BIOLOGICA NYSSANA
12 (2) December 2021: 87-111
DOI: 10.5281/zenodo.5759846

Frequency of herbal medicinal products use in Southeastern Serbia

Original Article

Matejić Jelena
University of Niš, Faculty of Medicine, Department of Pharmacy, Bulevar Dr Zorana Đinđića 81, 18000 Niš, Serbia
jekamatejic@gmail.com (corresponding author)

Pavlović Dragana
University of Niš, Faculty of Medicine, Department of Pharmacy, Bulevar Dr Zorana Đinđića 81, 18000 Niš, Serbia

Stefanović Nikola
University of Niš, Faculty of Medicine, Department of Pharmacy, Bulevar Dr Zorana Đinđića 81, 18000 Niš, Serbia

Stojanović Milica
University of Niš, Faculty of Medicine, Department of Pharmacy, Bulevar Dr Zorana Đinđića 81, 18000 Niš, Serbia

Žarković Lazar
University of Belgrade - Faculty of Biology, Institute of Botany and Botanical Garden "Jevremovac", Studentski Trg 16, 11000 Belgrade, Serbia

Marin Petar
University of Belgrade - Faculty of Biology, Institute of Botany and Botanical Garden "Jevremovac", Studentski Trg 16, 11000 Belgrade, Serbia

Džamić Ana
University of Belgrade - Faculty of Biology, Institute of Botany and Botanical Garden "Jevremovac", Studentski Trg 16, 11000 Belgrade, Serbia

Abstract:

The trend of herbal medicine use continues even today, despite the growing number of different synthetic, conventional drugs and the huge progress of the pharmaceutical industry. In recent decades, there has been an increasing use of different herbal medicinal products (HMP) in the prevention of diseases, treatment of chronic and recurrent conditions and diseases, and for maintaining good health. The aim of our paper was to determine the use of HMP in the area of Southeastern Serbia. The survey method was applied through a pre-compiled questionnaire in the Zaječar, Sokobanja and Aleksinac cities. The results of the research showed that there were 70 different HMP, which were most often used preventively (32.00%), while the rest were used in hypertension (23.50%), prostate hyperplasia (8.50%), diabetes (6.53%), depression (4.60%) and glaucoma (3.90%). The composition of the used products included 84 different herbal species, the most common of which were *Citrus* x *aurantium* L. (5.90%) and *Cucurbita moschata* Duchesne (3.60%). When it comes to prevention and/or treatment of diseases, statistical analysis showed that the respondents living in the Aleksinac and surrounding used more plant species compared to people from Sokobanja and Zaječar, while there was no difference between the respondents in the number of HMP used. Respondents who did not have prescribed synthetic drugs, used HMP for the purpose of prevention in a higher percentage.
It can be concluded that the respondents mostly use HMP as preventive means, but they also use them as an accompanying therapy.

Key words:
herbal medicinal products, treatment, frequency, prevention, Southeastern Serbia

Apstrakt:

Učestalost korišćenja lekovitih biljnih produkata u Jugoistočnoj Srbiji

Trend korišćenja biljnih lekova nastavlja se i danas, bez obzira na postojanje sve većeg broja različitih sintetičkih, konvencionalnih lekova i ogroman napredak farmaceutske industrije. Poslednjih decenija je konstatovana sve veća primena biljnih lekova u prevenciji bolesti, lečenju hroničnih i rekurentnih stanja i oboljenja, kao i za održavanje zdravlja. Cilj našeg rada bio je da se utvrdi upotreba lekovitih biljnih produkata (LBP) na teritoriji Jugoistočne Srbije. Primenjivana je metoda anketiranja putem unapred sastavljenog upitnika u sledećim gradovima: Zaječar, Sokobanja i Aleksinac. Rezultati istraživanja pokazali su da je u upotrebi bilo 70 različitih LBP, koji su najčešće korišćeni preventivno (32,00%), dok su ostali upotrebljavani kod hipertenzije (23,50%), hiperplazije prostate (8,50%), šećerne bolesti (6,53%), depresije (4,60%) i glaukoma (3,90%). Sastav korišćenih produkata sadržao je 84 različitih biljnih vrsta, a najčeće su bile zastupljene *Citrus* x *aurantium* L. (5,90%) i *Cucurbita moschata* Duchesne (3,60%). Statistička analiza je pokazala da su ispitanici koji žive na teritoriji Aleksinca koristili više biljnih vrsta kada je reč o prevenciji i/ili lečenju oboljenja u poređenju sa stanovnicima Sokobanje i Zaječara, dok nije bilo razlike među ispitanicima kada je reč o broju samih LBP. Ispitanici koji nisu imali propisane sintetičke lekove u terapiji u većem procentu su koristili LBP u svrhu prevencije.
Može se zaključiti da ispitanici u većoj meri koriste LBP kao preventivna sredstva, ali ih u velikom broju koriste i kao prateću terapiju.

Ključne reči:
lekoviti biljni produkti, lečenje, učestalost, prevencija, Jugoistočna Srbija

Received: July 18, 2021
Revised: October 03, 2021
Accepted: November 01, 2021

Introduction

Herbs have been used as the first drugs in the treatment of diseases, and in recent decades their use has been increasingly important in medicine (Barnes, 2012; Heinrich et al., 2018; Zhang, 2018). Herbal therapy is used by 75% of the world's population. This is due to better acceptability of herbal medicines, fewer side effects that can occur during therapy as well as the fact that they are cheaper (Sam, 2019). In addition, patients are more likely to opt for different herbal products as they believe that they are completely safe because they are of natural origin, and consequentlly that their concomitant application with conventional medicines is not dangerous at all. For these reasons, patients usually do not report the use of herbal medicine to their doctors and pharmacists (Dimitrijević et al., 2014). Yet, in some cases, herbal medicinal products could have a harmful effect on health if they are not used in the prescribed manner and under the supervision of a professional or could lead to harmful interactions with conventional drugs (Petrović et al., 2012). Herbal medicines, traditional herbal medicines and herbal teas are used for maintaining good health, prevention of diseases, treatment of chronic and recurrent conditions, diseases treatment on the recommendation of a doctor or pharmacist, and more often on the basis of the patient's decision (Petrović et al., 2012; Luketina-Šunjka et al., 2020). The use of medicinal plants in Serbia has a long tradition, and our previous work (Matejić et al. 2020) showed the exceptional presence of medicinal plant species in Eastern and Southeastern Serbia that are used for a large number of different indications.

The aim of this study was to investigate the frequency of herbal medicinal products (HMP): herbal medicines, traditional herbal medicines, herbal supplements, and different other herbal products that could be found in public pharmacy in Southeastern Serbia and to determine how much and in what way herbs are used in the treatment of patients in Southeastern Serbia. In this regard, it was necessary to answer the following questions: (1) what are the most commonly used HMP, (2) for what therapeutic purposes are HMP used, (3) which conventional drug therapy is used in combination with HMP, (4) how does age affect the frequency of HMP use, (5) are there differences in the frequency of herbal use among men and women?

Materials and Methods

Research area

The research was conducted in Southeastern Serbia, more precisely in three municipalities: Zaječar, Sokobanja and Aleksinac. The municipalities of Zaječar and Sokobanja belong to the Zaječar district, while the municipality of Aleksinac belongs to the Nišava district.

The municipality of Zaječar covers an area of 1069 km^2 and has 53,509 inhabitants in mid-2019 (Statistical Office of the Republic of Serbia, 2020). According to the latest research of the Public Health Institute "Timok" Zaječar (2020), the total number of residents of this municipality who were ill in 2019 was 39,240. Residents mostly suffered from respiratory diseases, i.e., 25.1% of the total number of patients. Then they suffered from cardiovascular diseases, about 16.0% of them. Musculoskeletal system and connective tissue diseases are in the third place with a share in the total morbidity of 11.0%. They were followed by urogenital system disorders (8.2%) and diseases from the group of symptoms, which includes pathological clinical and laboratory findings with 5.9% of the total morbidity. Digestive system diseases are in the sixth place, accounting for 5.0% of the total number of patients. After that, there are diseases related to the endocrine system, nutrition and metabolism, with a share in the total morbidity of 4.9%. In the seventh place are injuries, poisonings and the consequences of external factors (4.7%). Skin and subcutaneous tissue diseases account for 3.8%, while mental and behavioral disorders include 3.7% of the total number of patients. There are also diseases from other groups that do not individually contribute much to the number of patients and together make up the remaining 11.7%.

In 2019, the most common diagnosis was high blood pressure making 12.5% of the total number of diseases. Other common diagnoses were: acute pharyngitis and tonsillitis (11.0%); acute bronchitis and bronchiolitis (6.3%); other back diseases (5.7%); other symptoms, signs and pathological clinical and laboratory findings (4.0%); diabetes (3.8%); cystitis (3.2%); rhinitis, sinusitis and laryngitis (2.9%); degenerative joint disease and skin and subcutaneous tissue diseases (2.6%). The remaining 45% are other diseases.

In 2019, the Department for Women's Health Service of the Municipality of Zaječar reported 1,063 patients with various diseases. Most of them suffered from diseases of the urogenital system, as many as 75%. They are followed by diseases from the group of tumors with 13.9%, and then infectious and parasitic diseases with 10.9% of the total number of patients. The diagnoses made in the patients were: menstrual disorders (16.5%), cervicitis (16.3%), menopausal diseases (15.2%), salpingitis and oophoritis (9.0%) and female infertility (8.6%). One third of the total number are other diagnoses that were encountered in 2019 in women.

The municipality of Sokobanja covers an area of 525 km^2 with a total population of 14,755 in mid-2016 (Statistical Office of the Republic of Serbia, 2017). Based on the analysis of the Public Health Institute Niš (2017), a total of 23,700 patients were registered in the municipality of Sokobanja in 2016. Most of them suffered from cardiovascular diseases, namely 31.6% of the total morbidity. Respiratory diseases accounted about 24.7%. In the third place are genitourinary diseases with 7.5%, and in the fourth place are musculoskeletal and connective tissue diseases with 7.1% of the total number of patients. These are followed by mental and behavioral disorders with a share in the total morbidity of 4.7%. Digestive diseases are in the sixth place, accounting for 3.3%, followed by diseases from the group of symptoms, which includes pathological clinical and laboratory findings with 2.9%. They are followed by diseases from the group of factors that affect the health condition and contact with the health service, about 0.9%. Other groups of diseases together make up 17.3% of the total number of patients.

The most common diagnosis in 2016 was high blood pressure with 22.0% of the total number of diagnoses. It is followed by: acute pharyngitis and tonsillitis (10.0%), other back diseases (5.0%), tracheitis, emphysema and other obstructive lung diseases (4.5%) and cystitis (3.6%). There are various other diagnoses that together make up the remaining 54.5% of the total number of diseases.

During 2016, the Department for Women's Health Service of the municipality of Sokobanja registered 934 patients. In as many as 80.5% of cases, the patients suffered from genitourinary diseases. In the second place are diseases from the group of tumors with 7.2%, and in the third are diseases from the group of factors that affect health and contact with the health service with 5.2% of the total number of patients. They are followed by skin and subcutaneous tissue diseases, as well as diseases from the group of symptoms, which includes pathological clinical and laboratory findings, which account for 5.1% of the total morbidity. After that, there are infectious and parasitic diseases, with about 0.6%. Conditions belonging to the group of pregnancies, births and postpartum period make up 0.5% of the total number of patients. The five most common diagnoses in women were: pelvic inflammatory diseases (19.9%), menstrual disorders (17.8%), breast disease (13.4%), menopausal symptoms and cystitis (9.9%). These five diagnoses make up as much as 71.6% of all registered diseases.

According to data from 2015, the municipality of Aleksinac has 49,290 inhabitants on an area of 707 km^2 (Statistical Office of the Republic of Serbia, 2016). Based on the latest research by the Public Health Institute Niš (2017), there were a total of 57,242 patients in 2015. Cardiovascular diseases took the first place, accounting for 24.3% of the total morbidity. Next were respiratory diseases, with about 19.0%. In the third place are musculoskeletal and connective tissue diseases with 8.3%, and in the fourth place are genitourinary diseases with 7.0% of the total number of patients. Endocrine diseases make up 5.9%, while mental and behavioral disorders make up 4.4%. There are also diseases from other groups that together contribute to the total morbidity with 31.0%.

The most common diagnosis was high blood pressure with 19.9% of the total number of all diseases. Other diseases are: acute pharyngitis and tonsillitis (6.6%), back diseases (5.7%), diabetes (4.4%), cystitis (3.7%). Other types of diagnoses make up the remaining 59.8%.

In the Department for Women's Health Service of the municipality of Aleksinac, there were 3,464 registered patients during 2015. Women mostly suffered from genitourinary diseases, as many as 78.7%. In the second place are the factors that affect the health condition and contact with the health service with a share in the total morbidity of 9.5%. They are followed by diseases from the group of tumors with 7.8%, then conditions belonging to the group of pregnancies, births and postpartum period with 2.2% and diseases from the group of symptoms, which includes pathological clinical and laboratory findings with 1.0%. Blood and blood cell diseases as well as endocrine diseases make up 0.3% of the total number of patients. Other registered diseases account for 0.4%. Frequent diagnoses in patients were: other pelvic inflammatory diseases (25.5%), menstrual disorders (16.2%), other genitourinary diseases, cystitis and menopause (8.4%) and menopausal diseases (8.2%). The remaining third of total diseases are other types of diagnoses.

Ethnopharmacological survey

The survey has been conducted in a period of three months, more precisely from November 15, 2020 to January 15, 2021. We used a pre-compiled questionnaire, with the help of Adonis Pharmacy (https://www.adonisapoteka.rs). The questionnaires were completed thanks to employed masters of pharmacy, with the consent of the respondents, in accordance with all codes of ethics, in pharmacies located in the territory of Southeastern Serbia, in the three surveyed municipalities - Zaječar, Sokobanja and Aleksinac.

A total of 100 surveys were collected: 13 in Zaječar, 66 in Sokobanja, and 21 in Aleksinac. A total of 46 men and 54 women aged 1 to 88 were surveyed. The questionnaire consisted 6 questions

(one close and five open), and gives the following data on the respondents:

- gender
- age
- chronic diseases - YES or NO
- chronic diseases they suffer from, if YES
- treatment of chronic disease
- name of the HMP they use

The obtained data were then analyzed and compared with the literature. Chronic disease treatment was classified based on groups of drugs as prescribed by the Agency for Drugs and Medical Devices of Serbia (2021). The HMP was studied in detail, starting from its pharmaceutical form, through the plants that are part of it and contribute to its action. For each plant species, we specified its folk and Latin name according to The Plant List (2000) (http://www.theplantlist.org), the medicinal part used and the form in which it is contained in the medicine. Then, each HMP was associated with an appropriate chronic disease, the therapy of which it could contribute to. In the end, we did a systematization according to plant species (**Tab.1**).

Statistical analysis

The characteristics of the study group were defined as frequency (with or without percentage). Kruskal-Wallis test and Mann-Whitney U test (when data normality was not satisfied) were used to compare continuous data regarding the use of plants preparations and plants species between defined groups of informants. The Chi-square (χ^2) test was used to compare the distribution of plants preparations and plants species use between defined groups of informants. Statistical analyses were performed using SPSS statistical software (version 20.0) at the significance level set at $p<0.05$.

Results and discussion

Quantitative analyses

The results of the research showed that there were 70 different herbal medicines in use. The highest percentage was used preventively (32.00%), while the others were used in hypertension (23.50%), prostate hyperplasia (8.50%), diabetes (6.53%), depression (4.60%), glaucoma (3.90%) and angina pectoris and neurasthenia (2.60%). In their regular therapy, patients used drugs from the following groups: beta blockers (12.30%); ACE inhibitors, calcium antagonists and prostate hyperplasia therapy (6.60%); oral antidiabetics (6.20%); antihypertensive (5.30%); benzodiazepines (4.90%) and glaucoma therapy (4.10%). The most commonly used drugs were: Betamsal (0.4 mg) and Concor cor (1.25 mg) (2.90%); Cornelin (10 mg) and Tamsol (0.4 mg) (2.50%); Bromazepam (3 mg), Diazepam (5 mg), Tensec (5 mg) and Xalatan sol (2.10%); Cosopt sol, Glucophage (1000 mg) and Spironolakton (25 mg) (1.60%) and Amaryl (2 mg), Binevol (5 mg), Cornelin (20 mg), Diclofenac duo (75 mg), Enalapril (20 mg), Prilinda (5 mg) and Tritace comp (5 mg + 25 mg) (1.20%).

The largest number of HMP was in the form of: capsules (25.50%); tablets (23.60%); herbal tea (17.30%); solution (6.40%) and syrup (5.50%). The most commonly used were: Urasan forte (7.30%); Comprosta forte (6.40%); Phlebodia 600 (4.50%); senna tea (3,60%); Bilobil intense, peppermint tea, Palisept and Venodia plus (2.70%), Alpenkräuter cream, Gingival gel, Hipervag intim, Lagosa 150, Prospan syrup, Prospan effervescent tablets, Prostamol uno, Prostenal perfect, Relax, Rtanj tea (winter savory) and Venalek (1.8%).

Herbs whose medicinal ingredients are part of herbal medicines include 84 different species. All species originate from 45 different families, of which the largest number of species originate from the following families: Rutaceae (6.30%); Rosaceae (3.60%); Myrtaceae and Urticaceae (2.70%). The most common were the following species: *Citrus* x *aurantium* L. (5.90%); *Cucurbita moschata* Duchesne (3.60%); *Brassica napus* L., *Foeniculum vulgare* Mill. and *Valeriana officinalis* L. (3.20%); *Ginkgo biloba* L., *Melissa officinalis* L., *Senna alexandrina* Mill. and *Urtica dioica* L. (2.70%); *Hedera helix* L., *Hypericum perforatum* L., *Mentha* x *piperita* L., *Rosmarinus officinalis* L. and *Origanum vulgare* L. (2.30%); *Betula pubescens* Ehrh., *Calendula officinalis* L., *Eucalyptus globulus* Labill., *Humulus lupulus* L., *Matricaria chamomilla* L., *Rosa canina* L., *Vaccinium myrtillus* L. and *Zea mays* L. (1.80%); *Achillea millefolium* L., *Aesculus hippocastanum* L., *Equisetum arvense* L., *Glycyrrhiza glabra* L., *Mentha arvensis* L., *Oenothera biennis* L., *Petroselinum crispum* (Mill.) Fuss, *Silybum marianum* (L.) Gaertn. and *Vitis vinifera* L. (1.40%). The parts of the plant that were used as the source of ingredients in the largest percentage were as follows: folium (36.20%); flos (12.70%); herba and radix (10.40%); fructus (10.00%); semen (7.70%) and pericarpium (6.30%). Herbal ingredients were most often in the form of an extract (49.30%); then in the form of crushed herbal drugs (17.60%); essential oil (15.80%); isolated substances (7.20%) and in the form of powdered herbal drugs (5.40%).

Statistical analysis

A detailed statistical data processing was used to determine the frequency of use of HMP and plants in Southeastern Serbia.

Table 1. Frequency of HMP use in Southeastern Serbia

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Abies sibirica Ledeb., sibirska jela, Pinaceae	folium	essential oil	cream	Alpska krema	/	/	/
Abies alba Mill., jela, Pinaceae	folium	essential oil	ointment	Pavle balzam	/	/	/
Achillea millefolium L., hajdučka trava, Asteraceae	herba	extract	ointment, liquid	Asam crveni konjski balzam, Femisan A kapi, Femisan B kapi	Bromazepam (3 mg), Sidata (50 mg), Vivace (5 mg), Vivace plus	ACE inhibitors, antidepressant drug, antihypertensive drug, benzodiazepine	depression, hypertension
Aesculus hippocastanum L., divlji kesten, Sapindaceae	semen	extract, essential oil	gell, ointment, tablet	Asam crveni konjski balzam, Erbaven retard, Kesten gel	Bromazepam (3 mg), Sidata (50 mg), Vivace (5 mg), Vivace plus	ACE inhibitors, antidepressant drug, antihypertensive drug, benzodiazepine	depression, hypertension
Alchemilla xanthochlora Rothm., virak, Rosaceae	herba	extract	liquid	Femisan A kapi	/	/	/
Aloe ferox Mill., aloja, Xanthorrhoeaceae	succus	oil, powdered herbal substance	cream, tablet	Ten herbs, Vitalis sports cream	/	/	chronic obstipation
Althaea officinalis L., beli slez, Malvaceae	folium, radix	extract, fragmented herbal substance	herbal tea, pastilles, syrup	Beba C sirup belog sleza, Čaj korena belog sleza, Čaj protiv bronhitisa, Herbiko sirup belog sleza, Protect beli slez	Biprez (2.5 mg), Cornelin (10 mg), Enalapril (10 mg), Klometol (10 mg), Macropen (400 mg), Molicor (2 mg)	ACE inhibitors, calcium antagonists, antianginal drug, antiemetic drug, beta blocker, macrolide antibiotic	angina pectoris, hypertension

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Annona muricata L., graviola, Annonaceae	folium	powdered herbal substance	capsule	Amazonska graviola	Bisoprolol (5 mg), Iruzid (20 mg+ 12.5 mg)	antihypertensive drug, beta blocker	hypertension
Arctostaphylos uva-ursi (L.) Spreng., uva, Ericaceae	folium	fragmented herbal substance	herbal tea	Čaj lista uve, Kirkolina Lux čaj za mršavljenje	Biprez (2.5 mg), Cornelin (10 mg), Molicor (2 mg)	calcium antagonists, antianginal drug, beta blocker	angina pectoris, hypertension
Artemisia absinthium L., pelen, Asteraceae	herba	tincture	syrup	Amarapharm sirup	/	/	/
Betula pubescens Ehrh., breza, Betulaceae	folium	extract, tincture, fragmented herbal substance	herbal tea, powder, liquid	Kapi za mršavljenje, Urobitrat instant čaj, Uroprotekt čaj	Inkontan (15 mg), Marocen (500 mg), Panrazol (20 mg)	proton pump inhibitor, quinolone antibiotic, incontinence treatment	incontinence
Brassica napus L., uljana repica, Brassicaceae	flos	extract	tablet	Conprosta forte	Amaryl (2 mg), Amaryl (4 mg), Amlodipin (5 mg), Beneprost (5 mg), Betamsal (0.4 mg), Binevol (5 mg), Bromazepam (3 mg), Cornelin (10 mg), Cornelin (20 mg), Cosopt sol, Datust (0.5 mg), Dilacor (0.25 mg), Glucophage (1000 mg),	ACE inhibitors, calcium antagonists, antihypertensive drug, benzodiazepine, beta blocker, insulin, cardiotonic agent, oral antidiabetic drug, glaucoma treatment, benign prostatic hyperplasia treatment, vitamin	atrial fibrillation and atrial flutter, depression, glaucoma, benign prostatic hyperplasia, hypertension, diabetes type 2, diabetes type 1

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
					Insuman Basal SoloStar (100ij/ml), Monopril plus (20 mg + 12.5 mg), Prilinda (5 mg), Prinorm (100 mg), Tamsol (0.4 mg), Telmicor (40 mg), Tensec (5 mg), Tritace comp (5 mg + 25 mg), Vigantol sol, Xalatan sol		
Calendula officinalis L., neven, Asteraceae	flos	extract, essential oil	liquid, vaginal tablet	Femisan A kapi, Femisan B kapi, Hipervag intim	/	/	/
Camellia sinensis (L.) Kuntze, zeleni čaj, Theaceae	folium	fragmented herbal substance	herbal tea	Kirkolina Lux čaj za mršavljenje	/	/	/
Carum carvi L., kim, Apiaceae	fructus	extract	powder	Hipp čaj za dojilje	/	/	/
Centaurium erythraea Rafn, kičica, Gentianaceae	herba	tincture	syrup	Amarapharm sirup	/	/	/
Centella asiatica (L.) Urb., centela, Apiaceae	herba	extract	tablet	Erbaven retard	/	/	/
Chelidonium majus L., lišeivica, Papaveraceae	herba	fragmented herbal substance	herbal tea	Čaj herbe lišeivice	/	/	/
Citrus limon (L.) Osbeck, limun,	pericarpium	essential oil	capsule	GeloMytrol forte	Brufen (400 mg)	nonsteroidal	sinusitis

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Rutaceae						anti-inflammato-ry drug	
Citrus x *aurantium* L., gorka narandža, Rutaceae	pericarpium	isolated active components, essential oil	capsule, tablet	Detralex, Fluxiv, GeloMytrol forte, Phlebodia (600 mg), Venalek, Venodia plus	Amlodipin (10 mg), Azopt sol, Betamsal (0.4 mg), Beneprost (5 mg), Bisoprolol (2.5 mg), Bromazepam (3 mg), Brufen (400 mg), Cardiopirin (100 mg), Concor cor (1.25 mg), Corasp (100 mg), Cornelin (20 mg), Diazepam (5 mg), Enalapril (10 mg), Enalapril (20 mg), Farin (5 mg), Flekanid (100 mg), Hemopres (50 mg + 5 mg), Hypolip (20 mg), Lasix (40 mg), Monizol (20 mg), Nevotens (5 mg), Presolol (50 mg), Spironolakton (25 mg), Tensec (5 mg), Trimetacor (35 mg),	ACE inhibitors, calcium antagonists, antianginal drug, antiarrhythmic drug, benzodiazepine, beta blocker, diuretic, hypolipidemic drug, antiplatelet agent, nonsteroidal anti-inflammatory drug, oral anticoagulant, glaucoma treatment, benign prostatic hyperplasia treatment	angina pectoris, depression, glaucoma, hyperlipidaemia, benign prostatic hyperplasia, hypertension, neurasthenia, sinusitis, cardiac insufficiency, vein thrombosis

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
					Vazotal (10 mg), Vivace (2.5 mg), Xalatan sol		
Cucurbita moschata Duchesne, muskatna tikva, Cucurbitaceae	semen	extract	capsule	Urasan forte	Amaryl (2 mg), Cardiopirin (75 mg), Concor cor (1.25 mg), Cornelin (10 mg), Cosopt sol, Daktanol krem, Diazepam (5 mg), Molsidomin (4 mg), Monopril (10 mg), Nebilet (5 mg), Nitroglicerin (0.5 mg), Paravano (20 mg), Plavix (75 mg), Sinoderm N, Stugeron forte, Tamsol (0.4 mg), Tefor (850 mg), Tritace comp (2.5 mg + 12.5 mg), Vazotal (5 mg), Xalatan sol, Zofecard (30 mg)	ACE inhibitors, calcium antagonists, antianginal drug, antihypertensive drug, antimycotic drug, benzodiazepine, beta blocker, dermatic agent, hypolipidemic drug, antiplatelet agent, oral antidiabetic drug, glaucoma treatment, benign prostatic hyperplasia treatment, vertigo treatment	angina pectoris, depression, glaucoma, hyperlipidaemia, benign prostatic hyperplasia, hypertension, contact dermatitis, neurasthenia, pityriasis, cardiac insufficiency, diabetes type 2
Curcuma longa L., kurkuma, Zingiberaceae	radix	extract	capsule	Kurkuma forte	Diclofenac duo (75 mg)	nonsteroidal anti-inflammatory drug	osteoporosis

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Echinacea purpurea (L.) Moench, ehinacea, Asteraceae	herba	extract	effervescent tablet	Biogripin	/	/	/
Equisetum arvense L., rastavić, Equisetaceae	herba	fragmented herbal substance	herbal tea	Čaj protiv bronhitisa, Uroprotekt čaj	Biprez (2.5 mg), Cornelin (10 mg), Molicor (2 mg)	calcium antagonists, antianginal drug, beta blocker	angina pectoris, hypertension
Eucalyptus globulus Labill., eukaliptus, Myrtaceae	folium	essential oil	capsule, cream	Alpska krema, GeloMytrol forte, Vitalis sports cream	Brufen (400 mg)	nonsteroidal anti-inflammatory drug	sinusitis
Foeniculum vulgare Mill., morač, Apiaceae	fructus	extract, essential oil, powdered herbal substance , tincture, fragmented herbal substance	herbal tea, ointment, powder, liquid, tablet	Asam crveni konjski balzam, Čaj protiv bronhitisa, Hipp čaj za dojilje, Kapi za mršavljenje, Plantlax čaj za grčeve, Ten herbs, Urobitrat instant čaj	Biprez (2.5 mg), Bromazepam (3 mg), Cornelin (10 mg), Inkontan (15 mg), Marocen (500 mg), Molicor (2 mg), Panrazol (20 mg), Sidata (50 mg), Vivace (5 mg), Vivace plus	ACE inhibitors, calcium antagonists, antianginal drug, antidepressant drug, antihypertensive drug, benzodiazepine, beta blocker, proton pump inhibitor, quinolone antibiotic, incontinence treatment	angina pectoris, depression, hypertension, chronic obstipation, incontinence
Frangula purshiana Cooper, američka krušina, Rhamnaceae	cortex	powdered herbal substance	tablet	Ten herbs	/	/	chronic obstipation
Frangula alnus Mill., krušina, Rhamnaceae	cortex	tincture, fragmented herbal substance	herbal tea, liquid	Kapi za mršavljenje, Kirkolina Lux čaj za mršavljenje	/	/	/

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Gentiana lutea L., lincura, Gentianaceae	radix	powdered herbal substance , tincture	syrup, tablet	Amarapharm sirup, Ten herbs	/	/	chronic obstipation
Geranium robertianum L., zdravac, Geraniaceae	herba	extract	liquid	Femisan A kapi	/	/	/
Ginkgo biloba L., ginko, Ginkgoaceae	folium	extract	capsule, tablet	Bilobil intense, Ginko max, Gynkgobil, Tanakan	Amlodipin (10 mg), Barios (5 mg), Beviplex, Biprez (2.5 mg), Concor cor (1.25 mg), Dila-cor (0.25 mg), Enalapril (20 mg), Indapres (1.5 mg), Molsidomin (4 mg), Polivit B, Presolol (100 mg), Skopryl (10 mg), Spirono-lakton (25 mg), Tamsol (0.4 mg), Tritace comp (5 mg + 25 mg), Vestibo (16 mg)	ACE inhibitors, calcium antagonists, antianginal drug, antihypertensive drug, beta blocker, diuretic, cardiotonic agent, benign prostatic hyperplasia treatment, vertigo treatment, vitamin	benign prostatic hyperplasia, hypertension, vocal cord and larynx paralysis, cardiac insufficiency, vertigo and tinnitus
Glycine max (L.) Merr., soja, Fabaceae	semen	isolated active components	capsule	Essentiale forte N (300mg)	Folkis (5 mg), Hemokvin plus, Lyrica (25 mg), Pronison (20 mg), Salazopyrin (500 mg), Tamsol (0.4 mg)	antianemic drug for megaloblastic anemia, antiepileptic drug, antihypertensive drug,	depression, benign prostatic hyperplasia, hypertension, ulcerative colitis

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
						glucocorticoid, sulphonamide, benign prostatic hyperplasia treatment	
Glycyrrhiza glabra L., sladić, Fabaceae	radix	powdered herbal substance , fragmented herbal substance	herbal tea, tablet	Čaj protiv bronhitisa, Čaj slatkog korena, Ten herbs	Biprez (2.5 mg), Cornelin (10 mg), Molicor (2 mg)	calcium antagonists, antianginal drug, beta blocker	angina pectoris, hypertension, chronic obstipation, liver steatosis
Hedera helix L., bršljan, Araliaceae	folium	extract	syrup, powder, effervescent tablet	Intusin pulvis, Prospan sirup, Prospan šumeće tablete	/	/	/
Humulus lupulus L., hmelj, Cannabaceae	flos	extract	ointment, liquid, tablet	Asam crveni konjski balzam, Kapi za umirenje, Relax	Bromazepam (3 mg), NovoMix 30 FlexPen (100ij/ml), Sidata (50 mg), Vivace (5 mg), Vivace plus	ACE inhibitors, antidepressant drug, antihypertensive drug, benzodiazepine, insulin	celiac disease, depression, hypertension, diabetes type 1
Hypericum perforatum L., kantarion, Hypericaceae	flos	extract, essential oil	liquid, oil extract, vaginal tablet	Hipervag intim, Kapi za umirenje, Ulje od kantariona za spoljašnju upotrebu, Vaginalete sa kantarionom	Barios (5 mg), Concor cor (1.25 mg), Cornelin (10 mg)	calcium antagonists, beta blocker	hypertension
Lavandula angustifolia Mill., lavanda, Lamiaceae	flos	essential oil	gell	Kesten gel	/	/	/

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Malpighia emarginata DC., acerola, Malpighiaceae	fructus	extract	effervescent tablet	Biogripin	/	/	/
Marrubium vulgare L., očajnica, Lamiaceae	herba	powdered herbal substance	tablet	Ten herbs	/	/	chronic obstipation
Matricaria chamomilla L., kamilica, Asteraceae	flos	extract	gell, ointment, syrup	Asam crveni konjski balzam, Gingival gel, Herbiko sirup belog sleza	Amaryl (2 mg), Aspirin protect (100 mg), Bromazepam (3 mg), Glucophage (1000 mg), Sidata (50 mg), Vivace (5 mg), Vivace plus	ACE inhibitors, antidepressant drug, antihypertensive drug, benzodiazepine, antiplatelet agent, oral antidiabetic drug	depression, hypertension, diabetes type 2
Melissa officinalis L., matičnjak, Lamiaceae	folium	extract	ointment, powder, liquid, tablet	Asam crveni konjski balzam, Femisan B kapi, Hipp čaj za dojilje, Kapi za umirenje, Relax	Bromazepam (3 mg), NovoMix 30 FlexPen (100ij/ml), Sidata (50 mg), Vivace (5 mg), Vivace plus	ACE inhibitors, antidepressant drug, antihypertensive drug, benzodiazepine, insulin	celiac disease, depression, hypertension, diabetes type 1
Mentha arvensis L., poljska nana, Lamiaceae	folium	essential oil	cream	Alpska krema, Vitalis sports cream	/	/	/
Mentha x *piperita* L., pitoma nana, Lamiaceae	folium	essential oil, fragmented herbal substance	herbal tea, gell	Čaj lista nane, Gingival gel	Amaryl (2 mg), Aspirin protect (100 mg), Glucophage (1000 mg)	antiplatelet agent, oral antidiabetic drug	hypertension, diabetes type 2

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Myrtus communis L., mirta, Myrtaceae	folium	essential oil	capsule, ointment	GeloMytrol forte, Pavle balzam	Brufen (400 mg)	nonsteroidal anti-inflammatory drug	sinusitis
Ocimum basilicum L., bosiljak, Lamiaceae	folium	essential oil	liquid	Sinusol Majoran sprej za nos	Aspirin protect (100 mg), Bisoprolol (5 mg), Bromazepam (3 mg), Diclofenac duo (75 mg), Hemomycin (500 mg)	benzodiazepine, beta blocker, antiplatelet agent, macrolide antibiotic, nonsteroidal anti-inflammatory drug	hypertension
Oenothera biennis L., noćurak, Onagraceae	semen	essential oil, oil	capsule, vaginal tablet	Hipervag intim, Solgar ulje noćurka	/	/	/
Origanum vulgare L., vranilova trava, Lamiaceae	folium	isolated active components, fragmented herbal substance	herbal tea, capsule	Palisept, Uroprotekt čaj	Actawell (100 mg), Binevol (5 mg), Bromazepam (3 mg), Cornelin (20 mg), Elicea (10 mg), Irbenida plus (150 mg + 12.5 mg), Karvileks (12.5 mg), Lexilium (3 mg), Lunata (5 mg), Tefor (500 mg), Tresiba FlexTouch (200ij/ml), Tritace comp (2.5 mg + 12.5 mg)	calcium antagonists, antidepressant drug, antihypertensive drug, antipsychotic drug, benzodiazepine, beta blocker, hypnotic drug, insulin, oral antidiabetic drug	depression, hypertension, diabetes type 1

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Origanumn majorana L., majoran, Lamiaceae	folium	essential oil	liquid	Sinusol Majoran sprej za nos	Aspirin protect (100 mg), Bisoprolol (5 mg), Bromazepam (3 mg), Diclofenac duo (75 mg), Hemomycin (500 mg)	benzodiazepine, beta blocker, antiplatelet agent, macrolide antibiotic, nonsteroidal anti-inflammatory drug	hypertension
Orthosiphon aristatus (Blume) Miq., java čaj, Lamiaceae	folium	extract	powder	Urobitrat instant čaj	Inkontan (15 mg), Marocen (500 mg), Panrazol (20 mg)	proton pump inhibitor, quinolone antibiotic, incontinence treatment	incontinence
Passiflora edulis Sims, pasiflora, Passifloraceae	herba	extract	tablet	Alora ultra, Smirela noć	Co-Amlessa (4 mg + 5 mg + 1.25 mg), Eglonyl (50 mg)	antihypertensive drug, antipsychotic drug	gastro-intestinal neuroses, hypertension
Petroselinum crispum (Mill.) Fuss, peršun, Apiaceae	folium	extract, fragmented herbal substance	herbal tea, liquid	Femisan A kapi, Uroprotekt čaj	/	/	/
Pimpinella anisum L., anis, Apiaceae	fructus	extract	powder	Hipp čaj za dojilje	/	/	/
Pinus sylvestris L., srebrni bor, Pinaceae	folium	etarsko ulje	ointment	Pavle balzam	/	/	/
Plantago lanceolata L., bokvica, Plantaginaceae	folium	extract, fragmented herbal substance	herbal tea, liquid	Čaj protiv bronhitisa, Propolis kapi sa bokvicom	Biprez (2.5 mg), Cornelin (10 mg), Molicor (2 mg)	antianginal drug, calcium antagonists, beta blocker	angina pectoris, hypertension
Potentilla erecta (L.) Raeusch., srčenjak, Rosaceae	rhizoma	tincture	gell	Gingival gel	Amaryl (2 mg), Aspirin protect (100 mg),	antiplatelet agent,	hypertension, diabetes type 2

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
					Glucophage (1000 mg)	oral antidiabetic drug	
Primula veris L., jagorčevina, Primulaceae	folium, radix	extract, fragmented herbal substance	herbal tea, syrup	Bronho san jagorčevina, timijan, divizma, Čaj protiv bronhitisa	Biprez (2.5 mg), Cornelin (10 mg), Molicor (2 mg)	calcium antagonists, antianginal drug, beta blocker	angina pectoris, hypertension
Rhamnus alpina L., žestika, Rhamnaceae	cortex	powdered herbal substance	tablet	Ten herbs	/	/	chronic obstipation
Rheum palmatum L., rabarbara, Polygonaceae	radix	powdered herbal substance	tablet	Ten herbs	/	/	chronic obstipation
Ribes nigrum L., crna ribizla, Grossulariaceae	fructus	extract	pastilles	Isla cassis	Bisoprolol (2.5 mg)	beta blocker	hypertension
Ricinus communis L., ricinus, Euphorbiaceae	semen	extract	oil extract	Ricinusovo ulje	/	/	/
Rosa canina L., šipurak, Rosaceae	fructus	extract, fragmented herbal substance	ampoule, herbal tea, liquid, syrup	CH - Alpha plus, Herbiko sirup belog sleza, Kapi za mršavljenje, Kirkolina Lux čaj za mršavljenje	Diclofenac duo (75 mg)	nonsteroidal anti-inflammatory drug	arthritis
Rosmarinus officinalis L., ruzmarin, Lamiaceae	folium	extract, essential oil	gell, cream, liquid	Alpska krema, Kapi za umirenje, Kesten gel, Vitalis sports cream	/	/	/

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Rubus idaeus L., malina, Rosaceae	folium	extract	liquid	Femisan A kapi	/	/	/
Ruscus aculeatus L., veprina, Asparagaceae	rhizoma	extract	tablet	Erbaven retard	/	/	/
Salix alba L., bela vrba, Salicaceae	cortex	extract	effervescent tablet	Biogripin	/	/	/
Satureja montana L., rtanjski čaj, Lamiaceae	herba	fragmented herbal substance	herbal tea	Rtanjski čaj	Concor cor (1.25 mg)	beta blocker	hypertension
Senna alexandrina Mill., sena, Fabaceae	folium	powdered herbal substance , fragmented herbal substance	herbal tea, tablet	Čaj lista sene, Kirkolina Lux čaj za mršavljenje, Ten herbs	Amlogal (10 mg), Antiagrex (75 mg), Cardiopirin (75 mg), Concor (5 mg), Diazepam (5m g), Gluformin (1000 mg), Hlorpromazin (25 mg), Micardis (80 mg), Prilinda (5 mg), Tensec (5 mg), Trental (400 mg), Vasilip (20 mg)	ACE inhibitors, calcium antagonists, antihypertensive drug, antipsychotic drug, benzodiazepine, beta blocker, hypolipidemic drug, antiplatelet agent, oral antidiabetic drug, circulatory disorders treatment	depression, hyperlipidaemia, hypertension, chronic obstipation, diabetes type 2
Serenoa repens (W. Bartam) Small, testerasta palma, Arecaceae	fructus	extract	capsule	Prostamol uno, Prostenal perfect	Amaryl (3 mg), Andol (100 mg), Berlithion 600 (600 mg), Berodual N (0.05 mg + 0.021 mg), Cardipine (5 mg),	ACE inhibitors, calcium antagonists, antianginal drug, antihypertensive drug,	angina pectoris, atrial fibrillation and atrial flutter, benign prostatic hyperplasia, hypertension, chronic obstructive pulmonary disease, neurasthenia, diabetes type 2

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
					Concor cor (1.25 mg), Cornelin (10 mg), Diazepam (5 mg), Durofilin (125 mg), Glioksan (80 mg), Gluformin (1000 mg), Glucophage (1000 mg), Lexilium (3 mg), Monosan (20 mg), Skopryl plus, Spironolakton (25 mg), Tamsol (0.4 mg), Tefor (500 mg), Tensec (5 mg), Tritace (5 mg)	benzodiazepine, beta blocker, bronchospasmolytic agent, diuretic, antiplatelet agent, oral antidiabetic drug, diabetic polyneuropathy treatment, benign prostatic hyperplasia treatment	
Silybum marianum (L.) Gaertn., sikavica, Asteraceae	fructus	extract	capsule, tablet	Lagosa 150, Silymarin	Folkis (5 mg), Hemokvin plus, Lyrica (25 mg), Pronison (20 mg), Salazopyrin (500 mg), Tamsol (0.4 mg)	antianemic drug for megaloblastic anemia, antiepileptic drug, antihypertensive drug, glucocorticoid, sulphonamide, benign prostatic hyperplasia treatment	depression, benign prostatic hyperplasia, hypertension, liver steatosis, ulcerative colitis
Solidago virga-aurea L., zlatnica, Asteraceae	herba	extract	powder	Urobitrat instant čaj	Inkontan (15 mg),	proton pump inhibitor,	incontinence

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
					Marocen (500 mg), Panrazol (20 mg)	quinolone antibiotic, incontinence treatment	
Styphnolobium japonicum (L.) Schott, japanski bagrem, Fabaceae	flos	isolated active components	tablet	Erbaven retard, Fluxiv	Concor cor (1.25 mg), Flekanid (100 mg)	antiarrhythmic drug, beta blocker	cardiac insufficiency
Symphytum officinale L., gavez, Boraginaceae	radix	extract	gell	Beinwell Gavez gel	/	/	/
Taraxacum campylodes G.E.Haglund, maslačak, Compositae	radix	powdered herbal substance	tablet	Ten herbs	/	/	chronic obstipation
Thymus serpyllum L., majkina dušica, Lamiaceae	herba	fragmented herbal substance	herbal tea	Čaj protiv bronhitisa	Biprez (2.5 mg), Cornelin (10 mg), Molicor (2 mg)	calcium antagonists, antianginal drug, beta blocker	angina pectoris, hypertension
Thymus vulgaris L., timijan, Lamiaceae	herba	extract	syrup	Bronho san jagorčevina, timijan, divizma	/	/	/
Tussilago farfara L., podbel, Asteraceae	folium	fragmented herbal substance	herbal tea	Čaj protiv bronhitisa	Biprez (2.5 mg), Cornelin (10 mg), Molicor (2 mg)	calcium antagonists, antianginal drug, beta blocker	angina pectoris, hypertension
Urtica dioica L., kopriva, Urticaceae	folium, herba, radix	extract	capsule, powder, tablet	Hipp čaj za dojilje, Prostenal perfect, Venodia plus	Amaryl (3 mg), Andol (100 mg), Azopt sol, Berodual N (0.05 mg + 0.021 mg),	ACE inhibitors, calcium antago-nists, antianginal drug, benzodi-azepine, beta blocker,	angina pectoris, depression, glaucoma, benign prostatic hyperplasia, hypertension, chronic obstructive pulmonary disease,

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
					Bisoprolol (2.5 mg), Bromazepam (3 mg), Corasp (100 mg), Cornelin (10 mg), Cornelin (20 mg), Diazepam (5 mg), Enalapril (20mg), Farin (5mg), Glucophage (1000 mg), Monosan (20 mg), Presolol (50 mg), Tamsol (0.4 mg),Tensec (5 mg), Trimetacor (35 mg), Tritace (5 mg), Vivace (2.5 mg), Xalatan sol	bronchospasmolytic agent, antiplatelet agent, oral antidiabetic drug, oral anticoagulant, glaucoma treatment, benign prostatic hyperplasia treatment, vein thrombosis	neurasthenia, diabetes type 2, vein thrombosis
Vaccinium myrtillus L., borovnica, Ericaceae	folium	extract	tablet	Erbaven retard, Venodia plus	Azopt sol, Bisoprolol (2.5 mg), Bromazepam (3 mg), Corasp (100 mg), Cornelin (20 mg), Diazepam (5 mg), Enalapril (20mg), Farin (5 mg), Presolol (50 mg), Trimetacor (35 mg), Vivace (2.5 mg), Xalatan sol	ACE inhibitors, calcium antagonists, antianginal drug, benzodiazepine, beta blocker, antiplatelet agent, oral anticoagulant, glaucoma treatment	angina pectoris, depression, glaucoma, hypertension, neurasthenia, vein thrombosis

Latin name, Serbian name and family	Part of a plant	Form	Pharm. form	Name of HMP	All medicines used with HMP	Therapy groups	Present diseases when HMP was used
Vaccinium macrocarpon Aiton, američka borovnica, Ericaceae	fructus	fragmented herbal substance	herbal tea	Čaj ploda brusnice	/	/	/
Valeriana officinalis L., valerijana, Caprifoliaceae	radix	extract	ointment, liquid, tablet	Asam crveni konjski balzam, Femisan B kapi, Kapi za umirenje, Relax, Smirela noć, Valerijana kapi	Bromazepam (3 mg), Co-Amlessa (4 mg + 5mg + 1.25 mg), NovoMix 30 FlexPen (100ij/ml), Sidata (50 mg), Vivace (5 mg), Vivace plus	ACE inhibitors, antidepressant drug, antihypertensive drug, benzodiazepine, insulin	celiac disease, depression, hypertension, diabetes type 1
Verbascum phlomoides L., divizma, Scrophulariaceae	flos	extract	syrup	Bronho san jagorčevina, timija, divizma	/	/	/
Viscum album L., imela, Santalaceae	herba	extract	liquid	Femisan B kapi	/	/	/
Vitis vinifera L., grožđe, Vitaceae	folium, semen	extract	ointment, tablet	Asam crveni konjski balzam, Erbaven retard, Smirela noć	Bromazepam (3 mg), Co-Amlessa (4 mg + 5 mg + 1.25 mg), Sidata (50 mg), Vivace (5 mg), Vivace plus	ACE inhibitors, antidepressant drug, antihypertensive drug, benzodiazepine	depression, hypertension
Zea mays L., kukuruz, Poaceae	stigma	fragmented herbal substance	herbal tea	Čaj kukuruzne svile, Kirkolina Lux čaj za mršavljenje, Uroprotekt čaj	Concor (5 mg), Diazepam (5 mg), Gluformin (1000 mg), Hlorpromazin (25 mg), Prilinda (5 mg), Tensec (5 mg), Trental (400 mg)	ACE inhibitors, antipsychotic drug, benzodiazepine, beta blocker, oral antidiabetic drug, circulatory disorders treatment	depression, hypertension, diabetes type 2

Table 2. Number of HMP and species per respondent in relation to location

Location	Number of HMP per patient	Number of PS per patient
Aleksinac	1.05±0.22	3.33±2.48
Sokobanja	1.12±0.33	1.95±1.87
Zaječar	1.08±0.28	1.77±1.09
Kruskal-Wallis Test	Chi-Square=1.037; P=0.596	Chi-Square=9.749; P=0.008
Mann-Whitney U Test Post Hoc	/	**Aleksinac vs. Sokobanja, p=0.002** **Aleksinac vs. Zaječar, p=0.038** Sokobanja vs. Zaječar, p=0.816

PS-plant species

The results showed that the respondents living in the municipality of Aleksinac used more plant species for prevention and/or treatment of diseases compared to people from Sokobanja and Zaječar, while there was no difference between the respondents when it comes to the number of HMP (**Tab. 2**). **Tab. 3** shows that women used more herbal species when it comes to prevention and/or treatment of the disease compared to men, while there was no difference between the subjects when it comes to the number of HMP.

Table 3. Number of HMP and species per respondent in relation to location

Gender	Number of HMP per patient	Number of PS per patient
Male	1.97±0.25	1.67±1.73
Female	1.13±0.34	2.69±2.12
Mann-Whitney U Test	z=-1.065; P=0.287	z=-3.210; P=0.001

Table 4. Number of HMP and plant species per respondent in relation to age

Age	Number of HMP per patient	Number of PS per patient
≤35	1.05±0.22	2.33±1.56
36-50	1.14±0.36	2.61±2.38
51-64	1.09±0.29	2.27±2.29
≥ 65	1.10±0.31	1.72±1.62
Kruskal-Wallis Test	Chi-Square=1.223; P=0.747	Chi-Square=3.504; P=0.320
Mann-Whitney U Test Post Hoc	/	/

The analysis showed (**Tab. 4**, **Tab. 5**) there were no differences between the number of used HMP and plant species per subject in relation to age, and that they did not differ in the number of used HMP and plant species per subject in relation to the presence of chronic diseases. Also, in our study it was concluded (**Tab. 6**) that the subjects did not differ in the number of used HMP and herbal species per subject in relation to the number of conventional medicines per patient. Respondents who did not have finished pharmaceutical products in therapy used HMP for the purpose of prevention in a higher percentage (**Tab. 7**).

Table 5. Number of HMP/species per respondent in relation to chronic diseases

Presence of chronic diseases	Number of HMP per patient	Number of PS per patient
YES	1.12±0.33	2.04±2.06
NO	1.08±0.28	2.41±1.95
Mann-Whitney U Test	z=-0.597; P=0.550	z=-1.141; P=0.254

Table 6. Selection of indications for the use of HMP in relation to the number of medicines

Indication for the use of HP	Number of HMP per patient	Number of PS per patient
0 medicines	1.12±0.32	2.58±2.24
1-3 medicines	1.10±0.31	2.10±3.78
≥ 4 medicines	1.07±0.26	1.64±1.42
Kruskal-Wallis Test	Chi-Square=0.387; P=0.824	Chi-Square=3.981; P=0.137
Mann-Whitney U Test Post Hoc	/	/

In **Tab. 8**, it can be seen that most finished pharmaceutical products and HMP were used for the same indications. As expected, in the group of patients who used HMP for an indication different from the one for which the respondents used conventional medicines, 63.5% of them did not use medicines at all (**Tab. 9**).

Table 7. The purpose of the use of HMP in relation to the number of finished pharmaceutical products

Purpose of using HP	0 medicines	1-3 medicines	≥ 4 medicines
Prevention (n=79)	50 (63.29%)	11 (13.92%)	18 (22.78%)
Treatment (n=21)	2 (9.52%)	9 (42.86%)	10 (47.62%)
χ^2 Test	χ^2=19.821; p<0.001		

Comparative analysis

The area of Southeastern Serbia is known for its rich tradition of using herbal preparations and herbal medicines. The work by Matejić et al. (2020), shows that in the villages of the Timok and Svrljig region, people often opt for the use of plants from nature. This is the first measure of prevention, and even treatment, while they later decide to visit the doctor. According to the results of this ethnobotanical research conducted from 2015 to 2017, the local population used a total of 195 species in traditional treatments, specifically 31 species were used by the population of the Timok region, 77 both by the population of the Timok and Svrljig regions, and 87 by the population of the Srvrljig region.

Table 8. The most common indications for the use of conventional medicines and indications for the use of HMP

Indication	N (%)	Indication	N (%)
Cardiovascular diseases	37%	Cardiovascular diseases	18%
Benign prostatic hyperplasia	13%	Benign prostatic hyperplasia	19%
Mental disorders	12%	Mental disorders	11%
Diabetes	10%		
Ocular disorders	6%		
Other	24%		
Patients without comorbidity	49		

Table 9. Indications for the use of HMP in relation to the number of medicines

Indication for the use of HP	0 medicines	1-3 medicines	≥ 4 medicines
Same as in the case of finished pharmaceutical products (n=20)	1 (5%)	9 (45%)	10 (50%)
Different in relation to the indication of finished pharmaceutical products (n=80)	51 (63.75%)	11 (13.75%)	18 (22.50%)
χ^2 Test	χ^2=19.821; p<0.001		

The Timok region has a total of 108 species that have been used in the traditional treatment of the population. People most often used the following: *Hypericum spp., Matricaria chamomilla, Mentha* x *piperita, Urtica dioica, Juglans regia* and *Achillea millefolium.* All plant species that were used in the Timok region can be classified into a total of 47 families. Among them, most species are members of the families Lamiaceae, Rosaceae, Asteraceae, Apiaceae and Brassicaceae. Depending on the type of plant, different parts of it were used to make herbal preparations, and in as many as 94.6% of cases the aerial parts, flower, fruit, leaf and root were used. The population most often used herbs to prepare tea, in the form of compresses, as a tincture, fresh and cooked. Most of the plants were used internally (for internal use), 79.5% of the total number of plants, while a smaller number of plants were used externally (for external use), that is 20.5%. Plants from the Timok region were used in the treatment of the following systems: digestive, endocrine, metabolic and nutritional, integumentary, respiratory, circulatory and urinary, with 83.7% of all treated systems (Matejić et al. 2020).

The Svrljig region is characterized by a total of 164 different plant species that the population used for traditional medical purposes. In the Svrljig region, the most commonly used were: *Satureja montana, Sambucus nigra, Polygonum aviculare, Marrubium vulgare* and *Teucrium chamaedrys.* All species are classified in 64 families, and the largest percentage of them belongs to the Lamiaceae, Rosaceae, Asteraceae, Polygonaceae and Amaryllidaceae. The most used parts of plants were: aerial parts, leaf, flower, fruit and root. In 90.8% of cases, the plants were used in the form of tea, compresses, tinctures, for ritual purposes and fresh. In the largest percentage, the population used plants internally (for internal use), as much as 76.0%, while externally (for external use) 20.8% of the total number of plant species were used. However, 3.2% of species were used both externally and internally. The population used the plants in the treatment of various systems: digestive, endocrine, metabolic and nutritional, circulatory, urinary, integumentary, musculoskeletal and general and nonspecific, which represents 78.7% of all treated systems.

The research by Zlatković et al. (2014), conducted from 2011 to 2012, shows that 45 different species were in use on Mount Rtanj. The most commonly used was *Hypericum perforatum.* The largest percentage of the used plants belonged to the families Lamiaceae, Rosaceae and Asteraceae. They were used primarily in the treatment of the immune, respiratory and digestive systems.

The work by Jarić et al. (2015) showed that in the region of Suva planina the population used 128 different plant species in the period from 2012 to 2014. Most of them used the following species: *Achillea millefolium, Allium cepa, Allium sativum, Arctostaphyllos uva-ursi, Gentiana lutea, Hypericum perforatum, Juglans regia, Matricaria chamomilla, Mentha* x *piperita, Plantago lanceolata, Plantago major, Salvia officinalis, Sempervivum tectorum, Tilia cordata* and *Thymus serpyllum.* All used species are classified according to families, and the most common families were: Asteraceae, Rosaceae, Brassicaceae and Alliaceae. These herbs were used to treat mainly the respiratory system, disorders of the genitourinary and the digestive system.

The research by Janaćković et al. (2019), realized during 2016, indicates that 37 wild species were used among the population of Negotin Valley, most often the following: *Matricaria chamomilla, Urtica dioica, Hypericum perforatum, Salvia officinalis, Plantago major, Achillea millefolilium, Calendula officinalis* and *Taraxacum campylodes.* The largest percentage belonged to the families Lamiaceae, Asteraceae and Rosaceae, and they were primarily used to treat the immune, digestive and respiratory systems, as well as skin diseases.

All these ethnopharmacological researches are related to the plants used in traditional medicine, while our study gives a review of the plant species and HMP which are ingredients of pharmacological products and are distributed in public pharmacies. The number of people who use these pharmacological products increase even in rural areas.

Conclusions

Obtained results reflect a high frequency of the use of HMP in Southeastern Serbia. Residents of this area are more likely to opt for the use of various natural products than for conventional medicines. They use HMP to treat many diseases, and often in their prevention. The most commonly used preparation was Urasan forte. The composition of this preparation includes nutmeg (*Cucurbita moschata* Duchesne), one of the most common plant species. It is used in prostate hyperplasia, which together with other diseases of the urinary system often occurs in the inhabitants of this area. The most common species was bitter orange (*Citrus* x *aurantium* L.), an integral part of many HMP used in the treatment of hypertension, hyperlipidemia, venous thrombosis and sinusitis.

Most of the inhabitants suffered from hypertension, as confirmed by the relevant research conducted in this area. The results showed that the respondents from Aleksinac used more species for prevention and/or treatment of diseases compared

to people from Sokobanja and Zaječar, while there was no difference between the respondents when it comes to the number of HMP. Respondents who did not have conventional medicines in therapy used HMP for prevention in a higher percentage.

The local population prefers simple consumption of preparations in the form of capsules and tablets, but the traditional use of herbal teas is also very common.

Acknowledgements. The authors thank the Ministry of Education, Science and Technological Development of the Republic of Serbia for financial support (Grant No: 451-03-68/2020-14/ 200178, 451-03-9/2021-14/200113). We owe a special thanks to the Adonis Pharmacy (https://www.adonisapoteka.rs), which made this research possible.

References

Agency for Drugs and Medical Devices of Serbia 2021. National Drug Registry (Belgrade).

Barnes, J. 2012: Adverse Drug Reactions and Pharmacovigilance of Herbal Medicines. In: Talbot, J., Aronson, J.K. (eds.), *Stephens' detection and evaluation of adverse drug reacrions: principles and practice,* Willey- Blackwell, Chichester.

Dimitrijević, M., Catić-Đorđević, A., Stefanović, N., Pavlović, D., Veličković-Radovanović, R. 2014: Self-medication in primary healthcare in the teritiry of the city of Niš. *Acta Medica Medianae*, 53(3): 19-24.

Heinrich, M., Barnes, J., Prieto- Gracia, J., Gibbons, S., Williamson, E. 2018: *Fundamentals of Pharmacognosy and phytotherapy*. 3rd Edition. Elsevier.

Janaćković, P., Gavrilović, M., Savić, J., Marin, P.D., Dajić Stevanović, Z. 2019: Traditional knowledge on plant use from Negotin Krajina (Eastern Serbia): an ethnobotanical study. *Indian Journal of Traditional Knowledge*, 18(1): 25–33.

Jarić, S., Mačukanović-Jocić, M., Đurđević, L., Mitrović, M., Kostić, O., Karadžić, B., Pavlović, P. 2015: An ethnobotanical survey of traditionally used plants on Suva planina mountain (south-eastern Serbia). *Journal of Ethnopharmacology*, 175: 93–108.

Luketina-Šunjka, M., Rančić, N., Mihailović, N., Radević, S., Dagović, S., Jakovljević, M. 2020: Sealth self-evaluation of complementary and alternative medicine users in Serbia: cross-sectional national study. *Acta Medica Medianae*, 59(4): 34-42.

Matejić, J., Stefanović, N., Ivković, M., Živanović, N., Marin, D.P., Džamić, M.A. 2020: Traditional uses of autochthonous medicinal and ritual plants and other remedies for health in Eastern and South-Eastern Serbia. *Journal of Ethnopharmacology*, 261: 113186.

Petrović, S., Kukić-Marković, J., Pavlović-Drobac, M. 2012: Biljni lekoviti proizvodi: uslovi za bezbednu primenu. *Archive of Pharmacy*, 62(2): 119-35.

Public Health Institute "Timok" Zaječar, 2020: Analysis of the health status of the population of Zaječar district in the period from 2015 to 2019 (Zaječar). http://www.zavodzajecar.rs/images/pdf/AnalizaOkrugZajecar2015-2019.pdf

Public Health Institute Niš, 2017: Analysis of the health status of the population of the municipality of Sokobanja in the period from 2012 to 2016 (Niš). http://www.izjz-nis.org.rs/download/informatika/2017%20Analiza%20zdravstvenog%20stanja%20stanovnistva%20opstine%20Sokobanja%20%202012-2016.pdf

Public Health Institute Niš, 2017: Analysis of the health status of the population of the municipality of Aleksinac for 2015 (Niš).

Sam, S. 2019: Importance and effectiveness of herbal medicines. *Journal of Pharmacognosy and Phytochemistry*, 8(2): 354-357.

Statistical Office of the Republic of Serbia, 2016. Municipalities and regions in the Republic of Serbia 2016 (Belgrade). https://pod2.stat.gov.rs/ObjavljenePublikacije/G2016/pdf/G20162020.pdf

Statistical Office of the Republic of Serbia, 2017. Municipalities and regions in the Republic of Serbia 2017 (Belgrade). https://publikacije.stat.gov.rs/G2017/Pdf/G201713044.pdf

Statistical Office of the Republic of Serbia, 2020. Municipalities and regions in the Republic of Serbia 2020 (Belgrade). https://publikacije.stat.gov.rs/G2020/Pdf/G202013047.pdf

Zhang, L. 2018: Pharmacovigilance of Herbal and Traditional Medicines. In: Bate, A. (ed.), *Evidence-Based Pharmacovigilance Clinical and Quantitative Aspects*, Springer Nature, Humana press.

Zlatković, B.K., Bogosavljević, S.S., Radivojević, A.R., Pavlović, M.A., 2014: Traditional use of the native medicinal plant resource of Mt. Rtanj (Eastern Serbia): ethnobotanical evaluation and comparison. *Journal of Ethnopharmacology*, 151: 704–713.