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SUBALPINE GRASSLAND VEGETATION OF YARDIMLI AND ASTARA DISTRICTS (AZERBAIJAN)

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СУБАЛЬПИЙСКАЯ ЛУГОВАЯ РАСТИТЕЛЬНОСТЬ ЯРДЫМЛИНСКОГО И АСТАРИНСКОГО РАЙОНОВ (АЗЕРБАЙДЖАН)

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Abstract. Subalpine grasslands of Talish highlands are common in the subalpine zone of Yardimli and Astara highlands at lawny mountain-meadow soils at the height of 1750 m to 2400 m above sea level. During the carried out ecological-geobotanical research, it has been determined 3 formation classes, 5 formation groups and 11 associations. In parallel with the study of type composition and structure of phytocenosis found in the area of investigation, it has been also determined endemic species, productivity of formations, and intensification of degradation at soil-plant coverage of some lawny subalpine grasslands, decrease in abundance and productivity of forage crop. Currently, for the purpose of the improvement of natural phytocenosis productivity, crop quality, protection of their genetic reserve and landscapes, as well as the vegetation study for solution of protection problems on the base of scientific means is of a great importance.

Аннотация. Субальпийская луговая растительность Талышского нагорья распространена в субальпийском поясе Ярдымлинского и Астаринского нагорий на газонных горно-луговых почвах на высоте от 1750 м до 2400 м над уровнем моря. В ходе проведенных эколого-геоботанических исследований выделено 3 класса формаций, 5 групп формаций и 11 ассоциаций. Параллельно с изучением типового состава и структуры фитоценозов, выявленных в районе исследований, также установлены эндемичность видов, продуктивность формаций, усиление деградации при почвенно-растительном покрытии некоторых газонных субальпийских лугов, снижение численности и продуктивность кормовых культур. В настоящее время в целях повышения продуктивности естественных фитоценозов, качества сельскохозяйственных культур, охраны их генетического резерва и ландшафтов, а также изучения растительности для решения задач охраны на основе научных средств имеет большое значение.

Keywords: steppes, grasslands, plant communities, formation, association.

Ключевые слова: степи, травянистая растительность, фитоценоз, формация, ассоциация.

Depending on various typed soils of different heights, the Republic of Azerbaijan has multicolored vegetation, and the most valuable and useful trees, shrubs or grassy representatives have been found. One of regions possessing rich vegetation is Talish group regions [1]. During the researches, the study of subalpine meadow vegetation of Yardimli and Astara highlands was one of prior issues. Subalpine meadow vegetation of Talish highlands has been spread over lawny

mountain-meadow soils at subalpine zone at 1750 m to 2400 m above sea level [14]. For its origin, lawny meadows are nearly equal to swamped meadows and interfere in each other at appropriate condition of the area of distribution [1, 8]. These types of groupings have been found in Yardimli, at grazing areas of upper highlands of Astara region [4, 10].

Object & Methods

Subalpine meadow vegetation at subalpine zone of Yardimli and Astara regions has been determined as an object of the study. It has been conducted several geobotanical research works during the study of phytocenosis found at lawny mountain-meadow vegetation of subalpine zone of Talish highlands. In the result of conducted researches, as well as ecological - geobotanical data map of region, it has been revealed that subalpine meadow vegetation of Talish highlands found in Yardimli and Astara summer grazing areas. Data about distribution of subalpine meadows at Great Caucasus and Small Caucasus mountain chains, Nakchivan AR and Talish highlands were found in the works of most botanists [5-7, 11, 12].

Subalpine meadows are distinguished for their rich floristic composition, structure of formations and high productivity in comparison with alpine meadows [4, 11, 16].

During the study of the subalpine meadow vegetation of Talish high mountains, classification of subalpine vegetation was developed, systematic taxa, life forms were taken into account when determining the discovered plant [2, 3], "International Botanical Codex" [2, 3, 9], and projective coverage [17], ecological groups [18] have been studied by different methods.

Results & Discussion

During investigation it has been defined that subalpine meadow fauna of Talish highlands was formed of 3 formation classes, 5 formation groups and 11 associations.

The followings are determined as formation classes:

1. Wheat-grassy different-grassy stepped subalpine meadows;
- 2 Different-grassy-wheat-grassy subalpine steps;
- 3 Shrubby-different-grassy-wheat-grassy subalpine meadows.

It has been given comprehensive information about phytosenological structure and type composition of some formation classes below:

1. Wheat-grassy different-grassy stepped subalpine meadow formation class is represented with one *Festuceta-Poaetum-Thymosum* formation group and two *Festuceta ovina-Poaetum meyeri-Thymosum trautvetteri* and *Poaetum meyeri-Thymus osum trautvetteri* associations.

During the investigation, *Festuceta-Poaetum-Thymosum* formation group phytocenosis has been defined at №22 "Shixheli Yurdu" and №23 "Dara Kecmaz" summer grazing areas of Yardimli region. In the species composition of this phytocenosis it has been observed 19 species, which 2 of them are shrubs (12%), 2 of them subshrubs (8,0%), 15 of them perennial grasses (68%), and 3 of them a annual (12%). According to ecological analysis, 14 species of them are defined to be xerophytes (68%), 3 of them mesoxerophytes (12%), and 2 of them mesophytes (20.0%).

Dominant of the phytocenosis is *Thymus trautvetteri* Klokov & Des.-Shost., of which abundance is estimated as 3-4 points, sub dominance *Poa meyeri* Trin. ex Roshev. type abundance with 2-3 points and *Festuca ovina* L. type abundance with 2 points.

A three layering has been observed in the structure of investigated phytocenosis. Thus, trees as *Filipendula ulmaria* (L.) Maxim. on the layer I, grasses as *Elytrigia trichophora* (Link) Nevski, *Stipa holosericea* Trin. & Rupr., *Achillea vermicularis* Trin., *Poa meyeri* Trin. ex Roshev., *Onobrychis altissima* Grossh., *Bromopsis variegata* (M. Bieb.) Holub on the layer II, small-height shrubs as *Astragalus euoplus* Trautv., *A. aureus* Willd., *Acantholimon hohenackeri* (Jaub. & Spach)

Boiss., *Thymus trautvetteri* Klokov & Des.-Shost., *Alchemilla sericata* Rehb. ex Buser, *Trifolium repens* L., *Anisantha tectorum* (L.) Nevski etc. on the layer III have been observed. Project coverage of phytocenosis is 50-80%.

In the result of carried out researches, it has been revealed that degradation of soil-plant coverage of lawny subalpine meadows becomes more intensive, abundance and productivity of valuable forage crops decreases. That's why protection and storage of the phytocenosis, improvement of their structure are one of prior issues. As well, 1 of 25 species which was defined in type composition of relevant formation — *Thymus trautvetteri* Klokov & Des.-Shost. is considered as Azerbaijani endemic and it needs to be protected [3, 15].

2. Different-grassy wheat grassy subalpine step meadow formation class is represented with two formation groups and 4 formation associations and considered to be specific phytocenosis of Yardimli highlands. The formation, covering large area is observed in №3 “Yahar Yurd” of Yardimli region, as well in summer grazing areas in the boundary of Astara region. In the mentioned formation class, *Thymuseta-Stipetum-Festucosum* formation group is represented with *Thymuseta trautvetteri-Stipetum holosericea-Festucosum valiesiaca* association, and *Cephalarieta-Poaetum-Festucosum* formation group with *Cephalarieta kotschy-Poaetum pratensis-Festucosum ovina* and *Cephalarieta kotschy-Festucosum valiesiaca* associations.

During the investigation, it has been revealed 20 species in the species composition of *Thymuseta-Stipetum-Festucosum* formation. According to biomorphological classification, 3 of them were related to shrubs (12,5%), one to subshrubs (4,2%), 13 to perennial grasses (62,5%), and 3 to a annual grasses (20,8%). According to ecological analysis of these species, 14 were related to xerophyte (75,0%) and 6 to mesoxerophytes (25,0%).

Phytocenosis dominant of *Festuca valesiaca* Gaudin abundance is 3-4 points, sub dominances *Stipa holosericea* Trin. & Rupr abundance is 2-3 points and *Thymus trautvetteri* Klokov & Des.-Shost. abundance is 2.

Several species have been observed in the layers of phytocenosis plant coverage structure. Thus, on the layer I — *Stipa holosericea* Trin. & Rupr, layer II — *Festuca valesiaca* Gaudin, *Poa pratensis* L., *Filipendula vulgaris* Moench, *Astragalus aureus* Willd., and layer III — *Acantholimon hohenackeri* (Jaub. & Spach) Boiss., *Juniperus pygmaea* K. Koch., *Thymus trautvetteri* Klokov & Des.-Shost., *Elymus caninus* (L.) L., *Phleum phleoides* (L.) H. Karst., *Trifolium hybridum* L., etc. perennial grasses, as well as *Anisantha sterilis* (L.) Nevski, *Bromus briziformis* Fisch. & C.A. Mey., *Hordeum crinitum* (Schreb.) Desf., *Euphorbia hircana* Grossh. and *Xeranthemum squarrosum* Boiss. an annual grass have been determined. Total project coverage of phytocenosis is 20-60%.

In the result of conducted ecological-geobotanical researches, it has been determined that *Thymuseta-Stipetum-Festucosum* formation abundance is approximately equal to 7.2 metric centner.

Cephalarieta-Poaetum-Festucosum formation group of different grassy-wheat grassy subalpine meadow step formation class has been registered at N 9 summer grazing area of Yardimli region at 2004 m height above sea level. As it is depicted on classification scheme, the formation is represented with two associations. In the species composition of this formation, it has been shown 20 species of floral plants. The dominant of phytocenosis *Festuca rupicola* Heuff. its abundance is 2-3 points, the sub dominances are *Poa pratensis* L. and *Cephalaria kotschy* Boiss. & Hohen. and their abundance is estimated as 2 points. Total project coverage of phytocenosis is equal to 30-80%.

3. Bushy-different grassy-wheat grassy subalpine step meadow formation class is represented with 2 formation groups and 5 associations at Yardimli and Astara areas. *Astracantheta-Thymuseta-Festucosum* formation group of this formation class is spread over the large areas as N3 “Khanin kanari” of Astara region and along the Yardimli boundaries with neighbor lands of Iran

(at the foothills of Balmadin mountain, as well as at high slopes of Kalaputu mountain of Astara region at height of 2073 m above sea level. Essentially, flora coverage is spread over soft lawny mountain-meadow lands [4, 13]. *Festuca pratensis* Huds. creates proper subalpine lawny meadows.

It has been observed intensification of degradation and desertification process in grazing areas of phytocenosis. 22 types have been registered in type composition of phytocenosis, 3 of them defined as shrub (14,3%), 1 undershrub (3,6%), 1 subshrub (3,6%), 13 perennial grass (57,1%), 2 biennial grass (10,7%), 2 an annual grass (10,7%). During ecological analysis of the species, it has been defined that 17 of them are xerophyte (71,4%), 3 of them mesoxerophytes (17,9%) and 2 of them are mesophytes (10,7%).

Dominance in the cenosises is *Festuca pratensis* Huds., of which abundance is estimated 3-4 points, sub dominance *Thymus trautvetteri* Klokov & Des.-Shost. as abundance 2-3 points, and *Astragalus aureus* Willd. Podlech abundance as 2. Total project coverage of phytocenosis is 45-75%.

In phytocenotic structure, it has been determined *Rosa cuspidata* M. Bieb. on layer I, *Astragalus aureus* Willd., *A. resupinatus* M. Bieb., *Rumex scutatus* L., *Festuca pratensis* Huds., *Dactylis glomerata* L., *Thymus trautvetteri* Klokov & Des.-Shost., on layer II, *Festuca rupicola* Heuff., *Agrostis tenuis* Sibth., *Hypericum perforatum* L., etc. species on layer III.

While analyzing flora coverage on the base of ecological groups [18], determination of large distribution of xerophytes in the structure type of phytocenosis obviously proves desertification of investigated area. It has been met two types, as well as *Thymus trautvetteri* Klokov & Des.-Shost. and *Centaurea zuvandica* ssp. *gegharkunikensis* Gabrieljan plants specific to Azerbaijani flora in this phytocenosis, which also needs protection [3, 15].

Fauna coverage of *Acantholimoneta-Thymusetum-Poaosum* formation group of shrubby-various grassy subalpine steppe meadow formation class was spread over southern-eastern slope of "Khanbulag-Kurdasa" pasture lawns of Astara region.

This formation group includes 3 associations, and also *Acantholimoneta-hohenackeri-Thymusetum-trautvetteri-Poassum-pratensis*, *Acantholimonetum hohenackeri-Thymusosum kotschyanus* and *Thymusetum trautvetteri-Poaosum pratensis*.

In the type composition of phytocenosis *Poa pratensis* L., *Thymus trautvetteri* Klokov & Des.-Shost., has been defined as dominants, *Acantholimon hohenackeri* (Jaub. & Spach) Boiss. and *Thymus trautvetteri* Klokov & Des.-Shost. as subdominant. Abundance of edification types (dominants and subdominants) has been estimated 2-3 and 2 points. Total project coverage is determined between 30-70%.

Results

The carried out ecological-phytocenological research and investigation results show that most of plants found subalpine meadow areas of Talish highlands are perennial grasses and xerophytes dominate according to ecological analysis. Determination of large distribution of xerophytes in the type content of phytocenosis has obviously proved desertification of investigated area. Along with the study of type content (3 formation classes, 5 formation groups, 11 associations have been defined), structure of phytocenosis found in the investigated area, it has been determined endemic species, productivity of formations, intensification of degradation in some steppe subalpine meadow soil-flora coverage, decrease in abundance of forage crops and productivity. As it has been mentioned above, the achieved results show that improvement of crop quality, productivity of natural phytocenosis, protection of their genetic reserve and landscapes, as well as the study of vegetation for the solution of protection issues on the base of scientific means is of great importance.

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