differences compared with published data to date from other regions in the two countries.

On the Bg-side of the study area, *Cerasus avium* were sold as diuretic herbal teas (dry fruit stalks), similar to some markets in the Tr area where it is used as a diuretic and a remedy for nephritis and kidney stones<sup>13, 15</sup>. In open markets in the Tr sub-region, its documented usage was as a herbal tea for stomach and digestive system, which was previously reported for the Istanbul area<sup>16</sup>.

*Prunus spinosa* (blackthorn) was not detected in the field study in the Bg sub-region, where it is known mostly as an edible fruit snack (picked after the first days of autumn frost and a remedy against diarrhea and is very rarely used nowadays<sup>1</sup>. In contrast, blackthorn was sold in all visited open markets on the Tr-side and the same species was marketed in this study as a anti-diabetic plant with wide use. Folk medicinal treatment of diabetes with fruits is well known. It was reported in previous studies carried out in Kirklareli province that *Prunus spinosa* subsp. *dasyphylla* is the only plant recorded with the same usage (treatment of diabetes) in all studied localities<sup>13</sup>. Other reported uses of this species are for cardiac diseases<sup>13</sup>, asthma, bronchitis, diabetes<sup>12,15</sup>, and eczema<sup>20</sup>.

The use of different parts of walnut (leaves, bark, immature fruits, pericarpium, and seeds) is well known<sup>12,15-17,19</sup>. But an interesting finding is the selling of herbal tea from fruit septa (inner endocarpic projections of the fruit), which before was reported for the Istanbul region<sup>20</sup>.

In previous studies on the Turkish side of the study area, strawberry was not reported as a medicinal plant. Therefore, a very interesting finding is the single Kirklareli herbal tea sample from calyx of *Fragaria vesca* L. as a remedy for stomach complaints.

*Sideritis scardica* is a Balkan endemic with a few populations in Bulgaria. This species is included in the Red List of Bulgarian vascular plants as “endangered”. Over the past ten years, this plant has been one of the most popular and best selling herbal teas in Bulgaria, and because of that its natural populations were damaged. Nowadays, gathering this species from the wild is prohibited and a special scheme for its preservation and use has been developed<sup>29</sup>. According to these rules, only cultivated

plants may be sold in the open markets, which is not easy to control. *S. scardica* was documented on both sides of the study area. *Sideritis syriaca* L. is a Mediterranean species distributed in Strandja Mt. in the Bulgarian territory. *S. syriaca* is included in the Red List of Bulgarian vascular plants as critically endangered<sup>29</sup>. This species was not registered as sold in the open markets in any of the study area.

In the Kultur<sup>14</sup> study, which was realized in Kirklareli, *Silybum marianum* was visible in the area but no purpose was reported. We found that, in the same city's open markets, its achenes are sold as a remedy for liver protection after heavy alcohol consumption. According to previous studies in Istanbul, Yalova and Izmit, its stem and young shoot are eaten fresh or cooked with rice after the bark is peeled<sup>18,19</sup>. Additionally, stem pith of milk thistle is commonly consumed raw in the study region. The plant is used raw in cases of liver disease by local people<sup>30</sup>. In recent years it has become very popular in Bulgaria as a result of an officially registered plant based product called "Demir bozan". The name is of Turkish origin and translates directly as "iron destroyer", which figuratively carries a message about something with a lot of power. The name is used for herbal combinations sold in markets from dried *Clinopodium vulgare* (herba), *Crataegus monogyna* (flos), *Spirea ulmaria* (flos), *Equisetum arvense* (herba), *Veronica officinalis* (herba) and *Zea mays* (stigmata). It is also called "longevity tonic and elixir". However, the same name "demir bozan" is an old and common Turkish name for *Thalictrum aquilegifolium* in Bulgaria, with a very limited use today. In the field study, it was found that there was confusion and dual use of the herbal substance (dried leaves) of *Thalictrum aquilegifolium* and a manufactured herbal product. Seven of all the registered species were sold as parts with different uses and methods of preparation, which motivated categorizing them as both edible and medicinal plants (Bg: 4, Tr: 6). *Cornus mas*, *Rosa canina* and *Urtica dioica* are common on both sides of the study area.

In all of the visited open markets on the Bulgarian side, some medicinal plants were sold as herbal mixtures: a combination of more than two herbal substances with a special treatment purpose. Sometimes, the method of preparation and administration was written on the package or box.

In Kirklareli Province, more than 100 wild traditionally used medicinal plants were reported. The most used families were Rosaceae, Lamiaceae, and

Asteraceae<sup>14,15</sup>. The present study shows that around 25% of them were present in the open markets of the same area.

### **Edible plants**

Of all 41 taxa of registered wild plants, only 15 were sold as edible, from Rosaceae (4), Polygonaceae (2), Urticaceae (2), Malvaceae (1), Papaveraceae (1), Portulacaceae (1) Ericaceae (2) and Cornaceae (1) (Bg: 8, Tr: 12).

This group included species sold as edible greens, especially in the spring and early summer period. The presence of these vegetable leaves in the open markets is due to the preparation of stuffed pies and dishes filled with greens that are an important characteristic of both Bulgarian and Turkish traditional cuisines. Among the edible greens were species that clearly outline the difference between the two sides of the border: *Urtica urens*, *Malva sylvestris*, *Papaver rhoeas*, and *Portulaca oleracea*, which are not known (accepted) as edible for Bulgarians and were not registered in the open markets. They are commonly consumed fresh as salad or with yogurt and garlic. For Bulgarians, some of them have been associated in the past mainly with famine. This study confirmed previous results of Nedelcheva<sup>1</sup> that many informants on the Bg-side clearly named *Urtica dioica* as "edible" and *U. urens* as "not edible", and "not harvested".

"Edible green mixtures" that are cooked with olive oil and prepared as vegetable pie or consumed as meal, roasted, soup or salads and fresh edible were specific for the Tr-side. On the Bg-side, this way of preparing edible greens for consumption is not common. Thirty-seven wild plants used as leaf vegetables in mixtures were reported for Croatia<sup>22</sup>. *P. rhoeas* was the only overlapping species in both studies. In a study on edible plants from local markets in Izmir, Dogan *et al.*<sup>21</sup> reported 46 edible wild plant taxa, mostly from Asteraceae, represented by the largest number of taxa, followed by Apiaceae, Polygonaceae, Liliaceae, Lamiaceae, Amaranthaceae and Brassicaceae. A significantly greater number of plants and their diversity in the latter two studies compared with the present results is undoubtedly due to the influence of the Mediterranean, where there is very widespread use of wild green vegetables. This is the logical explanation for the differences in use of wild edible greens and their presence in open markets between the two sides of the Bulgarian-Turkish border. Regardless of the complexity of migration processes

in the origin of the two communities in the past, contacts and traditions within the boundaries of both countries were more important. This is supported by the limited contact between them in the last century.

### Conclusion

The number of established species from the Bulgarian and Turkish sides of the border area is comparable, but with a different emphasis on groups of plants and species diversity. The specific use of plants in the border sub-regions can be outlined as follows: 1) Bg-side open markets are principally places at which to sell and buy many wild medicinal plants and a relatively small number of fresh wild fruits and fresh wild edible greens. Wild medicinal plants are dominant. Medicinal plants are sold dry as mono-component herbal teas or very commonly as herbal mixtures (herbal preparations) (two or more herbal substances). “Wild edible green mixtures” were not sold in the open markets. 2) Tr-side open markets are very popular places to sell or buy fresh wild edible greens and wild fresh, dry fruits for healthy and traditional food and wild medicinal plants as mono-component herbal teas. Wild edible plants are dominant. “Wild edible green mixtures” are very commonly sold in the open markets.

Differences in the species diversity of wild edible greens were significant: *U. urens*, *Malva sylvestris*, *P. rhoeas*, and *P. oleracea* were specific to open markets on the Tr-side. With increased contact between the two countries over the past ten years and the growing popularity of the Mediterranean diet as a healthy lifestyle, there is a potential for change in this differentiation. This study confirms the notion of “*U. urens* is not an edible plant” as a cultural marker of Bulgarian society. Widespread use of blackthorn on the Tr-side for the treatment of the socially significant disease diabetes and the lack of such knowledge on the Bg-side is very likely a result of contemporary processes of formation and transmission of folk ethnobotanical knowledge. Evidence of the dynamics of these processes include certain interesting and uncommon findings such as selling herbal tea from fruit septa of *J. regia* L., and herbal tea from fruit calyx of *F. vesca*.

More overlapping species were detected among medicinal plants than among edible greens as regards distinguishing features. *P. spinosa* was marked as a medicinal plant with anti-diabetic potential (Tr). Wild plants played important roles for local people in the

past and are still significant as cultural markers in the modern lifestyle.

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