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BIOMORPHS OF MEDICINAL PLANTS IN CHECHEN REPUBLIC: SYSTEMATIC ANALYSIS

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Abstract

This report provides a systematic and biomorphological analysis of the family of medicinal plants in the Shali region of the Chechen Republic. The analysis is based on the processing of herbarium materials and field observations carried out by the authors. Modern medicines based on plant materials have been created as a result of summarizing the historical experience of different peoples of the world, as well as the search work of domestic and foreign scientists. Medicinal plants attract the attention of many people. 40% of valuable medicinal preparations are obtained only from plants. Medicinal plants have a promising future because there are about half a million plants in the world, and in most of them their medicinal activity has not yet been studied. The results of this study contribute to the knowledge of the diversity of medicinal plants in the Chechen Republic and may aid in the development of new plant-based medicines.

Keywords: Genus, hemicryptophytes, life form, medicinal mesophanerophytes, species, species

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1. Introduction

Shali district is an administrative-territorial unit and a municipal district within the Chechen Republic of the Russian Federation (Bortsova, 2007).

It is located in the foothill zone, in the central part of the republic. In the south it borders on the Shatoisky district, in the east - on Vedensky and Kurchaloevsky, in the west - on the Grozny region and in the north - on the urban district of Argun. The area of the district is 598.89 km² (Demin, 2007).

Many rivers flow through its territory, the largest of which are Argun, Bass, Dzhalka, Khulhulau and others.

2. Problem Statement

The purpose of this study is to conduct a systematic and biomorphological analysis. During the study, the following tasks were solved (Elbuzdukaeva et al., 2019; Galushko, 1975):

i. conducting a systematic analysis;

ii. conducting a biomorphological analysis of the family.

3. Research Questions

According to the information obtained during the study, 92 species of medicinal plants grow in the study area, united in 34 families (Astamirova et al., 2022). The systematic spectrum of this group of plants is given in Table 1 and Figure 1 (Gvozdetsky, 1954).

Table 1. Systematic composition of medicinal plants of the Shali region

№	Kind	Genus	Sort
	Polypop1aceae Bercht. et J. Presl.	Polypodium	Polypodium vulgare L.
	Lemnaceae S.F.Crav	Lemna	Lemna minor L.
	Orchidaceae Juss.	Dactylorhiza	Dactylorhiza salina (Turcz. ex Lindl.) Soo (D. sanasunitensis (Fleischm.) Soo) hyemale L.
		Orchis	Orchis ustulata L.
	Poaceae Barnhart	Elytrigia	Elytrigia repens (L.) Nevski (A. repens (L.) Beauv.)
		Phragmites	Phragmites australis (Cav.) Trin. ex Steud. (Ph. communis Trin.)
	Apiaceae Lindl.	Eryngium	Eryngium planum L.
	Aristolochiaceae Juss.	Aristoloehia	Aristoloehia clematitis L.
	Asteraceae Dumort. (Comnositae)	AchiIlea	AchiIlea millefolium L.
			AchiIlea setacea Waldst. et Kit.
		Arctium	Arctium paliadinii (Marc.) Grossh.
		Erigeron	Erigeron acris L. (E. Acer auct.)
		Carduus	Carduus nutans L.
		Pulicaria	Pulicaria vulgaris Gaertn. (P. prostrata (Gilib.))
		Taraxacum	Taraxacum officinale Wigg.
		Tussilago	Tussilago farfara L.
	Betulaceae S.F. Gray	Betula	Betula pubescens Ehrh.

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Boraginaceae Juss.	Anchusa	Anchusa azurea Mill. (A. italica Retz.)
	Eehium	Eehium vulgare L.
	Cynoglossum	Cynoglossum officinale L.
	Lithospermum	Lithospermum officinale L.
Brassicaceae Burnett (Cruciferae)	Berteroa	Berteroa incana (L.) DC.
	Draba	Draba nemorosa L.
	Neslia	Neslia paniculata (L.) Desv.
Cannabaceae Endl.	HumuIus	HumuIus lupulus L.
Caryophyllaceae Juss.	Melandrium	Melandrium album (Mill.) Garcke
	Stellaria	Stellaria holostea L.
		Stellaria media (L.) Vill.
Chenopod1aceae Vent.	Chenopodium	Chenopodium album L.
		Chenopodium botrys L.
		Chenopodium vulvaria L.
Convolvulaceae Juss.	Convolvulus	Convolvulus arvensisL.
	Calystegia	Calystegia sepium (L.) R.Br.
Fabaceae Lintll.	Amoria	Amoria repens (L.) C. Presl (T. repens L.)
	Asrtagalus	Asrtagalus glycyphyllos L.
	Melilotus	Melilotus officinalis (L.) Pall.
	Ononis	Ononis arvensis L.
	Lathyrus	Lathyrus pratensis L.
Elaeagnaceae Juss.	Hyppohpae	Hyppohpae rhamnoides L.
Fumariaceae PC.	Fumaria	Fumaria vaillantii Loisel
Geraniaceae Juss.	Erodium	Erodium cicutarium (L.) L'Her.
Juglandaceaea Rich, ex Kunth	Juglans	Juglans regia L.
Lamiaceae Until.	Nepeta	Nepeta cataria L.
	Origanum	Origanum vulgare L.
	Prunella	Prunella vulgaris L.
	Leonurus	Leonurus quinquelobatus Gilib (Leonurus cardiaca L.)
	Menta	Menta aquatica L.
		Menta arvensis L.
		Menta caucasica Gand. (M. longifolia (L.)Huds.)
	Salvia	Salvia verticillata L.
	Scutellaria	Scutellaria galericulata L.
	Teucrium	Teucrium chamaedrys L.
		Teucrium Polium L.
	Thymus	Thymus marschallianus Willd. (77г. Dimorphus Klok.et Shost.)
Lythraceae J.St.-Hil.	Lythrum	Lythrum salicaria L.
Moraceae Link	Morus	Morus Nigra L.
		Morus alba L.
Oleaceae Hoffmgg. et Link	Ligustrum	Ligustrum vulgare L.
Papaveraceae Juss.	Papaver	Papaver rhoeas L.
Plantaginaceae Juss.	Plantago	Plantago major L.
Polygonaceae Juss.	Fallopia	Fallopia convolvulus (L.) A. Love (Polygonum convolvulus L.; Bilderdikia convolvulus (L.) Dumort.)
	Polygonum	Polygonum aviculare L. (P. Heterophyllum Lindem.)
	Persicaria	Persicaria maculata (Rafin.) A. Et D. Love (Polygonum

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			maculatum Rafm.; P. persicaria L.)
		Rumex	Rumex obtusifolius L.
	Rhamnaceae Juss.	PaIiurus	PaIiurus spina-christi Mill.
	Rosaceae Juss.	Agrimonia	Agrimonia eupatoria L.
		Geum	Geum urbanum L.
		Filipendula	Filipendula vulgaris Moench (F. hexapatala Gilib.)
		Fragaria	Fragaria moschata (Duch) Weston
		Malus	Malus orientalis Uglitzk.
		Potentilla	Potentilla argentea L.
		Prunus	Prunus divaricata Ledeb.
			Prunus spinosa L.
		Rosa	Rosa myriacantha Smith
			Rosa canina L.
		Rubus	Rubus caesius L.
		Sorbus	Sorbus graeca (Spach) Lodd.ex Schauer.
		Galium	Galium Verum L.
			Galium aparine L.
		Cruciata	Cruciata laevipes Opiz (G. cruciata (L.)Scop.)
	Sal1caceae Mirb.	Salix	Salix alba L.
	Sambucaceae Batsch ex Borkh	Sambucus	Sambucus ebulus L.
			Sambucus Snigra L.
	Scrophulariaceae Juss.	Limosella	Limosella vulgaris Mill.
		Verbascum	Verbascum phlomoides L.
	Solanaceae Juss.	Datura	Datura stramonium L.
		Hyoscyamus	Hyoscyamus niger L. (H. bohemicus F. W. Schmidt)
		Solanum	Solanum nigrum L.
	Urticaceae Juss.	Urtica	Urtica dioica L.
			Urtica urens L.
	Violaceae Batsch	Viola	Viola arvensis Murr.
			Viola canina L.
Total:	34	78	92

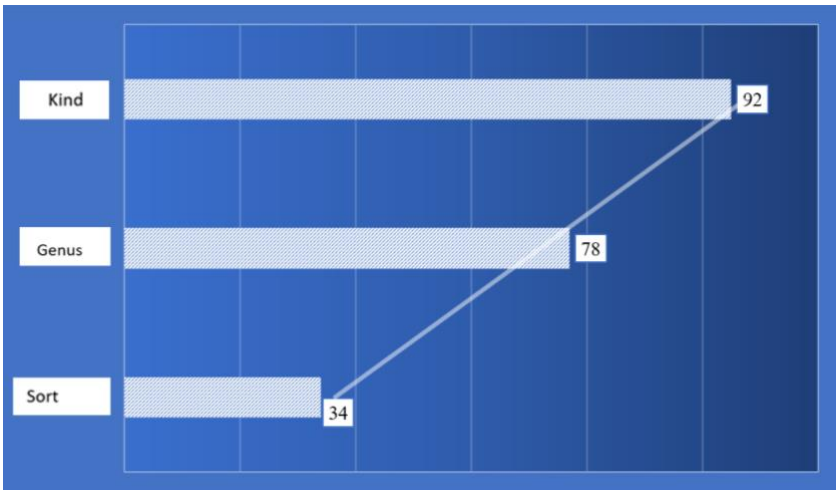

Figure 1. Systematic composition of medicinal plants of the Shali region

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Life forms, or biomorphs, are understood as a set of external features of a plant adapted to the whole complex of environmental factors (Kholodnyak, 2019; Miropolskaya, 2018). The most acceptable for biomorphological analysis is the system of “biological types” by Raunkier (1934).

According to the biomorphological parameter according to the classification of K. Raunkier, 7 biomorphs were identified, the spectrum of which is presented in Figure 2 (Seifert & Gams, 2011).

As can be seen from the given spectrum, hemicryptophytes predominate in the studied flora, accounting for more than half of all species (53 species) (Elbuzdukaeva et al., 2019). These are such species as: Polypodium vulgare L., Elytrigia repens (L.) Nevski (A. repens (L.) Beauv.), Eryngium planum L., Aristoloehia clematitis L., AchiIlea millefolium L., AchiIlea setacea Waldst. et Kit., Arctium paliadinii (Marc.) Grossh., Erigeron acris L. (E. acer auct.), Carduus nutans L., Taraxacum officinale Wigg., Tussilago farfara L., Anchusa azurea Mill. (A. italica Retz.), Eehium vulgare L., Cynoglossum officinale L., Lithospermum officinale L., Berteroa incana (L.) DC., HumuIus lupulus L., Melandrium album (Mill.) Garcke, Stellaria holostea L., Convolvulus arvensis L., Calystegia sepium (L.) R.Br., Amoria repens (L.) C. Presl (T. repens L.), Asrtagalus glycyphyllos L., Melilotus officinalis (L.) Pall., Ononis arvensis L ., Lathyrus pratensis L., Nepeta cataria L., Origanum vulgare L., Prunella vulgaris L., Leonurus quinquelobatus Gilib (Leonurus cardiac L.), Menta aquatica L., M. arvensis L., M. caucasica Gand. (M. longifolia (L.) Huds.), Salvia verticillata L., Scutellaria galericulata L., Lythrum salicaria L., Plantago major L., Rumex obtusifolius L., PaIiurus spina-christi Mill., Agrimonia eupatoria L., Geum urbanum L., Filipendula vulgaris Moench (F. hexapatala Gilib.), Fragaria moschata (Duch) Weston, Malus orientalis Uglitzk., Potentilla argentea L., Galium aparine L., Cruciata laevipes Opiz (G. cruciata (L.) Scop.), Sambucus ebulus L., Sambucus snigra L., Limosella vulgaris Mill., Verbascum phlomoides L., Hyoscyamus niger L. (H. bohemicus F. W. Schmidt), Urtica dioica L., U. urens L., Viola canina L. (Sugaipova & Gapurov, 2018).

4. Purpose of the Study

There are 6 species of mesophanerophytes: Betula pubescens Ehrh., Juglans regia L., Morus nigra L., M.alba L., Malus orientalis Uglitzk., Sorbus graeca (Spach) Lodd.ex Schauer (Vlasenko, 2007).

There are 7 species of nanophanerophytes: Hyppohpae rhamnoides L., Ligustrum vulgare L., PaIiurus spina-christi Mill., Rosa myriacantha Smith, R.canina L., Rubus caesius L., Sambucus snigra L. (Z. I. Iriskhanova, A. A. Ataeva, et al., 2021).

There are 3 species of hamefits: Teucrium chamaedrys L., T. polium L., Thymus marschallianus Willd. (77. Dimorphus Klok.et Shost.) (Z. I. Iriskhanova, M. A. Takaeva, et al., 2021).

There are 3 cryptophyte species: Dactylorhiza salina (Turcz. ex Lindl.) Soo (D. sanasunitensis (Fleischm.) Soo) hyemale L., Orchis ustulata L., Phragmites australis (Cav.) Trin. ex Steud. (Ph. communis Trin.) (Z. Iriskhanova et al., 2022).

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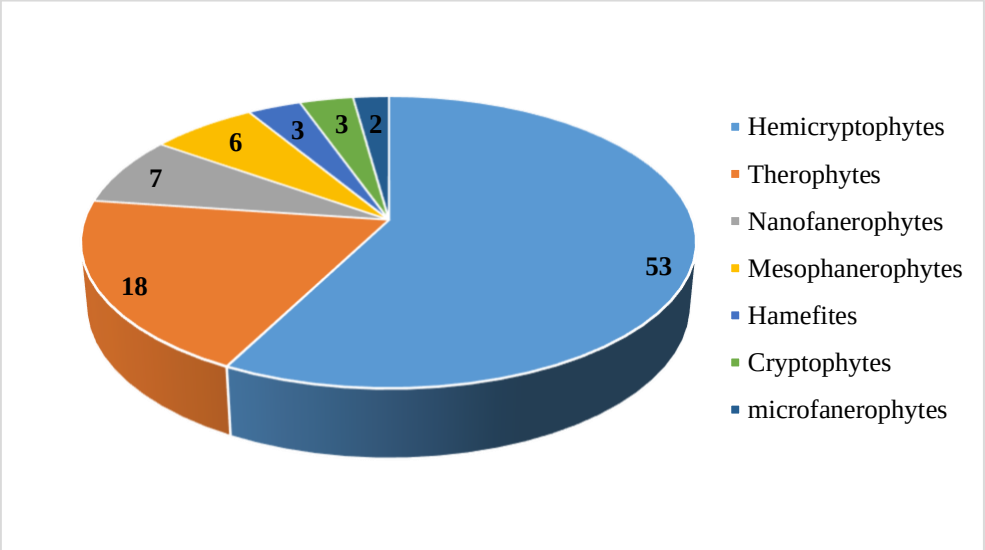

Figure 2. Biomorphological analysis of medicinal plants of the Shali region

There are 18 species of terophytes: Lemna minor L., Pulicaria vulgaris Gaertn. (P. prostrata (Gilib.) Aschers. Nom. Illegit.), Draba nemorosa L., Neslia paniculata (L.) Desv., Stellaria media (L.) Vill., Chenopodium album L., Ch. botrys L., Ch. vulvaria L., Fumaria vaillantii Loisel, Erodium cicutarium (L.) L'Her., Papaver rhoeas L., Fallopia convolvulus (L.) A. Love (Polygonum convolvulus L.; Bilderdikia convolvulus (L.) Dumort.), Polygonum aviculare L. (P. heterophyllum Lindem.), Persicaria maculata (Rafin.) A. Et D. Love (Polygonum maculatum Rafm.; P. persicaria L.), Galium verum L., Datura stramonium L., Solanum nigrum L., Viola arvensis Murr.

Microphanerophytes are the least numerous - 2 species, among them: Prunus spinosa L., Salix alba L.

5. Research Methods

For the first time, a complete list of species of medicinal plants in the Shali region is given. The object of the study are medicinal plants of the Shali region (Magomadova, 2019). The work was carried out by route research. We went to all the settlements of the Shali region, such as Avtury, Mesker-Yurt, Germenchuk and others, where herbariums of various types were collected. Route-geobotanical, route-floristic methods were used in the work. Species were determined according to the guide Galushko, and brief characteristics were given, the characteristic features of each species were highlighted.

6. Findings

The report provides a systematic and biomorphological analysis of medicinal plants in the Shali region of the Chechen Republic, including processing of herbarium materials and field observations. The study reveals that the family Rosaceae Juss. - Pink is the most dominant, followed by Laimiaceae Until family and Asteraceae Dumort. Medicinal plants have a promising future due to the large number of species not yet studied for their medicinal activity. Hemicryptophytes are the most common plant type in the studied flora.

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7. Conclusion

The leading position in the spectrum belongs to the family Rosaceae Juss. - Pink, numbering 15 species. The second place is occupied by the Laimiaceae Until family. - 12 types. In third place are representatives of the family Asteraceae Dumort. - 8 types. Next in decreasing number of species are the families Fabaceae Lintll. – 5 species, Polygonaceae Juss. represented by 4 types. Further, 4 families include 3 species each, 10 families each have 2 species, and 16 families are represented by one species each.

In the studied flora, hemicryptophytes predominate, accounting for more than half of all species (55 species). Microphanerophytes represented by 2 species are the least numerous.

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