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# Current Vegetation Situation of 'YENI KEND' Reservoir (Azerbaijan Republic) Surroundings

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***Abstract*** **– In this article, information was given about current vegetation situation of reservoir surroundings that established in the area of Yeni kend where the Kura River and its tributaries located in Shamkir district of Azerbaijan. The studies were implemented for the first time and as a result, bioecological, fitosenology structure, productivity and importance of their feed was characterized in detail of current vegetation situation of Yeni Kend reservoir area. It was defined that, as a biotic and abiotic effect results of anthropogenic, technogenic, and various environmental factors to fitosenology in current situation the process of succession has occured due to significant changes of characteristic biotopes (recovery and digression). It was defined for the first time that, in the current vegetation of the area zonary vegetation type is wormwood grove semi-deserts arisen from *Artemisia fragrans* edificator. Steppe and grassland plants that before were prevailing in this area, currently can be found as spots or in interzonary vegetation. It was found out that, surface productivity of phytocoenoses that was dominant in Artemisieta semi-dessert changes between 9.9 s/he and 29.2 s/he depending on humidity of the seasons of the year, also total mass of semi-desert phytocoenoses grown-reduced every year depending on environmental factors. It was recommended to take measures improving the surface for sowing the seeds of valuable forage crops in the areas exposed to degredation and succession in order to protect the natural gene pool of research plants.**

***Keywords*** **– Semi-desert, Succession, Restoration, Digression, Fitocenosis.**

## I. INTRODUCTION

It is known from classical scientific sources that, the information on the current status of plants should be collected, the reduction of their natural resources should be prevented, biological and ecological characteristics of the type of habitat should be studied in order to make benefit from natures [1], [2], [3] These issues were broadly reflected in works of German scientist A.A.Grossheym having a great role in study of Caucasus flora. [4].

There is almost no information about the current situation of most vegetation areas exposed to degredation of reservoirs surrounding areas although some research works were carried out on river banks of Azerbaijan [5], [6].

There happens severe process changes in the soil as a result of the washout due to regular water rise, and this shows its adequate negative impact mainly on the vegetation. Consequently, plant communities on the lands are completely destroyed that are being used for grazing by people for centuries. It also affects the economic well-being of people.Taking into account all of these it was set as main and relevant goal to study current vegetation situation of Yeni Yol reservoir surroundings in modern ecological conditions due to spreading degredation in vegetation and the process of desertification.

## II. MATERIAL AND METODICS

The research was implemented in a route and stationay way in 2014 -2015 in the surroundings of Yeni Kend reservoir located in Shamkir district of Azerbaijan Republic. The object of the study are semi-desert vegetation of the area and collected herbarium specimens. Nearly collected 200 different herbarium material were systematized by defining and was handed over to the herbarium fund stored in the Department of Biology of Azerbaijan State Agrarian University. Generally accepted geobotanical methods [7], [8] were used in the study of the vegetation of the area. Taxas has been identified according to the latest set of " Synopsis of the Caucasus flora" [9] work. The productivity of plant communities has been defined [10].

The north-eastern and central part of the research area is consisted of plains (majority), the southern part is consisted of the mountains. The territory of the region is divided into 4 zones on relief features: sloping plains, foothills and middle mountains. The climatic conditions vary according to these zones.

Dry winter, mild hot, semi-desert and dry desert climate prevails. The average temperature is from -2 ºC to + 2 ºC in January, and is 24-25 ºC in July. The annual precipitation is 300-450 mm. Mountain black, brown mountain-forest, mountain dark-brown, light brown, gray-brown desert and semi-desert, alluvial grassland-forest soi lis spread in the area.

Yeni Kend reservoir is included to Ganja-Gazakh economic region in Azerbaijan, and it is located in the north-west. The area is 1660 thousand square meters. km., and the population is 205 thousand people. The distance between Baku city, capital of Azerbaijan is 400 km, and the distance between Deller railway station and the reservoir is 4 km.

The total area of productive lands in the area is 1245.00 $km^2$, suitable lands for agriculture in the area is 415.00 $km^2$, lands for breeding pasture is 827.00 $km^2$, the total area of land planted is 388.00 $km^2$, and the total area of orchards is 27.70 $km^2$.

## III. EXPERMENTAL PART

The Kura River and its tributaries (Zayam, Shamkir, Jayir) cross from research area. Therefore, Yeni Kend reservoir was established in Shamkir region. Varying

degrees of erosion and significant changes in vegetation occured in connection with fluctuations in water. Generally, detailed geobotanical study of vegetation on any area is key for the creation of scientific gene pool on biodiversity of the flora and vegetation of its.

The carried research of vegetation shows that, in modern conditions wormwood plants give vegetation background and do edification. The type of plants forming the zonary in the area is *Artemisieta fragransetum* semi-desert. Also, steppe, desert and grassland groups are found on vegetation in interzonary and local forms. Observations showed that, succession occured on vegetation in *Artemisieta*, *Ephemereta*, *Alhagieta* and *Peganate* fitocenoseses due to environmental and anthropogenic factors and plant groups are replaced with each other. It was defined that, *Artemisia fraqrans* type that is extensive natural habitat and continuous fitocenos formed with the dominance of *Artemisieta* formation. *Artemisieta*, *Ephemereta*, Salsoleta-efemeretum, *Peganate-alhagietum*, *Ephemereta-artemisium*, *Artemisieta-efemeretum–peganate* groups get wider areas in taxonomic composition of the research fitocenoses. The mentioned plants forming the the fitocenoses mass of feed fitosenozların are consisted of different life forms and feed groups. Their flora composition is rich with valuable forage crops.

*Bromus yaponicus* Thunb., *Anisanta rubens* (L.) Nevski, *Lolium rigidum* Gaudin, *Eromopurum orientale* (L.) Jaub. et Spach, *Hordeum leporinum* Link), *Avena clauda* Durieu., ephemeras *Poa bulbosa* L.) and *Gagea fibrosa* (Desf.) Schult.et Schult.fil. including in Ephemera group are dominant and subdominant in desert vegetation of the area. Salsoas and annual long vegetation salsoas in different plant groups: *Salsola crassa* (Bieb.) Botsch., *Petrosimonia brachiata* Pall. and etc.; annual long vegetation from different plants *Peganum harmala* L., *Alhagi pseudoalhagi* (Bieb.) Desv., *Artemisia fragrans* Wild and *Salsola dendroides* Pall. from shrubs are often found in the flora composition of fitocenoses.

As a result of studies that have been conducted before establishment of the reservoir, although grassland, steppe and xerophytes plants spread in the area [3], currently the elements of desert and semi-desert are found only as a result of strong degredation.

1 plants type, 3 formation, and 10 association were defined for the current vegetation of the area and their taxonomic classification was designed and illustrated:

Type: Semi-desert

Formasiations: *Artemisieta fragrans*

Associations:

Ass. 1. Pure *Artemisia fragrans.*

Ass. 2. *Artemisia fragrans + Ephemeretum.*

Ass. 3. *Artemisia fragrans+Alhagi pseudoalhagi.*

Ass. 4. Several herbs- *Artemisieta* (*Artemisia fragrans+ Xantium strumarium + Senecio vernalis + Cartamnus oxyacantus + Capparis spinoza + Centaurea solsitalis)* and etc.

Ass. 5. *Artemisia fragrans + Ephemeretum + Salsola dendroides.*

Form: *Alhagieta psedoalhagi*

Ass. 1. *Alhagi psedoalhagi*

Ass. 2. *Alhagi psedoalhagi + Ephemeretum + Salsola dendroides + Alhagi psedoalhagi*

Ass. 3. *Hordeum leporinium + Cartamnus oxyacantus + Centaurea solsitalis + Alhagi psedoalhagi.*

Form: *Peganate harmalai*

Ass. 1. Efemerta - *Peganatum (Bromus yaponicus + Hordeum leporinium + Poa bulbosa + Peganum harmala).*

Ass. 2. Herbosa - *Peganatum* (*Atriplex tatarica + A.turcomanica + Capparis spinoza + Centaurea solsitalis + Euphorbia alepica* and etc.).

1 plants type - wormwood semi-desert, 2 formation – (*Artemisieta fragrans and Peganate harmalai)* and 7 associations; *Artemisia fragrans, Artemisia fragrans + Ephemeretum*, *Artemisia fragrans + Alhagi pseudoalhagi, Artemisia fragrans + Xantium strumarium + Senecio vernalis + Cartamnus oxyacantus + Capparis spinoza + Centaurea solsitalis, Artemisia fragrans + Ephemeretum + Salsola dendroides, Bromus yaponicus + Hordeum leporinium + Poa bulbosa + Peganum harmala, Atriplex tatarica + A.turcomanica + Capparis spinoza + Centaurea solsitalis + Euphhorbia alepica* and etc., mentioned above are also typical for Shamkir district.

All of the cenoses in vegetation has 2 and 3 storey geobotanical structure. It varies between 60-80% in fitocenoses due to the project cover, the environmental and anthropogenic factors. Floristic composition is poor, it consists totally 90 plant species only. The most common species in flora are *Asteraceae, Chenopodiaceae, Poaceae and Capparaceae* family representatives. Other families were established from minority species.

The studies were conducted for the first time in the modern context main crop type of the area is *Artemisieta* semi-desert. Previously, dominant plant types of steppe and grassland currently are found as spots or salsola mix. Wormwood is also widely used in animal breeding as winter pasture.

The rapid development of pastures, as well as high productivity is dependent on the amount of annual precipitation, their distribution per seasons and months and anthropogenic factors. So in 2014, the year of vegetation was characterized by unfavorable climate changes. A decrease in rainfall in the autumn and winter seasons, showing a negative effect on pastures by the end of May, delayed development of the plants. The bulk of productivity of area cenoses consisted of wormwood and salsolas. There were poor development in other food groups (grains, various grasses and legumes). For these reasons, in a result productivity per year in these cenoses was significantly low, like 6,5-8,2 cents/ha/.

Mainly in desert cenoses the main part of the food supply obtained from annual grain herbs. They contane 60, 2-80, 7% of net product in ephemeral cenoses dependent on annual climate conditions, *Artemisia fragrans + Ephemeretum* contane 55,5-67,6%, and *Ephemeretum + Salsola dendroides + Artemisia fragrans* contane 38,9-58,8%.

However, there was sparse because of high erosion, some valuable crops have been destroyed and spoiled. As a result, toxic and inedible plants relatively increased in

the pasture.To this end, vegetation in fitocenoses should be improved by spreading valuable forage grass seed, there should be proper grazing and the plants should be protected.

## IV. RESULTS

1. Bioecological, fitosenology structure, productivity and importance of their feed was complexly characterized in detail of current vegetation situation of Yeni Kend reservoir area for the first time.
2. It was defined that, as a biotic and abiotic effect results of anthropogenic, technogenic, and various environmental factors to fitosenology in current situation the process of succession has occured due to significant changes of characteristic biotopes (recovery and digression).
3. It was defined for the first time that, in the current vegetation of the area zonary vegetation type is wormwood grove semi-deserts arisen from *Artemisia fragrans* edificator. Steppe and grassland plants that before were prevailing in this area, currently can be found as spots or in interzonary vegetation.
4. It was found out that, surface productivity of phytocoenoses that was dominant in Artemisieta semi-dessert changes between 9.9 s/he and 29.2 s/he depending on humidity of the seasons of the year, also total mass of semi-desert phytocenoses grown-reduced every year depending on environmental factors.
5. As a result of conducted studies on research area plants in *Artemisieta* semi-deserts that is considered the winter pastures the vegetation exposed to degredation, productivity decreased, useful plants were under threat of extinction within the composition of pastures due to anthropogenic and environmental factors.
6. Based on the results, we consider it appropriate to carry out the following recommendations and proposals in order to maintain, improve and enhance productivity of the natural gene pool of research plants: It was recommended to take measures improving the surface for sowing the seeds of valuable forage crops in the areas exposed to degredation and succession in order to protect the natural gene pool of research plants.

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