

Bioecological features of *Gentiana* species

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Abstract

The study of *Gentiana* L. species is of great importance in the study of many unresolved issues related to the florogenetics of the genus. As a result of the analysis of the literature of many researchers, the geography of the species was analyzed.

The territory of the Republic of Azerbaijan occupies a special place in the region due to its floristic richness. Elements of the Mediterranean, Caucasus and Iran-Turan played a great role in the formation and occurrence of the flora of the republic. One of the main reasons for this is the suitability and similarity of climatic conditions.

Keywords: *Gentiana*, Azerbaijan, chorology, ecology, heliophytes

Introduction

The members of the Gentianaceae family are annual, biennial, perennial herbaceous plants. In 1952, A.A. Grossheim conducted a comprehensive study of the taxonomy of this family in the flora of the SSRI. He thoroughly studied the Gentianaceae family and divided the family into two subspecies and 11 sections [2, 5, 6]. Species distributed in the flora of Azerbaijan are concentrated in two subgenus and five sections [2]. *Gentiana* species have adapted to certain environmental conditions, they are characterized by plain and meadow phytocenoses. Bitter species are distributed in phytocenoses found in different mountain belts in Azerbaijan, in different soil types, with wide ecological amplitudes, on different slopes, in well-developed vegetation. Based on the study of the ecology of *Gentianaceae*, we can say that many of them have different environmental factors and habitats. Some species belonging to the sections of *Pneumonanthe*, *Aptera*, *Cyclostigma* live in shady places, forest edges, meadows; *Chondrophyll* and *Eugentina* species have adapted to the dry ecosystems. In research of the ecological characteristics of flowering species, the influence of various environmental factors should be noted [7].

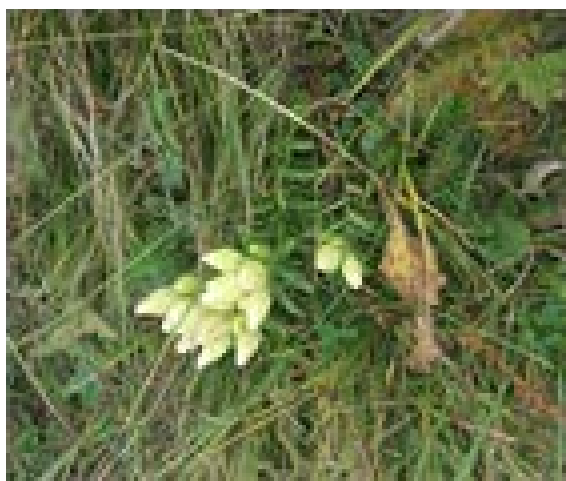


Fig 1: *Gentiana gelida* M.Bieb

According to their attitude to light, *Gentiana* species are divided into 3 groups:

1. Heliophytes (L.max.) Are sun-loving species, growing mainly in areas exposed to sunlight - *G.septemfida*, *G.cruciata* The members of this group are especially common for the plains.
2. Heliocystiophytes (L.opt.) Are shade-tolerant plants, grow in well-lit areas, grow better in the shade - *G.blepharophora*, *G.gelida*
3. Sitsiophytes (L.min) shade-plants - *G.nivalis*, *G.verna*, etc.

The majority of *Gentianaceae* family are heliophytes. They adapt to the environment due to their attitude to light, the structure of the leaf axis and the height of the trunk depend on the light conditions. If the heliophytes do not receive enough sunlight, changes will occur in these vegetative organs.

Material and Methods

Our research has been conducted on naturally growing species with different habitats and adapted to various environmental conditions. Several scientists have studied the ecological characteristics of the genus *Gentiana*. The species is found in all botanical and geographical regions of Azerbaijan in the middle and high mountain ranges. Personal herbarium materials stored in the Herbarium fund of the Institute of Botany of ANAS and collected by us were used as research materials. Through the research, the specimens collected during the Major Caucasus and Minor Caucasus 2016-2017 expeditions (from Guba, Gusar, Zaqatala-Sheki, Gakh, Balakan, Gadabay, Shamkir) have been identified in the field as well as in the laboratory and comparative morphological, systematical, areological and geographical methods have been applied for this purpose.

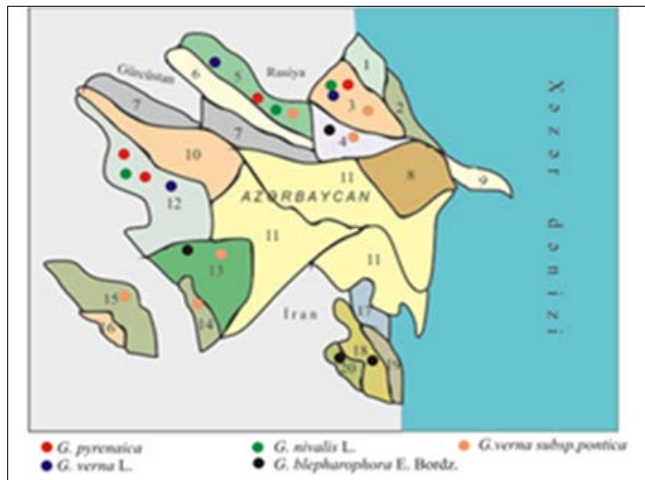


Fig 2: Distribution map of gentian species

Discussion of Results

Azerbaijan is located in two floristic provinces of the Holarctic domination (Circumboreal and Iran-Turan). These provinces (within Azerbaijan) are divided into 4 provinces (Caucasus, Atropatan, Hirkan and Turan) [3].

Caucasus province covers 9 botanical-geographical region (mountain ranges of Greater and Lesser Caucasus, Gobustan, Alaz.-Ayrich valley, Sam.-Dev lowland, Bozgir plateaus); Atropatan 3 (Nakhchivan, south of the Lesser Caucasus, Diabar); Hirkan 1 (Talysh); Turan 3 (deserts of the Eastern Caucasus, the Caspian lowlands and Absheron) [3]. Species with a wider range are considered ancient. Despite its antiquity, the genus is constantly developing. As a result of our research, 5 geographical elements were identified on the basis of NN Portenier's system during the chorological analysis of Acichichek species with different geographical areas in the territory of Azerbaijan. The system of geographical elements of the genus *Gentiana* L. distributed in Azerbaijan [8].

1. Holarctic geographical element (holarctic element). The natural range is the species that cover all three subdominants of the Holarctic dominant. This geographical element in Azerbaijan includes *G. aquatica*, *G. asclepiadea*.
2. Circumboreal geographical element (circumboreal element) This geographical element mainly includes species that cover the Circumboreal region, the Old and the New World. For example, *G. nivalis*
3. Caucasus geographical element (caucasian element). The range of species belonging to this geographical element is limited to the Caucasus province. However, these species are found in nearby provinces, especially in the Evksin province. For example, *G. septemfida*
4. Caucasus-European geographical element (caucasio-European element). The species included in this geographical element mainly include the provinces of the Caucasus-European subregion of the Circumboreal region (Atlantic-Europe, Central Europe, Illyria, Caucasus, Evksin, Eastern Europe and Crimea) – *G. blepharophora*, *G. cruciata*, *G. pyrenaica*, *G. verna*.
5. Iran-Turan element (irano-turanian element). Characteristic species of Iran-Turan region are widespread in 2 or more provinces of this region - *G. gelida*

The distribution areas of the genus *Gentiana* have been identified by us [3,4].

1. *G. asclepiadea* L. MC (Guba), MC is distributed in the eastern, MC western territories Calgan village of Siyazan region N 41°04.357'E 048°04.357'
 2. *G. septemfida* Pall. MC (Quba), MC east, MC west, MC north MCcent, Nax. Lenk.moun. spread. Shamakhi reg. Pirgulu N40°51.088'E048°07.761'
 3. *G. gelida* M. B. Min.C.nort. KQ center.Nax-Chalkhangala N39°27.457 'E 045°15.834 'N 39°32.327'E 045°48.390'
 4. *G. cruciata* L. MC(Quba), BQ east. BQ west, KQ pants. KQ center. Nax. mountain, lan. mountain Oguz Filfilli village N41°07.273 'E047°36.443' N 39°23.745'E045°39.929'
 5. *G. aquatica* L. MC (guba), MC east, MC west N41°12.346'E 048°52.051'
 6. *G. pyrenaica*. MC (guba) MC west, Min.C nort. Qusar district N41°25.223'E048°26.718
 7. *G. verna* L. MC (Quba), MC west, MinC nort. N 41°25.223'E 048°26.718'
 8. *G. nivalis* L. MC (Guba), MC west, MinC nort. Around Guba Jack village N 41°12.140 'E048°30.171'
 9. *G. blepharophora* E. Bordz. MC east, MC center. Lenk. moun.. Diab.
 10. *G. verna subsp. pontica* MC (Guba), MC west, MC east, Min.C cent. Min.C jan.Nax. mountain N39°23,708 'E 045°39,976' New distribution area: *G. asclepiadea*-MCnort. (Ganja, Gadabay) Maralgot 1954 meters. N40 ° 22.777'. E046 ° 18.703'.
 11. *G. blepharophora* E. Bordz - MC west Vendam. 801 metr. N40 ° 57,300'. E047 ° 55.941'.Zaqatala N41 ° 40.340'. E 046 ° 41.564'.
 12. *G. asclepiadea* L. – MCnort. N40 ° 22.861'. E046 ° 18.594
1. *G. umbellata* MB.Fl.taur-caus.III.188 (1819). A. Grossheim Fl.Kavk.III, 231 (1932); Опр.пач.Кавк.во Фл.СССР, XVIII, G.aurea var umbellata Kusn. B Mam.Фл.Кавк.IV.384 (1905) umbrella flower. It is an annual or perennial plant, blooms and bears fruit VI-VIII. In the western part of Caucasus Major (Guba) in rocky slopes, subalpine and alpine belts.
 2. *G. caucasica* MB, Fl.taur-cauc., I, 198 (1808), III, 192 (1819); A.Grossheim.Fl.Kavk., III, 230 (1932), 276; во Фл.СССР, XVIII, 603 (1952), Caucasian lily of the valley. Unity is a bright green, annual plant. It blooms and bears fruit in VII-VIII (IX-X). It was first described from the Caucasus. Currently, *Gentianella* is synonymous with the Caucasus.
 3. *G. lagodechiana* (Kusn.) A.Grossh.Фл.Кавк., III, 228 (1932), Опр.пачт.Кавк.275 (1948); во Фл.СССР, XVIII 553 (1952). *G. septemfida* var. *lagodechiana* Kusn в Мат Фл.кавк., IV.1.325 (1903) lagodex acacia, It is described by *G. lagodechiana* from the Caucasus. It is currently synonymous with *G. septemfida*.
 4. *G. angilosa* M.B.Fl.taur-cauc.I, 197 (1808) III, (1819). A. Grossheim.Fl.Kavk., III, 227 (1932).
 5. It is a short-lived perennial plant. It grows in Caucasus Major (Guba), in eastern and western areas of Caucasus Major, in high mountain slopes of subalpine and alpine belts, on gravelly

References

1. Flora of Azerbaijan. Baku, tt. VII. Izd. AN Azerbaijan. SSR, 1957, 87-99
2. Grossheim AA. Analysis of flora of the Caucasus. AzFAN USSR, 1939, 230.
3. Askerov AM. Higher plants of Azerbaijan, Baku - "Science", 2006:2:217
4. Talibov TH, Ibrahimov AS. Taxonomic spectrum of the flora of the Nakhchivan Autonomous Republic. (Higher spore, bare-seeded and covered-seeded plants). "Ajami" NPB, 2008, 350.
5. Grossheim AA. (1952) Gorechavkovye - Gentianaceae Dumort. / Flora of the USSR / M .; L .: Izd-vo AN SSSR, 1952:18:525-640.
6. Grossheim AA. Family Gentianaceae - gentian / Flora of the Caucasus / L .: Nauka, 1967, 202-216.
7. Bakhareva TG. Population structure of species of the genus *Gentiana* L. in high-mountain phytocenoses of the North-West Caucasus: Dis. ... Cand. biol. sciences / T.G. Bakharev. - Maykop, 2004, 143.
8. Portenier NN. Flora and botanical geography of the North Caucasus. Moscow, 2012, 293.