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CONTEMPORARY ASSESSMENT OF THE SPECIES CONTENT OF ENDEMIC AND SUBENDEMIC OF MIL STEPPE FLORA OF AZERBAIJAN

Abstract. In article species content of Mil steppe endemics of Kura-Araks lowland was clarified, they were grouped on life forms, ecological groups and distribution level. Obtained results may be useful for monitoring of environment and elaboration of measures on conservation of endemics in region.

Keywords: flora, genus, species, endemic, subendemic, areal.

Introduction. Along with systematical, geographical, biological and ecological analyses, the analysis of endemics of certain area is also important for floristical system and it allows to define rare and endangered species at the content of flora of concrete territory and thereby to evaluate its representativeness and conservation importance.

In our modern days due to increasing influence of human factor to environment the biodiversity conservation has become one of the actual problems. From this point of view conducting of researches on population level and biodiversity conservation require a special attention [7, 12, 21, 25, 26]. Studying of endemics of certain area gives an information about history of this area [1-5, 14-16, 19]. Significance of endemics as index of specificity and originality of certain area is also related with that their presence informs about difference of certain area from another.

Endemics- are species that distribution is limited with certain area, in other words, they have permanent residence in concrete local region. During analysis of endemic elements, their phylogenetic situation, chorological and ecological-phytocenological features, as well as their genesis and age have been determined. *Subendems* are those species that their areals go beyond the researched area. 22,5 % of species (about 240 species) of Azerbaijan flora belong to endemics [23]. Scientists such as S.H. Musayev, V.M.Alizadeh, A.M. Askerov etc. have studied Caucasus and Azerbaijan endemics [3, 5, 20].

In this article we have discussed the results of researches which conducted on contemporary assessment of species content of endemic and subendemic plants of Mil steppe flora of

Azerbaijan.

Material and methods. Research objects were natural populations of endemic and subendemic species of Mil steppe flora.

Initial analysis on diversity and distribution of endemic and subendemic plant species of region was conducted on literary references [6-10, 13, 17,18, 20]. Herbarium materials also were analysed, clarifying of species content and areals was determined at the result of our long-term field researches.

Identification of plants, separation of endemics and subendemics were defined on "Flora of Caucasus" [8-10], «Flora of Azerbaijan» [13]. Naming of taxons and species systematics were conducted on C.R. Cherepanov [11]. Life forms and ecological groups of studied species were also determined. Life forms of plants have been studied on method of Serebryakov [24]. Ecological groups were determined on relation with moisture [22].

In researched area phytosenological or geobotanical researches were conducted at desert, semidesert, hole-meadow and water-marshy phytocenoses which distributed at grey-meadow, meadow-grey, boggy-meadow, salty and saline soils. Climate of region is mainly temperate-hot semidesert and dry steppe types; middle annual temperature of air is 14,2°C, annual quantity of precipitation is 309 mm.

Results and discussion. In the Mil steppe of Kura-Araks lowland several rare, endangered, endemic and subendemic species are distributed. At the results of researches, literary references and herbarium materials, the species which distributed at the Mil steppe area were clarified, list of endemic and subendemic species was

prepared (Table 1).

It was determined that total species content of endemics and subendemics at Mil steppe consists of 40 species which belong to 31 genera and 20

families. 25 of them are Caucasus endemics, 11 species are Azerbaijan endemics and 4 species are subendemics. Families which are represented with most species are

Table 1

Taxonomic content of endemic species of Mil steppe

Family	Quantity of genera	On total quantity, %	Quantity of species	On total quantity, %
Asteraceae	4	13,0	7	17,5
Fabaceae	3	9,7	5	12,5
Liliaceae	3	9,7	3	7,5
Chenopodiaceae	2	6,5	3	7,5
Scrophulariaceae	2	6,5	2	5,0
Orchidaceae	2	6,5	2	5,0
Plantaginaceae	2	6,5	2	5,0
Iridaceae	1	3,2	3	7,5
Hyacinthaceae	1	3,2	2	5,0
Santalaceae	1	3,2	1	2,5
Ranunculaceae	1	3,2	1	2,5
Papaveraceae	1	3,2	1	2,5
Malvaceae	1	3,2	1	2,5
Lythraceae	1	3,2	1	2,5
Salicaceae	1	3,2	1	2,5
Caryophyllaceae	1	3,2	1	2,5
Rutaceae	1	3,2	1	2,5
Polygalaceae	1	3,2	1	2,5
Apiaceae	1	3,2	1	2,5
Boraginaceae	1	3,2	1	2,5
Total: 20	31	100,0	40	100,0

Asteraceae (7), *Fabaceae* (5), *Liliaceae* (4). Each of families of *Chenopodiaceae* and *Iridaceae* are represented with 3 species, each of *Orchidaceae*, *Scrophulariaceae*, *Plantaginaceae* families with 2 species (Fig.1). Each of rest families are represented with one species. Each genera of *Astragalus*, *Tragopogon* and *iris* are represented with 3 species and they are dominants. Genera of *Salsola*, *Taraxacum*, *Bellevalia* each are

represented with 2 species, rest genera- with one species.

On analysis of life forms 6 groups were determined: annuals, biennials, perennials, bush, subshrub and tree. Perennials contain 24 species, annuals – 11 species, biennials- 2 species. Bush, shrub and tree - each of them represented with one species (Fig. 2).

On analysis of endemic plants on ecological

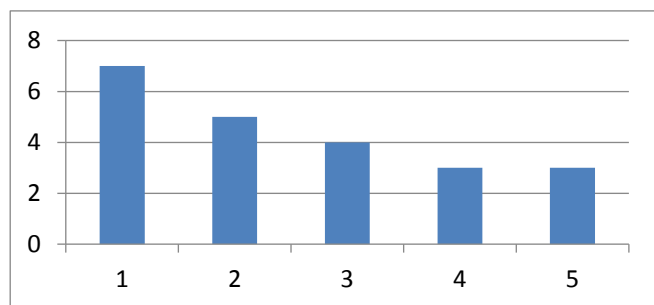


Fig.1. Quantity of endemics at dominating families in Mil steppe flora: 1- Asteraceae, 2- Fabaceae, 3- Liliaceae, 4- Chenopodiaceae, 5- Iridaceae

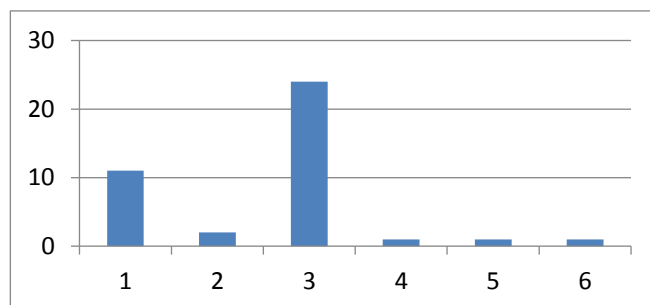


Fig.2. Life forms of endemic plants at Mil steppe flora: 1- annuals, 2- biennials, 3- perennials, 4- bush, 5- tree, 6- shrub

groups relation with moisture 4 groups were defined: xerophytes, mesophytes, mesoxerophytes and xeromesophytes. Species which belong to xerophytes are dominate with 17 species, in second place- mesoxerophytes with 10 species, third place- mesophytes with 7 species, in the last place xeromesophytes represented with 6 species (Fig.3). From taxonomic content spectrum of subendemics it was determined that subendemics in Mil steppe consist of 4 species which belong to 4 genera and 4 families that each of them contains 25% of total subendemics (Table 2).

List of some Caucasus endemics: *Merendera trigyna* (Stev ex Adams), *Allium leucanthum* C.Koch, *Bellevalia wilhelmsii* Stev, *Iris carthalinia*

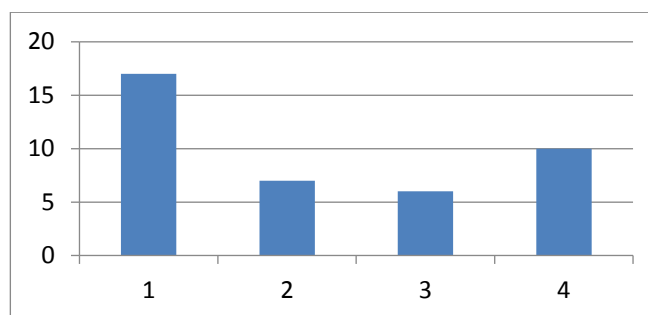


Fig. 3. Relation of endemics of Mil steppe flora on ecological groups: 1- xerophytes; 2- mesophytes; 3- xeromesophytes; 4- mesoxerophytes

Fomin, *Ophrus caucasica* Woronow ex Grossh., *Astragalus stevenianus* DC, *Plantago filiformis* C.Koch., *Tragopogon tuberosus* C.Koch. etc., some Azerbaijan endemics: *Iris helena* (C.Koch) C.Koch, *Papaver schelkownikowii* N.Busch,

Table 2

Taxonomic content of subendemics of Mil steppe area

Family	Quantity of genera	On total quantity, %	Quantity of species	On total quantity, %
Liliaceae	1	25	1	25
Fabaceae	1	25	1	25
Iridaceae	1	25	1	25
Hyacinthaceae	1	25	1	25
Total:	4	100,0	4	100,0

Astragalus ignarius M.Pop., *Alcea lenkoranica* Iljin., *Veronica amoena* Bieb.

etc., Azerbaijan subendemics: *Tulipa Eichleri*, *Iris acutiloba* CAMEy, *Bellevalia Fomini*, *Onobrychis vaginalis* CAM.

Conclusions. Relation with studied species at researched region it is necessary to prohibit agricultural activity such as pasture, planting etc. It is also important to conduct regularly monitoring of senopopulation situation on seasons; creating of seed bank for conservation of genetic potential; elaborate complex measures for reintroduction of species.

Therefore, species content of Mil steppe endemics of Kura-Araks lowland was clarified, they were grouped on life forms, ecological groups and distribution level. Obtained results may be useful for monitoring of environment and elaboration of measures on conservation of endemics in region.

References:

1. Akhundov G.F. *Enflora of Azerbaijan. Autoreferat of dissertation of doctor of biological sciences. Baku. 1973. 44 p.*

2. Alizadeh V.M., Farzaliyeva V., Abdiyeva R., Alirzayeva E. *International nature of conservation status and innovative approach to protection of prioritet endemics. Materials of international scientific conference dedicated to 75years of central botanical garden of ANAS. Baku, 1 part. 2009, P.21-25.*

3. Alizadeh V.M., Karimov V.N., Abdullayeva R.T. *Endemic, relict, rare and endangered plant species. National Map of Azerbaijan Republic. Baku Cartography factory. 2014, P.247.*

4. Anapiyev I.M. *Endemic, relict and rare species of plants of Central Kazakhstan and their conservation. Modern problems of ecology of Central Kazakhstan: Handbook of scientific works. - Karaganda, 1996, p. 103-107.*

5. Askerov A.M. *Endemics of Azerbaijan flora. Proceedings of ANAS Biological and medical sciences. 2014, Vol.66, N 1, p. 99- 105.*

6. Askerov A.M. *Subendemics of Azerbaijan flora. Plant kingdom of Azerbaijan (higher plants- Embryopyta), Baku. "TEAS PRESS" publishing house, 2016, p. 432-434.*

7. *Country research on biodiversity of*

- Azerbaijan Republic (national lecture on biological diversity convention). Baku, "Alrafil" publishing house, 2004, P.106.*
8. *Caucasian flora conspectus. St. Petersburg University's publishing house. 2003, Vol.1, P. 204.*
 9. *Caucasian flora conspectus. St. Petersburg University's publishing house. 2006, Vol.2, P. 467.*
 10. *Caucasian flora conspectus. St. Petersburg University's publishing house. 2008, Vol.3, P. 469.*
 11. *Cherepanov S.K. Vascular plants the former USSR. North American Branch Cambridge University. Press. 1995, P. 992.*
 12. *Dictionary of Azerbaijan Flora. With authority of acad. V.C.Hajiyev and T.E. Gasimova. Baku: ELM, 2008, P. 272.*
 13. *Flora of Azerbaijan. Publishing house of Academy of Sciences of Azerbaijan SSR. Baku. 1950-1961., Vol.1-8.*
 14. *Gurbanov E.M., Jabbarov M.T. Geobotanics. Baku "Baku University" publishing house, 2017, P. 320.*
 15. *Grossheim A.A. Flora of Caucasus. Baku:ELM, 1939-1967, Vol. 1-7.*
 16. *Hajiyev V.C., Musayev S.H., Alizadeh V.M. etc. Red List of the Endemic Plants of the Caucasus. 2014. By Misseri Botanical Garden . PO .Box 299, P. 451.*
 17. *Hajiyev V.D., Abdiyeva R.T. About criterias of determination of endemicity of plants. Proceedings of Institute of Botany of ANAS. Baku: ELM, 2004, Vol.25, p.23-27.*
 18. *Kamelin R.V. Florogenetical analysis of natural flora of mountain Middle Asia. L.: NAUKA, 1973, P.356.*
 19. *Khokhryakov A.P. Analysis of flora of Kolim highland. M.: NAUKA, 1989, P.152.*
 20. *Musayev S.H. Applying of endemic species of Azerbaijan flora. Proceedings of Azerbaijan National Academy of Sciences. Series of biological and medical sciences, Baku: ELM, 2005, № 1-2.*
 21. *Musayev S.G., Fataliyev R.A. Flora of Azerbaijan: New data. Proceedings of Institute of Botany of ANAS v. XXV. Baku: ELM, 2004, p.16-22.*
 22. *Odum U. Ecology. - M.: MiR, 1986, P. 248.*
 23. *Red Book of Azerbaijan Republic. Rare and endangered plant and fungi species. Second publication. Baku: East-West, 2013, P.676.*
 24. *Serebryakov I.G. Life forms of higher plants and their study. Field geobotany, M.-L.: NAUKA, 1964, Vol.3, p. 146-205.*
 25. *Tolmachev A.I. Introduction to geography of plants. L.: Publishing house of Leningrad University, 1974. P. 244.*
 26. *Zlobin Y.A. Principles and methods of studying of cenotic populations of plants. Teaching-methodical textbook. Kazan: KSU, 1989, P.147.*