

# BIOMORPHOLOGICAL ANALYSIS AND OCCURANCE OF ENDEMIC AND RELICT SPECIES OF THE CHECHEN REPUBLIC

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## Abstract

*This article provides a biomorphological analysis and occurrence of endemic and relict species of the Chechen Republic. Endemic species (taxa unique to a particular geographical area) are characteristic elements of local biodiversity. Narrow endemics occupy isolated habitats, often associated with limited ranges of ecological conditions or small common geographic ranges. The analysis is based on the processing of herbarium materials and field observations of the authors.*

**Keywords:** species, genus, family, flora, life form, biomorph, endemics, relicts, Chechen Republic

## I. Introduction

Species displaying a convergent subset of potential trait values are suited to local environmental conditions. The result is a general functional convergence within a community, a functional divergence between endemic species and non-endemic sympatric species, and relatively limited trait differences for endemics.

## II. Methods

The basis of the work is the material collected by the authors in 2020-2023, as well as data obtained from the study of herbarium collections of the Department of Botany, Zoology and Bioecology of the Chechen State University. A.A. Kadyrov.

## III. Results

According to the information obtained during the study, 180 species of plants grow in the wild in the study area, united in 65 families.

The leading position in the spectrum belongs to the family Fabaceae Lintll. - Legumes, numbering 18 species (10.0%). The second place is occupied by the Asteraceae Dumort family. (Compositae) - Asteraceae (Asteraceae) (13 species, 7.22%). The third place is occupied by the Campanulaceae Juss family. – Bellflowers (11 species, 6.11%). In total, 65 leading families include 180 species, which is 156.67%.

The life form is the result of a long-term adaptation of a plant to local conditions of existence, expressed in its external appearance [1]. The most acceptable for biomorphological analysis is the system of "biological types" by K. Raunkier [7].

The biomorphological spectrum of the vicinity of relict and endemic species of the Chechen Republic is presented in Table 1.

**Table 1:** *Biomorphological spectrum of relict and endemic species of the Chechen Republic*

BIOMORPHA	Hk	T	K	Phn	Phms	Ch	Phmg	Phm
	hemicryptophytes	Terophytes	cryptophytes	nanofanerophyte	mesophanerophyte	chamephite	megaphanerophyte	microfanerophyte
Number of species 179	112	14	16	9	4	20	2	2
% of total	62,6	7,8	8,9	5,0	2,2	11,2	1,1	1,1

There are 2 species of megaphanerophytes (1.1%): *Pinus sosnowskyi* Nakai (*P. hamata* (Stev.) Sosn.; *P. kochiana* Klotzsch) - Sosnowsky's Pine, *Ostrya carpinifolia* Scop. - Common hop.

There are 4 species of mesophanerophytes (2.2%): *Taxus baccata* L. - Berry yew, *Acer laetum* C.A. May. - Light maple, *Betula raddeana* Trautv. - Birch Radde, *Carpinus caucasica* Grossh. (*Carpinus betulus* L.) - Caucasian hornbeam.

There are 2 species of microfanerophytes (1.1%): *Cornus mas* L. - Common dogwood, *Juniperus hemisphaerica* J. et C. Presl (*J. depressa* Stev.) - Hemispherical juniper.

There are 9 species of nanofanerophytes (5.0%): *Juniperus oblonga* Bieb. (*J. communis* L.) - Oblong juniper, *J. sabina* L. - M. Cossack, *Cotinus coggygria* Scop. - Leather mackerel, *Corylus aveliana* L. - Common hazel, *Rhododendron caucasicum* Pall. - Caucasian rhododendron, *Asrtagalus brachylobus* Fisch. - Short-lobed Astracanthus, *Colutea orientalis* Mill - Oriental Bubblegum, *Rosa tschatyrdagi* Chrshan. - Rosehip Chatyrdag, *Viscum album* L. - White mistletoe.

There are 20 species of hamefites (11.2%): *Huperzia selago* (L.) Bernh. ex Schrank et C. Mart. (*H. petrovii* Sipl.) - Common ram, *Lycopodium annotinum* L. - Yearly club moss, *Selaginella helvetica* (L.) Spring - Swiss club moss, *Ephedra distachya* L. - Two-eared ephedra, *E. procrea* Fisch. et C.A. May. - E. tall, *Hedera pastuchovii* Woronow - Pastukhov's ivy, *Fumana procumbens* (Dun.) Gren. et Godr. - Recumbent Fuman, *Arctostaphylos caucasica* Lipsch. (*A. iiva-nrsi* (L.) Spreng.) - Caucasian bearberry, *Asrtagalus cornutus* Pall. - Horn-bearing Astracanthus, *A. karakugensis* Bunge - A. Karakuginskaya, *A. lehmannianus* Bunge - A. Lehmann, *A. varius* S.G. Gmel. (*A. virgatus* Pall.) - A. diverse, *Caragana mollis* (Bieb.) Bess. - Soft caragana, *Ononis pusilla* L. - Small steelhead, *Scutellaria andina* Charadze - Andean skullcap, *S. leptostegia* Juz. - Sh. finely scaly, *S. raddeana* Juz. - S. Radde, *Nitraria schoberi* L. (*N. caspia* Willd.) - Schober's salt peter, *Asperula dasyantha* Klok. - Pubescent woodruff, *A. diminuta* Klok. - I. reduced, *Rhodococcum vitis-idaea* (L.) Avror. (*Vaccinium vitis-idaea* L.) - Common lingonberry.

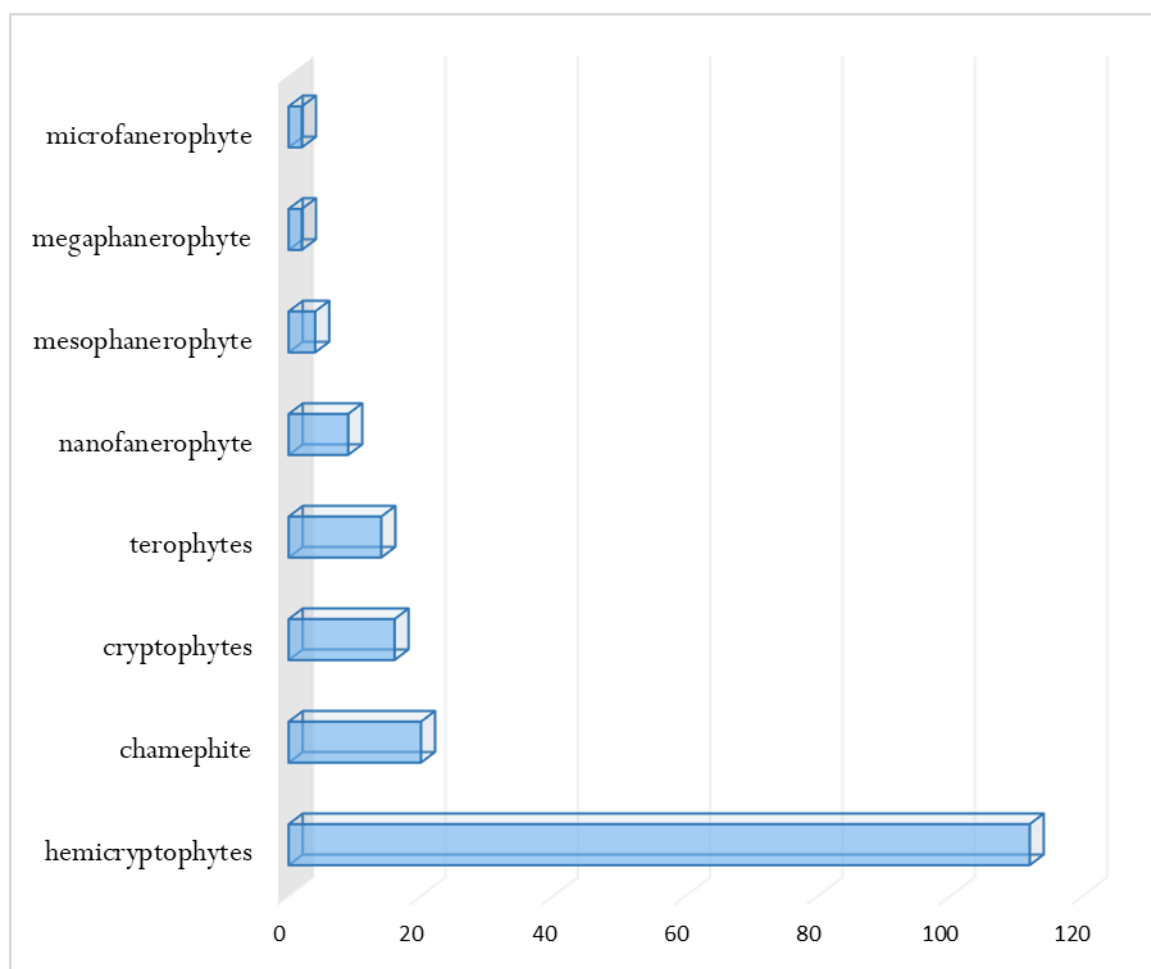
There are 112 species of hemicryptophytes (62.6%): *Polystichum aculeatum* (L.) Roth (*P. lobatum* (Huds.) Bast.) - Small-spined multi-row, *P. braunii* (Sperm.) Fee - M. Brown, *Asplenium ruta-muraria* L. - A. septentrionale (L.) Hoffm. - K. northern, *A. trichomanes* L. - K. hairy, *A. vtride* Huds. - K. green, *Ceterach officinarum* Willd. - Pharmacy scraper, *Phyllitis scolopendrium* (L.) Newm. - Centipede, *Polypodium vulgare* L. - Common centipede, *Cypripedium calceolus* L. - True slipper, *Calamagrostis caucasica* Trin - Caucasian reed grass, *Elymus prokudinii* (Seredin) Tzvel. (*R. prokudinii* Serediri) - Prokudin's wheatgrass, *Festuca primae* E. Alexeev - Prima's fescue, *F. daghestanica* (Tzvel.) E. Alexeev - Dagestan O., *Imperata cylindrical* (L.) Raeusch. - Imperata Cylindrical, *Poa primae* Tzvel. - Prima bluegrass, *Stipa daghestanica* Grossh. - Dagestan feather grass, *Mandenovia komarovii* (Manden.) Alava - Mandenovia Komarov, *Symphyloloma*

graveolens C.A. May. - Odorous joint fruit, *Asarum ibericum* Stev. ex Ledeb. (*Asarum intermedium* (C.A. Mey.) Grossh.) - Georgian hoof, *Arctium nemorosum* Lej. - Oak burdock, *Bellis perennis* L. - Perennial daisy, *Centaurea pseudotanaitica* Galushko nomen nudum - Lozhnodon cornflower, *Crepis hydrophiloides* Charadze - Swampy skerda, *Hieracium gudergomiense* Juxip - Gudergomis hawkweed, *Jurinea annae* Sosn. - Anna's head, *J. filicifolia* Boiss. - *Psephellus andinus* Galushko et Alieva (*C. Andina* (Galushko et Alieva) Czer.) - Andean *Psephellus*, *P. prokhanovii* Galushko (*C. prokhanovii* (Galushko) Czer.) - P. Prokhanova, *P. kemulariae* Charadze (*C. kemulariae* (Charadze) Czer.) - P. *Kemulariae*, *Pulicaria dolomiticum* Galushko - Dolomitic flea beetle, *Brunnera macrophylla* (Bieb.) Johnst. - Brunner large-leaved, *Omphalodes rupestris* Rupr. ex Boiss. - Rocky umbilical, *Rindera tetraspis* Pall. - *Rindera* four-shield, *Alyssum andinum* Rupr. - Andean beetroot, *Draba ossetica* (Rupr.) Somm. et Levier - Ossetian grits, *Erucastrum subnivale* Prima - Snowy jaundice, *Isatis pseudoararatia* Galushko nomennudum - False-Araratian woad, *Matthiola daghestanica* (Conti) N. Busch - Dagestan Levkoy, *Campanula andina* Rupr. - Andean bluebell, *C. annae* Kolak. - K. Anna, *C. argunensis* Rupr. - K. argunsky, *C. collina* Bieb. - K. kholmvoi, *C. daghestanica* Fomin - Dagestan bluebell, *C. darialica* Charadze - K. darialsky, *C. fedorovii* Charadze - K. Fedorova, *C. meyeriana* Rupr. - K. Meyer, *C. petrophila* Rupr. - K. Skalny, *Symphyantra galushkoi* Taisumov et Teimurov (*Campanula galushkoi* Taisumov et Teimurov.) - *Zymphiandra* Galushko, *S. pendula* (Bieb.) A.DC. (*Campanula pendula* Bieb.) - drooping Z., *Cerastium kasbek* Parrot Meu. - Multiflorous chickweed, *Dianthus arenarius* L. - Sand carnation, *D. daghestanicus* Charadze - G. Dagestan, *D. imereticus* (Rupr.) Schischk. - G. Imeretinskaya, *Oberna multifida* (Adams) Ikonn. (*S. multifida* (Adams) Rohrh.) - Multi-cut Auburn, *Petrocoma hoefftiana* (Fisch.) Rupr. - Göfft's *Petrocoma*, *Silene chlorifolia* Smith - Green-leaved tar, *S. compacta* Fisch. ex Hornem. - Clustered flower smoly, *Sedum stoloniferum* S.G. Gmel. - Stonecrop, *Scabiosa rotata* Bieb. - Wheel scabiosa, *Drosera rotundifolia* L. - Round-leaved sundew, *Tithymalus astrachanicus* (C.A. Mey.) Prokh. (*E. astrachanica* C.A. Mey. ex Prokh., *E. praecox* (Fisch. ex Boiss.) B. Fedtsch. et Fler.) - *Euphorbia Astrakhan*, *T. glareosus* (Pall. ex Bieb.) Prokh. (*E. glaeosa* Pall, ex Bieb., *E. maleevii* Tamamsch.) - *M. cartilaginosa*, *Amoria elisabethae* (Grossh.) Roskov (*T. elisabethae* Grossh.) daghestanica Rupr. - Dagestan alfalfa, *Onobrychis dielsii* (Sirj.) Vass. - Diels sainfoin, *Onobrychis inermis* Stev. - Unarmed sainfoin, *Onobrychis novopokrovskii* Vass. - Novopokrovsky's sainfoin, *Vavilovia formosa* (Stev.) Fed. - Beautiful *Vavilovia*, *Xanthobrychis majorovii* (Grossh.) Galushko Majorovii (Grossh.) - *Xanthobrychis Mayorova*, *Gentiana grossheimii* Doluch. - *Gentian Grossheim*, *Geranium kemulariae* Charadze - *Geranium Cumularia*, *Hypericum asperuloides* Czern. ex Turkish. - St. John's wort, *Marrubium plumosum* C.A. May. - Pinnate chandra, *Nepeta biebersteiniana* (Trautv.) Pojark. - Bieberstein's catnip, *N. cyanea* Stev. - K. blue, *N. czegemensis* Pojark. - K. Chegemsky, *Satureja pachyphylla* C.Koch - Thick-leaved savory, *Stachys fugax* Pobed. - Falling cleaner, *Goniolimon besserianum* (Schult.) Kusn. - *Goniolimon Besser*, *Paeonia biebersteiniana* Rupr. - Peony of Bieberstein, *Rapaver bracteatum* Lindl. - Common poppy, *Lysimachia nummularia* L. - Coin loosestrife, *Primula darialica* Rupr. - Darial primrose, *P. luteola* Rupr. - P. yellow, *P. zeylamica* Charadze et Kapell. - P. Tseylamsky, *Pyrola rotundifolia* L. - Wintergreen, *Actaea spicata* L. - Spike cohosh, *Helleborus caucasicus* A.Br. - Caucasian hellebore, *Pulsatilla andina* (Rupr.) Woronow - Andean dream, *Ranunculus auricomus* L. - Golden buttercup, *R. tebulosica* Prima - *Tebulos buttercup*, *Alchemilla elisabethae* Juz. - Elizabeth's cuff, *A. chlorosericea* (Buuser) Juz. - M. green silk, *Potentilla alexeenkoi* Lipsky - *Potentilla Alekseenko*, *P. ghalgana* Juz. (*P. oweriniana* Boiss.) - Ingush L., *P. orientalis* Juz. - Eastern L., *P. sterilis* (L.) Garcke - Barren L., *Galium mollugo* L. - Soft bedstraw, *Haplophyllum villosum* (Bieb.) G. Don fil. - Soft-haired whole leaf, *Saxifraga charadzae* Otsch. - Saxifrage Kharadze, *Scrophularia charadzae* Kem.-Nath. - Norichnik Kharadze, *S. minima* Bieb. - N. small, *Veronica bogosensis* Tumad. - *Veronica Bogoskaya*, *V. charadzae* Kem.-Nath. - V. Kharadze, *V. daghestanica* Rupr. ex Boiss. - V.

Dagestanskaya.

There are 16 species of cryptophytes (8.9%): *E. fluviatile* L. (*E. heleocharis* Ehrh.) - marshwort, *Ophioglossum vulgatum* L. - common grasswort, *Botrychium lunaria* (L.) Sw. - Moonflower, *Marsilea quadrifolia* L. - Four-leaved Marsilia, *Allium gunibicum* Miscz. ex Grossh. (*A. mirzoevii* Tscholokaschvili) - Gunib onion, *A. paradoxum* (Bieb.) G. Don fil. - Strange L., *A. ursinum* L. - Bear L. (Cheremsha), *Sternbergia colchiciflora* Waldst. et Kit. - Sternberg Colchicum, *Merendera ghalgana* Otsch. - Merender Ingush, *Muscari armeniacum* Leichtlin (*Mszo vitsianum* Baker) - Armenian mouse hyacinth, *Iris Notha* Bieb. - Iris (Iris) fake, *Gagea daghestanica* Levichev et Murtazaliev - Dagestan goose onion, *Corydalis bayerniana* Rupr. - X. Bayern, *C. roseo-purpurea* (Rupr.) Galushko - X. pink-purple, *Nymphaea alba* L. - White water lily, *Anemonoides blanda* (Schottet Kotschy) Holub (*A. blanda* Schottet Kotschy) - Pleasant anemonoides.

Teriphites 14 species (7.8%): *Salvinia natans* (L.) All. - *Salvinia* floating, *Alyssum parviflorum* Fisch. ex Bieb. (*A. rothmaleri* Galushko.; *A. campestre* auct.) - Small-flowered beetroot, *Lepidium pinnatifidum* Ledeb. - Pinnate cress, *Microthlaspi pertoliatum* (L.) F.K. May. (*Thlaspi perfoliatum* L.) - Pierced twig, *Sameraria cardiocarpa* Trautv. - Heart-fruited *Sameraria*, *Sedum argunense* Galushko - Argun stonecrop, *Scabiosa Micrantha* Desf. - Small-flowered scabiosa, *Tithymalus szovitsii* (Fisch. et C.A. Mey.) Klotzch et Garcke ex Klotzch (*E. szovitsii* Fash. et C.A. Mev.) - Schowitz's spurge, *Melilotus wolgicus* Poir. - Volga elecampane, *Trigonella coerulea* (Bieb.) Halacsy - bluish fenugreek, *Centaurium spicatum* (L.) Fritsch - spike-shaped centaury, *Papaver ocellatum* Woronow - Ocellated poppy, *Trapa hyrcana* Woronow - Hyrcanian chilim, *Pseudobetkea caucasica* (Boiss.) Lincz. - Pseudo-Betkea Caucasian.



**Fig. 1:** Biomorphological analysis of relict and endemic species of the Chechen Republic

#### IV. Discussion

The relationship between environmental parameters and traits that affect survival suggests that endemics are rare due to adaptive specialization and selection in favor of limited ranges and performance of traits. In practice, an understanding of functional variability, survival mechanisms, and associated ecological conditions is necessary to inform conservation measures for such species.

In addition, species coexist in communities, and relative productivity and competition between species is a key aspect of plant survival. The variation in functional trait values for endemic species may differ from that in sympatric species, which are often more geographically distributed and may show greater functional diversity. Being a phylogenetic and geographic relic at the same time is a common occurrence, and this raises even more conservation concerns. In this case, the relict species is not only evolutionarily unique, but also especially vulnerable to local disturbance due to its limitation to a reduced area. If this relic is found in a small area that is not rich in species, it is even more endangered as conservation measures will not be taken for other reasons.

Recently, there has been a tendency to designate certain narrowly distributed or isolated populations as relics when the species distribution is fragmented, even if the evolutionary status or phylogenetic position of these populations is either unknown or presumably not "deeply branched", and even if there is no evidence that this isolation was caused by the extinction of some related populations

The dominant species is *Carpinus caucasica* Grossh. (*Carpinus betulus* L.) - Caucasian hornbeam.

Usually (26 species) there are such species as *Lycopodium annotinum* L. - annual moss, *Polystichum braunii* (Sperm.) Fee - Brown's multi-row, *Asplenium ruta-muraria* L. - *Asplenium septentrionale* (L.) Hoffm. - Northern Kostenets, *A. trichomanes* L. - K. hairy, *A. vtride* Huds. - K. green, *Pinus sosnowskyi* Nakai (*P. hamata* (Stev.) Sosn.; *P. kochiana* Klotzsch) - Sosnowsky's pine, *Juniperus hemisphaerica* J. et C. Presl (*J. depressa* Stev.) *aquatica* L. - Plantain chastuha, *Allium ursinum* L. - Bear onion (Wild leek), *Calamagrostis caucasica* Trin - Caucasian reed grass, *Jurinea absinthifolius* Galushko - *Artemisia* sagebrush, *Alyssum andinum* Rupr. - Andean beetroot, *Lepidium pinnatifidum* Ledeb. - Pinnate cress, *Campanula collina* Bieb. - Hill bell, *Symphyandra galushkoi* Taisumov et Teimurov. (*Campanula galushkoi* Taisumov et Teimurov.) - *Zimfiandra Galushko*, *S. pendula* (Bieb.) A.DC. (*Campanula pendula* Bieb.) - drooping zebra, *Cerastium kasbek* Parrot - Kazbek sapling, *Oberna multifida* (Adams) Ikonn. (*S. multifida* (Adams) Rohrh.) - Auburn multidissected, *Cornus mas* L. - Common dogwood, *Corylus aveliana* L. - Common hazel, *Rhododendron caucasicum* Pall. - Caucasian rhododendron, *Amoria elisabethae* (Grossh.) Roskov (*T. elisabethae* Grossh.) - *Amoria* (Clover) Elizabeth, *Nepeta cyanea* Stev. - Blue catnip, *Alchemilla elisabethae* Juz. - Elizabeth's cuff, *Rhodococcum vitis-idaea* (L.) Avror. (*Vaccinium vitis-idaea* L.) - Common lingonberry.

Scattered 66 species occur: *Huperzia selago* (L.) Bernh. ex Schrank et C. Mart. (*H. petrovii* Sipl.) - Common ram, *Selaginella helvetica* (L.) Spring - Swiss club moss, *Phyllitis scolopendrium* (L.) Newm. - Centipede, *Polypodium vulgare* L. - Common centipede, *Salvinia natans* (L.) All. - *Salvinia* floating, *Ephedra distachya* L. - Two-eared ephedra, *E. procrea* Fisch. et C.A. May. - E. tall, *Juniperus oblonga* Bieb. (*J. communis* L.) - Oblong juniper, *Allium gunibicum* Miscz. ex Grossh. (*A. mirzoevii* Tscholokaschvili) - Gunib onion, *Merendera ghalgana* Otsch. - Merender Ingush, *Acer laetum* C.A. May. - Light maple, *Cotinus coggygria* Scop. - Leather mackerel, *Mandenovia komarovii* (Manden.) Alava - *Mandenovia* Komarova, *Symphyoloma graveolens*

C.A. May. - Odorous spice, *Arctium nemorosum* Lej. – Oak burdock, *Bellis perennis* L. – Perennial daisy, *Centaurea pseudotanaitica* Galushko nomen nudum - Lozhnodonsky cornflower, *Crepis hydrophiloides* Charadze - swampy skerda, *Hieracium gudergomiense* Juxip - Gudergomis hawkweed, *Jurinea filicifolia* Boiss. – *Psephellus andinus* Galushko et Alieva (*C. Andina* (Galushko et Alieva) Czer.) – Andean *Psephellus*, *P. prokhanovii* Galushko (*C. prokhanovii* (Galushko) Czer.) – *P. Prokhanova*, *Pulicaria dolomiticum* Galushko, *Betula raddeana* Trautv. – Radde birch, *Brunnera macrophylla* (Bieb.) Johnst. - Brunner large-leaved, *Omphalodes rupestris* Rupr. ex Boiss. – Rocky umbilical, *Alyssum parviflorum* Fisch. ex Bieb. (*A. rothmaleri* Galushko.; *A. campestre* auct.) – small-flowered beetroot, *Draba ossetica* (Rupr.) Somm. Et Levier - Ossetian Krupka, *Campanula andina* Rupr. – Andean bluebell, *C. Annae* Kolak. – *K. Anna*, *C. argunensis* Rupr. – *K. argunsky*, *C. daghestanica* Fomin – *K. Dagestansky*, *C. darialica* Charadze – *K. darialsky*, *C. petrophila* Rupr. – *K. rocky*, *Dianthus daghestanicus* Charadze – Dagestan carnation, *D.imereticus* (Rupr.) Schischk. – Imeretian carnation, *Petrocoma hoefftiana* (Fisch.) Rupr. – *Petrokoma* Gefft, *Silene chlorifolia* Smith – Green-leaved tar, *S.compacta* Fisch. ex Hornem. – *C. Clustered*, *Tithymalus glareosus* (Pall, ex Bieb.) Prokh. (*E. glaeosa* Pall, ex Bieb., *E. maleevii* Tamamsch.) - Cartilaginous spurge, *Asrtagalus brachylobus* Fisch. – Short-lobed *Astracanthus*, *A. supinus* Bunge – *A. adjoining*, *Caragana mollis* (Bieb.) Bess. – Soft caragana, *Colutea orientalis* Mill – Oriental bladderwort, *Medicago daghestanica* Rupr. – Dagestan alfalfa, *Onobrychis inermis* Stev. – Sainfoin unarmed, *O. novopokrovskii* Vass. – *E. Novopokrovsky*, *Vavilovia formosa* (Stev.) Fed. – Beautiful *Babylovia*, *Xanthobrychis majorovii* (Grossh.) Galushko. *Majorovii* Grossh.) - *Xanthobrychis* Mayorova, *Corydalis bayerniana* Rupr. – Bayern's *Corydalis*, *C. roseo-purpurea* (Rupr.) Galushko – Pink-purple X., *Gentiana grossheimii* Doluch. – Grossheim's gentian, *Geranium kemulariae* Charadze – *Cumularia's* geranium, *Nepeta biebersteiniana* (Trautv.) Pojark. – Bieberstein's catnip, *N.czegemensis* Pojark. – *K. Chegemsky*, *Scutellaria raddeana* Juz. – Radde's skullcap, *Paeonia biebersteiniana* Rupr. – Peony of Bieberstein, *Primula darialica* Rupr. – Darial primrose, *P. luteola* Rupr. - *P. yellow*, *P.zeylamica* Charadze et Kapell. – *P. Tseylamsky*, *Actaea spicata* L. – Spike crow, *Asperula diminuta* Klok. – Reduced woodruff, *Scrophularia minima* Bieb. – Small boletus, *Veronica bogosensis* Tumad. - *Veronica Bogoskaya*, *Pseudobetckea caucasica* (Boiss.) Lincz. - *Pseudo-Betkea* Caucasian, *Viscum album* L. - White mistletoe.

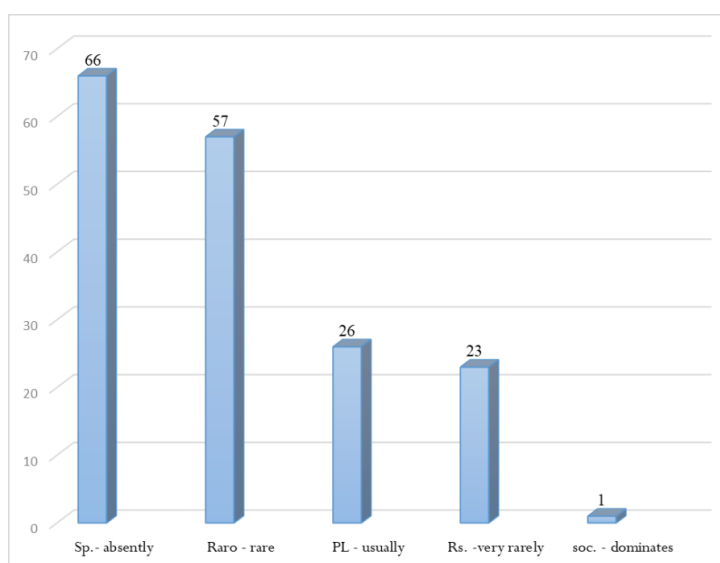
57 species are rare: *E. fluviatile* L. (*E. heleocharis* Ehrh.) – marshwort, *Botrychium lunaria* (L.) Sw. – Semilunar vine, *Polystichum aculeatum* (L.) Roth (*P. lobatum* (Huds.) Bast.) – Pharmacy scraper, *Marsilea quadrifolia* L. – Four-leaved marsilia, *Juniperus sabina* L. – Cossack juniper, *Allium paradoxum* (Bieb.) G.Don fil. – Strange onion, *Iris Notha* Bieb. – *Iris* (*Iris*) fake, *Gagea daghestanica* Levichev et Murtazaliev – Dagestan goose onion, *Elymus prokudinii* (Seredin) Tzvel. (*R. prokudinii* Serediri) - Prokudin's wheatgrass, *Festuca primae* E. Alexeev - Prima's fescue, *Stipa daghestanica* Grossh. - Dagestan feather grass, *Hedera pastuchovii* Woronow - Pastukhov's ivy, *Asarum ibericum* Stev. ex Ledeb. (*Asarum intermedium* (C.A. Mey.) Grossh.) - Georgian hoof, *Jurinea annae* Sosn. - Anna's headwort, *Psephellus kemulariae* Charadze (*C. kemulariae* (Charadze) Czer.) *eraria cardiocarpa* Trautv. – Heart-fruited *Sameraria*, *Campanula fedorovii* Charadze – Fedorov's bellflower, *Cerastium multiflorum* C.A. Meu. – Multiflorous sapling, *Ostrya carpinifolia* Scop. – Common hop hornbeam, *Sedum argunense* Galushko – Argun stonecrop, *Sedum stoloniferum* S.G. Gmel. – Stonecrop, *Scabiosa micrantha* Desf. – Small-flowered scabiosa, *Drosera rotundifolia* L. – Round-leaved sundew, *Arctostaphylos caucasica* Lipsch. (*A. iiva-nrsi* (L.) Spreng.) - Caucasian bearberry, *Tithymalus astrachanicus* (C.A. Mey.) Prokh. (*E. astrachanica* C.A. Mey. ex Prokh., *E. praecox* (Fisch. ex Boiss.) B. Fedtsch. et Fler.) - Astrakhan *Euphorbia*, *Asrtagalus cornutus* Pall. – Horn-bearing *Astracanthus*, *A. varius* S.G. Gmel. (*A. virgatus* Pall.) - *A. diverse*, *Onobrychis dielsii* (Sirj.) Vass. – Diels sainfoin, *Trigonella coerulescens* (Bieb.) Halacsy – Blue fenugreek, *Centaureum spicatum* (L.) Fritsch – Spike centaury, *Hypericum asperuloides* Czern. Ex Turkish. – St. John's wort, *Marrubium plumosum* C.A. May. – Shandra pinnate, *Satureja*

pachyphylla C.Koch – Thick-leaved savory, Scutellaria andina Charadze – Andean skullcap, S. leptostegia Juz. – Sh. small-scaled, Stachys fugax Pobed. – Falling chistet, Nitraria schoberi L. (N. caspia Willd.) – Schober’s saltpeter, Rapaver ocellatum Woronow – Eyed poppy, Lysimachia nummularia L. – Coined loosestrife, Anemonoides blanda (Schottet Kotschy) Holub (A. blanda Schottet Kotschy) – Pleasant anemonoides, Pulsatilla. andina (Rupr.) Woronow - Andean dream, Ranunculus tebulosica Prima - Tebulos buttercup, Alchemilla chlorosericea (Buuser) Juz. – Green silk cuff, Potentilla sterilis (L.) Garcke – Barren cinquefoil, Rosa tschatyrdagi Chrshan. – Chatyrdag wild rose, Asperula dasyantha Klok. – Pubescent woodruff, Galium mollugo L. – Soft bedstraw, Haplophyllum villosum (Bieb.) G. Don fil. – Soft-haired whole leaf, Saxifraga charadzae Otsch. – Saxifrage Kharadze, Scrophularia charadzae Kem.-Nath. – Norichnik Kharadze, Veronica charadzae Kem.-Nath. – Veronika Kharadze, Trapa hyrcana Woronow – Hyrcanian chilim

Very rare 23 species: Taxus baccata L. - Berry yew, Sternbergia colchiciflora Waldst. et Kit. – Colchicum sternbergia, Muscari armeniacum Leichtlin (Mszo vitsianum Baker) – Armenian mouse hyacinth, Cypripedium calceolus L. – Real slipper, Jurinea ingushetica Galushko – Ingush headwort, Rindera tetraspis Pall. – Rindera four-shielded, Dianthus arenarius L. – Sand carnation, Fumana procumbens (Dun.) Gren. et Godr. – Foumana recumbent, Scabiosa rotate Bieb. – Tithymalus szovitsii (Fisch. et C.A. Mey.) Klotzch et Garcke ex Klotzch (E. szovitsii Fasch. et C.A. Mev.) Melilotus wolgicus Poir. – Volga elecampane, Ononis pusilla L. – Little steelwort, Goniolimon besserianum (Schult.) Kusn. – Goniolimon Besser, Nymphaea alba L. – White water lily, Rapaver bracteatum Lindl. – Common poppy, Pyrola rotundifolia L. – Round-leaved wintergreen, Helleborus caucasicus A.Br. – Caucasian hellebore, Ranunculus auricomus L. – Golden buttercup, Potentilla alexeenkoi Lipsky – Alekseenko's Potentilla, P. ghalgana Juz. (P. oweriniana Boiss.) - Ingush L., P. orienthalis Juz. - L. eastern.

**Table 2:** Occurrence of relict and endemic species of the Chechen Republic

No	Occurrence	Number of species	% of total number of species
1.	Soc - dominates	1	0,58
2.	PL - usually	26	15,03
3.	Sp.- absently	66	38,15
4.	Raro - rare	57	32,95
5.	Rs. -very rarely	23	13,29



**Fig. 2:** Percentage distribution of species occurrence

Hemicryptophytes are represented by 112 (62.6%) species, cryptophytes - by 16 species (8.9%), terophytes by 14 species (7.8%), nanophanerophytes by 9 species (5.0%), mesophanerophytes by 4 species (2.2%), chamephytes are represented by 20 species (11.2%), megaphanerophytes and microphanerophytes by 2 species (1.1%). The largest number of species occurs scattered (66 species), 57 species are rare, 26 species are usually found, 23 species are very rare, 1 species dominates.

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