

## Medicinal plants of the flora of Azerbaijan, used in homeopathy

M.P. Mehdiyeva

(Department of Plant Resources of the Institute of Botany of the National Academy of Sciences of Azerbaijan)

### SUMMARY

An information-analytical study of the nomenclature of medicinal plants of the flora of Azerbaijan, used in homeopathy, was carried out. 257 species were identified, their taxonomic, biomorphological, ecological analysis, as well as analysis by the content of the main groups of biologically active substances, are presented. The main spectrum of therapeutic properties and diseases for which the studied types of medicinal plants are used in official and folk medicine have been determined.

Key words: taxonomy, biomorphology, ecology, biologically active compounds, therapeutic properties of medicinal plants, homeopathy.

The flora of Azerbaijan is rich and varied. At present, it is represented by 4745 species belonging to 193 families and 900 genera. Of these, 63 species are higher spore plants, 24 are gymnosperms, 4658 are angiosperms [5]. Among them there are many useful plants, including medicinal, which are widespread throughout the republic - in forests, steppes, semi-deserts, deserts, as well as weeds in crops, orchards and vegetable gardens. The variety of natural conditions in Azerbaijan makes it possible to procure some types of medicinal raw materials, as well as to grow some of them.

The inventory of medicinal plants was launched in the last century. So, as a result of long-term expeditionary surveys of various botanical and geographical regions and subsequent laboratory analyzes, 800 species of medicinal plants were identified. The species composition, distribution areas and approximate stocks of the most important medicinal plants, such as licorice, tragacanth, astragalus, barberry, hawthorn, elecampane, St. John's wort, buckthorn, madder, scumpia, sumac, wild rose, and others were clarified. [3, 8, 10, 20, 22].

Along with the identification and experimental research of medicinal plants, the study of the heritage of traditional medicine is of great importance. So, W.C. Alekperov, based on the study of medieval sources (XIII-XVIII centuries) in the field of medicine and pharmacy, carried out a retrospective analysis of the medicinal flora of medieval Azerbaijan [1]. As a result, the author identified 365 species of medicinal plants in the flora of Azerbaijan, of which only 113 are integrated into modern herbal medicine. In modern generalizing works, the species composition of medicinal plants in the flora of Azerbaijan is limited mainly by pharmacopoeial species, the number of which does not exceed 400 species [2, 9].

Thus, there is no complete systematized information about medicinal plants of the republic in the literature. This fact prompted us to make an inventory (according to literary data, herbarium materials of the Institute of Botany of the National Academy of Sciences of Azerbaijan, replenishing them with the results of our own field research in 2000-2005) and on its basis to create a computer data bank of biodiversity of medicinal plants of the flora of Azerbaijan, including those used in homeopathy. The passport compiled by us for each type of medicinal plant and entered into the computer database includes 26 parameters reflecting the bioecological characteristics, chemical composition, medicinal properties, therapeutic groups, forms of application, etc. [15, 16]. To date, we have identified 1532 species of medicinal plants growing in the flora of Azerbaijan, belonging to 179 families and 760 genera. Among the medicinal plants of the flora of Azerbaijan, there are species that have been used and are still used in Tibetan, Chinese, Indian, Korean, and other areas of traditional medicine, as well as in folk and official (so-called scientific and traditional medicine, including homeopathy), veterinary medicine. In the course of our research, we also found numerous species included in the State Pharmacopoeias of various countries [4, 6, 7, 18, 19, 25, etc.].

The purpose of this work was an information and analytical study of the nomenclature medicinal plants of the flora of Azerbaijan used in homeopathy. The tasks of the study included the following questions: carrying out a taxonomic,

biomorphological, ecological analysis, as well as analysis of the content of biologically active substances and types of biological action. The objects of the study were "The nomenclature of producing plants and raw materials for the production of homeopathic medicines in Russia", "Herbal analgesics", "Plant resources of the USSR", "Plant resources of Russia and neighboring countries", "Phytotherapy", "Flora of Azerbaijan", "Encyclopedic dictionary of medicinal, essential oil and poisonous plants" and others [11,17, 18, 19, 23, 26]. The analysis made it possible to identify 257 species of plants of the flora of Azerbaijan, used in world practice to obtain homeopathic medicines (Table 1).

Table 1

## List of types of medicinal plants of the flora of Azerbaijan, used in homeopathy

Наименование видов			
<i>Achillea filipendulina</i> Lam.	<i>Descurainia Sophia</i> (L.) Webb ex Prantl	<i>Lotus corniculatus</i> L.	<i>Rhus coriaria</i> L.
<i>Achillea millefolium</i> L.	<i>Dryopteris filix-mas</i> (L.)Schott	<i>Lycopersicon esculentum</i> Mill.	<i>Ricinus communis</i> L.
<i>Actaea spicata</i> L.	<i>Ecballium elaterium</i> (L.)A.Rich.	<i>Lycopus europaeus</i> L.	<i>Rosa canina</i> L.
<i>Adonis aestivalis</i> L.	<i>Elaeagnus angustifolia</i> L.	<i>Lythrum salicaria</i> L.	<i>Rosa centifolia</i> L.
<i>Aesculus hippocastanum</i> L.	<i>Elytrigia repens</i> (L.)Nevski	<i>Malva neglecta</i> Wallr.	<i>Rosa damascena</i> Mill.
<i>Aethusa cynapium</i> L.	<i>Ephedra distachya</i> L.	<i>Malva sylvestris</i> L.	<i>Rumex acetosa</i> L.
<i>Agrimonia eupatoria</i> L.	<i>Epilobium palustre</i> L.	<i>Marrubium vulgare</i> L.	<i>Rumex crispus</i> L.
<i>Agrostemma githago</i> L.	<i>Equisetum hyemale</i> L.	<i>Matricaria recutita</i> L.	<i>Ruta graveolens</i> L.
<i>Ailanthus altissima</i> (Mill.)Swingle	<i>Equisetum telmateia</i> Ehrh.	<i>Medicago sativa</i> L.	<i>Salix alba</i> L.
<i>Ajuga reptans</i> L.	<i>Euonymus europaea</i> L.	<i>Melia azedarach</i> L.	<i>Salix purpurea</i> L.
<i>Allium sativum</i> L.	<i>Euonymus verrucosa</i> Scop.	<i>Melilotus officinalis</i> (L.)Pall.	<i>Sambucus ebulus</i> L.
<i>Allium ursinum</i> L.	<i>Eupatorium cannabinum</i> L.	<i>Mentha pulegium</i> L.	<i>Sambucus nigra</i> L.
<i>Aloe arborescens</i> Mill.	<i>Euphorbia amygdaloides</i> L.	<i>Menyanthes trifoliata</i> L.	<i>Sanguisorba officinalis</i> L.
<i>Amygdalus communis</i> L.	<i>Euphorbia villosa</i> Waldst.et Kit.	<i>Mercurialis perennis</i> L.	<i>Sanicula eurorea</i> L.
<i>Anagallis arvensis</i> L.	<i>Euphrasia stricta</i> D.Wolff ex J.F.Lehm.	<i>Myosotis arvensis</i> (L.)Hill	<i>Saponaria officinalis</i> L.
<i>Anthriscus cerefolium</i> (L.)Hoffm.	<i>Filipendula ulmaria</i> (L.)Maxim.	<i>Myrtus communis</i> L.	<i>Satureja hortensis</i> L.
<i>Apium graveolens</i> L.	<i>Fragaria vesca</i> L.	<i>Narcissus poeticus</i> L.	<i>Scrophularia nodosa</i> L.
<i>Aristolochia clematis</i> L.	<i>Fraxinus excelsior</i> L.	<i>Narcissus pseudonarcissus</i> L.	<i>Scrophularia umbrosa</i> Dumort.
<i>Armoracia rusticana</i> Gaerth. C.A.Mey.et Scherb.	<i>Fumaria officinalis</i> L.	<i>Nasturtium officinale</i> R.Br.	<i>Sedum acre</i> L.
<i>Artemisia absinthium</i> L.	<i>Galega officinalis</i> L.	<i>Nerium oleander</i> L.	<i>Senecio vulgaris</i> L.
<i>Artemisia vulgaris</i> L.	<i>Galega orientalis</i> Lam.	<i>Nicotiana tabacum</i> L.	<i>Sigesbeckia orientalis</i> L.
<i>Asparagus officinalis</i> L.	<i>Galinsoga parviflora</i> Cav.	<i>Nigella sativa</i> L.	<i>Silybum marianum</i> (L.) Gaertn.
<i>Avena sativa</i> L.	<i>Galium aparine</i> L.	<i>Nymphaea alba</i> L.	<i>Sisymbrium officinale</i> (L.) Scop.
<i>Bellis perennis</i> L.	<i>Galium odoratum</i> (L.)Scop.	<i>Olea europea</i> L.	<i>Solanum nigrum</i> L.
<i>Berberis vulgaris</i> L.	<i>Galium rubioides</i> L.	<i>Onopordon acanthium</i> L.	<i>Solidago virgaurea</i> L.
<i>Beta vulgaris</i> L.	<i>Galium verum</i> L.	<i>Origanum vulgare</i> L.	<i>Stachys officinalis</i> (L.)Trevis.
<i>Betula pubescens</i> E.	<i>Gentiana cruciata</i> L.	<i>Oxalis acetosella</i> L.	<i>Stellaria media</i> (L.) Vill.
<i>Brassica nigra</i> (L.) Koch	<i>Geranium robertianum</i> L.	<i>Padellus mahaleb</i> (L.)Vass.	<i>Syringa vulgaris</i> L.
<i>Bryonia alba</i> L.	<i>Geum urbanum</i> L.	<i>Padus avium</i> Mill.	<i>Tamus communis</i> L.
<i>Bryonia dioica</i> Jacq.	<i>Glechoma hederacea</i> L.	<i>Papaver dubium</i> L.	<i>Taxus baccata</i> L.
<i>Calendula officinalis</i> L.	<i>Glycyrrhoza glabra</i> L.	<i>Papaver rhoeas</i> L.	<i>Teucrium chamaedrys</i> L.
<i>Caltha palustris</i> L.	<i>Gossypium hirsutum</i> L.	<i>Papaver somniferum</i> L.	<i>Teucrium scordioides</i> Schreb.
<i>Calystegia sepium</i> (L.)R.Br.	<i>Gymnadenia conopsea</i> (L.)R.Br.	<i>Parnassia palustris</i> L.	<i>Thalictrum minus</i> L.
<i>Cannabis sativa</i> L.	<i>Hedera helix</i> L.	<i>Persica vulgaris</i> Mill.	<i>Thea sinensis</i> L.
<i>Capsella bursa-pastoris</i> (L.) Medik.	<i>Helianthemum nummularium</i> (L.)Mill.	<i>Petroselinum crispum</i> (Mill.) A.W.Hill	<i>Tilia cordata</i> Mill.
<i>Castanea sativa</i> Mill.	<i>Helianthemum ovatum</i> (Viv.) Dun.	<i>Phaseolus vulgaris</i> L.	<i>Trifolium arvense</i> L.
<i>Centaureum erythraea</i> Rafn	<i>Helianthus tuberosus</i> L.	<i>Phyllitis scolopendrium</i> (L.)Newm.	<i>Trifolium pretense</i> L.
<i>Chaerophyllum temulum</i> L.	<i>Herniaria glabra</i> L.	<i>Physalis alkekengi</i> L.	<i>Trigonella foenum-graecum</i> L.
<i>Cheiranthus cheiri</i> L.	<i>Hyoscyamus niger</i> L.	<i>Phytolacca americana</i> L.	<i>Tropaeolum majus</i> L.
<i>Chelidonium majus</i> L.	<i>Hypericum perforatum</i> L.	<i>Pimpinella peregrina</i> L.	<i>Tulipa confusa</i> Garb.
<i>Chenopodium ambrosioides</i> L.	<i>Inula helenium</i> L.	<i>Pimpinella saxifraga</i> L.	<i>Typha latifolia</i> L.
<i>Chenopodium botrys</i> L.		<i>Plantago arenaria</i> Waldst.et Kit.	<i>Ulmus glabra</i> Huds.
<i>Chenopodium vulvaria</i> L.		<i>Plantago lanceolata</i> L.	<i>Ulmus minor</i> Mill.
			<i>Urtica urens</i> L.
			<i>Vaccinium vitis-idaea</i> L.

<i>Cichorium intybus</i> L.	<i>Iris germanica</i> L.	<i>Plantago major</i> L.	<i>Valeriana officinalis</i> L.
<i>Cirsium arvense</i> (L.) Scop.	<i>Iris pseudocorus</i> L.	<i>Plantago media</i> L.	<i>Valeriana tiliifolia</i> Troitzk.
<i>Citrullus colocynthis</i> (L.) Schrad.	<i>Juglans regia</i> L.	<i>Platycladus orientalis</i> (L.)	<i>Veratrum lobelianum</i> Bernh.
<i>Citrus limon</i> (L.) Burm. fil.	<i>Juncus effusus</i> L.	Franco	<i>Verbascum speciosum</i> Schrad.
<i>Clematis vitalba</i> L.	<i>Juniperus sabina</i> L.	<i>Polygonum aviculare</i> L.	<i>Verbascum thapsus</i> L.
<i>Colchicum szovitsii</i> Fisch. et C.A. Mey.	<i>Juniperus virginiana</i> L.	<i>Polypodium vulgare</i> L.	<i>Verbena officinalis</i> L.
<i>Colchicum speciosum</i> (Stev.)	<i>Lactuca sativa</i> L.	<i>Polytrichum commune</i> L.	<i>Veronica officinalis</i> L.
<i>Conium maculatum</i> L.	<i>Lactuca serriola</i> L.	<i>Portulaca oleracea</i> L.	<i>Viburnum opulus</i> L.
<i>Convolvulus arvensis</i> L.	<i>Lamium album</i> L.	<i>Potentilla anserine</i> L.	<i>Vinca herbacea</i> Waldst. et Kit.
<i>Conyza canadensis</i> (L.) Cronq.	<i>Lathyrus sativus</i> L.	<i>Potentilla erecta</i> (L.) Raeusch.	<i>Vinca major</i> L.
<i>Cornus mas</i> L.	<i>Laurocerasus officinalis</i> M. Roem.	<i>Potentilla recta</i> L.	<i>Vinca minor</i> L.
<i>Crataegus curvisepala</i> Lindm.	<i>Laurus nobilis</i> L.	<i>Potentilla reptans</i> L.	<i>Vincetoxicum hirundinaria</i> Medik.
<i>Crocus sativus</i> L.	<i>Lemna minor</i> L.	<i>Prunella vulgaris</i> L.	<i>Viola odorata</i> L.
<i>Cucurbita maxima</i> Duch.	<i>Leonurus cardiaca</i> L.	<i>Prunus spinosa</i> L.	<i>Viscum album</i> L.
<i>Cucurbita moschata</i> (Duch.) Poir.	<i>Lepidium sativum</i> L.	<i>Punica granatum</i> L.	<i>Vitex agnus-castus</i> L.
<i>Cucurbita pepo</i> L.	<i>Leucanthemum vulgare</i> Lam.	<i>Ranunculus bulbosus</i> L.	<i>Vitis vinifera</i> L.
<i>Cupressus sempervirens</i> L.	<i>Lilium candidum</i> L.	<i>Ranunculus repens</i> L.	<i>Xanthium strumarium</i> L.
<i>Cuscuta europaea</i> L.	<i>Linaria vulgaris</i> Mill.	<i>Ranunculus sceleratus</i> L.	<i>Zea mays</i> L.
<i>Cynoglossum officinale</i> L.	<i>Linum catharticum</i> L.	<i>Raphanus raphanistrum</i> L.	
<i>Daphne mezereum</i> L.	<i>Lolium temulentum</i> L.	<i>Raphanus sativus</i> L.	
<i>Datura stramonium</i> L.	<i>Lonicera caprifolium</i> L.	<i>Rhododendron caucasicum</i> Pall.	
	<i>Lonicera xylosteum</i> L.		

Taxonomic analysis of the floristic spectrum of medicinal plants used in homeopathy, showed that angiosperms dominate Magnoliophyta - 245 species (95.33%). Moreover, the representatives of the class Magnoliopsida accounts for a significantly larger number of species. Lower, higher spore and gymnosperms are poorly represented, only 12 species belonging to 8 families and 9 genera, they account for 4.67% of the total number of species (Table 2).

table 2

Quantitative distribution of taxonomic units of medicinal plants in flora Azerbaijan used in homeopathy, in general by taxa

Отделы и классы	Семейство		Род		Вид		Пропорции семейство: род : вид
	абс. чис.	доля, %	абс. чис.	доля, %	абс. чис.	доля, %	
<b>Ascomycotina</b>							
Ascolichens	1	1,05	1	0,48	1	0,38	1:1:1
<b>Equisetophyta</b>							
Equisetopsida	1	1,05	1	0,48	2	0,78	1:1:2
<b>Polypodiophyta</b>							
Polypodiopsida	3	3,16	3	1,45	3	1,17	1:1:1
<b>Pinophyta</b>							
Pinopsida	2	2,11	3	1,45	5	1,95	1:1.5:2.5
<b>Gnetophyta</b>							
Ephedropsida	1	1,05	1	0,48	1	0,38	1:1:1
<b>Magnoliophyta</b>							
Magnoliopsida	75	78,95	178	86	222	86,38	1:2.37:2.96
Liliopsida	12	12,63	19	9,18	23	8,95	1:1.58:1.92
<b>Всего:</b>	<b>95</b>	<b>100</b>	<b>207</b>	<b>100</b>	<b>257</b>	<b>100</b>	<b>1:2.18:2.71</b>

The ratio of groups of different taxonomic ranks and especially information on the numerical composition of families give a clear idea of the structure of plants. Thus, 13 leading families of the medicinal flora under consideration contain 127 species, i.e. 49.42% of its composition. In class Magnoliopsida for a share The 10 largest families, including 6 or more species, account for 45.53%. In class Liliopsid medicinal plants are much smaller and relatively large 3 families make up 3.89% of the total number of species (Table 2).

Some members of these families, such as: *Achillea millefolium*, *Artemisia absinthium*, *Cichorium intybus*, *Cirsium arvense*, *Glycyrrhiza glabra*, *Pimpinella peregrina*, *Capsella bursa-pastoris*, *Geum urbanum*, *Origanum vulgare*, *Filipendula ulmaria*, etc., being edificers or dominants widespread plant formations, cover large areas mainly in mountainous regions. These largest families, including medicinal plants used in homeopathy, are also leading in the floristic spectrum of Azerbaijan.



Families represented by 2–4 species (25 families) make up 26.07% of the total number of species. The share of single-species families (54 families) accounts for 21.01% of the total number of species. Despite the fact that the families Araliaceae, Berberidaceae, Boraginaceae, Celastraceae, Dryopteridaceae, Juncaceae, Lemnaceae, Lythraceae, Phytalaccaceae, Polygonaceae, Sambucaceae, Taxaceae, Verbenaceae, Violaceae, Viscaceae, Cornaceae, etc. are few in number (1-2 species), at the same time they include the dominant species of the most common forest, meadow cenoses, as well as wetland vegetation. These include *Hedera helix*, *Berberis vulgaris*, *Dryopteris filix-mas*, *Myosotis arvensis*, *Euonymus europaea*, *Cornus mas*, *Lemna minor*, *Juncus effusus*, *Lythrum salicaria*, *Phytolacca americana*, *Polygonum aviculare*, *Taxus baccata*, *Sambucus ebulus*, *Visdo o alba officinalis*, *Viratum*

Regarding genera, it should be noted that the greatest diversity of species is characterized by genera *Potentilla* (5 types), *Plantago* (4), *Galium* (4), *Vinca* (3), *Artemisia* (3), *Cucurbita* (3), *Ranunculus* (3), *Papaver* (3), *Rosa* (3) which account for 14.5%.

Of the 257 types of medicinal plants used in homeopathy, 23 are cultural: *Petroselinum crispum*, *Allium sativum*, *Narcissus pseudonarcissus*, *Nerium oleander*, *Vinca major*, *Calendula officinalis*, *Cheiranthus cheiri*, *Raphanus sativus*, *Cannabis sativa*, *Citrullus colocynthus*, *Cucurbita maxima*, *C. moschnata*, *C. pepogaris* h. *Melia azedarach*, *Syringa vulgaris*, *Zea mays*, *Amygdalus communis*, *Ruta graveolens*, *Ailanthus altissima*, *Vitex agnuscastus*.

Among the medicinal plants of the flora of Azerbaijan, used in homeopathy, there are 3 relict species (*Taxus baccata*, *Castanea sativa*, *Rhododendron caucasicum*), 1 endemic to the Caucasus (*Rhododendron caucasicum*) and 1 endemic to Azerbaijan (*Euphrasia stricta*) [12].

Table 3

Quantitative distribution of species and genera of medicinal plants used in homeopathy in leading families

Семейства	Число родов во флоре Азербайджана	Доля, %	Число видов во флоре Азербайджана	Доля, %	Число исследуемых родов	Доля, %	Число исследуемых видов	Доля, %
<b>Magnoliopsida</b>								
<i>Asteraceae</i>	135	3,15	600	12,64	21	10,14	25	9,73
<i>Rosaceae</i>	29	3,22	199	4,19	14	6,76	19	7,39
<i>Lamiaceae</i>	42	4,67	219	4,62	12	5,8	13	5,06
<i>Fabaceae</i>	69	7,67	502	10,58	9	4,35	11	4,28
<i>Ranunculaceae</i>	21	2,33	97	2,04	7	3,38	10	3,89
<i>Brassicaceae</i>	74	8,22	252	5,31	9	4,35	10	3,89
<i>Apiaceae</i>	75	8,33	184	3,88	8	3,86	9	3,50
<i>Cucurbitaceae</i>	8	0,89	14	0,30	4	1,93	7	2,72
<i>Scrophulariaceae</i>	25	2,78	163	3,44	5	2,42	7	2,72
<i>Solanaceae</i>	17	1,89	38	0,80	6	2,9	6	2,33
<b>Liliopsida</b>								
<i>Poaceae</i>	120	13,33	472	9,95	4	1,93	4	1,56
<i>Melanthiaceae</i>	3	0,33	20	0,42	2	0,97	3	1,17
<i>Liliaceae</i>	5	0,56	40	0,84	3	1,45	3	1,17

As a result of the analysis of the biomorphological structure [21], we found that the prevailing biomorph of medicinal plants used in homeopathy are herbaceous plants, the largest part of which are perennials (127 species). The next largest group of species (64 species) are annual grasses. A significantly smaller number of species is accounted for by trees (25 species), shrubs (25 species), and biennial grasses (12 species). Shrubs (*Viscum album*, *Vaccinium vitisidaea*) and lianas shrubs (*Hedera helix* and *Vitis vinifera*) weakly, 2 species each, which account for 1.56% (diagram 1).

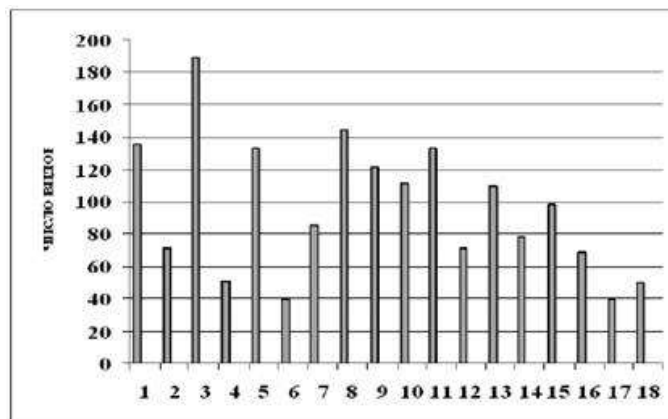


Diagram 1. The ratio of biologically active substances in medicinal plants used in homeopathy.

On the abscissa: 1 - alkaloids; 2 - coumarins; 3 - flavonoids; 4 - glycosides; 5 - essential oils; 6 - resins; 7 - saponins; 8 - vitamin C; 9 - tannins; 10 - carbohydrates; 11 - fatty oils; 12 - vitamin E; 13 - phenol carboxylic acids; 14 - organic acids; 15 - steroids; 16 - triterpenoids; 17 - carotenoids; 18 - anthocyanins

Environmental analysis showed that in relation to the water factor [24] among medicinal plants used in homeopathy, mesophytes (33.07%), xeromesophytes (30.74%) and mesoxerophytes (17.12%) prevail. These are mainly plants of wet and steppe meadows, as well as weeds. Mesophytes are mainly represented by cultivated species, among the wild ones it can be noted *Potentilla anserina*, *Phyllitis scolopendrium*, *Juncus effusus*, etc. The most widespread and xeromesophytes with significant natural reserves are *Lathyrus sativus*, *Euphorbia amygdaloides*, *Inula helenium*, *Xanthium strumarium*, *Plantago major*, *P. lanceolata*, *Solanum nigrum*, *Polypodium vulgare*, *Clematis vitalba*, etc. Typical mesoxerophytes are *Rosa canina*, *Achillea filipendulina*, *Malva sylvestris*. xerophytes (9.34%) and hygromesophytes (5.45%), confined to stony, gravelly and humid habitats. Of the most common xerophytes, it can be noted *Juniperus sabina*, *Teucrium chamaedrys*, *Rhus caryaria*, *Galium verum*, *Matricaria recutita*, *Polygonum aviculare*, etc., from hygromesophytes - *Prunella vulgaris*, *Veronica officinalis*, *Eupatorium cannabinum*, *Nasturtium officinale*, *Equisetum telmateia*, etc. Hygrohydrophytes (*Caltha palustris*, *Menyanthes trifoliata*), halomesoxerophytes (*Plantago arenaria*, *Asparagus officinalis*), halohydromesophytes (*Apium graveolens*, *Ranunculus sceleratus*) and parasites (*Cuscuta europaea*, *Viscum album*) are represented by 2 types (3.11%) and are in third place. In fourth place are halomesophytes (*Elytrigia repens*), haloxerophytes (*Descurainia sophia*) and hydrophytes (*Lemna minor*), for a share which account for 1.17%.

The above data of the ecological analysis of medicinal plants are confirmed by the data of the analysis of their distribution in various types of vegetation. The distribution of medicinal plants according to the main types of vegetation showed that the predominant number of species grows in the following types of vegetation: weed (68 species), forests and shrubs (51 species). A significant number of species are found among mountain meadow (30 species), forest (28 species), upland xerophytic (16 species) and coastal (15 species) vegetation. From 4 to 10 species are recorded in the composition of desert, dry steppe, mountain steppe, rocky talus, chally meadow, wetland and psammophytic littoral vegetation.

The highest concentrations of medicinal plants in the composition of these types of vegetation were noted in the foothills, lower and middle mountain belts (from 400 to 1800 m above sea level), respectively, 139, 153 and 164 species. Whereas in the alpine, subalpine and upper mountain belts there are much less of them (from 10 to 66 species). Thus, the analysis made it possible to establish that medicinal plants are part of various cenoses and their growth in those is not the same, which is apparently associated with the different intensity of the formation of biologically active substances in life forms and ecological groups of plants. As a result of the analysis, it was revealed that most species (102–155) of medicinal plants used in homeopathy contain flavonoids, vitamin C, alkaloids, essential and fatty oils, tannins. A significant number of species (55–92) contain

phenol carboxylic acids, carbohydrates, steroids, saponins, organic acids, coumarins, triterpenoids and carotene. Low indicators are characterized by species (1–15) containing bitter substances, sesquiterpenoids, vitamin PP, rubber, vitamin K, gums, aromatic, cyanogenic compounds, quinones, phytoncides, cardenolides, tannides, vitamin D and carotene (diagram 1).

The content of the above biologically active compounds determines the therapeutic effect of medicinal plants. In this regard, during the analysis, we tried to group plants used in homeopathy according to their therapeutic properties used in modern allopathic and traditional medicine. At the same time, we were aware of the fact that the spectrum of biological action in no way can correlate with the prescription of the appropriate medicines for homeopathic indications. The analysis showed that most (54.23%) of medicinal plants exhibit a diuretic effect. A significant part (20.90–39.30%) has wound healing, anthelmintic properties, anti-inflammatory, laxative, diaphoretic, analgesic, expectorant, astringent, antipyretic and antibacterial activity. The share of poisonous species of medicinal plants accounts for 28.36%. A small part of the species (7.96–17.91%) is characterized by sedative, hypotensive, antitumor, choleric, antiseptic, hemostatic, tonic, anticonvulsant, protistocidal, antispasmodic, emetic, emollient, soothing, detoxifying, bactericidal action. And the lowest rates (0.50–7.46%) were established for the species of medicinal plants with lactogenic, carminative, stimulating, antiulcer, antiherpetic, anti-trichomonas, virucidal, enveloping, vasodilating, vasoconstrictor, exciting, anti-scorb, soothing, anti-cancer, hypnotic, radioprotective, immunomodulatory, antimutagenic and other actions and properties (diagram 2).

The results of the performed analysis allowed us to rather conditionally group the plants in accordance with the main direction of their pharmaco-therapeutic action. The data obtained are shown in Table 5. As can be seen from Table 5, most of the medicinal plants (45.14–83.66%) are used for gastrointestinal, nervous, infectious, skin diseases, as well as diseases of the heart, vascular system, lungs, upper respiratory tract, bladder, kidney, liver and gallbladder. During the analysis, plants were identified that are used to treat other diseases. However, the volume and specifics of the research (resource study) do not allow dwelling in more detail on the purely medical aspects of the problem and provide complete information about medicinal plants. having a certain therapeutic effect and belonging to all other therapeutic groups. This ratio characterizes the main spectrum of diseases in which medicinal plants are used.

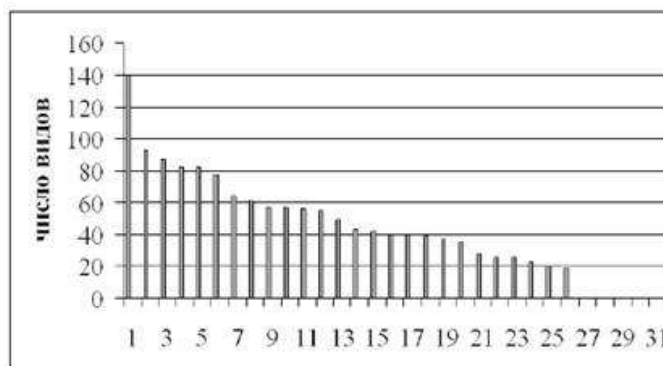


Diagram 2. Quantitative distribution of medicinal plant species by biological action in allopathic medicine

Along the axis of ablation: 1 - diuretic; 2 - wound healing; 3 - anthelmintic; 4 - anti-inflammatory; 5 - antibacterial; 6 - laxative; 7 - poisonous; 8 - hemostatic; nine - pain reliever; 10 - astringent; 11 - expectorant; 12 - diaphoretic; 13 - sedative; 14 - tonic; 15 - choleric; 16 - antitumor; 17 - hypotensive; 18 - antiseptic; 19 - hemostatic; 20 - fortifying; 21 - antispasmodic; 22 - protistocidal; 23 - emetic; 24 - emollient; 25 - antioxidant; 26 - antifungal

Table 4

## Quantitative distribution of medicinal plant species by therapeutic groups

Заболевания	Число видов	% от общего числа исследуемых видов
Желудочно-кишечные	215	83,66
Сердца и сосудистой системы	195	75,88
Легких и верхних дыхательных путей	193	75,10
Мочевого пузыря и почек	175	68,09
Нервные	151	58,75
Инфекционные	138	53,70
Печени и желчного пузыря	117	45,53
Кожные	116	45,14
Женские	68	26,46
Гнойные раны, язвы	63	24,51
Злокачественные опухоли	54	21,01
Опухоли	40	15,56
Ожоги	38	14,79
Глазные	37	14,40
Сахарный диабет	37	14,40
Венерические	35	13,62
Селезенки	32	12,45
Ушные	16	6,23
Аллергия	11	4,28
Нарушение обмена веществ	12	4,67
Отравления	10	3,89
Крови	6	2,33
Лимфатической системы	1	0,39

We also analyzed the ratio of species of large families within the specified therapeutic properties. As a result, it was found that the leading place is occupied by species that are part of 10 families, combining from 7 to 25 species. Moreover, the largest number of species of these families has diuretic and wound-healing properties, they account for 25.29%. The tonic effect is shown mainly by representatives of this family. Lamiaceae (1.95%) and Rosaceae (1.56%), and antispasmodic - those of this. Asteraceae (1.95%). A significant part of the species of this family. Asteraceae (3.89%), Rosaceae (2.72%) Scrophulariaceae (2.33%) and Lamiaceae (1.95%) has anti-inflammatory properties. Sedative and hemostatic action is manifested mainly by the types of this family. Asteraceae (respectively, 3.50 and 3.11%), Lamiaceae (respectively, 3.11 and 1.95%) and Rosaceae (hemostatic 3.50%). The largest number of species with antitumor activity is noted in the families Asteraceae (*Onopordum acanthium*, *Artemisia campestre*, *A. vulgaris*, *Calendula officinalis*, *Cichorium intybus*) Cucurbitaceae (*Citrullus colocynthis*, *Ecballium elaterium*, *Bryonia dioica*, *B. Triba alba*) and Fabaceae (*Glycyrrhiza glabra*, *Melilot*, which accounts for the share of *Glycyrrhiza glabra*, *Melilot*, respectively, 1.95%, 1.56% and 1.17% of the total number of species (Table 4).

Thus, the studied plants have a wide spectrum of therapeutic action, which cannot be used in any way when prescribing them as homeopathic medicines.

Table 5

Distribution of medicinal plant species of leading families used in homeopathy according to biological action

Действие, свойства, активность	Apiaceae	Asteraceae	Brassicaceae	Cucurbitaceae	Fabaceae	Lamiaceae	Ranunculaceae	Rosaceae	Solanaceae	Scrophulariaceae
Гипотензивное		3		2	2	4	3	2	3	3
Желчегонное		6		2		3		4	1	1
Диуретическое	4	10	7	6	8	8	4	11	2	5
Седативное	1	9				8	2	3		1
Гемостатическое	3	8	3			5		9		2
Тонизирующее						5		4		
Слабительное		6	4	5	1		4	3	1	2
Отхаркивающее	1	8	5		3	6		3	1	4
Потогонное	3	8		1		5		6		3
Жаропонижающее								5	2	1
Ранозаживляющее	2	11	3	1	3	9	4	7	3	4
Спазмолитическое		5								
Противоопухолевое	2	5		4	3	1	2			2
Противовоспалительное	1	10			3	5		7	2	6
Болеутоляющее	1	7						5		2
Мягчительное					4					3
Лактогенное					4	3	2			1
Вяжущее	1	5						9		1
Антисептическое		4				6		4	2	
Антибактериальное		8	4	3	2	8	5	6	3	3
Антигельминтное	2	9	4	5	3	4	1	7	4	13
Антифунгальное		4		2		5	2			
Антиоксидантное	3	4				2				
Ядовитое			2	4		2	6	1	3	

## CONCLUSIONS

1. For the first time, as a result of the information and analytical research carried out from the general The number of species (1532) of medicinal plants of the flora of Azerbaijan revealed 257 species used in homeopathy. Of these, 245 species (95.33%) are angiosperms. The remaining 12 species (4.67%) belong to gymnosperms - 6 species (2.33%), the highest - 5 species (1.95%) and the lowest spore - 1 species (0.39%).

2. It was found that in the floristic spectrum of the studied species, the leading place is occupied by family representatives Asteraceae, Rosaceae, Lamiaceae, Fabaceae, Ranunculaceae, Brassicaceae, Apiaceae, Cucurbitaceae, Scrophulariaceae, Solanaceae, Poaceae, Melanthiaceae, Liliaceae, including 127 species (49.42%). And childbirth is the most diverse Potentilla, Plantago, Galium, Vinca, Artemisia, Cucurbita, Ranunculus, Papaver, Rosa, constituting 14.5% of the total number of studied species.

3. It has been determined that most of the studied species of medicinal plants (from 102 to 155 species) contains tannins, fatty, essential oils, alkaloids, vitamin C and flavonoids.

4. It was revealed that most of the studied species have diuretic (54.23%), significant - wound healing, anthelmintic, anti-inflammatory, laxative, diaphoretic, analgesic, expectorant, astringent, antipyretic and antibacterial properties (20.90–39.30%).

5. It was found that most of the studied medicinal plants (from 116 to 215 species) used in official and folk medicine for the following diseases: skin, liver and gallbladder, infectious, nervous, bladder, kidney, lungs and upper respiratory tract, heart, gastrointestinal.

6. It was revealed that the largest number of species possessing (according to literature data) antitumor activity, noted in this. Asteraceae, Cucurbitaceae and Fabaceae.



7. The conducted information and analytical research opens up prospects the use of medicinal plants of the flora of Azerbaijan in the search for new medicinal products with the necessary biological activity.

#### LITERATURE

1. Alekperov F.U. Written sources of the XXVIII centuries. on health care in medieval Azerbaijan: Author's abstract. dis. ... Dr. of History. Sciences. - Baku, 1998. -- 39 p.
2. Aliev N.I. Medicinal plants of Azerbaijan and herbal medicine. - Baku: Elm, 1998. -- 343 p. (in Azerbaijani).
3. Aliev R.K., Prilipko L.I., Damirov I.A. Prospects for the use of local plant resources for the production of medicines in Azerbaijan. - Baku: Azerbaijan State Publishing House, 1961. -- 226 p.
4. Aseeva T.A., Blinova K.F., Yakovlev G.P. Medicinal plants of Tibetan medicine. - Novosibirsk: Nauka, 1985. -- 160 p.
5. Askerov A.M. Higher plants of Azerbaijan. Abstract of the flora of Azerbaijan. - Baku: Elm, 2005-2007. - T.I. - 247 p.; T.II. - 283 p.; T.III. - 240 p. (in Azeri)
6. Gammerman A.F., Thunder I.I. Wild medicinal plants of the USSR. - M.: Medicine, 1976. -- 272 p.
7. Gammerman A.F., Damirov I.A., Karryev M.O., Yakovlev G.P. Scientific medicinal plants medicine of the USSR, not included in the Pharmacopoeia. - Ashgabat: Ylym, 1970. -- 185 p.
8. Grossheim A.A., Isaev Ya.M., Karyagin I.I., Rzazade R.Ya. Medicinal plants of Azerbaijan. - Baku: AzFAN, 1942. -- 135p.
9. Damirov I.A., Prilipko L.I., Shukurov D.Z., Kerimov Yu.B. Medicinal plants Azerbaijan. - Baku: Maarif, 1988. -- 320 p.
10. Ismailov N.M., Ulukhanov B.G. Stocks of the most important species of medicinal plants and protection thickets in the Azerbaijan SSR // Resources of wild medicinal plants of the USSR. - M.: VILAR. 1975. - Issue. 3. - S. 124-128.
11. Kiseleva T.L., Tsvetaeva E.V. Nomenclature of producing plants and raw materials for production homeopathic medicines price Russia. - M., 2002. -- 122 p.
12. Red Book of the Azerbaijan SSR. Rare and endangered species animals and plants. - Baku: Ishyg, 1989. -- 543 p.
13. Ladygina E.A., Morozova R.S. Phytotherapy. - L.: Medicine, Edition 2, supplemented, 1990. - 303 s.
14. Mashkovsky M.D. Medicines. - M.: Medicine, 1986. part 1, 2.
15. Mehtieva N.P. On the creation of a data bank of medicinal plants of the flora of Azerbaijan / Materials of the IV International Conference on Biological Diversity and Plant Introduction, June 5-8, 2007, St. Petersburg. - SPb., 2007. - S. 57-58.
16. Mekhtieva N.P. Biological activity and therapeutic properties of medicinal plants flora of Azerbaijan / I Russian phytotherapeutic congress / Collection of scientific papers of the congress, March 14-16, 2008, Moscow. - M., 2008. - S. 276-284.
17. Herbal analgesics. Series "Homeopathy and herbal medicine for practical to the doctor and pharmacist" / Edited by A.A. Karpeev and T.L. Kiseleva. - St. Petersburg: Homeopathy and herbal medicine, 1997. Issue 3. - 154 p.
18. Plant resources of the USSR. Flowering plants, their chemical composition, use. - L.: Science, 1985-1993. - T. 1-7.
19. Plant resources of Russia and neighboring states. Flowering plants, their chemical composition, use. - SPb.: Nauka, 1994-1996. - T. 8. - T.9. - 571 p.
20. Vegetable raw materials of the Azerbaijan SSR. / Ed. A.A. Grossheim. - Baku: Fan, 1942. issue 2, - 144 p. 20. Rzazade R.Ya. Folk medicinal plants of Azerbaijan // Medicinal plants of Azerbaijan / Edited by A.A. Grossheim, etc. - Baku: AzFAN USSR. 1942. - pp. 106-166.
21. Serebryakov I.G. Life forms of higher plants and their study // Field Geobotany. Moscow: Academy of Sciences of the USSR. 1964. V.3 - 530 s.
22. Fedorov A.I.A. Medicinal plants used in folk medicine of Talysh // Vegetable raw materials. - M.-L.: Publishing house of the Academy of Sciences of the USSR. 1949. -- 479s.
23. Flora of Azerbaijan. Baku: Publishing house of the Academy of Sciences of the Azerbaijan SSR. 1950-1961. - T.I. - 370 p.; T.II. - 317 c.; T.III. - 407 p.; T.IV. - 400 p.; TV - 580 c.; T.VI. - 540 p.; T.VII. 648 c.; T.VIII. - 676 p.

24. Shennikov A.P. Introduction to Geobotany. - L. : Publishing house of Leningrad University, 1964. - 447s.

25. Shreter A.I. Medicinal flora of the Caucasus. - M. : Medicine, 1979. -- 365 p.

26. Encyclopedic Dictionary of Medicinal, Essential Oil and Poisonous Plants. - M. :

State bldg. agricultural literature, 1951. - 487 p.

Author's address

**Ph.D. Mehtieva N.P.**

Leading researcher Department of Plant Resources of the Institute of Botany of the National Academy of Sciences of Azerbaijan 1073,  
Baku, Badamdar highway, 40 +994 (12) 439-32-30

---

Mekhtiyeva, M.P. Medicinal plants of the flora of Azerbaijan, used in homeopathy / M.P. Mehtieva // Traditional Medicine. - 2009. - No. 1 (16). - pp. 12-20.

[To favorites](#)