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THE STRUCTURAL ANALYSIS OF MEDICINAL PLANTS AND THEIR USE TO TREAT THE GASTROINTESTINAL TRACT DISEASES

LIUBOV MAKHOVSKA, VICTORIA GNIEZDILOVA, OKSANA NESPLIAK, VIRA BUNIAK

Abstract. Medicinal plants have long been used in the treatment of various diseases and diseases of the digestive system, in particular. They contain almost all biologically active substances, which gives them an advantage over synthetic drugs, and the possibility of long-term use. On the basis of processing of literature sources the systematical and biomorphological analyzes of herbs were carried out. We analyzed the medicinal plants which are used to treat diseases of the gastrointestinal tract, including four groups: stomach (atony, achillia, ulcer, gastritis), intestine (enteritis, colitis), liver and gallbladder (hepatitis A, cholangitis, cholecystitis, nausea) and dyspeptic disorders (vomiting, constipation, diarrhea, bloating). Each of these groups of illnesses is characterized by a specific list of medicinal plants with an indication of their life form. 110 species of medicinal plants were identified, which belong to 102 genera, 46 families, 33 orders, 4 classes and 3 divisions. Among studied herbs, the most numerous are herbaceous polycarpics - 60 species (54.55%), while annuals have 21 species (19.01%), trees - 9 species (8.18%), shrubs - 8 species (7.27%), biennials - 7 species (6.36%), semi-shrubs - 4 species (3.64%) and lianas - 1 species (0.91%). The taxonomic and biomorphological structure of the studied plants is presented in general and analyzed in detail in each of the selected groups of diseases. Examples of plants that used in the treatment of various diseases of the gastrointestinal tract are given. It was established that for intestinal disease 28 species are used, liver and gallbladder - 47 species, stomach - 60 species and dyspeptic disorders - 75 species of herbs.

The article shows the results of taxonomic and biomorphologic analysis of medicinal plants that are used to treat the gastrointestinal tract diseases are based on literary data.

Keywords: medicinal plants, taxonomic structure, biomorphologic structure, gastrointestinal tract.

1. INTRODUCTION

Diseases of the gastrointestinal tract are common among the population and rank second only to cardiovascular disease. Almost every patient has some extent severe digestive disorders that require correction, although at the moment they may not manifest [3].

Herbs are especially useful in the treatment of gastrointestinal tract diseases. Almost the entire spectrum of pharmacological action is used, as there is a therapeutic effect on the condition of other

organs and systems (nervous, immune, endocrine, etc.). Phytotherapeutic agents, even in a minimal amount, can significantly improve the condition of patients [6, 12].

The aim of our work was to conduct systematic and biomorphological analyzes of medicinal plants used to treat digestive system diseases.

2. MATERIALS AND METHODS

The species composition of medicinal plants used in the treatment of digestive organs is given by "Opredelitel vysshyh rastenij Ukrainy" [8], "Atlasom likarskyh roslyn" [7]. Systematical structure is presented by A.L. Takhtajan [11], biomorphological - by I.G. Serebryakov [9], pharmacological characteristics - based on the analysis of literature sources [1, 2, 4, 5, 6, 12].

3. RESULTS AND DISCUSSION

To treat the digestive tract diseases 110 species of medicinal plants are used, which in taxonomic terms belong to 102 genera, 46 families, 33 orders, 4 classes (*Equisetopsida*, *Pinopsida*, *Magnoliopsida*, *Liliopsida*) and 3 divisions (*Equisetophyta*, *Pinophyta* та *Magnoliophyta*) (Tab. 1).

Taxas (division/class)	Families		Genera		Species		Proportions
	abs. number	%	abs. number	%	abs. number	%	
<i>Equisetophyta/ Equisetopsida</i>	1	2,5	1	0,98	1	0,91	1:1:1
<i>Pinophyta/ Pinopsida</i>	1	2,5	1	0,98	1	0,91	1:1:1
<i>Magnoliophyta/ Magnoliopsida</i>	40	85,0	95	93,14	103	93,63	1:2,8:3
<i>Liliopsida</i>	4	10,0	5	4,90	5	4,55	1:1,2:1,2
Total:	46	100	102	100	110	100	1:2,5:2,8

Tab.1. Taxonomical structure of Medicinal plants.

Magnoliophyta is the largest division by species richness. It includes 108 species (98.18 % of their total number). 103 species (93.63 %) belong to *Magnoliopsida*. Divisions *Equisetophyta* and *Pinophyta* are represented by one species – *Equisetum arvense* L. та *Juniperus communis* L. respectively.

The predominant families are *Asteraceae* – 20 видів (18.18 % of their total number), *Rosaceae* – 10 видів (9.09 %), *Lamiaceae* – 9 видів (8.18 %). Two families contain six species each (5.45 %) – *Apiaceae* і *Polygonaceae* (table 2). The families *Solanaceae* and *Fabaceae* include, respectively, 5 species (4.55%) and 4 species (3.64 %). Three species (2.73 %) include *Brassicaceae* and *Gentianaceae*. Other families account for 40.0% of studied species, of which 30 families have only one species (*Papaveraceae*, *Urticaceae*, *Caprifoliaceae*, *Plantaginaceae*, *Valerianaceae* etc.). The species richness of families is 2.8.

№ in order	Family	Genus		Species	
		abs. number	%	abs. number	%
1.	<i>Asteraceae</i>	19	18,63	20	18,18
2.	<i>Rosaceae</i>	8	7,84	10	9,09
3.	<i>Lamiaceae</i>	9	8,82	9	8,2
4.	<i>Apiaceae</i>	6	5,88	6	5,45
5.	<i>Polygonaceae</i>	3	2,94	6	5,45
6.	<i>Solanaceae</i>	5	4,90	5	4,55

Tab. 2. Systematic analysis of main families.

The vast majority of genera, namely 95 (93.14% of the total number of genera), have a low level of floristic wealth and are single-species. Six genera (5.88%) - *Rumex* L., *Potentilla* L., *Ononis* L., *Gentiana* L., *Filipendula* Mill., *Artemisia* L. include 2 species each, while the genus *Polygonum* L. includes 3 species.

The detailed results of the biomorphological analysis are represented on Figure 1. According to our data, polycarpic herbs form the largest group – 60 species (54.55 %) (*Artemisia absintium* L., *A. vulgaris* L., *Gentiana lutea* L., *Salvia officinalis* L., *Lamium album* L., *Achillea submillefolium* L., *Hypericum perforatum* L., *Mentha piperita* L., *Hieracium villosum* Jacq., *Urtica dioica* L., *Aguilegia vulgaris* L., *Marrubium vulgare* L., *Potentilla anserina* L., *Valeriana exaltata* Mihan, *Equisetum arvense* L., *Pulmonaria officinalis* L., *Rheum rhaponticum* L., *Levisticum officinalis* Koch etc.). The monocarpic herbs (annual plants) take the second place – 21 species (19.01 %) (*Avena sativa* L., *Xanthium spinosum* L., *Chamomilla recutita* L., *Datura stramonium* L., *Apium graveolens* L., *Cucurbita pepo* L., *Saponaria officinalis* L., *Polygonum arviculare* L. etc.). Trees are represented by nine species (8,18 %) (*Betula pendula* Roth, *Juglans regia* L., *Salix alba* L., *Populus nigra* L. etc.). Less species are shrubs – eight species (7.27%) (*Arctostaphylos uva-ursi* (L.) Spreng, *Rosa canina* L., *Viburnum opulus* L., *Sambucus nigra* L., *Frangula alnus* Mill., *Prunus spinosa* L., *Ononis spinosa* L., *Viscum album* L.). Seven species (6.36 %) are biennial plants (*Archahgelica officinalis* Hoffm, *Gentarium erythraea* Rafn, *Carum carvi* L., *Plantago major* L., *Allium sativum* L., *Hyoscyamus niger* L., *Verbascum phlomides* L.). Such group as subshrubs are represented by four species (3.64 %) (*Vaccinium myrtillus* L., *Genista tinctoria* L., *Rhodococcum vitis-idaea* Avror, *Rubus caesius* L.). And lianas take only one species (0.91 %) – *Vitis vinifera* L.

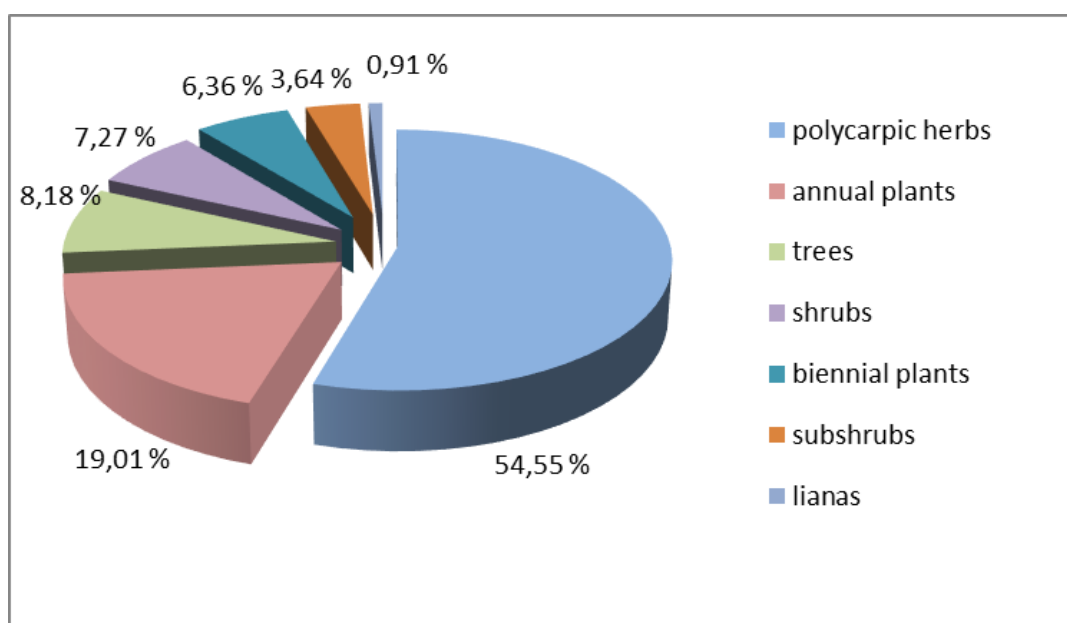


Fig. 1. The analysis of the plants' life-forms.

Diseases of the gastrointestinal tract are divided into four groups: stomach, intestines, liver and gallbladder and dyspeptic disorders [3].

60 species of studied plants belonging to 28 families are used for the treatment of gastric diseases. Among them, 3 families dominate (24.6%): *Asteraceae*, *Rosaceae*, *Lamiaceae*. Biomorphological analysis showed a predominance of herbaceous polycarpics – 35 видів (58.33 %): *Menyanthes trifoliata* L., *Melissa officinalis* L., *Artemisia absintium* L., *Gentiana lutea* L., *Thymus serpyllum* L., *Hypericum perforatum* L., *Achillea submillefolium* L., *Filipendula vulgaris* Moench, *Symphytum officinale* L., *Solanum tuberosum* L., *Polemonicum caeruleum* L. etc. The second place is occupied by annual plants - 10 species (16.67%): *Fumaria officinalis* L., *Cnicus benedictus* L., *Polygonum arviculare* L., *Bidens tripartite* L., *Calendula officinalis* L., *Chamomilla recutita* L., *Gnaphalium uliginosum* L., *Datura stramonium* L., *Euphrasia rostkoviana* Hayne, *Thlaspi arvense* L. Biennial plants (*Archahgelica officinalis* Hoffm, *Gentarium erythraea* Rafn, *Carum carvi* L.,

Plantago major L., *Allium sativum* L.) and trees (*Betula pendula* Roth., *Juniperus communis* L., *Juglans regia* L., *Berberis vulgaris* L., *Styphlonobium japonicum* (L.) Schott.) are represented by five species each (8.33%). Shrubs are a smaller group and have 4 species (6.67%) – *Arctostaphylos uva-ursi* (L.) Spreng, *Rosa canina* L., *Viburnum opulus* L., *Sambucus nigra* L. The least numerous are lianas - 1 species (1.67%): *Vitis vivifera* L.

The most common stomach diseases are atony, achillia, ulcers and gastritis (table 3). Gastric atony is a decrease or complete loss of gastric muscle tone, which can be congenital or acquired [5]. Such herbs are used for its treatment: *Menyanthes trifoliata* L., *Carum carvi* L., *Linaria vulgaris* Mill., *Mellissa officinalis* L., *Arctostaphylos uva-ursi* (L.) Spreng, *Betula pendula* Roth., *Menyanthes trifoliata* L., *Archahgelica officinalis* Hoffm, *Gentarium erythraea* Rafn etc.

Achillia - disorders of the secretory function of the gastric glands, a symptom of gastric disease (gastritis, cancer); under these conditions, you can use such plants: *Polygonum arviculare* L., *Cichorium intybus* L., *Helichrysum avenarium* (L.) Moench, *Allium sativum* L., *Carum carvi* L., *Artemisia absintium* L., *Gentiana lutea* L., *Cnicus benedictus* L., *Armoracia rusticana* Gaertn, *Juniperus communis* L., *Acorus calamus* L., *Berberis vulgaris* L., *Hypericum perforatum* L., *Taraxacum officinale* L., *Mentha piperita* L., *Inula helenium* L., *Tanacetum vulgare* L., *Rosmarinus officinalis* L., *Ruta hortensis* L., *Rosa canina* L. etc.

Gastritis - inflammation of the gastric mucosa, which causes a violation of its function [3]. For this disease, preference is given to the following species of plants: *Fumaria officinalis* L., *Gentiana cruciata* L., *Acorus calamus* L., *Hypericum perforatum* L., *Plantago major* L., *Rosmarinus officinalis* L., *Polygonum arviculare* L., *Cichorium intybus* L., *Altheae officinalis* L., *Atropa bella-donna* L., *Viburnum opulus* L., *Chamomilla recutita* L., *Gnaphalium uliginosum* L., *Tussilago farfara* L., *Gleochoma hederaceae* L., *Thlaspi arvense* L. etc.

Gastric ulcer - damage to the gastric mucosa, accompanied by the appearance of a defect in it, which does not heal for a long time [3]. Following species of plants are often used for its treatment: *Betula pendula* Roth., *Acorus calamus* L., *Achillea submillefolium* L., *Altheae officinalis* L., *Symphytum officinale* L., *Viburnum opulus* L., *Solanum tuberosum* L., *Calendula officinalis* L., *Chamomilla recutita* L., *Polemonicum caeruleum* L., *Gnaphalium uliginosum* L. etc.

The largest number of analyzed species - 75 (68.2%), which belong to 36 families are used for dyspeptic disorders. The dominant families are: *Asteraceae*, *Rosaceae*, *Apiaceae*, *Polygonaceae*. Among the life forms, polycarpics predominate - 37 species (49.33%): *Mellissa officinalis* L., *Artemisia absintium* L., *Gentiana lutea* L., *Acorus calamus* L., *Lamium album* L., *Linaria vulgaris* Mill., *Achillea submillefolium* L., *Hypericum perforatum* L., *Taraxacum officinale* L., *Mentha piperita* L., *Inula helenium* L., *Tanacetum vulgare* L., *Artemisia vulgaris* L., *Ruta hortensis* L., *Altheae officinalis* L., *Equisetum arvense* L., *Angelina sylvestris* L., *Ononis arvensis* L., *Levisticum officinalis* Koch. etc. Annual plants are represented by 13 species (17.33 %): *Fumaria officinalis* L., *Polygonum arviculare* L., *Chamomilla recutita* L., *Gnaphalium uliginosum* L., *Capsella bursa-pastoris* (L.) Medik, *Polygonum hydropiper* L., *Xanthium spinosum* L., *Avena sativa* L. etc. Trees include eight species (10.67 %) – *Betula pendula* Roth., *Juniperus communis* L., *Berberis vulgaris* L., *Juglans regia* L., *Salix alba* L., *Quercus robur* L., *Aesculus hippocastanum* L., *Populus nigra* L. Biennial plants and shrubs are represented by seven species each (9.33 %) – *Archahgelica officinalis* Hoffm, *Gentarium erythraea* Rafn, *Carum carvi* L., *Plantago major* L., *Allium sativum* L., *Hyoscyamus niger* L., *Verbascum phlomides* L. and *Arctostaphylos uva-ursi* (L.) Spreng, *Rosa canina* L., *Viburnum opulus* L., *Sambucus nigra* L., *Frangula alnus* Mill., *Ononis spinosa* L., *Viscum album* L. Three species belong to subshrubs (4.0 %) – *Genista tinctoria* L., *Rhodococcum vitis-idaea* Avror, *Rubus caesius* L.

Dyspeptic disorders include: diarrhoea, bloating, nausea, vomiting, constipation. Diarrhoea is a disorder that is accompanied by frequent bowel movements [3]. To suppress the secretory and digestive activity of the intestines, as antidiarrheals, should be used: *Archahgelica officinalis* Hoffm, *Gentarium erythraea* Rafn, *Arctostaphylos uva-ursi* (L.) Spreng, *Artemisia absintium* L., *Salvia officinalis* L., *Acorus calamus* L., *Berberis vulgaris* L., *Lamium album* L., *Juglans regia* L., *Tanacetum vulgare* L., *Polygonum arviculare* L., *Sambucus nigra* L., *Geum urbanum* L., *Ledum palustre* L., *Fragaria vesca* L., *Frangula alnus* Mill., *Rhodococcum vitis-idaea* Avror, *Rubus caesius* L., *Potentilla erecta* (L.) Raeusch., *Valeriana exaltata* Mihan, *Polygonum hydropiper* L., *Rheum rhaponticum* L. etc.

Bloated abdomen - a dyspeptic condition with excessive flatulence [12], for the treatment of which some herbs are recommended. They include: *Carum carvi* L., *Linaria vulgaris* Mill., *Melissa officinalis* L., *Gentiana lutea* L., *Gentiana cruciata* L., *Salvia officinalis* L., *Juniperus communis* L., *Inula helenium* L., *Ruta hortensis* L., *Allium sativum* L., *Chamomilla recutita* L., *Arnica montana* L., *Anethum graveolens* L., *Apium graveolens* L., *Avena sativa* L., *Levisticum officinalis* Koch etc.

Vomiting - unauthorized secretion of gastric contents through the mouth [4]. The following plant species are effective: *Betula pendula* Roth., *Menyanthes trifoliata* L., *Archangelica officinalis* Hoffm., *Gentarium erythraea* Rafn, *Acorus calamus* L., *Lamium album* L., *Juglans regia* L., *Achillea submillefolium* L., *Hypericum perforatum* L., *Mentha piperita* L., *Hyoscyamus niger* L., *Valeriana exaltata* Mihan, *Equisetum arvense* L., *Angelina sylvestris* L., *Cucurbita pepo* L.

Nausea is a pathological condition in which there are frequent calls for vomiting [5]. To eliminate this condition such plants are used: *Lamium album* L., *Archangelica officinalis* Hoffm., *Juglans regia* L., *Gentarium erythraea* Rafn, *Acorus calamus* L., *Achillea submillefolium* L., *Hypericum perforatum* L., *Mentha piperita* L., *Hyoscyamus niger* L., *Valeriana exaltata* Mihan, *Angelina sylvestris* L. etc.

Constipation - a delay in the excretion of intestinal contents for one or more days. To overcome it you may use laxative plants containing fiber, pectin and hemicellulose [6] – *Menyanthes trifoliata* L., *Taraxacum officinale* L., *Viburnum opulus* L., *Sambucus nigra* L., *Capsella bursa-pastoris* (L.) Medik, *Genista tinctoria* L., *Frangula alnus* Mill., *Rhodococcum vitis-idaea* Avror, *Ononis spinosa* L., *Ononis arvensis* L., *Verbascum phlomides* L., *Anethum graveolens* L.

In liver disease, the formation and secretion of bile is disturbed, so you should use choleric plants, the active substances of which are essential oils, phytosterols, flavonoids, resins, etc. [1]. The most common diseases of the liver and gallbladder are hepatitis A, cholangitis and cholecystitis. For the treatment of these diseases 47 species of studied plants (42.73%) from 26 families are used. The most numerous of them were the following families: *Asteraceae*, *Rosaceae*, *Lamiaceae*. The dominant group is herbaceous polycarpic plants - 32 species (68.08%): *Menyanthes trifoliata* L., *Linaria vulgaris* Mill., *Agrimonia eupatoria* L., *Artemisia absintium* L., *Gentiana lutea* L., *Gentiana cruciata* L., *Armoracia rusticana* Gaertn, *Acorus calamus* L., *Hypericum perforatum* L., *Mentha piperita* L., *Hieracium villosum* Jacq., *Inula helenium* L., *Tanacetum vulgare* L., *Rosmarinus officinalis* L., *Ruta hortensis* L. etc. There are eight species of annual plants (17.02%): *Fumaria officinalis* L., *Cnicus benedictus* L., *Calendula officinalis* L., *Euphrasia rostkoviana* Hayne, *Centaurea cyanus* L., *Capsella bursa-pastoris* (L.) Medik, *Zea mays* L., *Saponaria officinalis* L.; three species of trees (6.38 %): *Betula pendula* Roth., *Berberis vulgaris* L., *Salix alba* L.; two species of shrubs (4.26 %): *Rosa canina* L., *Frangula alnus* Mill.; one species (2.13%) of biennial plants and subshrubs: *Gentarium erythraea* Rafn ta *Genista tinctoria* L.

Cholangitis is a nonspecific inflammation of the bile ducts due to the penetration of infections from the gallbladder, intestines, blood and lymphatic vessels [3]. To treat this disease *Tanacetum vulgare* L., *Cichorium intybus* L., *Solidago virgaurea* L., *Zea mays* L., *Urtica dioica* L., *Aguilegia vulgaris* L. are used.

Hepatitis A, B, C - infectious diseases with liver damage caused by relevant viruses [4]. The following plants are used to treat hepatitis A: *Agrimonia eupatoria* L., *Artemisia absintium* L., *Fumaria officinalis* L., *Gentiana lutea* L., *Armoracia rusticana* Gaertn, *Berberis vulgaris* L., *Hypericum perforatum* L., *Mentha piperita* L., *Inula helenium* L., *Tanacetum vulgare* L., *Rosmarinus officinalis* L., *Ruta hortensis* L., *Cichorium intybus* L., *Rosa canina* L., *Calendula officinalis* L., *Chelidonium major* L., *Geum urbanum* L., *Genista tinctoria* L., *Solidago virgaurea* L., *Asarum europaeum* L., *Zea mays* L., *Fragaria vesca* L., *Rumex acetosa* L. etc.

Cholecystitis is an inflammation of the gallbladder wall [2]. This disease is treated with plants such as: *Gentarium erythraea* Rafn, *Agrimonia eupatoria* L., *Fumaria officinalis* L., *Acorus calamus* L., *Berberis vulgaris* L., *Cichorium intybus* L., *Helichrysum avenarium* (L.) Moench, *Rosa canina* L., *Atropa bella-donna* L., *Capsella bursa-pastoris* (L.) Medik, *Zea mays* L., *Frangula alnus* Mill., *Hepatica nobilis* Mill., *Marrubium vulgare* L.

Intestinal disorders include enteritis and colitis, for the treatment of which 28 species (25.45%) of studied plants from 17 families are used. The most numerous families are *Asteraceae* and *Rosaceae*. Among biomorphs, herbaceous polycarpic plants are represented by 15 species (53.57%): *Gentiana lutea*

<i>Lamium album</i> L.		+								+	+		+	
<i>Juglans regia</i> L.		+				+				+	+		+	
<i>Achillea millefolium</i> L.		+	+	+						+	+		+	
<i>Hypericum perforatum</i> L.		+		+		+	+			+	+		+	
<i>Taraxacum officinale</i> L.		+		+								+		
<i>Mentha piperita</i> L.		+		+			+			+	+			+
<i>Hieracium villosum</i> Jacq.		+	+			+	+							
<i>Inula helenium</i> L.		+					+							+
<i>Tanacetum vulgare</i> L.		+				+	+	+					+	
<i>Plantago major</i> L.		+		+	+	+							+	
<i>Artemisia vulgaris</i> L.		+											+	
<i>Rosmarinus officinalis</i> L.		+		+			+							
<i>Ruta hortensis</i> L.		+					+							+
<i>Polygonum arviculare</i> L.		+		+									+	
<i>Cichorium intybus</i> L.		+		+			+	+	+					
<i>Helichrysum aenarium</i> (L.) Moench		+					+		+					
<i>Allium sativum</i> L.		+												+
<i>Bidens tripartite</i> L.		+												
<i>Rosa canina</i> L.		+	+				+		+				+	
<i>Althea officinalis</i> L.			+	+	+	+							+	
<i>Atropa bella-donna</i> L.			+	+					+					
<i>Filipendula vulgaris</i> Moench			+										+	
<i>Symphytum officinale</i> L.			+	+									+	
<i>Viburnum opulus</i> L.			+	+		+						+	+	
<i>Solanum tuberosum</i> L.			+	+										
<i>Calendula officinalis</i> L.			+				+							
<i>Chamomilla recutita</i> L.			+	+	+	+							+	+
<i>Polemonicum caeruleum</i> L.			+											
<i>Styphlonobium japonicum</i> (L.) Schott			+											
<i>Gnaphalium uliginosum</i> L.			+	+										+
<i>Filipendula denudata</i> (J. et C. Presl.) Fritsch				+									+	
<i>Chelidonium major</i> L.				+			+							
<i>Sambucus nigra</i> L.				+								+	+	
<i>Geum urbanum</i> L.				+		+	+						+	
<i>Datura stramonium</i> L.				+										
<i>Euphrasia rostkoviana</i> Hayne				+		+	+							+
<i>Tussilago farfara</i> L.				+										
<i>Glechoma hederaceae</i> L.				+		+								
<i>Thlaspi arvense</i> L.				+										
<i>Ledum palustre</i> L.					+	+							+	
<i>Eriophorum latifolium</i> Hoppe					+	+								
<i>Vaccinium myrtillus</i> L.					+	+								
<i>Rumex confertus</i> Willd.					+	+							+	
<i>Arnica montana</i> L.						+	+							+
<i>Salix alba</i> L.						+	+						+	
<i>Verbena officinalis</i> L.							+							
<i>Centaurea cyanus</i> L.							+							
<i>Capsella bursa-pastoris</i> (L.) Medik							+		+			+		

<i>Genista tinctoria</i> L.							+						+		
<i>Solidago virgaurea</i> L.							+	+							
<i>Asarum europaeum</i> L.							+								
<i>Antennaria dioica</i> (L.) Gaertn							+				+	+			
<i>Zea mays</i> L.							+	+	+						
<i>Origanum vulgare</i> L.							+								
<i>Saponaria officinalis</i> L.							+								
<i>Fragaria vesca</i> L.							+							+	
<i>Rumex acetosa</i> L.							+								
<i>Urtica dioica</i> L.								+							
<i>Aguilegia vulgaris</i> L.								+							
<i>Frangula alnus</i> Mill.									+				+	+	
<i>Hepatica nobilis</i> Mill.									+						
<i>Marrubium vulgare</i> L.									+					+	
<i>Quercus robur</i> L.						+								+	
<i>Rhodococcum vitis-idaea</i> Avror						+							+	+	
<i>Rubus caesius</i> L.						+								+	
<i>Potentilla anserina</i> L.						+									
<i>Potentilla erecta</i> (L.) Raeusch.						+								+	
<i>Prunus spinosa</i> L.						+									
<i>Hyoscyamus niger</i> L.										+	+				
<i>Valeriana exaltata</i> Mihan										+	+		+	+	
<i>Equisetum arvense</i> L.											+		+		
<i>Angelina sylvestris</i> L.										+	+		+	+	
<i>Cucurbita pepo</i> L.										+	+				
<i>Linum crepitans</i> (Boenn.) Dumort.													+		
<i>Ononis spinosa</i> L.													+		
<i>Ononis arvensis</i> L.													+		
<i>Verbascum phlomides</i> L.													+		
<i>Anethum graveolens</i> L.													+		+
<i>Aesculus hippocastanum</i> L.														+	
<i>Polygonum bistorta</i> L.														+	
<i>Polygonum hydropiper</i> L.														+	
<i>Pulmonaria officinalis</i> L.														+	
<i>Xanthium spinosum</i> L.														+	
<i>Viscum album</i> L.														+	
<i>Apium graveolens</i> L.															+
<i>Populus nigra</i> L.														+	
<i>Rheum rhaponticum</i> L.														+	
<i>Avena sativa</i> L.															+
<i>Levisticum officinalis</i> Koch															+
Total:	18	32	18	32	7	28	39	6	14	15	16	13	45	26	

Tab. 3. The use of medicinal plants for diseases of the gastrointestinal tract.

4. CONCLUSIONS

As a result of the analysis of literature sources for the treatment of diseases of the digestive system 110 species of plants belonging to 102 genera, 46 families, 33 orders, 4 classes (*Equisetopsida*, *Pinopsida*, *Magnoliopsida* *Liliopsida*) and 3 divisions (*Equisetophyta*, *Pinophyta* та *Magnoliophyta*) were revealed.

The predominant families are *Asteraceae* – 20 species (18.18 % of the total number of species), *Rosaceae* – 10 species (9.09 %), *Lamiaceae* – 9 species (8.18 %), *Apiaceae* – 6 species (5.45 %) i *Polygonaceae* – 6 species (5.45 %). The species richness of families is 2.8.

Among biomorphs medicinal plants were distributed: herbaceous polycarpic - 60 species (54.55%), annual plants - 21 species (19.01%), trees - 9 species (8.18%), shrubs - 8 species (7.27 %), biennial plants - 7 species (6.36%), subshrubs - 4 species (3.64%), lianas - 1 species (0.91%).

60 species of medicinal plants are effective in gastric disease, 28 species in the intestine, 47 species in the liver and gallbladder, and 75 species in dyspeptic disorders.

In various diseases of the gastrointestinal tract are most often used such plant species as: *Gentarium erythraea* Rafn, *Acorus calamus* L., *Menyanthes trifoliata* L., *Fumaria officinalis* L., *Hypericum perforatum* L., *Artemisia absintium* L., *Gentiana lutea* L., *Gentiana cruciata* L., *Achillea submillefolium* L., *Mentha piperita* L., *Chamomilla recutita* L., *Betula pendula* Roth., *Archahgelica officinalis* Hoffm, *Salvia officinalis* L., *Berberis vulgaris* L., *Juglans regia* L., *Tanacetum vulgare* L., *Plantago major* L., *Cichorium intybus* L., *Rosa canina* L., *Altheae officinalis* L., *Viburnum opulus* L.

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Address: Liubov Makhovska, Victoria Gniezdilova, Oksana Nespliak, Vira Buniak, Vasyl Stefanyk Precarpathian National University, 57 Shevchenko St., Ivano-Frankivsk 76018, Ukraine.

E-mail: liubov.makhovska@pnu.edu.ua; viktoria.gniezdilova@pnu.edu.ua;
oksana.nespliak@pnu.edu.ua; vira.buniak@pnu.edu.ua.

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Маховська Любов, Гнезділова Вікторія, Неспляк Оксана, Буняк Віра. Структурний аналіз лікарських рослин та застосування їх при захворюваннях органів шлунково-кишкового тракту. *Журнал Прикарпатського університету імені Василя Стефаника*, 7 (4) (2020), 66–75.

Лікарські рослини з глибокої давнини використовуються при лікуванні різних захворювань, і при хворобах органів травлення, зокрема. Вони містять майже всі біологічно активні речовини, що надає їм перевагу над синтетичними лікарськими препаратами, та можливість застосування впродовж тривалого часу. На основі опрацювання літературних джерел проведено систематичний та біоморфологічний аналізи лікарських рослин, які застосовуються при захворюваннях органів шлунково-кишкового тракту, серед яких виділено чотири групи: шлунка (атонія, ахілія, виразка, гастрит), кишечника (ентерит, коліт), печінки та жовчного міхура (гепатит А, холангіт, холецистит, нудота) і диспептичні розлади (блювота, закрепи, діарея, вздуття). Кожна з цих груп характеризується певним видовим списком лікарських рослин із зазначенням життєвих форм. Виявлено 110 видів лікарських рослин, які відносяться до 102-х родів, 46-и родин, 33-х порядків, 4-х класів та 3-х відділів. Серед лікарських рослин найбільш чисельнішими є трав'яні полікарпики – 60 видів (54,55 %), тоді як однорічники налічують 21 вид (19,01 %), дерева – 9 видів (8,18 %), кущі – 8 видів (7,27 %), дворічники – 7 видів (6,36 %), напівкущі – 4 види (3,64 %) та ліани – 1 вид (0,91 %). Таксономічну та біоморфологічну структури досліджуваних рослин подано загалом та детально проаналізовано в кожній із виділених груп хвороб. Наведено приклади рослин, які застосовують при лікуванні різних захворювань органів шлунково-кишкового тракту. Встановлено, що при захворюванні кишечника використовують 28 видів, печінки та жовчного міхура – 47 видів, шлунка – 60 видів та диспептичних розладах – 75 видів лікарських рослин. Для лікування різних захворюваннях шлунково-кишкового тракту найчастіше використовуються такі види рослин, як: *Gentarium erythraea* Rafn, *Acorus calamus* L., *Menyanthes trifoliata* L., *Fumaria officinalis* L., *Hypericum perforatum* L., *Artemisia absintium* L., *Gentiana lutea* L., *Gentiana cruciata* L., *Achillea submillefolium* L., *Mentha piperita* L., *Chamomilla recutita* L., *Betula pendula* Roth., *Archangelica officinalis* Hoffm, *Salvia officinalis* L., *Berberis vulgaris* L., *Juglans regia* L., *Tanacetum vulgare* L., *Plantago major* L., *Cichorium intybus* L., *Rosa canina* L., *Altheae officinalis* L., *Viburnum opulus* L.

Ключові слова: лікарські рослини, систематична структура, біоморфологічна структура, шлунково-кишковий тракт.