Bioecological Characteristics and Natural Regeneration of Gum Tree (*Pistacia Mutica* F.et. M.), Relict Plant of Eldar Pine State Natural Reserve

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Abstract:

Eldar Pine State Natural reserve is an area with status of protection and benchmark survey department established in Samukh administrative region by a decree № 350 of the President of Azerbaijan Republic December 16, 2004. The main purpose of establishment of the reserve is to protect the nature and to study growth dynamics of flora, in order to preserve natural state of Eldar pine forests in Eldar slot area, the only land of biodiversity of genetic fund, forest diversity, environmental systems, typical and rare natural complexes and objects (juniper, gum tree, Eldar pears etc.) in the world. Eldar Pine State Natural Reserve is only reserve of Azerbaijan where anthropogenic impact is not found. The area is protected by border-guards, as it is located in Georgia-Azerbaijan border. Presently the area of Eldar Pine reserve is 1686 ha.

Key words: Pistacia mutica, relikt, xerophyte, sparse forest, pitch.

Introduction:

Eldar plateau is located in the northern and north-western part of Samukh administrative region, in the west of Azerbaijan. Eldar slot, the area of Azerbaijan-Georgia, is located in the east from Chobandagh ridge (892 m), in the west from Mingachevir reservoir, in the right bank of Iori (gabirri) river. Eldar steppe is referred to Jeyranchol-Bozdagh region while geobotanical division of the territory of Azerbaijan.

The relief of Eldar plateau consists of arid-denudation mountains (low, partially moderate, mediumly fragmented, wrinkled, low and moderate, intensively fragmented, wrinkled ridges and divisions) and accumulative plains. (B.A.Budagov). Here arid-denudation mountains mainly contains of badlands and loamy karsts.

The highest peak of Eller slot ridge is 450-710 m. Chobandagh is located in absolute height of 892 m. Palantokan ridges (406) of low mountains made an orographic complexity in Eldar mountain nature. In the region of survey it was found out spreading of lands of brown mountain-forest, chestnut and light chestnut, gray-meadow and meadow-gray lands of Eastern Transcaucasia and mostly saline lands. Steppe climate with mild winter and hot, dry summer is dominant in the area.

Figure 1 Study area

Research material and methods:

The first planned research work of flora and vegetation of Eldar desert has been conducted by us in 2006. In survey of flora and vegetation of Eldar desert, classical and geobotanical reserch materials (A.A.Grossheym, 1926, 1930; L.G. Ramenski, 1937, 1971; A.P. Shennikov, 1935, 1938, 1950; P.D. Yaroshenko, 1961; L.E. Rodina, 1958, 1961; L.I. Prilipko, 1977; V.J. Hajiyev, 1974; V.J.Hajiyev, O.I. Yevstratova, 1982) have been used. The research work has been conducted by detail-route method and halfstationary, biomorphological description of

collected materials in cameral environment and through assignments. The research works of deserts have been conducted on 7 routes during 168 days in spring, summer and autumn months of every survey year. More than 1000 herbarium samples have been developed and 213 geobotanics has been described. Geobotanical descriptions have been carried out each kilometer depending on relief and characteristics of vegetation in sample sites on route. In every sample site described, there have been considered name and size of site,relief, species, total projectice coverage, abundance, phenophase and vital situation. Desciption of geobotanical profiles has been conducted as well as the description of sample sites.

Mostly as the description of the profile is nearly the same with the description of sample site, there has been conducted a new description. On the basis of references, herbarium samples and research materials, characteristics of vegetation of the site have been analyzed and within the boundaries of this area there have been found out spreading of 406 higher plant species referring to 4 classes, 19 rows, 56 families, 195 genders.

There are many types of plants in Eldar desert typical for Azerbaijan. They are mostly deserts, semi-deserts and steppes. However, arid sparse forests, bogged meadows and grassy wetlands are limitedly found in such research region. Vegetation of Eldar desert is characterized by specific features. It has reached to the modern level through the long way of evolution. Some species are developed in wide areas and some in small ones. Such a fundamental difference is primarily reflected in desert and semi-desert plants.

The area is very interesting with its relikt plants. Relikt plants have a main role in modern flora and vegetation as it has a high range adaptation. It is due its some biological characteristics, durable hugh productivity, length of vegetation, ability of shooting, less exactingness to soils. Among relikt plants Pinus eldarica, Juniperusfotedisima, punica granatum, pistica mutica efidra, etc can be mentioned.

One of the most important condition of solidity and sustainability of biocenosis as well as their ability of self-regulation is species diversity of plants in nature. That's why each biological species is environmental factor in phytosenoz. Lack of necessary information about their number and reserves creates difficulties in organization of their protection. Aliyev J.A. 2008. In this regard gum-tree (Pistacia mutica) is very important in Eldar desert. As it is a xerophytic plant, Gum tree (Pistacia mutica) plays an important role in sustainability in the formations gained from different geological ages with typical characteristics related to continentality of climate (Isgandarov E.O.2010).

It is a tree with corona and in the shape of ball with the height of 6-10 (15) meter and diameter of 60-70 cm. After damage or cutting of the main body it gains the shape of bush. The diameter of the body is nearly 1-1,35 m and its surface is covered with deep pleated, grey-brown bark. Bark of body branches is ash-grey and bark of shoots is reddish brown. Its leaves are falling, single-featherlike or complex. It blossoms out after leafing out and is 3/5-7/9 leafy. Its upper part is hairy, with narrow-winged stalk. It is two-storey plant. Its fruits are broom-shaped.

Normal fruiting is recorded in 20-25 aged trees. Old gum trees have straight branched tight corona and good shadow. Rich fruiting of gum-trees as a rule is observed once a year or every 3-4 years. Its fruits are on broom-shaped bunches, its ripening period occurs gradually and get reddish color.

Gum tree is slow-growing and perennial tree. It lives nearly 800-1000 years. It is light-loving plants and has ball-shaped and decorative appearance. Gum tree is a plant withstanding high temperature (40^0), winter frosts (-300) and powerful winds.

The wood of gum tree is hard, heavy, tight, pleasant scent and beatiful framed and smoothing.From the end of May till the end of October, gum tree produces gum with scented oil of nearly 80-100 grammes. The pitch, in dried form and like gum, is used in varnish,

paint and pharmaceutics industry. As its fruits contain 60 % oil and 25,69% nitrogenous substances, it is used in feeding of animals and taking engineering oil. Its fruits are collected as fodder for pigs. They are used roasted. It is a perennial, drought-resistant and light-loving plant. It has a long root system through deep layers of land and fixing it. It is heat-resistant and less demanding for land.

During the research work natural regeneration of gum tree in Eldar Pine State Natureal Reserve. For this purpose, depending on the age and thickness of grove in permanent sample areas the process of natural regeneration has been observed and number of sprouts were controlled in 2009-2012.

Regeneration of gum-tress in Eldar Pine State Natural Reserve depends on a number of factors. Among these factors, we can mention productivity of seeds, climatic conditions, humidity of soil, zoo factors, grassy cover of land. Natural regeneration in gum-trees is mainly observed in female trees. On the eve of ripening of seeds there is observed strong winds.Therefore, natural regeneration of gum-tress is observed both in open areas and under male trees. There are sprout out seeds stratificated in definite condition. So natural regeneration is stronger where forest substrate is found. Sample areas are in 0,3 density in young grove (nearly up to 25-30 age) and 0,3 – 0,5 and 0,8density in middle-aged grove (56-60 aged). Besides, the process of natural regeneration has been studied in the grove with 80 and 150 average age and 0,3 density.

Natural regeneration of gum-trees in Eldar Pine State Natural Reserve is unsatisfactory as a result of growth of grass cover, increasing of turfing process and non-suitability of climatic condition. Natural regeneration is extremely weak in young and old trees. The process of natural regenration is satisfactory in case of 0,5 density in middle-aged grove.

In low-crowded grove, beams of light reaches the surface of land, heats it, humidity decreases and adolescents are destructed. Firstly, the upper part of young tree and then the root is dried. If a gum tree needs a shadow of grass cover in the first year, it should absolutely get light in 3-4 years. In this condition, the height of sprouts is 5-6 cm. Grass cover is 40 cm. In this case the sprouts are either destructed or there is occured fresh shoots in sleeping seeds. This destruction is observed every year. It continues till the time that its root grows well. We can find 5-6 aged adolescents. Crowdness of trees should be 0,5 for normal growth of adolescents.

Thorn bushes are found in gum-tree grove and it plays a role of defense for their sprouting out. The ability of sprouting out is studied in 100-150 old trees. Gum-trees make a free-form structure with juniper-trees, Eldar pines in xerophytic sparse forest in Eldar Pine State Natural Reserve. Unlike gum-trees, juniper trees have no ability to sprout out.So when a juniper tree is destructed it prevents erosion of gum-tree soil or by sprouting out it increases sustainability phytosenoz it generates.

During the research work, plant formations that gum-trees create in xerophytic sparse forest of Eldar Pine State Natural Reserve (Prilivko L.I. 1970). Xerophytic sparse forests have deep botanical-geographical roots.

Taking into account botanical composition of xerophytic sparse forests in Eller slot mountain, bioecological characteristics of species and natural condition of the area, these types of plants are divided into two classes: evergreen and shedding leaves arid sparse forestry.

Evergreen arid sparse forestry. It occupies main site in the area. There are mainly juniper trees and pine species in this forestry. They form mixed forests in large areas and fully forestry in smaller areas. Here is spread only 1 species of pine (Pinus eldarica) and 3 species of juniper-tree (Juniperus foetdissima, J. Oblonga, J. Polyjarpos). As it is known these species are evergreen. Here are formed species of Ephedra too. Grassy steppes are also found in this area.

Arid sparse forestry with shedding of foliage are spreading out in western and northern slopes of Eller slot mountain. Dry bushy gum-tree formation. In this kind of senoz Pinica, granatium, Berberis iberica B. Vulqarus, Pyrus

eldarica, etc have been spread out. Gum-tree and juniper –tree sparse forests. In this formation is rich with trees and bushy plants, and grassy plants have rich species.

As gum –trees play leading role in senoz, spread out a wide area and due too its biological characteristics, they are indispensable for species adjacent to them.

Gum trees are also found mixedly in Tugai forests, on the bank of Iori river. The growing condition is characterized as contrasting humidity regime in Tugai forests in Eldar Pine State Natural Reserve. Thus, soil humidity is excessive related to floods in spring, however, in summer a lack of humidity is observed after absorption of water. So here is exposed to humidity changes from wet swamps to drought in vegetation. White poplars, elm trees, oleaster trees, willow trees, etc bear for these changes of humidity in this way. Gum trees oak and buble formation on the precipitous edge of river bed. Underground water is in very deep in river precipices where gum trees spread out. Completely disappearing of anthropogenic impacts in recent years, Arundo donax rapidly spread out the borders of semi-desert and Tugai forests and it makes the area impenetrable. As Arundo donax has a strong ability to shoot, it has negative impact on natural regeneration of gum-trees. Adolescents and young trees are very rare in these areas.

Resume:

The article is about bioecological characteristics of Pustacia mutica, one of the relikt plants in Eldar Pine State Natural Reserve, natural regeneration ad formation. The research works revealed that natural regeneration of Gum-tree is weak either in arid sparse forestry or in riparian forests.

References

Prilipko L. I. (1970) Plant cover of Azerbaijan "Science" publication, p. 121-122.

Aliyev J. A. Akramov Z.I. Mammadov A.T. (2008) Biological diversity. Baku: "Science" publication. P. 88-89.

E.O. Iskender. Promection Rare and disappearing trees and bushes of Azerbaijan and the analysis of us condimion transactions of saciety of Azerbaijan Botanists volume I t. 2010-25-28.