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Survey on current status of folk medicine in Bulgaria reported by local knowledgeable persons

Asya Dragoeva, Zheni Stoyanova, Martin Marinov, Vanya Koleva

University of Shumen, Faculty of Natural Sciences, Department of Biology,
115 Universitetska Str., 9700 Shumen, Bulgaria

Abstract: *Traditional knowledge is of real danger to be lost in modern society. This research is a part of an ethnobotanical survey aimed on documentation of current status of folk medicine in Central and Northeastern Bulgaria. Semi-structured interviews with local knowledgeable persons were provided. Quantitative ethnobotanical indices consisting of Fidelity level (FL) and Informant consensus factor (ICF) were calculated as indicatives of local importance of species and prevalent uses of species. The respondents reported 15 category uses: to treat 12 health disorders, for prophylaxis/immune stimulation, other health connected conditions and plants included in the diet as food/spices. The highest number of plants was used for the treatment of gastrointestinal diseases (65.9%), cardiovascular problems (53.4%) and urinary system problems (46.6%). It should be noted that many herbal medicines are related to disease prevention (52.3%). Maximum FL value (100%) of Hypericum perforatum for digestive and nervous system disorders and Thymus sp. for respiratory system diseases was calculated. Numerous species and specific applications were listed in the paper, contributing to the base ethnobotanical data. Specific use categories indicate most spread health disorders and proved treatments in the studied regions. Results also reflect the growing interest in disease prevention (immune stimulation) and a healthy diet.*

Keywords: Ethnobotany, Questionnaire survey with key informants, Healthy lifestyle, Disease prevention

Introduction

Increasing interest in traditional knowledge to a great degree is a consequence of the concept of a healthy lifestyle [1]. This concept includes two important strategies – utilization of natural remedies and an appropriate diet. Plants have been used worldwide to treat various diseases [2]. In Europe traditional

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health practices existed from ancient times. Unfortunately, in modern society this heritage is of real danger to be lost [3]. Local knowledge is of global importance because of geographical, climate and cultural distinctiveness. So, recently numerous studies have been focused on documentation of indigenous utilization of plants. Such studies contribute to enrich the ethnobotanical data and are tools for the identification of novel drugs [4]. Furthermore, it is known that foods have cure property. Scientific researches on bioactive components in foods lead in the 1990s to the concept of "functional foods", which beyond basic nutrition needs provide health benefits [5]. Functional foods are a major part of healthy lifestyle strategies – numerous studies confirmed that plants are a rich source of various bioactive compounds [6]. Culinary herbs and spices have an important role in cultural heritage [7, 8]. So, matters of interest in ethnobotanical surveys nowadays are data about plants used as a food and spices by indigenous people.

This research is a part of an ethnobotanical survey carried out over a period of approximately 2 years in Central and Northeastern Bulgaria. The aim of the study was twofold. The first part is focused on the most commonly used wild plants in the studied region as a tool for development of plant biodiversity protection strategies (data included in [9]). In this paper we presented the second part of the study – documentation of current status of folk medicine in Bulgarian society and quantitative analysis of this data.

Materials and Methods

This research is a second part of ethnobotanical survey [9]. Ethnobotanical information was collected during semi-structured interviews with local knowledgeable persons.

Quantitative ethnobotanical indices were estimated – Fidelity level (FL) and Informant consensus factor (ICF) [10, 11, 12, 13]:

- ✓ Fidelity level determines the most preferred species for the treatment of particular use-category. This index presents a percentage of informants who mentioned the uses of certain plant species. It is calculated by using a formula FL = (Ip/Iu)×100 where Ip is the number of respondents who reported the usage of a given species for particular use-category and Iu is the total number of respondents who used for any purpose the same species**.**
- ✓ The level of homogeneity among information provided by different informants was calculated using the following formula: ICF = (Nur − Nt)/(Nur − 1) where, Nur - number of use reports for a particular category; Nt - number of species used for that category for all informants. IFC Values range between 0 and 1, where "1" indicates the highest level of informant consent (homogeneity of information among respondents). In order to calculate ICF, the reported uses were classified into 15 different categories on the basis of gathered information: diseases of the musculoskeletal system; nervous system disorders; sensory system disorders; digestive system disorders; diseases

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of the respiratory system; circulatory system disorders; diseases of the urinary system; conditions related to reproductive health; diseases of the immune system; endocrine and metabolic disorders; cancer; diseases of the skin; nonspecific immune stimulation; conditions not elsewhere classified; functional foods.

Results and Discussion

Diversity of plants and their uses

The mode of utilization of plant species is listed in **Table 1** (See the Annex). Data on scientific name and local name, ethnobotanical use and mode of preparation are included in the table. In ethnobotanical studies standard medicinal classifications are not always suitable for description of plant uses [14]. It is most convenient to classify use categories based on body systems and plant utilization mentioned by respondents. In the present study plants are reported for 15 category uses: to treat 12 health disorders, for prophylaxis/immune stimulation, other health connected conditions and plants included in the diet as food/spices.

In the present study a total of 88 species, belonging to 82 genera and 44 families were reported by the informants. From 88 species, 86 were used for medicinal applications, 79 of which were used to treat more than one disease and the remaining 7 species were used to treat only one disease. As shown in **Table 1** (See the Annex), the highest number of plants was used for the treatment of gastrointestinal diseases (65.9%), cardiovascular problems (53.4%), urinary system problems (46.6%). Ethnobotanical data about medicinal plants application show most significant diseases for local people. So, a great variety exists in different surveys. It could be explained by the specificity of informants (randomly interviewed or key informants), design of the study (selected region or wide territory), etc. According to results in the studied regions the most frequent health disorders are connected with gastrointestinal, cardiovascular and urinary systems. Listed by respondents modes of treatment have been proved by traditional practice. Detailed information gathered in this study about specific plant utilization in such disorders could contribute to the ethnobotanical data base.

In current ethnobotany a matter of interest is not only the transmission of local knowledge through the generations, but also the dynamics of this knowledge influenced by modern society. Informants` reports showed the importance of the concept of a healthy lifestyle. Many reported herbal medicines are related to prophylaxis/immune stimulation (52.3%). Disease prevention is amongst the major tasks of current society. Numerous plants were included in diet as a food (18.18%) and spices (18.18%). This is in accordance with the increasing interest in a healthy diet. Traditional medicine worldwide has proved the importance of food as a medicine from ancient times. Current studies are focused on integration of healthy food in healthcare practice [15]. Our results reflect a presence of this new approach in Bulgarian folk medicine.

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Plants used for health connected conditions not elsewhere classified included mainly treatment of wounds (14.77%), anti-inflammatory (10.23%), cold/influenza (9.09%) and insect bites (4.55%). Plants were used also as anthelmintic (3.41%), antibacterial (2.27%), antifungal (1.14%) and infection diseases (tuberculosis and dysentery) (3.41%).

Mode of preparation

In the present survey reports of extraction resulting from boiling a plant in water were mentioned in **Table 1** (See the Annex) as a decoction. Respondents describe infusions as steeping herbs in hot water for a short period of time. Maceration (immersing a plant in water, oil or alcohol) at room temperature also was reported. The most common mode of preparation for internal use was infusions (teas) (50 uses reported) and decoctions (17 uses reported). Cold water extracts used internally were reported rarely (5 uses reported). Some plants were used internally as a raw fresh plant, juice, sugar syrup, etc. (17 uses reported). External use often includes poultice/compress, described as an application of herbal matter (fresh or extracted after maceration/decoction/infusion) to the skin. Ointments and alcohol extracts were used mainly externally. Irrigation/rinsing and baths were another mode of application. All described principal methods of herbal preparations were widely reported in other similar surveys [16].

Several recipes in combination of given species with 1 to 2 herbs were described (**Table 2**). In other study in Bulgaria combinations also were reported [17]. Herbal recipes in combination are of importance for searching of new pharmacological remedies. Broadly, according to [18], “Synergy is a process in which some substances cooperate to reach a combined effect that is greater than the sum of their separate effects”. Understanding of the molecular mechanism of synergic action could lead to more effective novel drugs [19].

Table 2. Combination of plants species and therapeutic usage

№	Plant species	Therapeutic usage
1.	Aerial parts of *Achillea millefolium* L., *Viscum album* L., *Equisetum arvense* L.	High blood pressure – cold extract (int)
2.	Flowers of *Achillea millefolium* and *Rubus idaeus* L.	Varicose veins – ointment (ext)
3.	*Armoracia rusticana* P. Gaertn., B. Mey. & Scherb. (fresh roots), *Curcuma longa* L. (dried roots) and *Citrus limon* (L.) Osbeck (fresh peel)	Expectorant – mixture (int)
4.	*Melissa officinalis* L. (aerial parts), *Valeriana officinalis* L. (roots), *Melilotus officinalis* (L.) Pall. (aerial parts)	Sedative – decoction (int)
5.	*Origanum vulgare* L. (aerial parts), *Crataegus*	Respiratory diseases, cough – decoction (int)

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	monogyna Jacq. (stem with froots) and *Rosa canina* L. (froots)	
6.	Aerial parts of *Sideritis scardica* Griseb. and *Origanum vulgare* L.	Anemia – decoction (int)
7.	*Avena sativa* L. (seeds) and *Symphytum officinale* L. (roots)	Joint and bone complaints – decoction (int)
8.	Aerial parts of *Agrimonia eupatoria* L., *Teucrium chamaedrys* L. and *Cichorium intybus* L.	Gastrointestinal diseases – decoction (int)
9.	*Aesculus hippocastanum* L. (seeds), *Syringa vulgaris* L. (flowers) and *Helianthus annuus* L. (young inflorescence)	Joint diseases, rheumatism – tincture (ext)

Therapeutic usage – ext: externally, int: internally

Ethnoindices

Fidelity Level (FL) evaluated the preferred species for specific plant-use category **(Table 3)**. Results revealed maximum FL value (100%) of *Hypericum perforatum* for digestive and nervous system disorders and *Thymus* for respiratory system diseases. As can be seen, the total number of informants citing the species and total number of informants citing the species for all plant-use categories were one and the same (N = 15). The same plants are listed among species with highest RFC and UV indices. The most popular to indigenous people species usually have higher fidelity level than less popular plants [12]. The same authors underlined that high FL may indicate that species contain valuable phytoconstituents. On the other hand, the results of our study confirmed the statement of other researchers, that plants with low use value should not be considered to be less important [12]. As can be seen, *Sambucus nigra* and *Crataegus monogyna* showed higher value for Nonspecific immune stimulation than *Matricaria chamomilla* and *Hypericum perforatum*. So, different indices are indicative for different purposes of quantitative analysis.

Table 3. Fidelity level (FL) value of most frequently used medicinal plants reported for a given plant-use category

Medicinal Plant	Plant-use category	Ip	Iu	FL %
Sambucus nigra L.	Nonspecific immune stimulation	5	6	83.33
Achillea millefolium L.	Conditions related to reproductive health	4	6	66.67

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Achillea millefolium L.	Digestive system disorders	4	6	66.67
Matricaria chamomilla L.	Nonspecific immune stimulation	4	5	80.00
Matricaria chamomilla L.	Diseases of the respiratory system	4	5	80.00
Hypericum perforatum L.	Nervous system disorders	7	7	100.00
Hypericum perforatum L.	Digestive system disorders	7	7	100.00
Hypericum perforatum L.	Diseases of the urinary system	4	7	57.14
Hypericum perforatum L.	Nonspecific immune stimulation	4	7	57.14
Hypericum perforatum L.	Conditions not elsewhere classified	4	7	57.14
Melissa officinalis L.	Nervous system disorders	3	4	75.00
Origanum vulgare L.	Diseases of the respiratory system	3	4	75.00
Thymus sp. div.	Diseases of the respiratory system	6	6	100.00
Thymus sp. div.	Digestive system disorders	4	6	66.67
Thymus sp. div.	Nonspecific immune stimulation	5	6	83.33
Crataegus monogyna Jacq.	Circulatory system disorders	5	6	83.33
Urtica dioica L.	Circulatory system disorders	5	6	83.33
Urtica dioica L.	Diseases of the musculoskeletal system	4	6	66.67

Ip: the number of respondents who reported the usage of a given species for particular use-category; Iu: the total number of respondents who used for any purpose the same species

Informant Consensus Factor (ICF) was calculated for the analysis of the use of the medicinal plants against specific use-categories (**Table 4**). The reported plant uses were classified into 15 categories. The highest number of plant species (65.91%) was reported to treat digestive system disorders. The second group is circulatory system disorders (52.27%) and diseases of the urinary system (46.59%). Numerous species were reported for nonspecific immune stimulation (46.59%).

Table 4. Use categories and informant consensus factor (ICF) for each plant-use category

Plant-use category	**Use reports Nur**	**Species used Nt**	**(%) All Species**	**ICF**
Diseases of the musculoskeletal system	32	27	30.68	0.16
Nervous system disorders	41	26	29.55	0.38
Sensory system disorders	13	10	11.36	0.25
Digestive system disorders	90	58	65.91	0.36
Diseases of the respiratory system	50	33	37.50	0.35

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Circulatory system disorders	65	46	52.27	0.30
Diseases of the urinary system	53	41	46.59	0.23
Conditions related to reproductive health	17	13	14.77	0.25
Diseases of the immune system	2	2	2.27	0.00
Endocrine and metabolic disorders	27	22	25.00	0.19
Cancer	6	6	6.82	0.00
Diseases of the skin	21	20	22.73	0.05
Nonspecific immune stimulation	69	46	52.27	0.34
Conditions not elsewhere classified	54	45	51.14	0.17
Functional foods	43	30	34.09	0.31

Nur - number of use reports for a particular category; Nt - number of species used for that category for all informants

In the present survey the ICF values ranged from 0.00 to 0.38. The highest ICF value was reported for nervous system disorders (0.38), digestive system disorders (0.36) and diseases of the respiratory system (0.35). Higher ICF value indicates effective treatment of specific disease by respondents. Additionally, ICF may reflect prevalent health disorders for local people [12]. The least ICF values (0.00) were found for diseases of the immune system and cancer. Such absence of utilization of particular species was reported in other survey [10]. Documentation of the traditional utilization of foods and spices is an important part of contemporary ethnobotanical surveys. It should be noted that nonspecific immune stimulation and functional foods are amongst the use categories with the highest ICF values, indicating the influence of the healthy lifestyle concept in contemporary society.

As can be seen from **Table 4**, ICF values in the present survey are relatively low. This could be a consequence of the fact that selected respondents rely on specific source of information and inhabit different regions of the country. Despite of this, useful information about important disorders can be obtained. A high ICF value indicates that relatively few species are used by the most of respondents [20]. So, low ICF values in this study could serve as indicative not only of the rich flora of Bulgaria, but also of specific valuable heritage of knowledge in different regions and for the necessity for documentation of this information.

Conclusion

This work contributes to improve the folk medicine knowledge in studied regions of Bulgaria. Numerous species and specific applications were listed in the paper, contributing to base ethnobotanical data. Use categories indicate the most spread health conditions in studied regions and proved therapeutic

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plants usage. Current interest in a healthy lifestyle is intrinsically connected with reports of disease prevention (immune stimulation and prophylaxis) and a healthy diet.

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ANNEX

Table 1. List of plants used by respondents

Family/Scientific name	Local name	Health disorders	Pr, Is	Others	F, Sp	Therapeutic usage
Adoxaceae						
1. Sambucus ebulus L.	Trevist buz (Buzak)	rheumatism, mild laxative, diuretic, respiratory disorders, allergy	Is, Pr	insect bites		int – sugar syrup (Fr), ext – poultice (fresh L)
2. Sambucus nigra L.	Cheren buz	improves nervous system, gastrointestinal and liver diseases, laxative, vasodilator, respiratory and urinary systems inflammations	Is, Pr		F (Fr)	int – infusion (Fl), sugar syrup (Fr), ext – bath (boiled R)
Amaryllidaceae						
3. Allium sativum L.	Chesun	gastric inflammmation, stimulates digestion, hypotensive	Pr	antibacterial, dysentery	F	int – raw plant
4. Allium ursinum L.	Div chesun (Levurda)	joint disorders, rheumatism, arthritis, poor digestion	Is, Pr	insect bites, wounds	F, Sp (L)	int – fresh leaves, ext – tincture, poultice
5. Galanthus nivalis L.	Kokiche	locomotor disorders, throat pain				ext – tincture
6. Allium siculum Ucria. subsp. *dioscoridis* (Sm.) K. Richt.	Samardala	gastrointestinal/gallbladder pain, cholesterol control, nausea, respiratory inflammation, hypotensive, atherosclerosis		anti-helmintic	Sp (L)	int – fresh leaves
Anacardiace						
7. Cotinus coggygria Scop.	Smradlika	gym disorders, aphthous ulcer, diarrhea, hemorrhoids, kidney infections, externally – female genitalia inflammation, skin inflammations		antiinflammatory, dysentery, wounds		int – infusion, ext - decoction (compress, irrigation/rinsing)
Apiaceae						
8. Anethum graveolens	Kopur	stomachic, colitis, carminative, baby colic, sedative,	Pr	recovery after	Sp	int – infusion, decoction, raw

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L.		insomnia, heart/circulatory diseases, hypotensive, urinary system	trauma, stimulates milk flow	(AP)	plant
9. Apium graveolens L.	Tselina	rheumatism, arthritis, gout, nyctalopia, digestive, hypotensive, cholesterol control, diuretic	antiinflammatory, general tonic	F (R, L), Sp (L)	int – fresh leaves juice
10. Levisticum officinale W.D.J.Koch	Devisil	sedative, poor digestion, lung complaints, expectorant, circulation		Sp (L)	int – infusion (R)
11. Pimpinella anisum L.	Anason	abdominal pain, gastritis, respiratory tract inflammation, cough, expectorant			int – infusion
Asparagaceae					
12. Convallaria majalis L.	Momina sulza	cirrhosis of liver, heart failure, cardiac neurosis			int – infusion
Araceae					
13. Arum maculatum L.	Zmiyarnik	hemorrhoids			int – cold water extract
Araliaceae					
14. Hedera helix L.	Brushlyan	rheumatism, arthritis, lungs disorders,warts (externally)			int – cold water extract
Asphodelaceae					
15. Aloe vera (L.) Burm.f.	Aloe	joint disorders, weakened muscles, eye inflammation, Is cataract, gastritis, ulcer, colitis, liver disorders, runny nose, improves cardiac function, diuretic, urinary tract, leucorrhoea, thyroid function, anticancer, skin infections	antiinfluenza, insect bites, wounds, burns, detox		int and ext – fresh leaves juice
Aspleniaceae					

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16.Asplenium scolopendrium L.	Volski ezik	sore throat, expectorant, cough, kidney problems, angina (ischemic pain)			int – infusion
Asteraceae					
17. Achillea millefolium L.	Byal ravnets	rheumatic and back pain, sciatica, limbs tingling, gingivitis, toothache, eye and facial nerves inflammation, ulcer, poor digestion, appetite enhancing, hypotensive, anemia, palpitations, cough, diuretic, urinary tract infections, kidney disorders, menstrual pain, heavy bleeding, fibroids, ovarian ailments, reduces blood glucose, acne		antiinflammatory, cold, headache, detox, menopause, wounds, parasites	int – infusion, combination*, ext – infusion: compress, baths, irrigation/rinsing; ointment (Fl)
18. Arctium lappa L.	Repey	joint disorders, colitis, kidney stones, diabetes, skin disorders		antibacterial	int – infusion, ext – infusion: compress, rinsing
19. Artemisia absinthium L.	Byal pelin	liver diseases, stimulates the appetite, improves digestion			int – infusion
20. Calendula officinalis L.	Neven	sedative, inflammation of oral cavity, gastritis, ulcer, gastrointestinal inflammations, liver disorders, heart diseases, varicose veins, runny nose, urinary tract infections, melanoma	Pr	antiinflammatory, cleanse the blood, wounds, burns, trauma, tired eyes	int – infusion, ext – ointment
21. Carduus acanthoides L.	Magareshki trun	cough, asthma, strengthens the heart, raises low blood pressure	Pr		int – infusion
22. Cyanus segetum Hill	Sinya metlichina	liver and gallbladder diseases, improves digestion, cough, respiratory tract inflammmations, kidney disease			int – infusion
23. Cichorium intybus L.	Sinya zhluchka	sedative, gastritis, ulcer, liver and gallbladder diseases, stimulates the appetite, improves digestion, hemorrhoids, kidney disorders	Pr		int – infusion
24. Matricaria chamomilla L.	Layka	rheumatism, neuralgia, irritaded eyes, oral cavity, teeth and respiratory tract inflammations, carminative, spasmolytic, hemorrhoids, kidney		antiinflammatory, teething, wounds,	int – infusion, ext – ointment, infusion: irrigation/rinsing,

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		stones, urinary system infections, leucorrhoe, boils, eczema		pregnancy		compress
25. Taraxacum officinale F. H. Wigg.	Glukharche	rheumatism, stomach, liver and gallbladder disorders, improves digestion, mild laxative, hypotensive, arteriosclerosis, anemia, kidney infections, diuretic	Pr	antiinflammatory	F (L)	int – infusion, decoction, ext – compress
26. Tussilago farfara L.	Podbel	cough, bronchitis, laryngitis, varicose veins, thrombophlebitis		trauma, superficial wounds		int – infusion, ext – ointment, compress
27. Silybum marianum (L.) Gaertn.	Byal trun	liver disorders	Is, Pr			int – seed oil
28. Solidago virgaurea L.	Zlatna pruchitsa	kidney sand and stones				int – cold water extract
Betulaceae						
29. Betula pendula Roth	Byala breza	gallbladder disorders, cardiac diseases, kidney and bladder stones, lichen planus				int – decoction, ext – rinsing
30. Corylus avellana L.	Leska	strengthens heart and circulatory system, varicose veins, anemia, urinary system disorders, kidney sand	Pr	recovery from illness	F (Fr)	int – Fr, mixed Fr/honey, infusion (L, Ba)
Boraginaceae						
31. Symphytum officinale L.	Zarasliche	varicose veins				ext – ointment
Brassicaceae						
32. Armoracia rusticana P. Gaertn., B. Mey. & Scherb.	Khryan	rheumatism, gout, cough, expectorant, sinusitis, bronchitis, strengthens heart, diuretic	Pr	influenza symptoms	Sp	int – raw root, raw root with honey, combination*, ext – poultice
33. Brassica nigra (L.) K. Koch	Cheren sinap	rheumatism, arthritis, lung disorders, stimulates circulation		antiinflammatory, warm qualities		ext – poultice (mixed with flour and water)

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Cannabaceae					
34. Humulus lupulus L.	Khmel	sedative, appetite enhancing, improves digestion		analgesic activity	int – infusion
Caryophyllaceae					
35. Herniaria glabra L.	Izsiplivche	urinary system, kidney and bladder sand/stones, diuretic		tuberculosis	int – infusion
Crassulaceae					
36. Sedum maximum (L.) Suter	Debela mara	ear pain			ext – fresh juice
Cucurbitaceae					
37. Cucurbita pepo L.	Tikva	osteoporosis, cholesterol control (Se), diuretic, prostate disease, thyroid disorders	Pr	anthelmintic (Se), detox	int – edible food
38. Ecballium elaterium (L.) A. Rich.	Luda krastavitsa	rheumatism, arthritis, joint complaints	Is		ext – tincture (once daily - poisonous)
Ericaceae					
39. Vaccinium vitis-idaea L.	Chervena borovinka	enhances vision, strenghtens the gums, vascular muscle tone, urinary tract disorders	Is, Pr	F (Fr)	int – decoction (L)
Equisetaceae					
40. Equisetum arvense L.	Polski khvosht	rheumatism, hemoptysis, hemostatic, diuretic, kidney stones, metrorrhagia			int – infusion, decoction
Fabaceae					
41. Galega officinalis L.	Zhablek	cleanses urinary tract, eczema			int – infusion, ext – poultice
42. Phaseolus vulgaris L.	Fasul	cardiac insufficiency, kidney and bladder inflammations, reduces blood glucose			int – decoction

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Gentianaceae						
43. Centaurium erythraea Rafn	Cherven kantarion	gastric inflammmation, diabetes	Pr			int – infusion
Geraniaceae						
44.Geranium macrorrhizum L.	Zdravets	anxiety and stress, hypotensive, blood glucose control				int – fresh chewed, cold-water extract, infusion
45. Pelargonium zonale (L.) L'Hér. ex Aiton	Mushkato			wound healing		ext – poultice (fresh)
Ginkgoaceae						
46. Ginkgo biloba L.	Ginko	improves memory, regulates cerebral and limbs blood flow	Pr			int – infusion
Hypericaceae						
47. Hypericum perforatum L.	Zhult kantarion	rheumatism, arthritis, gout, sedative, depresion, anxiety, insomnia, ear pain, ulcer, gastritis, colic, liver and gallblader disorders, gallstones, sore troat, catarrh, improves cardiac function, varicose veins, hemorrhoides, hemostatic, urinary tract infections, kidney stones, diabetes, menstrual pain, skin irritations	Is, Pr	antiinflammatory, trauma, menopause, burns, wounds, insect bites		int – infusion, decoction, ext – ointment
Iridaceae						
48. Crocus sativus L.	Shafran				Sp	
Juglandaceae						
49. Juglans regia L.	Orekh	joint diseases, rickets, bone spur, improves memory, cholesterol control, anemia, hemorrhoids, gingivitis, leucorrhoea, low potency, eczema	Is, Pr	eye strain, pregnancy, wounds	F (N)	ext – poultice, rinsing (decoction – L, green husk)

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Lamiaceae						
50. Lavandula angustifolia Mill.	Lavandula	rheumatism, sedative, insomnia, migraine, neuralgia, palpitations, nervous stomach, laryngitis, colic, kidney inflammation, pimples	Pr	wounds	Sp (Fl)	int – infusion, ext – inhalation, ointment, tincture
51. Marrubium vulgare L.	Pchelnik	gastrointestinal disorders, diarrhea				int – decoction
52. Melissa officinalis L.	Matochina	sedative, insomnia, depresion, nervous stomach, poor digestion, palpitations, hypotensive, herpes	Pr	mental/physical exhaustion		int – infusion, decoction, combination*
53. Mentha spicata L.	Dzhodzhen	colitis, gastrointestinal/ gallbladder pain, nausea, ovarian disorders and cysts, menstrual pain	Pr	cold, exhaustion, insect bites	Sp	int – infusion
54. Mentha sp.	Menta	anxiety, nervous stomach, nausea, poor digestion, hypotensive, ears/nose/throat inflammation, expectorant	Pr	insect bites		int – infusion
55. Ocimum basilicum L.	Bosilek	depression, mouth inflammations, gastritis, colitis, poor digestion, lung diseases (smokers)	Is, Pr	antiinflammatory, stimulates milk flow, exhaustion	Sp	int – infusion
56. Origanum vulgare L.	Rigan	sedative, insomnia, gastrointestinal pain, liver disorders, appetite stimulant, sore throat, cough, expectorant, bronchitis, lung diseases, urinary tract disorders	Is, Pr		Sp	int – infusion, combination*
57. Rosmarinus officinalis L.	Rozmarin	rheumatism, vertigo, liver and gallbladder diseases			Sp	int – infusion, ext – compress
58. Salvia officinalis L.	Gradinski chay	gym and teeth disorders, inflammation in the oral cavity, aphthous ulcer, cough, expectorant, laryngitis, tonsillitis	Is, Pr	disinfection of the oral cavity		int – infusion, ext – inhalation
59. Sideritis scardica Griseb.	Mursalski chay	cough, bronchitis, tonsillitis, asthma, anemia, hypotensive, liver diseases, kidney disorders, cancer	Is, Pr	antioxidant		int – decoction, combination*

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60. Thymus sp. div.	Mashterka	anxiety, insomnia, oral cavity inflammation, gastritis, ulcer, colitis, diarrhea, loss of apetite, carminative, sore throat, laryngitis, bronchitis, lung disorders, cough, expectorant, low blood pressure, acne, pimples	Is, Pr	cold, influenza, wounds	Sp	int – infusion, ext – ointment, inhalation
Lauraceae						
61. Laurus nobilis L.	Dafinov list	arthritis			Sp	ext – compress, combination*
Malvaceae						
62. Malva sylvestris L.	Kamilyak, slez	gastric ulcer, intestinal disorders,sore throat, laryngitis, cough, bladder disorders, cystitis, mastopathy, eye strain		antiinflammatory, sprains/trauma, wounds		int – infusion, ext – poultice (fresh plant)
63. Tilia sp.div.	Lipa	disorders of oral cavity, nose and throat, tonsillitis, laryngitis, tracheitis, bronchitis, lung disorders, pneumonia	Pr	influenza		int – infusion, ext – gargled (decoction)
Moraceae						
64. Ficus carica L.	Smokinya	respiratory tract infections, sore throat, cough, improves cardiac function, ulcer, gingivitis, improves liver function, pancreatic diseases, improves digestion, laxative, lowers blood sugar, improves kidney function, acne, pimples	Pr	cleanses blood vessels	F (Fr)	int – infusion/decoction (L), ext – compress (L), milk juice from green fruits
Papaveraceae						
65. Chelidonium majus L.	Zmiysko mlyako	tooth disorders, stomach diseases, poor digestion, improves liver function, hepatitis, stomach cancer, warts and tetter	Pr			int – infusion, ext – fresh juice (poisonous)
Pinaceae						
66. Pinus sylvestris L.	Byal bor	upper respiratory tract infection, tonsillitis, bronchitis, cough, expectorant, dyspnea, gallstone, kidney stones		tuberculosis		int – infusion (L, LBd), syrup (LBd)

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Plantaginaceae						
67. Plantago major L.	Zhivovlek	gastrointestinal pain, liver inflammations, bronchitis, expectorant, boils	Pr	antiinflammatory, wounds, insect bites		int – infusion, ext – poultice (fresh)
Poaceae						
68. Avena sativa L.	Oves	bone and joint disorders, rheumatism, gout, gastritis, colitis, blood pressure control, cholesterol control, laxative, kidney sand, rashes	Pr	recovery from illness		int – decoction, combination*, ext – compress (boiled in water)
69. Zea mays L.	Tsarevitsa	rheumatism, muscle strengthening, liver and gallbladder diseases, haemorrhage, kidney and bladder sand/stones, urinary tract diseases, cystitis, diabetes		skin irritation (flour)	F (Se)	int – boiled seeds, corn silk (Sgm) decoction, ext – flour
Polygonaceae						
70. Persicaria hydropiper (L.) Delarbre	Vodno piperiche	kidney and bladder stones		purulent wounds		int – infusion, ext – poultice (fresh plant)
Primulaceae						
71. Primula veris L.	Iglika	sedative, insomnia, laxative, improves cardiac function				int – infusion
Ranunculaceae						
72. Nigella sativa L.	Posevna chelebitka	cancer				int – seed oil
Rosaceae						
73. Agrimonia eupatoria L.	Kamshik	gastritis, ulcer, colitis				int – decoction (combination*)
74. Aronia melanocarpa	Aroniya	blood pressure control	Pr		F (Fr)	int – raw fruit juice

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(Michx.) Elliott						
75. Crataegus monogyna Jacq.	Glog	anxiety, stress, depression, hypotensive, arrhythmia, improves cardiac and circulatory function, Raynaud's disease, diuretic, enlarged prostate	Pr			int – raw fruits, infusion, decoction, tincture (Fr)
76. Fragaria vesca L.	Gorska yagoda	gastroenteric/ gallbladder inflammation, palpitations, kidney and bladder inflammation, kidney stones		cold		int – infusion
77. Prunus persica (L.) Batsch	Praskova	rheumatism, gout, nausea, constipation, hypotensive, improves cardiac function, anemia	Pr	recovery from illness, fatigue	F (Fr, K)	int – Fr & K-honey mixture
78. Rosa canina L.	Shipka	periodontitis, gastritis, ulcer, kidney inflammation, urinary system sand and stones, diuretic	Is, Pr	cold, influenza	F	int – infusion, decoction
79. Rosa x *damascena* Herrm.	Roza	sedative, mild laxative, irritation of the face skin	Pr			int – infusion, ext – ointment, compress
80. Rubus idaeus L.	Malina	oral cavity inflammation, aphthous ulcer, gastroenteric inflammation, diarrhea, high stomach acid, sore throat, cardiac/circulatory system, varicose veins, trouble getting pregnant, during pregnancy, to give birth easily, skin rashes	Pr	in the case of poisoning	F (Fr)	int – infusion, juice from raw fruits
Rubiaceae						
81. Galium verum L.	Enyovche	thyroid disorders				int – infusion
Salicaceae						
82. Salix alba L.	Byala vurba	rheumatism, gout, sedative, urinary tract		diaphoretic		int – cold water extract
Sapindaceae						
83.Aesculus hippocastanum L.	Konski kesten	joint diseases, rheumatism, arthritis, periodontitis				ext - fresh Se (gym), combination*
Solanaceae						

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84. Lycium barbarum L.	Godzhi beri	dizziness, hepatoprotective, cardiac and circulatory system, male sexual dysfunction, improves vision	Is, Pr			int – dried fruits
85. Solanum tuberosum L.	Kartof			reduce swelling		ext – poultice
Urticaceae						
86. Urtica dioica L.	Kopriva	rheumatism, gout, joint/muscle, stomach pain, hepar, digestive, mild laxative, cough, circulatory system, anemia, blood clotting, kidney disorders, diuretic, allergy, diabetes	Is, Pr	intestinal mucus cleanse, blood-purifier	F (AP)	int – infusion
Zingiberaceae						
87. Curcuma longa L.	Kurkuma	sedative, insomnia, metabolic disorders, atypical cells	Is		Sp	"golden milk" – extract mixed with cow milk
88. Zingiber officinale Roscoe	Dzhindzhifil	sedative, nausea, vomiting, digestive, diseases of nose, throat and lungs, urinary system disorders	Is, Pr		Sp	int – raw R mixed with honey, decoction

Pr: Prophylaxis, Is: immune stimulant, F: Food, Sp: Spice; Part used – L: Leaf; AP: Aerial Parts; Fr: Fruit; Fl: Flower; R: Root/rhizomes; Se: Seed; N: Nuts; K: Kernel; combination* - Combinations with other plants are presented in Table 3; Therapeutic usage – ext: externally, int: internally.

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