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Application of medicinal plants for decorative purposes by the local population on the North Black Sea coast (Bulgaria)

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Abstract: *The aim of the present study is to identify medicinal plants used for decorative purposes by the local population along the Northern Black Sea coast (Bulgaria). A survey was conducted in the period 2014-2020. The interviews with the local population were conducted "face to face" with the help of pre-prepared original questionnaires. The surveyed locals are 709 people from 32 settlements. Respondents were randomly selected. They are of different age groups, gender, ethnicity, education and employment. The folk names of the used medicinal plants are recorded. The results show that a significant proportion of respondents (52.89%) use medicinal plants for decorative purposes. The medicinal plants used for decorative purposes by the locals are 73 species, belonging to 61 genera from 30 families. The present study is part of a larger ethnobotanical study of medicinal plants in the region of the North Black Sea coast.*

Keywords: ethnobotany, medicinal plants, ornamental plants, Northern Black Sea coast

Introduction

Growing flowering plants is an activity that dates back to ancient times. Acad. Kumarov claims that the flowers are as old as the cultivated plants that served as human food. This means that their cultivation dates back to the time when man began to engage in agriculture [1].

There is no written information about the use of medicinal plants for decorative purposes from the distant past in Bulgaria. The information reaches us through the folklore and the spiritual culture of the

Bulgarians. In the yards of the houses are grown plants of the local flora such as: *Crocus sp. diversa*, *Galanthus elwesii* Hook.f., *G. nivalis* L., *Hedera helix* L., *Primula vulgaris* Huds., *Syringa vulgaris* L. and others. In addition to a decorative effect, they also have healing properties. The following foreign species are also grown as ornamentals: *Aloe vera* (L.) Burm.f., *Calendula officinalis* L., *Pelargonium zonale* (L.) L'Her., *Tagetes sp. diversa* and others. In this way, medicinal plants can be easily used when needed. A significant part of the ornamental plants people got from nature.

Ethnobotanical research of the application of medicinal plants for decorative purposes is still a new direction in ethnobotany in Bulgaria. Some ethnobotanical studies in Bulgaria contain data on the use of medicinal plants for decorative purposes [2, 3]. Other studies have examined the use of ornamental medicinal plants for human use, but have not described their use as ornamental species [4, 5, 6]. No such study has been conducted in the Northern Black Sea region. This necessitates research among local people in order to study and preserve local knowledge.

Materials and methods

The study was conducted within the floristic subregion of the North Black Sea coast (Fig. 1).

Figure 1. Geographical location of the study area

To determine the types of medicinal plants are used: "Determinant of plants in Bulgaria" [7], "Flora of the People's Republic of Bulgaria" [9, 10]. The names of the taxa are accepted according to the International Plant Names Index [11]. The list of families is structured according to APG IV [12].

To identify the origin of the species, the "Conspectus of the Bulgarian Vascular Flora. Distribution Maps and Floristic Elements" was used [13]. The determination of the cultural types of medicinal plants is according to Kitanov [14].

Conservation status is presented using the following documents: Annex V to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora [15], Annex I of the Convention on the Conservation of European Wildlife, fauna and natural habitats (Bern Convention) [16], Annex II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) [17], Red Data Book of the Republic of Bulgaria, vol. 1. Plants and fungi [18], Annexes III and IV to the Biodiversity Act of the Republic of Bulgaria [19].

The sociological survey method was applied to collect the primary information. It was attended by 709 locals from 8 cities: Varna, Aksakovo, Beloslav, Kavarna, Shabla, Byala, Balchik, and Obzor and 24 villages: Bozhurets, Bulgarevo, Vaklino, Gorun, Durankulak, Ezeretz, Kamen Bryag, Kichevo, Krapetz, Kumanovo, Poruchik Chunchevo, Sveti Nikola, Topola, Tyulenovo, Hadzhi Dimitar, Ezerovo, Kazashko, Osenovo, Bliznatzi, Kamenar, Kranevo, Shkorpilovtzi, Goritza, and Topoli, located on the Northern Black Sea coast.

Ethnobotanical data were collected through an extensive interview aimed at creating open, informal and semi-structured interviews. The interview technique is a face-to-face technique used in other ethnobotanical studies [3, 6, 28]. The survey was conducted only with local residents at random.

The field ethnobotanical research was conducted through a specially created questionnaire on paper.

For conducting a survey with the participation of volunteers, permission was obtained No.96/24.09.2020 from the Commission for Ethics of Research at the Medical University - Varna. All interviews were conducted after obtaining the prior informed consent of the participants, according to the Code of Ethics of the International Society of Ethnobiology (ISE) [21].

The following methods have been applied to reveal the nature, dependencies and tendencies of the observed phenomena and to interpret the obtained results [22, 23]:

- Parametric analysis;
- Nonparametric analyzes.

They are used to test hypotheses for abnormally distributed quantitative and qualitative quantities. They have been chosen for this purpose:

- χ^2 to verify the conformity of an empirical frequency distribution with a given theoretical model;

- Pearson's criterion for comparing empirical and theoretical distributions and for multiple tables.

The significance level (α) of the null hypothesis is $P < 0.05$ with a 95% confidence interval. The main measure of the strength of the dependence is the correlation coefficient (r). When it has a positive value, it can be said that the relationship between the phenomena is right, and when it is negative, the relationship is inverse.

The following quantitative indices were used for ethnopharmacological and ethnobotanical research:

- **Respondent Consensus Ratio** (F_{IC} (IAR). It is applied in studies based on open list plant species interviews and / or open interviews within specific areas of ethnobotany or categories of use [25]. It provides information on respondents' consensus on the use of a medicinal plant in a particular disease, group of symptoms or category of use.
- **The Fidelity Level** (FL – Fidelity Level) indicates respondents' choice of a potential plant that treats a disease or is used for a specific use [30]. It quantifies the significance of a species for a given purpose.
- **Importance Value Index** (IVs – Importance Value). This index measures the share of respondents who consider a species to be the most important. Values range from 0 to 1 [24].

Microsoft Excel 2010 and specialized software for statistical processing SPSS v. 19.0 for Windows were used in data processing [26]. Following the latest recommendations for the publication of ethnobotanical field studies [27], the primary data are presented unchanged, which allows a direct comparison in other similar studies.

Results and discussion

As medicinal plants with application for decorative purposes, we consider those plants that are used to make fresh or dry bouquets, are grown as indoor or garden ornamental plants. Of the 709 locals surveyed on the North Black Sea coast, 375 people (52.89%) answered that they use and 334 people (47.11%) answered that they do not use medicinal plants for decorative purposes. The importance value index is slightly above average (IVs = 0.53). For decorative purposes in the study area are used 73 species of medicinal plants of 61 genera and 30 families (Appendix).

The medicinal plants used for decorative purposes, distributed in the floristic subregion of the North Black Sea coast, are 58 species. This represents 9.94% of the total number of medicinal plants in the floristic subregion of the North Black Sea coast [28]. Such species are, for example: *Crocus sp.*, *Galanthus elwesii* Hook. f., *G. nivalis* L., *Paeonia peregrina* Mill., *Primula veris* L., *Syringa vulgaris* L., *Xeranthemum annuum* L. and others. There are only two plants distributed in other floristic regions of Bulgaria: *Pinus nigra* Arn. and *Helleborus odorus* Waldst. & Kit. ex Willd. Of the cultivated plants, 13 species are used: *Calendula*

officinalis L., *Pelargonium zonale* (L.) L'Her., *Rosa centifolia* L., *Rosmarinus officinalis* L., *Tagetes sp. diversa*, and others.

Some of the medicinal plants have protection status and are included in national and international nature protection documents. Annex V to Council Directive 92/43/EEC of the Council of the European Communities on the conservation of natural habitats and of wild fauna and flora includes two species: *Galanthus nivalis* L. and *Ruscus aculeatus* L. Annex I of the Convention on the Conservation of European Wildlife, Fauna and Natural Habitats (Bern Convention) includes two other species: *Cyclamen coum* Mill. and *Paeonia tenuifolia* L. Annex II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) includes 7 species: *Cyclamen coum* Mill., *Galanthus elwesii* Hook.f., *G. nivalis* L., *Leucojum aestivum* L., *Orchis purpurea* Huds., *O. Simia* Lam., and *O. tridentata* Scopoli. The medicinal plants included in Annex III of the Biodiversity Act of the Republic of Bulgaria are 5 species: *Galanthus elwesii* Hook.f., *G. nivalis* L., *Paeonia tenuifolia* L., *Limonium vulgare* Mill., *Cyclamen coum* Mill. Annex IV of the Biodiversity Act of the Republic of Bulgaria includes 8 species: *Leucojum aestivum* L., *Ruscus aculeatus* L., *R. hypophyllum* L., *Scilla bifolia* L., *Crocus sp. diversa*, *Orchis purpurea* Huds., *O. Simia* Lam., and *O. tridentata* Scopoli. The Red Book of the Republic of Bulgaria includes 5 species: *Cyclamen coum* Mill., *Galanthus elwesii* Hook.f., *G. nivalis* L., *Limonium vulgare* Mill. and *Paeonia tenuifolia* L.

The high number (58 species) of medicinal plants used by the local flora for decorative purposes confirms the working hypothesis that the local population knows the decorative qualities of some of the plant species, as well as their habitats. On the other hand, the inhabitants of the North Black Sea coast are not aware of the conservation status of conservationally important species such as: *Cyclamen coum* Mill., *Galanthus elwesii* Hook.f., *G. nivalis* L., *Paeonia tenuifolia* L., species of the family Orchidaceae. The collection of such plants is most often for bouquets or the whole plant is transferred for cultivation in private yards. Not to be overlooked is the fact that plants that are not medicinal but are included in various documents for the protection of plant diversity are often collected. Such plants are: *Limonium meyeri* (Boiss.) O. Kuntze, *L. gmelini* (Willd.) O. Kuntze, *Stipa lessingiana* Trin. & Rupr., *S. ucrainica* P.A. Smirn., *Fritillaria pontica* Wahl. and others. The lack of information of the locals, as well as the lack of control are essential prerequisites for population reduction and destruction of rare and valuable plant species.

Most responses for use as ornamental plants were obtained for the use of the following cultivated species: *Pelargonium zonale* (L.) L'Her. (FL 75,46), *P. roseum* Willd. (FL 52,53), *Tagetes sp. diversa* (FL 47,46), and wild species: *Galanthus elwesii* Hook.f. and *G. nivalis* L. In total for the two species of the genus *Galanthus* the answers are 228 (FL 60,8%). Most of the surveyed locals grow the two species of the genus *Galanthus* in their yards, and the rest collect them for bouquets from their natural habitats. It is worth noting

that both species are included in Annex 3 of the Biodiversity Act and in the Red Data Book of the Republic of Bulgaria.

Regarding the use of medicinal plants for decorative purposes in Bulgaria, some settlements located in different parts of the country have been studied. An ethnobotanical study of medicinal plants in the region of the town of Ispirih [2], which is located in the floristic region of Northeastern Bulgaria and is close to the study area, describes 9 species of medicinal plants used by the local population for decorative purposes. Of these, only *Muscari neglectum* Guss. not specified by locals on the North Black Sea coast. In the present study, 64 species of more medicinal plants with application for decorative purposes were identified. An ethnobotanical study of wetlands along the North Black Sea coast [3] states that 9.73% of locals use 25 species of medicinal plants for decorative purposes. Of these, *Cotinus coggygria* Scop. not indicated for use as an ornamental plant in the present study, as well as *Petunia* sp., which is not indicated as a medicinal plant. In the present study, 49 species more medicinal plants are indicated for decorative purposes. The significant difference in the number of medicinal plants used for decorative purposes in the area of the town of Ispirih [2] and in the North Black Sea Wetlands [3], compared to the present study, is due to the larger area that is the subject of our study, the larger number of settlements - and the larger number of surveyed residents.

The results of the survey show the following:

1. According to the size of the settlement

The respondents who answered that they use medicinal plants for decorative purposes in the cities are 252 people (52.60%) and 92 people (53.80%) are residents of the villages. After analyzing the results obtained, we found that the inhabitants of towns and villages use a similar number of medicinal plants - 46 species in cities and 55 species in villages. Despite the close number of medicinal plants used for decorative purposes, there are some differences in the knowledge of medicinal plants and their decorative qualities by the locals according to the size of the settlement. A significant difference is also observed in the types of medicinal plants grown for decorative purposes, which depends on the availability of space for their cultivation. When processing the results, we found that there is a significant difference in the types of medicinal plants used for decorative purposes, according to the size of the settlement. For example, the inhabitants of the cities indicated plants that were not indicated by the inhabitants of the villages. Examples are: *Corydalis solida* (L.) Clairv., *Polygonatum multiflorum* (L.) All., *P. odoratum* (Mill.) Druce, *Ruscus aculeatus*, *Aloe arborescens* Mill., *Quercus* sp., *Pinus nigra* Arn., *Platanus hybrida* Brot., *Clematis vitalba* L., *Paliurus spina-christi* Mill., *Citrus limon*, *Tilia tomentosa* Moench., *Papaver rhoeas* L., *Laurus nobilis* L., *Helianthus annuus* L. and others. The inhabitants of the villages grow species that are not indicated by the inhabitants of the cities, such as: *Galanthus elwesii*, *Colchicum autumnale* L., *Cota tinctoria* L., *Echinops* sp., *Tanacetum vulgare* L., *Sedum* sp., *Iris pseudacorus* L. and others.

An interesting fact about the application of medicinal plants for decorative purposes is the use of cones, acorns, plane trees, sagebrush, leaves of various deciduous trees for making children's applications with natural materials. This application of medicinal plants is reported by city dwellers.

After the correlation analysis, we found a weak positive relationship ($r = 0.1$) between the number of medicinal plants used for decorative purposes and the size of the settlement in which the respondents live. The results are considered statistically significant ($P = 0,03$).

2. According to ethnicity

Representatives of all ethnic groups responded that they use medicinal plants for decorative purposes. The highest percentage of Armenians is 9 people (100%) and Tatars - 3 people (100%), followed by Turks - 21 people (91.30%), Roma - 21 people (56.76%), Bulgarians - 305 people (48.57%) and diggers - 4 people (44.44%). It is noteworthy that among the representatives of the smaller ethnic groups, such as Armenians and Tatars, all respondents answered that they use medicinal plants for decorative purposes.

After processing the obtained results, we found that the locals on the North Black Sea coast most often use between 1 and 5 species of medicinal plants for decorative purposes (Fig. 2).

Figure 2. Number of medicinal plants used for decorative purposes according to the ethnicity of the respondents

For the use of a larger number of species - between 6 and 10, as well as between 11 and 15 species of medicinal plants, answers were received only from Bulgarians. The percentage of respondents from smaller ethnic groups is higher, but they use fewer species of medicinal plants for decorative purposes. The Bulgarians who use over 5 types of medicinal plants are 82 people (26.89%).

The correlation dependence shows a weak negative relationship ($r = - 0.1$) between the number of medicinal plants used for decorative purposes and the ethnicity of the respondents. However, the results are not statistically significant ($P = 0.05$).

3. According to age

Representatives of all age groups use medicinal plants for decorative purposes. The largest participation is of respondents from 51 to 60 years - 69 people (60%), followed by respondents over 80 years - 14 people (58.33%), from 61 to 70 years - 75 people (57.62%), from 71 to 80 years - 34 people (53.97%), from 41 to 50 years - 60 people (53.09%), from 31 to 40 years - 43 people (47.78%), up to 20 years - 52 people (46.43%), from 21 to 30 years - 28 people (45.16%). It is noteworthy that with increasing age the number of respondents who use medicinal plants for decorative purposes increases. This result is explained by the fact that younger people are less likely to pay attention to ornamental plants, and that these plants in the home are usually cared for by older family members.

Most responses were obtained for the use of 1-5 species of medicinal plants in all age groups (Fig. 3). Respondents under the age of 20 do not use more than 5 species of medicinal plants.

Figure 3. Number of medicinal plants used for decorative purposes according to the age of the respondents

The obtained relationship between the number of used medicinal plants and the age of the respondents correlates with the working hypothesis that with increasing age the interest in ornamental plants increases. The Pearson coefficient shows a moderate relationship ($r = 0.31$). The results are statistically significant ($P = 0.01$).

4. According to gender

Of the 709 people surveyed, locals on the North Black Sea coast, 75 men (35.89%) and 300 women (60%) indicated that they use medicinal plants for decorative purposes. Twice the percentage of women is due to the fact that they usually take care of the decoration of the household. And by this criterion the greatest is the use of 1-5 species of medicinal plants (Fig. 4). Only women use more than 10 plants.

Figure 4. Number of medicinal plants used for decorative purposes according to the gender of the respondents

Correlation analysis showed a weak relationship ($r = 0.032$) between the number of medicinal plants used for decorative purposes and the sex of the respondents. The results are statistically significant ($P = 0.01$).

5. According to education

The number of respondents who answered that they use medicinal plants for decorative purposes, according to the level of education is as follows: without education - 3 people (21.43%), with primary - 6 people (46.15%), mainly - 103 people (53.09%), average - 198 people (53.95%) and higher - 65 people (53.72%). It is noteworthy that only people without education use the use of medicinal plants for decorative purposes. These are respondents from Roma and Kopanar ethnic groups. In the other groups the use of medicinal plants for decorative purposes is close to more than half of the respondents. This fact means that the attitude of the locals to ornamental plants is not formed in school. The largest participation is of the locals, who use between 1 and 5 species of medicinal plants (Fig. 5) for decorative purposes. After the correlation analysis, we found a weak relationship ($r = 0.13$) between the number of medicinal plants used and the education of the respondents. The results are considered statistically significant ($P = 0.02$).

Figure 5. Number of medicinal plants used for decorative purposes according to the education of the respondents

6. According to employment

According to their employment, the respondents using medicinal plants for decorative purposes are distributed as follows: students - 51 people (45.54%), working - 188 people (50.54%), unemployed - 20 people (60.61%) and pensioners - 116 people (60.42%). The highest percentage of pensioners and the unemployed is probably due to the fact that they have the most free time. The most common is the use of 1-5 species of medicinal plants (Fig. 6).

Figure 6. Number of medicinal plants used for decorative purposes according to the employment of the respondents

The correlation analysis shows a weak relationship ($r = 0.2$) between the number of medicinal plants used for decorative purposes and the employment of the respondents. The results are considered statistically significant ($P = 0.04$).

7. Quantitative ethnobotanical analysis

After the calculations, we found a high value of the respondent's consensus index ($FIC = 0.75$). The result shows lasting knowledge in the use of medicinal plants for decorative purposes. The degree of knowledge stored, the choice of the type and number (FL) of medicinal plants used, as well as the number of locals who use them, is determined by the importance (IVs) of the specific use of medicinal plants according to the respondents. Knowledge of the use of medicinal plants for decorative purposes is defined as significant (IVs 0.52) by locals on the North Black Sea coast.

Conclusion

Ethnobotanical knowledge about the application of medicinal plants for decorative purposes is largely preserved and passed down through the generations. The locals in the region of the Northern Black Sea coast use a significant number of medicinal plants for decorative purposes - 73 species. There is no significant

difference in the number of medicinal plants used for decorative purposes by the inhabitants of small and large settlements. We reported differences in the types of medicinal plants used. In terms of gender, women know more species with decorative qualities and use them more often. Locals with lower education, from Roma and Kopanar ethnic groups less often use medicinal plants for decorative purposes. The use of medicinal plants by pensioners and the unemployed is more popular. The locals do not have knowledge about the conservation status of conservationally important species collected from their natural habitats. Although these plants and their natural habitats are located in areas of the European ecological network "Natura 2000", the population is either not aware of their status or control activities for their protection are not effective enough. This fact is essential for the conservation of species and their natural habitats.

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Appendix. Medicinal plants used for decorative purposes by the locals on the North Black Sea coast

Family	Scientific names	Bulgarian names	Conservation status	LMP	Origin	UR (FL) n = 375
Amaryllidaceae	<i>Galanthus elwesii</i> Hook.f.	Elwesiewo kokiche	E;EN;CS	*	1	62 (16,53)
Amaryllidaceae	<i>Galanthus nivalis</i> L.	Snezhno kokiche	E;EN;CS;DH	*	1	166 (44,27)
Amaryllidaceae	<i>Leucojum aestivum</i> L.	Blatno kokiche	R;CS		1	8 (2,13)
Apocynaceae	<i>Vinca herbacea</i> Waldst. & Kit.	Trevist zimzelen		*	1	6 (1,6)
Apocynaceae	<i>Vinca major</i> L.	Golyam zizmezelen, golyama vinka		*	1	11 (2,93)
Araliaceae	<i>Hedera helix</i> L.	Brashlyan		*	1	24 (6,4)
Asparagaceae	<i>Asparagus officinalis</i> L.	Zaycha syanka		*	1	14 (3,73)
Asparagaceae	<i>Convallaria majalis</i> L.	Momina salza			1	15 (4)

Asparagaceae	<i>Coridalis solida</i> (L.) Clairv.	Lisichina, Tiltikuyruk		*	1	4 (1,07)
Asparagaceae	<i>Polygonatum multiflorum</i> (L.) All.	Mnogocvetna momkova salza		*	1	1 (0,27)
Asparagaceae	<i>Polygonatum odoratum</i> (Mill.) Druce	Lechebna momkova salza		*	1	3 (0,8)
Asparagaceae	<i>Ruscus aculeatus</i> L.	Bodliv zalist, div chimshir	R;DH	*	1	1 (0,27)
Asparagaceae	<i>Ruscus hypophyllum</i> L.	Podezichen zalist	R		1	16 (4,27)
Asparagaceae	<i>Scilla bifolia</i> L.	Sinchets	R	*	1	45 (12)
Asphodelaceae	<i>Aloe arborescens</i> Mill.	Darvesno aloe			3	52 (13,86)
Asphodelaceae	<i>Aloe vera</i> (L.) Burm.f.	Aloe			3	60 (16)
Asteraceae	<i>Achillea millefolium</i> L.	Byal ravnets		*	1	4 (1,07)
Asteraceae	<i>Bellis perennis</i> L.	Parichka		*	1	32 (8,53)
Asteraceae	<i>Calendula officinalis</i> L.	Neven, zhalta ruzha			3	156 (41,6)
Asteraceae	<i>Carduus acanthoides</i> L.	Magareshki bodil		*	1	7 (1,87)
Asteraceae	<i>Centaurea cyanus</i> L.	Metlichina		*	1	34 (9,07)
Asteraceae	<i>Cota tinctoria</i> (L.) J.Gay	Zhalto podrumiche		*	1	14 (3,73)
Asteraceae	<i>Echinops sp. diversa</i>	Chelyadnik			1	6 (1,6)
Asteraceae	<i>Inula helenium</i> L.	Byal oman		*	1	63 (16,08)
Asteraceae	<i>Helianthus annuus</i> L.	Slanchogled			3	92 (24,53)
Asteraceae	<i>Xeranthemum annuum</i> L.	Bezsmartniche, suho tsvete		*	1	89 (23,73)
Asteraceae	<i>Senecio jacobaea</i> L.	Obiknoven sporezh		*	1	12 (3,2)
Asteraceae	<i>Tagetes sp. diversa</i>	Kamshitsa, turta			3	178 (47,46)
Berberidaceae	<i>Berberis vulgaris</i> L.	Kisel tran		*	1	19 (5,07)
Caryophyllaceae	<i>Gypsophyla paniculata</i> L.	Metlichesta mishorka		*	1	1 (0,27)
Colchiciaceae	<i>Colchicum autumnale</i> L.	Karpikozhuh, mrazovets		*	1	3 (0,8)
Crassulaceae	<i>Sedum sp. diversa</i>	Tlastiga			1	1 (0,27)
Crassulaceae	<i>Sempervivum sp. diversa</i>	Debelets			1	4 (1,07)

Fabaceae	<i>Trifolium pratense</i> L.	Livadna detelina		*	1	38 (10,13)
Fagaceae	<i>Quercus sp. diversa</i>	Dab			1	32 (8,53)
Geraniaceae	<i>Geranium macrorrhizum</i> L.	Zdravets		*	1	1 (0,27)
Geraniaceae	<i>Pelargonium roseum</i> Willd.	Indrishe, mandrishanka			3	197 (52,53)
Geraniaceae	<i>Pelargonium zonale</i> (L.) L'Her.	Mushkato			3	283 (75,46)
Iridaceae	<i>Crocus sp. diversa</i>	Minzuhar	R		1	6 (1,6)
Iridaceae	<i>Iris pumila</i> L.	Drebna perunika		*	1	24 (6,4)
Iridaceae	<i>Iris pseudacorus</i> L.	Blatna perunika		*	1	178 (47,47)
Lamiaceae	<i>Origanum vulgare</i> L.	Rigan		*	1	23 (6,13)
Lamiaceae	<i>Rosmarinus officinalis</i> L.	Rozmarin			3	75 (20)
Lamiaceae	<i>Salvia officinalis</i> L.	Gradinski chay			4	5 (1,33)
Lamiaceae	<i>Thymus sp. diversa</i>	Mashterka		*	1	7 (1,87)
Lauraceae	<i>Laurus nobilis</i> L.	Dafinov list			3	18 (4,8)
Malvaceae	<i>Althaea officinalis</i> L.	Lechebna ruzha		*	1	8 (2,13)
Malvaceae	<i>Tilia tomentosa</i> Moench.	Srebrolistna lipa		*	1	5 (1,33)
Oleaceae	<i>Ligustrum vulgare</i> L.	Ptiche grozde, maslinka		*	1	3 (0,8)
Oleaceae	<i>Syringa vulgaris</i> L.	Lyulyak		*	1	2 (0,53)
Orchidaceae	<i>Orchis purpurea</i> Huds.	Purpuren salep	R;CS	*	1	8 (2,13)
Orchidaceae	<i>Orchis simia</i> Lam.	Maymunski salep	R;CS	*	1	70 (18,67)
Orchidaceae	<i>Orchis tridentata</i> Scopoli.	Trizabest salep	R;CS	*	1	4 (1,07)
Paeoniaceae	<i>Paeonia peregrina</i> Mill.	Cherven bozhur		*	1	2 (0,53)
Paeoniaceae	<i>Paeonia tenuifolia</i> L.	Tesnolisten bozhur	E;EN;BC		1	2 (0,53)
Papaveraceae	<i>Papaver rhoeas</i> L.	Polski mak		*	1	121 (32,27)
Pinaceae	<i>Pinus nigra</i> Arn.	Cheren bor			3	5 (1,33)
Platanaceae	<i>Platanus hybrida</i> Brot.	Chinar, platan			3	10 (2,66)
Plumbaginaceae	<i>Limonium vulgare</i> Mill.	Obiknovena garlitsa	E;EN	*	1	4 (1,07)
Primulaceae	<i>Cyclamen coum</i> Mill.	Ciklama, buturche	E;EN;BC;CS	*	1	2 (0,53)
Primulaceae	<i>Primula veris</i> L.	Lechebna iglika		*	1	8 (2,13)
Primulaceae	<i>Primula vulgaris</i> Huds.	Obiknovena iglika,		*	1	8 (2,13)

		bezstablena iglika				
Ranunculaceae	<i>Consolida regalis</i> Gray.	Obiknovena ralitsa		*	1	71 (18,93)
Ranunculaceae	<i>Clematis vitalba</i> L.	Povet, lozina, zhiv plet		*	1	3 (0,8)
Ranunculaceae	<i>Helleborus odorus</i> Waldst. & Kit. ex Willd.	Kukuryak		*	3	1 (0,27)
Ranunculaceae	<i>Nigella arvensis</i> L.	Chelebitka		*	1	34 (9,07)
Ranunculaceae	<i>Ranunculus ficaria</i> Huds.	Zhalturche		*	1	6 (1,6)
Rhamnaceae	<i>Paliurus spina-christi</i> Mill.	Draka		*	1	1 (0,27)
Rutaceae	<i>Citrus limon</i> (L.) Osbeck.	Limon			3	12 (3,2)
Rosaceae	<i>Crataegus monogyna</i> Jacq.	Cherven glog		*	1	14 (3,73)
Rosaceae	<i>Rosa centifolia</i> L.	Rosa			3	48 (12,8)
Rosaceae	<i>Rosa canina</i> L.	Shipka			1	2 (0,53)
Violaceae	<i>Viola tricolor</i> L.	Tricvetna temenuga		*	1	3 (0,8)

Legend:

Conservation status: E – the plant is included in Annex III of the Biodiversity Act of the Republic of Bulgaria; R – the plant is included in Annex IV of the Biodiversity Act of the Republic of Bulgaria; EN – the plant is included in the Red Book of the Republic of Bulgaria in the category "endangered species"; BC – the plant is included in the Berne Convention; CS – the plant is included in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); DH – Annex V to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

LMP: The species is included in the Annex to the Law on Medicinal Plants of the Republic of Bulgaria

Origin: 1 – species that is distributed in the floristic subregion of the North Black Sea coast; 2 – the species is foreign to the flora of Bulgaria; 3 – species that is distributed in another floristic region of Bulgaria; 4 – cultivated plant; 5 – adventive species

UR: Number of respondents who use a species for decorative purposes

FL (%): Loyalty index