

Evaluation of Populations of *Agrostis Planifolia* C. Koch Type on the High Mountains of the Lesser Caucasus

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Abstract:

The article is an evaluation of populations of Agrostis, determination of age and quantity spectra in different areas and in different plant groups in the high mountains of north-eastern part of the Lesser Caucasus in 2012-2013. As a result of the study in 2012-2013 second cenopopulation type is young, in 2012 first type of cenopopulation and in 2013 first, third, fourth cenopopulations are types of connection and in 2012 third and fourth cenopopulation types are mature.

Key words: cenopopulation, age index, efficiency index, restoration index, substitution index

Introduction

Without studying cenopopulation, it is not possible to identify the ways of conservation of biological diversity. Studying this problem is more important because of the antropogenic anomalies that severely affected to the north-eastern part of high valleys of the Lesser Caucasus. In general, It takes to clarify their position and determine the reactions to different conditions in order to determine the effective protection of rare species. Concepts about the species of biology and structure is the basis of the forecast of cenopopulation. This is more

relevant to study the sod-forming cereals in terms of the cenopopulation level. Grains play an important role in the high mountain phytocenosis. In this regard the Poaceae family, the genus of *Agrostis* L. and the species of *Agrostis planifolia* C. Koch have been studied by us. Distribution of sexes in different environmental conditions are described by extensively polymorphism in connection with intraspecific hybridization apomixis. There is no monograph on the genus. But there can be found some information about the genus in literatures of China, the United Kingdom, Scandinavia and Spain [1].

Material and method

In 2012-2013 the studies were carried out in Dashkasan district, mountain system Goshgar, the massif Khoshbulag, in Goygol region, the mountain massif Kapaz and at the sloping hillsides of Togana and Chaykendi.

The geobotanical description was carried out in order to determine the character of species's distribution in the study area [2]. Researches have been implemented by stationary and route methods. Stationary researches have been carried out in the sample areas of 100 square meters. The geographical position which the species are encountered, the end conditions (relief, slope, etc) are shown in the description of sample areas. The physical condition of the end place and the full floristic list was compiled. The abundance of the area where the species are encountered is marked with a scale of Durudue. The project cover of the populations is estimated according to Kapten [3].

The accepted phytocenosis methods were used for the description of group plants [2,4]. 'The flora of Azerbaijan', Summary of Azerbaijan flora, 'Summary of the flora of the Caucasus' were used to name species that take part in group plants and 'International Code of Botanical Nomenclature' were taken into account. [5, 6, 7, 8, 9].

The structure of the cenopopulation of studied species have been carried out by accepted methods: ability to sprout germination- C, juvenil-y, immature- im, virginil-v

*** In the Republic of Azerbaijan**

Young generic - g1, g2 mid-generic, old-generic G3, subsenil-ss, senile-s. [10, 11]. Some demographic indicators: the index of recovery

$$\dot{I}_b = \frac{j+im+v}{g1+g2+g3}$$

(j-juvenil, im-immature, v-virginil, g1-young generic, g2-mid-generic, g3-old generic), substitution index

$$J_o = \frac{j+im+v}{(g1+g2+g3)+(ss+s)}$$

(ss-subsenil, s-senile), cenopopulation type with "delta - omega" criteries

$$\Delta = \frac{\sum k_i * n_i}{N}$$

i-ontogenetic situation, k_i-"price", n_i- number of individuals, i- status of the population

N- total number of individuals in population;

$$\varphi = \frac{\sum n_i * e_i}{\sum N_i}$$

n_i-number of plants, i-state, e_i- plant efficiency were appointed [12, 11, 13].

Results and their discussion.

Agrostis planifolia C. Koch, 1848, Linnacea-leaf bag

Been described in Transcaucasia. "Auf dem des untern Sudabhange Kaukasus, auf Trachyt, 1525m, CKoch".

South-East Asia, spread to Turkey.

This is a short-rooted perennial grass plant. It's about 20-80 cm in height. Solid, straight or crooked naked body forms a soft sod.. Leaves are straight. The leaves from the trunk is 1

mm and the leaves from branches is about 2-6 mm width. Leaves in the upper portion are elongated, length is about 2-4 mm. Large and small brooms are compact, 5-10 cm length and 1-5 cm width. There are sharp wrinkled branches. Spike scales are like a long lancet and sharp. It is about 2-2.5 mm length and colorful. Down floral scales are to the straight axis, so they oppose from the middle section of axis.. There are no colorful scales on the upper part. Basis part of the scales are shorted-haired. There is only one, small and colorful spike. There are two spike scales with bisexual flower. Down flower scales are short-spiked. Upper flower scales are shorter in two times than down flower. The root system contains less branched roots. Roots are fragile and fibrous. Incision is the most fragile. Outside is covered by light brown leather. There can be seen lying buds and dry leaves on branched condex. Condexes lean at the end of ontogeny. Scion system consists of underground and above-ground shoots. Surface shoots are like a broom. Vegetative shoots are polycyclic and monopodial branching. Leaves stretch to the scabbard leaf board covering by intense bloom. Generative shoots are long, strong and without leaf (flower-bearing). Generative shoots 2.5-3 times longer than the length of an ordinary leaf. It's covered by open hairs. Generative shoots remain a period after seeding. By the activity of meristem tissues, older individuals and underground shoots in the system are branching monopodially and formed by sleeping buds.

Cenopopulation of the species of *Ag. planifolia* was studied in Dashkasan district, mountain system Goshgar, the Association of Nardeto-Agrosticetum (*Nardus stricta*+ *Agrostis planifolia*) (I CP), in Goygol region, the Association of Alchimillato-Agrostisetum (*Alchimilla caucasica*+ *Ag. planifolia*) (II CP) of the mountain massif Kapaz, The Association of *Agrostisetum planifolia* (III CP) around the sloping hillsides of Chaykend and The Association of Thymeto-Agrostisetum (*Thymus caucasicus*-*Ag. planifolia*) (IV CP) at

the sloping hillsides of Togana village.

I CP is 2800 m above the sea level, the coverage area is 300 square meters, PC is 50-60 %

II CP is 2200 m above the sea level, the coverage area is 500 square meters, PC is 80-90 %

III CP is 800-850 m above the sea level, the coverage area is 400 square meters, PC is 70-80 %

IV CP is 1800 m above the sea level, the coverage area is 600 square meters, PCA is 80-90 %

The species of *Agrostis planifolia* is an integral part of different phytocenosis and its attitude to the environmental factors is not same. Therefore, the ontogenetic structure of *Ag. planifolia* differs from each other in studying cenopopulations. (Schedule 1.)

Schedule 1.

Structure of cenopopulation ontogenesis where *Ag. planifolia* has spreaded in different years

CP \ Ont. period	I CP		II CP		III CP		IV CP		Σ	%
	2012	2013	2012	2013	2012	2013	2012	2013		
J	5	7	-	-	4	5	-	3	24	6,2
Im	4	5	-	3	7	7	4	5	35	9,1
V	7	7	5	3	7	9	7	8	53	13,7
G ₁	7	9	5	4	8	9	8	8	58	15,0
G ₂	9	12	6	5	10	10	18	14	84	21,7
G ₃	10	12	7	5	9	9	6	8	66	17,1
S _s	6	5	5	4	3	4	3	4	34	8,8
S	6	4	4	4	3	5	3	3	32	8,3
Σ	54	61	32	28	51	58	49	53	386	100

As seen in the schedule, I, II populations in 2012-2013, and IV population in 2013 are full member. The other populations are incomplete. Because of the strong influence of anthropogenic load, cenopopulation is not complete in this area. Majority of generative individuals in all populations promotes the rapid

seed formation.

In 2013 the age spectrum of Agplanifolia is characterized by two peaks-middle-aged and older generative long-term plants on the Goshgar mountain system. According to L.B.Zauqolnova, this kind of spectrum is associated with continuous recovery of perennial sod-forming grains[14]. On the one hand, the majority of young generative individuals in the populations of Ag. planifolia provides the transition of plant to the young and generative state, on the other hand this age is allowed to continue for a long time in Goygol region. Majority of juvenil and immature individuals in the spectrum is a result of mass appearance and seed productivity. As there are juvenil and immature individuals at the end, quantity of senile plants is lower.

The study was carried out and the results of the evaluation of Agplanifolia is described in Table 2. According to the results of the study every two years younger type II SP ($\Delta = 0,14-0,16$; $\dot{\omega} = 0,10-0,15$), the first SP in 2012, in 2013 I, III, IV SP type of transition ($\Delta = 0,41-0,47$; $\dot{\omega} = 0,32-0,49$), the type of mature SP III and IV in 2012 ($\Delta = 0,38-0,39$; $\dot{\omega} = 0,34 -0,38$). The ability of restoration was observed minimally in II population in 2012, maximally in III population in 2013.

Schedule 2.

Evaluation of cenopopulation of Ag. planifolia

N CP		CP type	Growing periods of orthogenesis, by total per cent					Index			
			j	im	v	g1-g3	Ss,s	Δ	$\dot{\omega}$	\dot{I}_b	\dot{I}_s
2012	1	transition	9,26	7,4	13	48,1	22,2	0,42	0,32	0,61	0,42
	2	young	0	0	15,6	56,2	28,1	0,16	0,15	0,27	0,18
	3	mature	7,8	13,7	13,7	52,9	11,8	0,39	0,34	0,66	0,54
	4	mature	0	8,2	14,3	65,3	12,2	0,38	0,38	0,34	0,28
2013	1	transition	11,5	8,2	11,5	54,1	14,7	0,47	0,49	0,57	0,45
	2	young	0	10,7	10,7	50	28,6	0,14	0,10	0,42	0,27
	3	transition	8,6	12,1	15,5	48,3	15,5	0,45	0,10	0,75	0,77
	4	transition	5,7	9,4	15	56,6	13,2	0,41	0,49	0,53	0,43

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