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## CHARACTERISTICS OF THE HOLE-MEADOW VEGETATION OF KUR-ARAS LOWLAND (AZERBAIJAN)

©*Asadova K.*, ORCID: 0000-0001-6531-3444, Baku State University,  
Baku, Azerbaijan, kamalaasadova@bsu.edu.az

## ХАРАКТЕРИСТИКА ЧАЛЬНО-ЛУГОВОЙ РАСТИТЕЛЬНОСТИ КУРА-АРАКСИНСКОЙ НИЗМЕННОСТИ (АЗЕРБАЙДЖАН)

©*Асадова К. А.*, ORCID: 0000-0001-6531-3444, Бакинский государственный университет,  
г. Баку, Азербайджан, kamalaasadova@bsu.edu.az

*Abstract.* In article the description of the main types of meadow communities which were registered in Mil plain was given. It was also given their geobotanical classification. Distribution, contemporary situation, species biodiversity, morphobiological, bioecological and phytocenological features of this vegetation was analyzed. It was determined that hole-meadow vegetation type of researched area contains 4 formation classes, 14 formation groups and 39 associations.

*Аннотация.* В статье приведено описание основных типов чально-луговой растительности на Мильской равнине. Проанализированы ее распространение, видовое разнообразие, морфологические, биоэкологические и фитоценологические характеристики. Установлено, что чально-луговая растительность изучаемого региона состоит из 4 классов формации, 14 групп формации и 39 ассоциаций.

*Keywords:* flora, vegetation, species biodiversity, associations.

*Ключевые слова:* флора, растительность, биоразнообразие, ассоциации.

### Introduction

Rationalization of nature management remains as an important problem of modern science and agriculture. Its solution requires accounting of all natural resources, including plant cover. Meadow vegetation plays a great role, as at treeless grounds namely this vegetation protects soil from erosion, saves water, serves as a source of food for animals [7, 11, 15].

Mil plain is situated between Kur and Aras rivers. It covers southern-western part of Kur-Aras lowland [9, 10]. For this region temperate hot semidesert climate is characteristic, average annual temperature is between 14–20°C, annual precipitation — 332 mm [14]. In the research area it was conducted geobotanical researches at desert, semidesert, hole-meadow and wetland phytocenoses [5, 6]. These phytocenoses are distributed at grey-meadow, marsh-meadow and salted soils [3, 16].

### Materials and research methods

We have conducted research work on hole-meadow vegetation of Mil plain during 2014–2016 years. For classifying of vegetation, we have used generally accepted phytocenological and

ecological approaches. In analysis we have used schemes which prepared by several scientists [12, 13].

Herbariums have been collected during field research and were determined on Askerov [1] and Flora of Caucasus [4] based on systematic taxons; naming of species was given on World Flora Online [17].

### Results and its discussion

Hole-meadow vegetation of Mil steppe is different from desert and semidesert phytocenoses of region with its rich species content. In this region perennial mesophytes dominate [8].

Studying of species content and condition of meadow vegetation serves as the base for rational usage of haymaking and pasture lands and preventing them from degradation. Hole-meadow vegetation of Mil plain belong to intrazonal vegetation distributed at light grey-meadow, grey-meadow, meadow-grey and alluvial-meadow soils. At the researched area this vegetation is represented with 4 formation classes, 14 formation groups and 39 associations. We have used the dominant-determinant method of geobotany [2].

*Hole-meadowlike meadows formation class* is represented with one formation group: Alhagietum - Cynodonosum. Alhagietum pseudoalhagi - Cynodonosum dactylon association of Alhagietum-Cynodonosum formation group is one of the most distributed associations of the freshwater basins of Kur-Aras lowland (Table).

Table.

SPECIES CONTENT OF ALHAGIETUM PSEUDOALHAGI-CYNODONOSUM DACTYLON  
ASSOCIATION WITH DOMINANCE OF *Alhagi pseudoalhagi*

<i>Species</i>	<i>Abundance</i>	<i>Layering, height, cm</i>	<i>Phenological phase (April-May)</i>
<i>Shrubs</i>			
<i>Tamarix ramosissima</i>	1	I, 220	flowering
<i>Licium rutenicum</i>	1	I, 100	flowering
<i>Subshrubs</i>			
<i>Salsola dendroides</i>	1	II, 50	veg.
<i>Undershrubs</i>			
<i>Suaeda microphilla</i>	1	II, 30	veg.
<i>Artemisia szowitsiana</i>	1	II, 40	veg.
<i>Grains</i>			
<i>Hordeum leporinum</i>	1	III, 20	flowering
<i>Cynodon dactylon</i>	1	III, 30	veg.
<i>Alopecurus myosuroides</i>	1	III, 14	flowering
<i>Parapholis incurva</i>	1	III, 10	flowering
<i>Legumes</i>			
<i>Glycyrrhiza glabra</i>	2	II, 40	flowering
<i>Alhagi pseudalhagi</i>	3–4	II, 45	veg.
<i>Different grasses:</i>			
<i>Limonium meyeri</i>	1	III, 30	veg.
<i>Polygonium patulum</i>	1	III, 25	veg.
<i>Cirsium arvense</i>	1	III, 30	blooming
<i>Galium tricornutum</i>	1	III, 35	flowering
<i>Carduus cinereus</i>	1	III, 45	flowering

*Shrubby-perennial grassy meadow formation class* is represented with 7 formation groups: Tamarixeta-Alhagietum-Cynodonosum, Lagonycheta-Alhagietum-Cynodonosum, Tamarixeta-Alhagietum-Aeluropusosum, Tamarixeta-Salsoletum-Alhagiosum, Tamarixeta-Glycyrrhizetum-Artemisiosum, Tamarixeta-Artemisietum-Cynodonosum, Tamarixeta-Artemisietum-Elymusosum.

*Tamarixeta-Alhagietum-Cynodonosum formation group* is represented with 3 associations: Tamarixeta ramosissima-Alhagietum pseudoalhari-Cynodonosum dactylon, Tamarixetum ramosissima-Alhagiosum pseudoalhari, Alhagietum pseudoalhari-Cynodonosum dactylon.

Tamarixeta-Alhagietum-Cynodonosum formation contains 23 species; from them 2 species (8,7%) are shrubs, 1 species (4,4%) — undershrub, 1 species (4,4%) - subshrub, 7 species (30,4%) perennials, 1 species (4,4%) biennial and 11 species (47,7%) annuals; as well as from the same species 9 species (39,1%) are xerophytes, 2 species (8,7%) halophytes, 7 species (30,4%) mesoxerophytes and 5 species (21,8%) mesophytes.

Dominant of this phytocenosis is *Cynodon dactylon* (L.) Pers. with 3-4 points of abundance; subdominant is *Alhagi pseudoalhari* (Bieb.) Fisch. with 2-3 points of abundance and *Tamarix ramosissima* Lebed. with 2 points of abundance. Plant species are in three layers; at the first layer *Tamarix ramosissima* Lebed., at the second layer *Alhagi pseudoalhari* and at the third layer *Cynodon dactylon* (L.). Overage height of plant cover is 30-50 sm; total project cover between 60-80%.

*Lagonycheta-Alhagietum-Cynodonosum formation group* is represented with 3 associations: Lagonycheta farctum-Alhagietum pseudoalhari-Cynodonosum dactylon, Lagonychetum farctum-Alhagiosum pseudoalhari, Alhagietum pseudoalhari-Cynodonosum dactylon.

*Tamarixeta-Alhagietum-Aeluropusosum formation group* is represented with 2 associations: Tamarixeta ramosissima-Alhagietum pseudoalhari-Aeluropusosum repens, Alhagietum pseudoalhari-Aeluropusosum repens.

*Tamarixeta-Salsoletum-Alhagiosum formation group* is represented with 3 associations: Tamarixeta ramosissima-Salsoletum dendroides-Alhagiosum pseudoalhari, Tamarixetum ramosissima-Salsoletum dendroides, Salsoletum dendroides-Alhagiosum pseudoalhari.

*Tamarixeta-Glycyrrhizetum-Artemisiosum formation group* is represented with 3 associations: Tamarixeta ramosissima-Glycyrrhizetum glabra-Artemisiosum Szowitsiana, Tamarixeta ramosissima-Glycyrrhizosum glabra, Glycyrrhizetum glabra-Artemisiosum Szowitsiana.

*Tamarixeta-Artemisietum-Cynodonosum formation group* is represented with 3 associations: Tamarixeta ramosissima-Artemisietum Szowitsii-Cynodonosum dactylon, Tamarixeta ramosissima-Artemisiosum Szowitsii, Artemisietum Szowitsii-Cynodonosum dactylon.

*Tamarixeta-Artemisietum-Elymusosum formation group* is represented with 3 associations: Tamarixeta ramosissima-Artemisietum Szowitsii-Elymusosum repens, Tamarixetum ramosissima-Artemisietum Szowitsii, Artemisietum Szowitsii-Elymusosum repens.

*Hole-saltwart meadows formation class* is represented with 3 formation groups: Artemisieta-Alhagietum-Cynodonosum, Petrosimonieta-Alhagietum-Cynodonosum, Salsoleta-Limonietum-Cynodonosum.

*Artemisieta-Alhagietum-Cynodonosum formation group* has 3 associations: Artemisieta szowitsii-Alhagietum pseudoalhari-Cynodonosum dactylon, Artemisieta szowitsii-Alhagiosum pseudoalhari, Alhagietum pseudoalhari-Cynodonosum dactylon.

*Petrosimonieta-Alhagietum-Cynodonosum formation group* has 3 associations: Petrosimonieta brachiata-Limonietum meyeri-Cynodonosum dactylon, Petrosimonietum brachiata-Limoniosum meyeri, Limonietum meyeri-Cynodonosum dactylon.

*Salsoleta-Limonietum-Cynodonosum formation group* has 3 associations: *Salsoleta dendroides-Alhagietum pseudoalhagi-Cynodonosum dactylon*, *Salsoletum dendroides-Alhagiosum pseudoalhagi*, *Alhagietum pseudoalhagi-Cynodonosum dactylon*.

*Shrubby-perennial grassy hole meadows formation class* is represented with 3 formation groups: *Rubuseta-Glycyrrhizetum-Artemisiosum*, *Phragmiteta-Alhagietum-Cynodonosum*, *Tamarixeta-Phragmitetum-Cynodonosum*.

*Rubuseta-Glycyrrhizetum-Artemisiosum formation group* is represented with 3 associations: *Rubuseta sanguineus-Glycyrrhizetum glabra-Artemisiosum szowitsii*, *Rubusetum sanguineus-Glycyrrhizosum glabra*, *Glycyrrhizetum glabra-Artemisiosum szowitsiana*.

*Phragmiteta-Alhagietum-Cynodonosum formation group* is represented with 3 associations: *Phragmiteta australis-Alhagietum pseudoalhagi-Cynodonosum dactylon*, *Phragmitetum australis-Alhagiosum pseudoalhagi*, *Alhagietum pseudoalhagi-Cynodonosum dactylon*.

*Tamarixeta-Phragmitetum-Cynodonosum formation group* is represented with 3 associations: *Tamarixeta hohenackeri-Phragmitetum australis-Cynodonosum dactylon*, *Tamarixetum hohenackeri-Phragmitosum australis*, *Phragmitetum australis-Cynodonosum dactylon*.

Hole-meadow vegetation of researched area is mainly found as small spots at the place of destroyed tugay forests, in the holes, at the wetted soils.

Edificator of *Alhagietum pseudoalhagi-Cynodonosum dactylon* association is – *Alhagi pseudoalhagi* (Bieb.) Fisch. It is perennial plant 30–70 cm in height. Stem is branched, shoots are naked, green and thin, erect. Lower thorns are 1–2 cm in length, short and hard; others are thin, elastic, grow with slanting direction, the thorns reach to 2–3 cm to the end of summer. Leaves are 5–28 mm in length, 1–8 mm in width, oval or lanceolate. Flowers arrange on thorns with number of 3–8 together. Calyx is bell-like and naked. Corolla is pink colored. Fruit is indehiscent legume, straight or bent, naked and seeds are 1–10 in number. Flowering is in June, fruiting — in July.

*Alhagietum pseudoalhagi-Cynodonosum dactylon* association contains 16 species: shrubs — 2 (11,7%), subshrubs — 1 (5,9%), undershrubs — 2 (11,7%), grains — 4 (23,5%), leguminous — 2 (11,7%), different grasses — 5 (29,4%). From them annuals contain 6 species (35,3 %), perennials — 10 species (64,7%). Total project cover — 50%.

In association the first layer contains *Tamarix ramosissima* and *Licium rutenicum* which abundance is 1, height is 100–220 cm. At the second layer *Alhagi pseudoalhagi*, *Salsola dendroides*, *Suaeda microphylla*, *Glycyrrhiza glabra* are distributed which abundance is 3–4, overage height 45 sm. At the third layer: from grains *Cynodon dactylon*, *Alopecurus myosuroides*, from different grasses *Polygonum patulum*, *Limonium meyeri*, *Cirsium arvense*, *Carduus cinereus* are distributed which abundance is 1, overage height is 10–30 cm.

### Conclusion

Thus, the results of floristic and geobotanical research conducted at hole-meadow vegetation of Mil plain have allowed us to elaborate their classification. It was determined that meadow vegetation type of researched area is collected in 4 formation classes, 14 formation groups and 39 associations. Some of these plants have fodder and medicinal importance.

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