

Formation of Vegetation on the Screes and Rocks, Especially Reserved Territories of Eastern Regions of Azerbaijan

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I. INTRODUCTION

In the eastern highlands of the Lower Caucasus screes and rocks are the landscape of vegetation. They take about one third part of the total highland territory. We have determined the type composition of petrophits and objective laws of their geographical spreading. Studying of the highlands primary-naked substrata is usually carried out beginning with investigation of the highland vegetation. On the screes and rocks 2500-3200 m. higher sea level, floral composition consists of 183 flourishing species. Special edaphic and microclimatic conditions of the screes and rocks made it possible to save there lots of species of the past climatic time. The highland screes and rocks served as shelters for the ancient plants in the unpleasant climatic conditions. Studying of these plants (their biology, ecology, systematic characters) in the nature and cultivation, elucidates the basis and ways of formation of flora and characteristics of climate in present epoch.(9) According to the types of vegetation of screes and rocks we find out a group of petrophits on the primary-naked limy edges, on the gravelly lays of crumbly substrata, in the lower parts of all steeps of highlands where the plants usually don't make thick vegetation (7). By their origin and ways of formation the vegetation of screes and rocks differ between themselves. In this case usually much attention is paid to the vegetation of screes and rocks. We have defined type composition, ecology and objective laws of geographical spreading of petrophits. Investigations of vegetation of primary-naked substrata are usually carried out within general investigations of highlands' vegetation.

Formation of the scree vegetation. Screes are characterized by lots of unpleasant factors as: moving and unsteadiness, lack of soil, unexpected cover driven by the wind or shower, everyday temperature of the highlands etc.(8) In the conditions of landslide the cracks are formed on severe dislocated parts of the highlands. Such kinds of cracks are usually met in the narrow passages of the river valleys. At the result of any natural cases the cracked parts divide into small pieces and driven down by the strong winds or by the rains. Accumulation of these pieces under the rocks form mountain deposits that called screes. Big pieces of the cracks gather underneath and the smaller parts (gravel, sand) gather and cover over them. Scree vegetation cover about

one third part of the rocks and screes and they usually followed by meadows, shrubberies and forests. By the features of situation the screes are divided into movable and immovable ones. Both features are useless for massive dislocation of plants and formation of thick vegetation on them. On the definite height their floristic composition changes. The scree vegetation of the Lower Caucasus has not investigated perfectly yet. Besides of all, this subject attracts attention by the point of studying the adaptation of the plants to the moving situation of the soil substrata and influence of that great role of vegetation for fastening of the screes. Screes and alluvials arrange special environment for the plants. In the friable gravelly environment permanent humid is gathered underneath and thermal conditions arranged over them. So the roots of the scree plants pierce through the depth of the soil. Their roots are stringy, firm and reeling. They twine round the scree materials very well. These valuable features have great role for firming of the screes and for growing the vegetation (7). The plants themselves are sprawling and grow in small groups as patches and in separate species. So it is difficult to divide them into formation. In the less moving parts of the screes, in the reliable midlines and in the moving parts we can meet the plants as *Vicia alpestris*, *Trogonocaryum involucratum*, *Silene caucasica*, *Nonea alpestris*. On the screes of the alpine lines of the highlands *Nepeta supine*, *Lamium tomentosum*, *Scrophularia minima*, *Veronica minuta*, *Alreosium oreophilum*, *Cerastium cerastoides*, *Didymophysa aucheri* are met. Unslipping screes are overgrown with lots of species. *Vicia alpestris*, *Chamaescadium acaule*, *Silene caucasica*, *Anthemis cretica*, *Nepeta cyanea* distinguish among them. Much more of the scree vegetation are shown in the table №1 according to the descriptions of two experimental areas 50 sq. m. each.

Description №1 (20.06.2013) of screes on the stream sources around the village Khoshbulag, Dashkesan region. Eastern slopes of the Koshkar mountain massif. (height 2250-3200 m. higher sea level). Grey sand like schist go out and cover the area unceasingly.

Description №2 (10.8.2013) of expositions of northern slopes of the Main Mountain Range at the source of the Koshkarchay river, height 2500-3000 m. higher sea level.

Table 1
Floral composition of species of screes and alluvials of eastern highland parts of the Lower Caucasus

Names of the plants	Abundance of phenophases			
	1	2	1	2
	2	3	4	5
<i>Betonica nivea</i> Stov.	1	-	Shr	-
<i>Nepeta lamiifolia</i> Willd.	1	-	Shr	-
<i>Nepeta supina</i> Stev.	1	1	Veg	Blooming
<i>Nepeta cyanea</i> Stev.	-	1	-	Blooming
<i>Draba siliquosa</i> Bieb.	1	-	Blooming	-
<i>Asperula alpine</i> Bieb.	1	2	Veg	Blooming
<i>Chaerophyllum humile</i> Steven ex Bieb.	2	-	Shr	-
<i>Cirsium tomentosum</i> C.A.Mey.	1	-	bud	-
<i>Cirsium macrocephalum</i> C.A.Mey.	1	-	Blooming	-
<i>Silene depressa</i> Bieb.	3	1	Blooming	Blooming
<i>Silene ruprechtii</i> Schischk.	-	1	-	Blooming
<i>Silene caucasica</i> (Bunge) Boiss.	-	1	-	Blooming
<i>Scrophularia olympica</i> Boiss.	1	-	Veg	Blooming
<i>Scrophularia minima</i> Bieb.	1	2	-	Blooming
<i>Lamium tomentosum</i> Willd.	2	-	Shr	-
<i>Jurinella moschus</i> (Hablitz) Bobr.	1	2	Veg	Blooming
<i>Sedum oppositifolium</i> Sims.	1	1	Veg	Blooming
<i>Sedum tenellum</i> Bieb.	1	-	Veg	-
<i>Vicia alpestris</i> Stev.	2	1	Shr	Blooming
<i>Symphyoloma graveolens</i> C.A.M.	-	1	-	Blooming
<i>Didymophysa aucheri</i> Boiss.	-	2	-	Blooming
<i>Dracocephalum botryoides</i> Stev.	-	1	-	Blooming
<i>Veronica minuta</i> C. A. Mey	-	1	-	Blooming
<i>Veronica petraea</i> (Bieb). Stev.	-	1	-	Blooming
<i>Allium kunthianum</i> Vved.	-	2	-	Blooming
<i>Allium oreophilum</i> C.A.Mey.	-	1	-	Blooming
<i>Ranunculus arachnoideus</i> C.A.M.	-	1	-	Blooming
<i>Cerastium cerastoides</i> (L.) Britt	-	2	-	Blooming
<i>Cerastium multiflorum</i> C.A.Mey	-	3	-	Blooming
<i>Anthemis cretica</i> L. Subsp.iberica (Bieb.) Grierson	-	1	-	Blooming
<i>Chamaescidium acaule</i> (Bieb.) Boiss.	1	-	Blooming	-
<i>Alyssum andinum</i> Rupr	-	1	-	Blooming
<i>Trigonocaryum involucreatum</i> (Stev.) Kusn	-	1	-	Blooming
<i>Nonea alpestris</i> (Stev.) G.Don	-	1	-	Blooming
<i>alpestris</i> Stev.	-	1	-	Blooming
<i>Cerastium dagestanicum</i> Schischk.	2	1	Blooming	

Rock vegetation has been formed by lots of species, concerning to different life forms. But they have cserophit features and were introduced as sparse groups, as well as separate species of small shrubbery, pillow-shaped plants and grass.

On the mountain ranges, river canyons and highlands the rocks resemble forehead and in some areas they look terrace shaped planes. By first sight they seem absolutely lifeless, deprived from soil. Formation of vegetation on the rocks, stones and ruins have thick ties with origin of biogenic environment and

soil (1). Microorganisms –autotrophy bacteria, aquatic plants, mushrooms, lichens, that secrete organic acids assisting destruction of the mountainous species and accumulation of fine earth, have primary role on formation of the primitive soil cover over the limy-schist substrates (6).

In the case their dying off there happens accumulation of organic substances which mix with fine earth and make conception of soil. By this way microorganisms and inferior plants prepare environment for the plants of highest quality.

Rocks differ by availability of their original ecological conditions, for adaptation of growing plants and the plants gain special adaptation – rapture of the roots, vegetative organs with large amount of vein and advanced transpiration structure, pillow-shape forms.

Rock complexes, stony areas and accumulation of rock wreckages at the skirts of mountains,(screes), accumulation of soft wreckages, (alluvials) and softer forms of relief in the cup-shape excavations, ravines, dells, narrow grooves are the landscape making elements of the breaking points of the highlands. At the end of spring they deliver from melting snow of which icy water flow down slowly. At the lower levels the water of melting snow, rain and springs run down impetuously, stormy streams that soak and wash down breaking points of highlands form narrow valleys on the highlands (3, 5).

We can meet following rock plants on the borders of alpine meadows of the highlands: *Valeriana alpestris* , *Aster alpinus*, *Dianthus caucaseus*, *Sempervivum caucasicum*, *Silene pygmaea*, *Campanula petrophila*, *C. Saxifraga*, *C. Ciliata*, *Draba bruniiifolia*, *D. mollissima*, *Saxifraga adenophora*, *S.exarata*, *Cystopteris fragilis*, *Asplenium viride*, *Draba incompta*, *Saxifraga moschata*.

On the limy rocks we can meet species as- Campanula alliarifolia, *C. Tridentata*, *Jurinella moschus*, *Asperula alpine*.

Some kinds of bushes that flattened against the rocks- the *Rhamnus depressa* and others have adapted to the existing situation. Composition of the rock vegetation changes according to the height. There are more decorative species in this composition. The species as *Draba siliquosa*, *Betonica nivea*, *Campanula saxifraga* and others distinguish according to the sweetnees of their flowers. On the alpine zone and high rocks the vegetation composition changes slowly. These species get adapted to the conditions of dry climate of the subnival zone.

On the screes and rocks, 2500-3200m higher sea level, floral composition consists of 183 flourishing species. Lichen groups play essential role on growing of some species on the lifeless rocks and screes of subnival zones of the Lower Caucasus. Important role of Lichens rise on the lifeless rocks and screes of highlands of the Lower Caucasus that occupy large area. We

make the formation scheme of vegetation on the naked rocks of the highlands:

Microorganisms - *Lecidella anomaloides* + *Rhizocarpon geographicum* + *R. geminatum* + *Lecanora polytropha* + *Aspicilia cupreoatra* + *A.alpina* + *Haematomma ventosum* + *Umbilicaria cylindrica* + *U.deusta* + *U.polyphylla* + *Parmelia saxatilis* + *Stereaulon alpinum* + *Leprocaulon microscopicum* + *Cladina stellaris* + *Cetraria islandica* + *C.cucullata* The following species - *Saxifraga pseudolaevis*, *Cerastium cerastoides*, *C.multiflorum*, *Alchimilla sericea*, *Saxifraga pseudolaevis*, *Cerasticum multiflorum*, *Minuartia circassica*, *Alopecurus laquroides* and others grow for the first time. The plants types named above are met on the most parts of the Greater and Lower Caucasus mountain ranges (6).

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