

USE OF MEDICINAL PLANTS FOR COSMETIC PURPOSES BY THE LOCALS ON THE NORTH BLACK SEA COAST (BULGARIA)

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Abstract. The present study is part of a larger ethnobotanical study of medicinal plants in the North Black Sea coast and is the first purposive study on use of medicinal plants for cosmetic purposes in Bulgaria. Its aim is to identify medicinal plants used for cosmetic purposes by the local population on the North Black Sea coast. The survey was conducted in the period 2014-2020. The interviews with the local population were conducted face-to-face with the help of original questionnaires. The surveyed locals were 709 people from 32 settlements. Respondents were selected at random. They were of different age groups, gender, ethnicity, education and employment. The folk names of the used medicinal plants were recorded. The results show that a significant proportion of respondents (42.60%) use medicinal plants for cosmetic purposes. The medicinal plants used in cosmetics by the locals were 55 species of 50 genera from 36 families.

Key words: ethnobotany, local knowledge, traditional use, herbs.

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INTRODUCTION

Before inorganic chemistry conquered cosmetics, herbs were used as the main helpers of female beauty (PAMUKOV & AKHTARDZHIEV 1989). For Bulgaria, the earliest evidence for the use of plant resins was found in the historical and archaeological reserve "Sboryanovo", where a resin from *Pinus halepensis* M. Bieb. was found, dating from the IV-III century BC. One of the applications of this type of resin is for cosmetic purposes (ZLATEVA ET AL. 2007). In the healing recipes of St. Ivan Rilski (NEDELICHEVA 2012) existed seven recipes with medicinal plants and ointments prepared for external use for skin problems, some of which could be referred to as cosmetic, such as a cracked skin.

The use of perfume in the Bulgarian tradition has long been known. The plants themselves were used directly, not an extract of them. This fact is evidenced by the rich folklore of the Bulgarians. In the 17th century, *Rosa damascena* Mill. began to be cultivated in Bulgaria for the production of perfumed water, and only later the rose oil was used for perfumes and for industrial purposes (VAKARELSKI 1977).

The modern literature is rich in information about the use of medicinal plants for cosmetic purposes. Many publications provide information about their use in cosmetics with recipes included (IVANOV ET AL. 1973; PAMUKOV & AKHTARDZHIEV 1989; LANDZHEV 2005). The *Book of Herbs* (MABEY ET AL. 2001) contains detailed herbal recipes for skin, hair, oral hygiene, herbal soaps, cosmetic and nourishing face and hand masks, as well as information on aromatherapy.

Despite the significant number of ethnobotanical studies in Bulgaria in recent years (IVANOVA & IVANOV 2009; NEDELICHEVA 2012; KOZUHAROVA ET AL. 2013; STOYNEVA-GÄRTNER & UZUNOV 2015; CHERNEVA ET AL. 2017; MINCHEVA ET AL. 2019), so far, no purposeful ethnobotanical studies of medicinal plants with use in cosmetics have been made. However, some publications indicate their application. For example, a study in Ispirih (KULTUR 2008; KULTUR & SAAMI 2009) identified six species of medicinal plants for use in cosmetics. KOLEVA ET AL. (2015) mentioned two species of medicinal plants indicated for the interior of the country, and NANOVA ET AL. (2015) noted three species of medicinal plants for use in cosmetics.

The aim of the present study is to clarify the use of medicinal plants for cosmetic purposes by the locals on the North Black Sea coast.

MATERIAL AND METHODS

The field ethnobotanical study was conducted in the period 2014-2020 in 32 settlements located on the northern Black Sea coast, which includes eight 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, Goritza, Kranevo, Shkorpilovtzi and Topoli).

Ethnobotanical data were collected through an extensive interview aimed at creating open, informal and semi-structured interviews. The *face-to-face* interview technique is also used in other ethnobotanical studies (KOLEVA ET AL. 2015; CHERNEVA 2017; ZAHARIEV & RADEVA 2020). For this purpose, an original questionnaire was created, printed and filled in on paper. The survey involved 709 randomly selected locals.

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

For determination of the medicinal plants *Handbook for Plants in Bulgaria* (DELIPAVLOV ET AL. 2011), *Flora of the People's Republic of Bulgaria* (JORDANOV 1963-1976; KUZMANOV 1979) and *Flora of the Republic of Bulgaria* (KOZHUKHAROV 1995; PEEV 2013) were used. The Latin names of the species were adopted according to the INTERNATIONAL PLANT NAMES INDEX. Families were identified according to APG IV (ANGIOSPERM PHYLOGENY GROUP 2016). The identification of the native or alien type of the plants according to their origin was based on the *Conspectus of the Bulgarian Vascular Flora* (ASSYOV ET AL. 2012). Medicinal plants were outlined according to the MEDICINAL PLANTS ACT (2000), ZAHARIEV & IVANOV (2014) and ZAHARIEV ET AL. (2015). The determination of the cultural types of medicinal plants was according to KITANOV (1986).

Medicinal plants used in cosmetics are defined as those plants that are used as raw material for the production of cosmetic products and plants that are used directly as a cosmetic. According to the Regulation (EC) 1223/2009, *cosmetic product* means any substance or mixture intended to come into contact with any external part of the human body (epidermis, hair and hair, nails, lips and external genitalia) or with the teeth and the mucous membrane of the oral cavity, exclusively or primarily for the purpose of cleaning, perfuming, altering, protecting, maintaining them in good condition or correcting body odor.

Correlation analysis was conducted to assess the strength of the relationship between the studied indicators using the Pearson coefficient in quantitative indicators. Nonparametric analyzes were applied to test hypotheses in abnormally distributed quantitative and qualitative magnitude. χ^2 was used to check the correspondence of the empirical frequency distribution with a given theoretical model. The significance level (α) of the null hypothesis was $P < 0.05$ with a 95% confidence interval. The main measure of the strength of the dependence was the correlation coefficient (r). The verification of the statistical significance of the correlation coefficient was performed by the Significance threshold. When it is less than α (the risk of error is 0.05), then the calculated correlation coefficient can be taken as a reliable

estimate and considered statistically significant. Its value is interpreted according to the generally accepted scale (CHOLAKOV 2002). When the correlation coefficient is positive, it can be said that the dependence between the phenomena is right, and when it is negative, it is accepted that the dependence is inverse.

Several quantitative indices for ethnopharmacological and ethnobotanical studies have been used to analyze the obtained data (HOFFMAN & GALLAHER 2007; HEINRICH ET AL. 2009):

- Analysis of quantitative data that introduce the ratio of the agreement between the respondent F_{IC} (IAR), also called the coefficient of consensus of the respondent, is calculated by the formula:

$$F_{IC} = \frac{n.UR - n.taxa}{n.UR - 1}$$

where n is the number of respondents, UR are the answers for the use of a medicinal plant. This factor is applied in studies based on interviews with an open list of plant species and/or open interviews within certain areas of ethnobotany (*e.g.*, medicinal plants, food plants) or categories of use (HEINRICH ET AL. 2009). The IAR or F_{IC} provides information on respondents' consensus on the use of a medicinal plant in a particular disease, symptom group, or category of use.

- The Fidelity Level (FL) index indicates respondents' choice of a potential plant that treats a disease or is used for a specific use (TSIOUTSIU ET AL. 2019). It is calculated by the following formula:

$$FL(\%) = \frac{Np}{N} 100$$

where Np is the number of responses for use for a particular plant species in a given category of application, and N is the total number of respondents who indicated the plant for any use. FL quantifies the significance of a species for a given purpose

- Importance Value Index (IV_s) is calculated as: $IV_s = \frac{n_{is}}{n}$

where n_{is} is the number of respondents who use medicinal plants, n is the total number of respondents. This index measures the share of respondents who consider a species to be the most important. Values range from 0 to 1 (HOFFMAN & GALLAHER 2007).

Statistical data processing was performed with Microsoft Excel 2010 and SPSS v. 19.0.

RESULTS AND DISCUSSION

Out of the 709 locals surveyed in the North Black Sea coast, 302 people (42.60%) answered that they use medicinal plants and 407 people (57.40%) answered that they do not use medicinal plants for cosmetic purposes. The index for the value of importance was slightly below the average ($IV_s=0.42$).

For cosmetic purposes in the study area 55 species of medicinal plants of 50 genera and 36 families are used (*Appendix 1*). Of these, 17 species are distributed in the floristic subregion of the North Black Sea coast: *Achillea millefolium* L., *Arctium lappa* L., *Cotinus coggygia* Scop., *Hedera helix* Lowe., *Matricaria chamomilla* L., etc. Of the medicinal plants alien to the Bulgarian flora, 13 species are used: *Aesculus hippocastanum* L., *Aloe vera* (L.) Burm.f., *Calendula officinalis* L., *Callisia fragrans* L., *Helianthus tuberosus* L., *Helleborus odorus* Waldst. & Kit. ex Willd., *Ricinus communis* L. and *Veratrum lobelianum* Bern. From the cultivated plants, 22 species (*Allium cepa* L., *Brassica oleracea* L., *Cucumis melo* L., *Helianthus annuus* L., *Petroselinum crispum* (Mill.) A. W. Hill. etc.) are used.

Among the medicinal plants identified by us with application in cosmetics, 15 species are included in the LAW ON MEDICINAL PLANTS OF THE REPUBLIC OF BULGARIA. The other 39 species are listed in the specialized literature on medicinal plants, published in Bulgaria.

The most commonly used medicinal plants for cosmetic purposes by the local population are *Aloe vera*, *Calendula officinalis*, *Lavandula angustifolia* Mill., *Matricaria chamomilla*, *Mentha* sp. div. and *Rosa damascena*. Among the medicinal plants used for cosmetics the most rich in genera are the families Asteraceae (7), Lamiaceae (6) and Rosaceae (6).

Regarding the usable part, the local population most widely uses plant oils from *Amygdalus communis* L., *Argania spinosa* Skeels, *Eucalyptus* sp., *Melaleuca alternifolia* (Maiden & Betche) Cheel, *Prunus armeniaca* L., *Rosmarinus officinalis* L., etc. This fact shows that the majority of the local population uses medicinal plants for cosmetic purposes as a finished product and is supplied with them through the trade network. A significantly smaller part of the respondents answered that they are supplied with medicinal plants for cosmetic purposes by collecting them from nature. These are mostly residents of smaller settlements.

The most common application of medicinal plants in cosmetics is for washing hair (mainly nettle, walnut, ivy) and face masks (most widely the fruits of cucumber, tomato, pomegranate, peach, lemon, grape, etc.). An interesting fact is the widespread use of *Hedera helix* leaves for washing hair particularly by residents of Byala.

During the study, no new species was identified in ethnobotanical aspect as used in cosmetics for the region of the Northern Black Sea coast. All 55 species of medicinal plants known and applied by the local population have been described in the specialized literature. Only *Verbascum* sp., presented in the herbal recipes of

St. Ivan Rilski (NEDELICHEVA 2012), was not mentioned in the present study. The other six species from these recipes, namely *Aloe* sp., *Allium cepa*, *Cinnamomum zeylanicum* Blume, *Juglans regia* L., *Syzygium aromaticum* (L.) Merr. & L. M. Perry and *Zingiber officinale* Roscoe were named by people during the present study. An ethnobotanical study for the town of Ispirih (KULTUR 2008; KULTUR & SAAMI 2009) identified six species of medicinal plants for use in cosmetics, all of which appeared in the present study. KOLEVA ET AL. (2015) described the use of *Centaurium erythraea* against hair loss, but the plant was not indicated for cosmetic use by locals on the North Black Sea coast. Both abovementioned studies do not indicate the correlations for the use of medicinal plants in cosmetics in terms of demographic indicators

The comparison of our results with those from other ethnobotanical studies demonstrates that we found a significantly higher number of medicinal plants used for cosmetic purposes. This is due, on the one hand, to the fact that so far no ethnobotanical studies have been conducted in Bulgaria on the use of medicinal plants in cosmetics and, on the other hand, that the current study was made in a large number of settlements.

Results according to the size of the settlement

Of the respondents, 242 urban residents (80.13%) and 60 rural residents (19.87%) answered that they use medicinal plants for cosmetic purposes. The inhabitants of the cities use a larger number of medicinal plants in cosmetics (48 species) than the inhabitants of the villages (34 species).

The higher number of medicinal plants used by urban residents compared to villages is explainable by the higher percentage of surveyed urban residents (75.88%) than in rural areas (24.12%), as well as by some demographic peculiarities of the population - in the cities there is a higher percentage of younger population. On the other hand, people in larger settlements increasingly use foreign species of medicinal plants in cosmetics such as: *Aloe vera*, *Argania spinosa*, *Eucalyptus* sp., *Melaleuca alternifolia* (Maiden & Betche) Cheel., *Syzygium aromaticum*, etc., which are not indicated by the villagers. This is due to the better awareness of the inhabitants of the cities. In addition, the possibility of obtaining ready-made herbal cosmetics from the trade network in the cities is much greater than in the villages. This fact was also confirmed during the fieldwork of the survey. It is noteworthy that the villagers more often use medicinal plants collected from nature or grown in their yards, such as: *Calendula officinalis*, *Hedera helix*, *Juglans regia*, *Matricaria chamomilla*, *Urtica dioica* L. and others. This use testifies to the preserved ethnobotanical knowledge among the inhabitants of the villages for the application of medicinal plants in cosmetics. The use of foreign medicinal plants has become widespread in the cities and the use of ready-made cosmetic products is much greater. Most respondents use between one and five species of medicinal plants, regardless of the size of the settlement. The use of six to ten species of

medicinal plants is significantly higher among urban residents.

In reflecting the influence of the settlement (town or village) on the number of medicinal plants used for cosmetic purposes the correlation coefficient ($r=-0.07$) shows the presence of a weak negative relationship. The results are statistically significant ($P=0.001$).

Results by ethnicity

The ethnic composition of the respondents who use medicinal for cosmetic purposes is rich and includes five ethnic groups. The highest participation was reported among Armenians (30%), followed by Bulgarians (24%), Roma (22%), Turks (12%) and Kopanari (12%). Only the representatives of the Tatar ethnic group do not report that they use medicinal plants for cosmetic purposes. This result is due to the smaller number of participants from this ethnic group, as well as to the fact that they are male.

According to our study, the population on the North Black Sea coast most often uses between one and five species of medicinal plants for cosmetic purposes, regardless of ethnicity (**Fig. 1**). There is a significant share in the use of medicinal plants for cosmetic purposes among Armenians, but a weaker use among ethnic groups such as Turks and Kopanari. The use of more medicinal plants in cosmetics - between six and ten and over ten species is present only in the Bulgarian ethnic group.

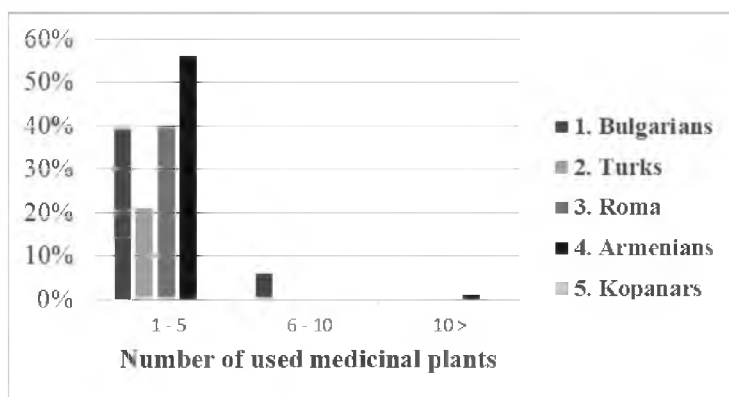


Fig. 1. Number of medicinal plants used for cosmetic purposes according to the ethnicity of the respondents

The correlation coefficient shows a weak positive relationship between the parameters medicinal plants used and ethnicity ($r=0.160$). The results are statistically significant ($P=0.002$).

Results according to the age of the respondents

The highest share of respondents using medicinal plants for cosmetic purposes in the North Black Sea region by age groups was reported in the group up to 20 years (27%), followed by 31-40 (17%), 41-50 (17%), 51-60 (14%), 61-70 (13%), 21-30 (8%), 71-80 (3%) and 80 years (1%).

An interesting result is the significant use of medicinal plants for cosmetic purposes by the youngest locals, those under 20 years of age (27%). This fact means that they have knowledge about the use of medicinal plants and prefer them because they are cheaper than finished cosmetic products and / or because they are natural products.

In all age groups of the studied area, the use of between one and five species of medicinal plants predominates (**Fig. 2**). The largest share is among young people under the age of 20. The same age group is dominated by the answers which point

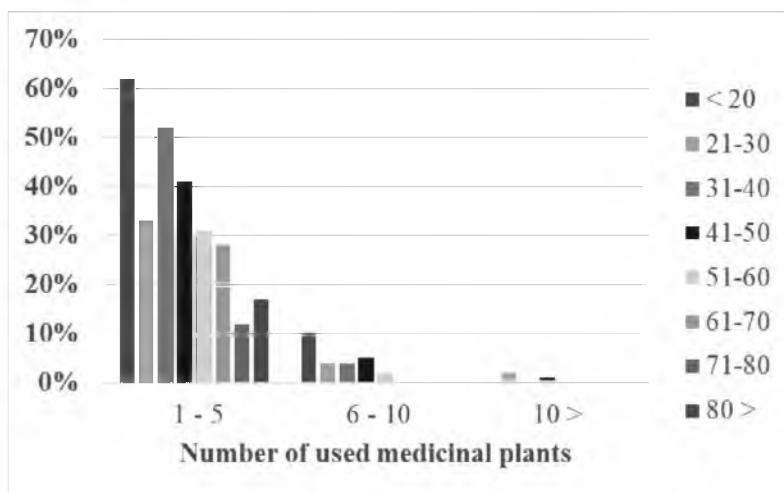


Fig. 2. Number of medicinal plants used for cosmetic purposes according to the age of the respondents.

the use of more medicinal plants (from six to ten species). This fact shows that young people are better acquainted with the use of medicinal plants for cosmetic purposes.

Correlation analysis shows a weak positive relationship ($r=0.15$) between the use of medicinal plants for cosmetic purposes and the age of the respondents. The results are statistically significant ($P=0.03$).

Results by gender of respondents

In the survey, 30 men (9.93%) and 272 women (90.07%) answered that they use medicinal plants for cosmetic purposes (**Fig. 3**). The significantly higher

participation of women is logical considering the fact that such application of medicinal plants is mostly a priority for women.

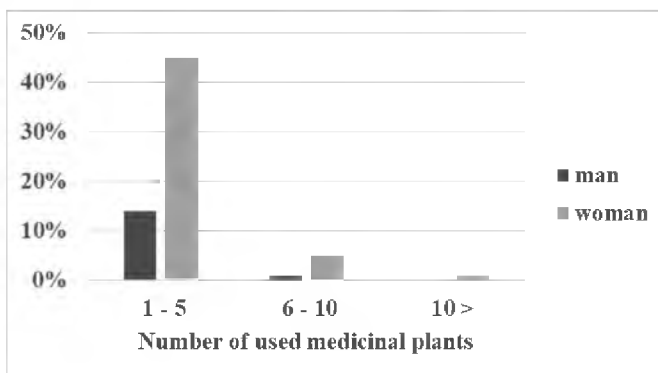


Fig. 3. Number of medicinal plants used for cosmetic purposes according to the gender of the respondents.

The calculations confirm the hypothesis of a strong relationship between sex and the number of medicinal plants used for cosmetic purposes. Correlation analysis showed a significant positive relationship ($r=0.510$) between the number of medicinal plants used and the sex of the respondents. The obtained results are statistically significant ($P=0.004$).

Results according to the education of the respondents

The majority of respondents have secondary education (39%), followed by respondents with primary (35%) and higher education (23%), and 7% of respondents were without education (Fig. 4).

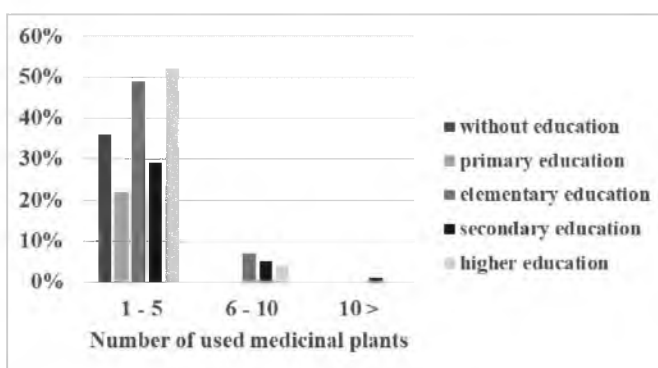


Fig. 4. Number of medicinal plants used for cosmetic purposes according to the education of the respondents.

The surveyed respondents without education are representatives of the Roma and Turkish ethnic groups, and those with primary education are Bulgarians over the age of 80.

People with higher education use medicinal plants to a greater extent for cosmetic purposes and the correlation analysis shows a weak negative relationship ($r=-0.109$) between the number of medicinal plants used and the education of the respondents. However, the results are not statistically significant ($P=0.8$).

Results according to the employment of the respondents

In terms of employment, the largest number of respondents are working (154 people, or 50.99%), followed by students (84, 27.81%), retirees (47, 15.56%) and the unemployed (17, 5.63%). After analyzing the results of the study, we found that mostly working respondents use medicinal plants for cosmetic purposes, but the unemployed use a larger number of species (Fig. 5).

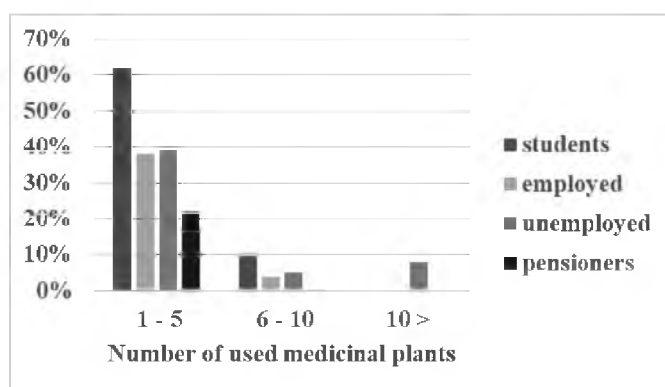


Fig. 5. Number of medicinal plants used for cosmetic purposes according to the employment of the respondents.

The correlation analysis shows a weak positive relationship ($r=0.140$) between the number of medicinal plants used for cosmetic purposes and the employment of the respondents. The result is considered statistically significant ($P=0.004$).

Quantitative ethnobotanical analysis

For the use of medicinal plants for cosmetic purposes, 302 responses (UR) were obtained for 55 species of medicinal plants, and the consensus index of the respondent was above the average value ($F_{IC}=0.63$). 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 (IV_s) of the specific use of medicinal plants according to the respondents. For the region of the North Black Sea coast IV_s marks a value slightly below the average (0.42).

The highest number of answers was obtained for the species: *Cucumis melo* (FL 117), *Aloe vera* (FL 103), *Coffea* sp. (FL 72), *Calendula officinalis* (FL 71) and *Urtica dioica* (FL 66) (**Appendix 1**).

CONCLUSION

The locals of the North Black Sea region use a significant number of medicinal plants for cosmetic purposes - 55 species. The use of medicinal plants for cosmetic purposes is significantly higher by the inhabitants of the cities (80%), compared to those of the small settlements (20%). Locals of the Armenian ethnic group use medicinal plants more often than other ethnic groups, while Bulgarians more often have knowledge of the use of more than five species of medicinal plants. In terms of gender, there is a slight trend for the use of medicinal plants by men (10%) and significant use by women (90%). Local residents with higher education and students have more knowledge about the application of medicinal plants.

With regard to ethnobotanical knowledge about the application of medicinal plants in cosmetics, local knowledge is largely preserved and passed through the generations. Despite the widespread use of local and cultivated medicinal plants in cosmetics, we registered significant use of finished cosmetic products. They are easily available in the commercial network and are becoming increasingly popular through the media, global networks and communications. However, consumers of finished cosmetic products are usually familiar with the content and properties of the medicinal plants contained in them.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this article.

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Family	Scientific Name	Bulgarian Name	LMP	Origin	Usable part	UR(FL), n=302
Amaryllidaceae	<i>Allium cepa</i> L.	luk		4	1; 4; 9;10	5 (1,66)
Anacardiaceae	<i>Cotinus coggygria</i> Scop.	smradlika, tetra	*	1	8;10	22 (7,28)
Apiaceae	<i>Petroselinum crispum</i> (Mill.) Fuss.	magdanoz, merudiya		4	1;9;10	5 (1,66)
Araliaceae	<i>Hedera helix</i> L.	brushlyan	*	1	1;8;10	29 (9,6)
Asphodelaceae	<i>Aloe vera</i> (L.) Burm. f.	aloe		4	15	103 (34,11)
Asteraceae	<i>Achillea millefolium</i> L.	byal ravnets	*	1	9;11	1 (0,33)
Asteraceae	<i>Arctium lappa</i> L.	repey	*	1	10;12	1 (0,33)
Asteraceae	<i>Calendula officinalis</i> L.	neven		4	11	71 (23,51)
Asteraceae	<i>Helianthus annuus</i> L.	slunchogled		4	2;11;15	1 (0,33)
Asteraceae	<i>Helianthus tuberosus</i> L.	guliya, zemna yabulka, eralma		4	5	3 (0,99)
Asteraceae	<i>Matricaria chamomilla</i> L.	layka, laykuchka	*	1	11	63 (20,86)
Asteraceae	<i>Taraxacum officinale</i> F. H. Wigg.	gluharche	*	1	1;10;11	2 (0,66)
Brassicaceae	<i>Brassica oleracea</i> L.	zele		4	10	1 (0,33)
Buxaceae	<i>Buxus sempervirens</i> L.	chemshir		2	8	9(2,98)
Commelinaceae	<i>Callisia fragrans</i> (Lindl.) Woodson	kalizia		2	10	1 (0,33)
Crassulaceae	<i>Sempervivum</i> sp. div.	debelets		1	1;15	2 (0,66)
Cucurbitaceae	<i>Cucumis melo</i> L.	pupesh		4	13	17 (5,62)
Euphorbiaceae	<i>Ricinus communis</i> L.	ritsin		4	16	1 (0,33)
Fagaceae	<i>Quercus</i> sp.	dub		1	1;6;7;12	1 (0,33)
Hippocastanaceae	<i>Aesculus hippocastanum</i> L.	konski kesten		4	12;13	2 (0,66)
Juglandaceae	<i>Juglans regia</i> L.	oreh	*	1	7;10;12;13	52 (17,21)

Family	Scientific Name	Bulgarian Name	LMP	Origin	Usable part	UR(FL), n=302
Lamiaceae	<i>Lavandula angustifolia</i> Mill.	lavandula		4	9;11;16	65(21,51)
Lamiaceae	<i>Mentha piperita</i> L.	menta		4	9;10;16	28 (9,27)
Lamiaceae	<i>Mentha spicata</i> L.	dzhodzhen, gyuzum, yuzum, chiriz, nane	*	1	9;10;11;16	11 (3,64)
Lamiaceae	<i>Mentha</i> sp.	menta		1	9;16	50 (16,56)
Lamiaceae	<i>Rosmarinus officinalis</i> L.	rozmarin		4	9;16	2 (0,66)
Lamiaceae	<i>Thymus</i> sp. diversa	mashterka	*	1	1;9;11;16	8 (2,65)
Lauraceae	<i>Cinnamomum verum</i> J. Presl	kanela		2	6	32 (10,59)
Linaceae	<i>Linum usitatissimum</i> L.	len		1	9;11;13;16	35 (11,59)
Melanthiaceae	<i>Veratrum lobelianum</i> Bernh.	chemerika	*	3	13;16	1 (0,33)
Myrtaceae	<i>Melaleuca alternifolia</i> Cheel	chaeno durvo		2	16	21 (6,95)
Myrtaceae	<i>Syzygium aromaticum</i> (L.) Merr. & L. M. Perry	karamfil		2	11	1 (0,33)
Oleaceae	<i>Olea europaea</i> L.	maslina		2	12;16	1 (0,33)
Papaveraceae	<i>Chelidonium majus</i> L.	zmiysko mlyako	*	1	9;15	11 (3,64)
Pinaceae	<i>Pinus nigra</i> J.F.Arnold	cheren bor		3	1;7;8;10;12	13 (4,3)
Plantaginaceae	<i>Plantago major</i> L.	shirokolisten zhivovlyak	*	1	10	1 (0,33)
Polygonaceae	<i>Rheum officinale</i> Baill.	reven		2	2	2 (0,66)
Punicaceae	<i>Punica granatum</i> L.	nar		2	12;15	11 (3,64)
Ranunculaceae	<i>Helleborus odorus</i> Waldst. & Kit. ex Willd.	kukuryak	*	3	2;9;11	10 (3,31)
Rosaceae	<i>Amygdalus communis</i> L.	badem		4	12;16	2 (0,66)
Rosaceae	<i>Crataegus monogyna</i> Jacq.	cherven glog	*	1	1;12	1 (0,33)

Family	Scientific Name	Bulgarian Name	LMP	Origin	Usable part	UR(FL), n=302
Rosaceae	<i>Cydonia oblonga</i> Mill.	dyulya		4	8;10;12;13	2 (0,66)
Rosaceae	<i>Prunus armeniaca</i> L.	kaysiya		4	12;13;16	2 (0,66)
Rosaceae	<i>Prunus domestica</i> L.	sliva		4	12;15;16	1 (0,33)
Rosaceae	<i>Prunus persica</i> (L.) Batsch.	praskova		4	12	1 (0,33)
Rosaceae	<i>Rosa damascena</i> Mill.	maslodayna roza		4	11	65 (21,52)
Rubiaceae	<i>Coffea</i> sp.	kafe		2	13	13 (4,30)
Rutaceae	<i>Citrus limon</i> (L.) Osbeck	limon		2	12;15	17 (5,63)
Sapotaceae	<i>Argania spinosa</i> Skeels	arganiya		2	16	6 (1,99)
Solanaceae	<i>Lycopersicon esculentum</i> Mill.	domat		4	12	13 (4,3)
Solanaceae	<i>Solanum tuberosum</i> L.	kartof		4	5	2 (0,66)
Urticaceae	<i>Urtica dioica</i> L.	kopriva		1	9;10	66 (21,85)
Vitaceae	<i>Vitis vinifera</i> L.	loza		4	12;15;16	22 (7,28)
Zingiberaceae	<i>Curcuma longa</i> L.	kurkuma		2	5	19 (6,29)
Zingiberaceae	<i>Zingiber officinale</i> Roscoe	dzhindzhifil		2	3;5	17 (5,63)

Legend:

LMP – plant included in the Medicinal Plants Act of the Republic of Bulgaria.

Origin: 1 –Plant of the indigenous flora; 2 – Plant of the flora of Bulgaria; 3 – Alien plant for Bulgaria; 4 – Cultivated plant.

Usable part: 1 - whole plant; 2 - root; 3 - rhizome; 4 - bulb; 5 - tubers; 6 - crust; 7 - wood; 8 - twig; 9 - stalk; 10 - leaves; 11 - flower; 12 - fruit; 13 - seed; 14 - resin; 15 - juice; 16 – oil.

UR - number of citations.

FL (%) - fidelity index.

n = x, (%) – number, (%) of answers received in the application.