

## Vegetation of Plain Azerbaijan and Its Use

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### ABSTRACT

Results of ethnobotanical investigations carried out in the plain botanical-geographical regions of Azerbaijan (Kurdamir, Agdash, Goychay, Ujar, Hajigabul) have been shown in the paper. 120 associations are registered, which are the taxon's belonging to 46th families, which are concentrated in 4 plant types (semi-desert, water-wetland-oasis, forest, alluvial-meadow) in the area flora. *Poaceae* by 21 species is superior to other families and 14 of them are using for their useful properties. Local herbs are used by local communities to treat diarrhea, ear pain, warmth, jaundice, flu, cough, and skin diseases. In addition, snake bites, healing of various wounds in the body, and burns are healed by domestic herbs. The area flora along with medicinal plants also is used for food, feed, fuel and technical purposes. Arid forests are rapidly spreading in the area. However, efforts and knowledge of keeping the plant are on the first stage. Megalophytes and terophytes are more in the area. Hemicryptophyte, nanophanerophyte and geophytes plants come in after them. All types of greenery in arid and longevity forests of the area flora are dependent on the participation of trees. This research can be a cause of progress in the field of plant phytochemistry, molecular biochemistry and microbial biology in study of the second metabolites of plants. Ethnobotanical work is very important for these scientific studies, because a great age-old experience comes to light.

**Key words:** Ethnobotany; plain areas; use of plants.

### INTRODUCTION

The focus of the development of humanity lies in the fact that the natural environment, interaction nature and society, the protection of the environment, the effective use of natural resources, the negative impact of human activity on the environment, and the focus on the development of dynamic and ecotourism in the existing natural systems. These problems have been regulated on the state level (Decree of the President of the Republic of Azerbaijan, 2001), as well as in the scientifically education in the Azerbaijan Republic [Aliyev et al., 2008; Mehdiyeva et al., 2008; Ibadullaeva et al., 2017; Munir et al., 2018; Gasimov et al., 2018]. Violation of the ecological balance in

natural systems is mainly reflected in plain areas.

Ethnobotany is a science that learns the relationship between plants and humans: "ethno" - learning of people and "botany" - study of plants. Ethnobotany explores complex relationships between plants and cultures used. The purpose of ethnobotany is to cover how plants are managed or integrated into human society - such as building materials, tools, clothing, food, medicine, cosmetics, dyeing and weaving in public life. Ethno-botanical information is up to human civilization, that is, ancient, but the term "ethnobotany" was first developed by the American botanist John Harshberger [1896]. Manilal [1989] designates ethnobotany today to express the entire

spectrum of direct relationships between plant and man. According to Arora [1997], ethnobotany is understood in a wider context, meaning the entire area of useful relationships between plant and human.

In our opinion is possible to learn more about the desert and semi-desert phytocenosis by an integrated approach. Use the same methods for the efficient use of herbicides, their protection and rehabilitation on the basis of the existing disadvantages are important first of all. All these considerations are aimed at the classification of plants by studying, protecting and rehabilitating the terrestrial condition of Azerbaijan's plain lands and conducting ethnobotanical investigations.

## MATERIAL AND METHODOLOGY

The study is carried out in 2019. The area was carried out in the plain territory of Azerbaijan's – next botanical-geographical districts (Kurdamir, Agdash, Goychay, Ujar, Hajigabul). Field surveys cover all parts of the area by the route method. Up to 100 herbarium materials were collected as a result of the research.

Interviews were conducted in the research area by up to 90 persons (Figure 1). Information about plant using by indigenous people in veterinary medicine, bee-keeping, children's and adolescents' diseases, including wild foods, vegetables, fragrant and technical uses was used in accordance with ancient traditions (salting, melting, cooking, drying, keeping, etc.) have been collected. Interviews were used by commonly used methodologies [Guber, 2001; Martin, 2001]. The research area was recruited for 10 days to collect plants from different parts of the region. The local names of the plants and plant parts (organs) used by local communities were recorded. Negotiations were held with local residents in different villages to mark local names. The height of the samples and other settings were obtained via GPS. Collected herbariums were inscribed and found in Herbarium of the Institute of Botany of ANAS. At the same time, raw materials

were collected to study the scientific basis of the methods of using plants (1-2 kg of dry weight of all species).

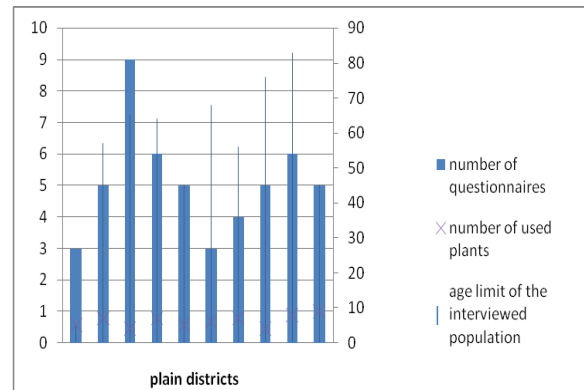


Figure 1. Assessment inquiries among human populations

The life form of plants was classified according to the Raunkiaer system (1934). Danish Christen Christensen Raunkiaer has developed a classification system for the durability of flowering plants in adverse time of the year. The Raunkiaer system is based on incremental points that renew or increase plant growth. Raunkiaer's life forms are as follows:

- I. Phanerophytes: leafy trees and herbs that end in long-term, forest or grassland with shoots of more than 25 cm above soil surface. Phanerophytes are also divided into mesaphanerophytes, mezophanerophytes, microphanerophytes, and nanophanerophytes.
- II. Hamephytes: low-haired herbs that can preserve the seeds that are not less than 25 cm above the soil surface by leaves or snow.
- III. Hemicriptophytes: herbs and rosette plants protected by hull and leaves on the soil surface.
- IV. Geophytes: An unhealthy environment is Perennial floristic plants are underground or underwater in the form of bulbous or nodule.
- V. Terophytes: Plants that survive seeds in the soil under unbearable periods, which complete the whole life cycle of seeds during a year, one season.

Other special life forms that are not classified according to their hump are systematized for the leaf: Succulents, Halophytes, Epiphytes, etc.

## EXPERIMENTS AND CONCLUSIONS

Important to study the flora and herbiculture of the region and, in particular, to investigate ethnobotics and to discover new ways and means of using plants are more actually in the plain territory of Azerbaijan has been exposed to acute anthropogenic activity. Intensive use of eco-systems leads to natural ecological situation, destroys the desertification are negatively affects the structure of the vegetation. Special attention should be paid to the prevention of any adverse effects in the wilderness and the surrounding eco-cities, especially as the winter pasture area. The quality of this pasture is high quality of food and is cheaper, which is very important for the Republic. On the other hand, the early spring flora of the area is rich by nutrients and medicinal plants, and people are widely used them. In winter, spring and summer (in plain areas) and in the lowlands, migratory cultivation has been used as fossil fuels. This plain area is also one of the most promising territories. Significant growth of farming and agriculture over the last years

leads to the loss of productivity of pastures and grasses, shrinkage of soil, deterioration of product quality, pumping of humus, desert and dry steppe fossils.

Unplanned livestock grazing on this territory and overload are cause of soil erosion, formation of paths without plants, and as results all these processes negative influence on the pastures and in the same time large part of soil are degraded and make changes in plant and soil cover. On the other hand, plants are harvested for different purposes or reduced by gallstones.

Information about more than 70 plants was collected during the survey. A catalog about this has been prepared. Some examples of the survey questionnaires carried out are presented in Table 1. As shown from the table, in these area meets Higher spore (*Equisetum arvense*), Monocotyledonous (*Avena sativa*, *Agropyron repens*) and also Dicotyledons (*Plantago lanceolata*, *Achillea nobilis*, *A.bibersteini*, *A.millefolium*), and also trees and bushes (*Juniperus sp.*) use as medicinal and food plants.

## Questionnaire

Table 1.

Districts	Goychay district, sub-forest areas	Goychay district, Garayazi village	Hajıqabul district Udulu village	Kurdemir district, Garabucaq village	Agdash district, near Turynchay	Ucar district, Melikballi village
Question	2	3	4	5	6	7
Local name	Horsetail	Oats	Wheat-grass	Plantain	Juniper	Yarrow
Latin name	<i>Equisetum arvense</i>	<i>Avena sativa</i> L.	<i>Agropyron repens</i>	<i>Plantago lanceolata</i>	3 species of <i>Juniperus</i>	3 species of <i>Achillea</i>
Using	From the Middle Ages	From very ancient time	Last time	From ancient time	From very ancient time	From ancient time
Developing phase	Young virginal	Dry plant and seeds	Surface and fatty acids	Leaves and stems at all times	Young virginal leaf and fruit	In a reproductive period, blossoms
Using for food	Not using	Dried as food and adds warm meals in the winter.	Not using	Not using	The fruit is in the preparation of various dishes	Young stems of <i>A.nobilis</i> use in national food "Dovga"
Ecological plants	In forest, near edges the river	In meadows	Distrib everywhere	It spreads along the edges of the river	In woods, in humid soils	Along the edges of the river
About Cultivation	No cultivation	Cultivated	Used for greening	Introduction	Cultivated in yards	Not cultivated
Using for feed	Unusable	Good feed for animals. Heyvanlar, for wild and domestic birds, ducks	Good feed for animals and birds, added to silage	Silage is prepared, eaten in pastures, increases animal's meat and milk	Not using	Using as feed
Using for medicinal	Inflammation of the urinary bladder and kidneys. Wound healing, blood susceptible, astringent	Skin and urticaria are hilarious and irritating. It develops and renews the movement of the kidneys.	The juice and root juice using in the broth and pneumonia	Leaf and stomach are used for stomach intestinal infections and wound in the wound.	Using in blood clotting and internal bleeding.	In gastrointestinal illness, diarrhea is consumed.

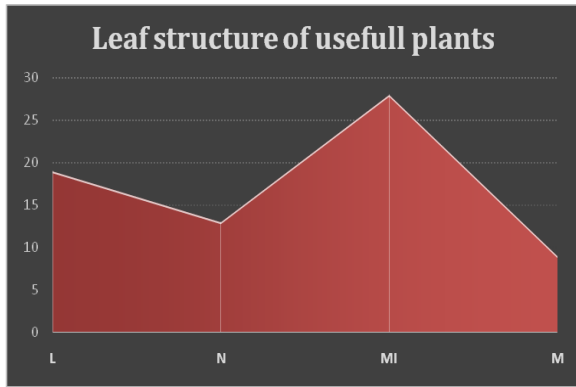


Figure 2. Quantite of plants (Motley grass)

As can be seen from the figure Microphyle (Mi) plants are more common. Leaf sizes in them are moderate (between 0.25 cm<sup>2</sup> and 2.02 cm<sup>2</sup>). 11 species of Megafilose plants are more than 2 species of

nanophanerophytes (9 species). These are only the using wild grasses.

Note: Classess according leaf size. Table 2

No	Leaf size according classess	Symbol	Diaposon
1	Leptophyl	L	Less than 25mm <sup>2</sup>
2	Nanophyl	N	Beetween 25x9mm <sup>2</sup> - 25mm <sup>2</sup>
3	Mikrophyl	Mi	Beetween 25x9x9mm <sup>2</sup> 25x9mm <sup>2</sup>
4	Megaphyl	M	Up 25x9x9mm <sup>2</sup>

In addition to the ethnobotany investigations, terrestrial herbs were analyzed and phytocenological investigations were performed in the areas of livestock and winter grazing (table 3, table 4).

Table 3. The tier of plantation in the area

Tier	The name of the main plants producing the tier	projective cover, %	Medium altitude (cm)
Plant location and use in arid areas			
I	Subshrub Sea blite	10-20	40-70
II	Fragil Pea tree// Peashrub	20-40	20-60
III	Ephemers	40-60	10-30

Table 4. The phytocenological structure of the vegetation (winter pasture areas)

№	Plant species	Abundance (by ball)	Altitude (by cm)	Phenology phase
Goychay district, Garayazi village				
1.	Jerusalem thorn	3-4	150-200	Vegetation
2.	Hemointercepted Bluestem	1-2	30-40	Flowering
3.	Aegilops	1-2	15-20	Flowering
4.	Fragrant wormwood	2-3	10-15	vegetasiya
5.	Eastern Germander	1-2	5-15	Flowering
6.	Georgian Knapweed ( Cornflowered)	1-2	15-20	Flowering
7.	Peganum//Burial ground	1	20-40	Vegetation
Hajigabul district Udulu village				
8.	Subshrub Sea blite	2	40-70	Vegetasiya
9.	Treelike Pea tree// Peashrub	1-2	30-60	Vegetasiya
10.	Fragil Pea tree// Peashrub	1-2	20-40	Vegetasiya
11.	Shober Nirobush//Nitraria	1	40-80	Flowering
12.	Reddish Brome-grass	3-4	15-30	Flowering
13.	Harel barley	2-3	10-20	Flowering
14.	Eastern Eremopyrum	1	5-10	Flowering
15.	Small Canary grass	1-2	10-15	Flowering
16.	Couch grass	1	5-10	Vegetasiya
17.	Japanese Brome-grass	1	5-8	Flowering
18.	Fragrant wormwood	1	15-20	Vegetasiya
19.	Boughy petrosimonia	2	5-15	Vegetasiya
Kurdemir district, Garabujag village				
20.	Multibranch tamarisk	1	100-150	Flowering
21.	Eastern Eremopyrum	3-4	5-10	Flowering
22.	Coastal Aeluropus	1-2	10-15	Flowering
23.	Creeping Wheat-grass	1	5-10	Flowering
24.	Ordinary Camel's -thor// Tickseed	1-2	40-60	vegetasiya
25.	Boughy petrosimonia	2-3	5-10	vegetasiya
Ujar district, Malikballi village				
26.	Caspian Halostachys	2	70-100	Vegetation
27.	Caspian Potash plant	1	40-60	Flowering
28.	Subshrub Sea blite	1	20-50	Flowering
29.	Boughy petrosimonia	2-3	10-20	Vegetation
30.	Fleshy saltwort	1	5-10	Vegetation
31.	Goat grass (Aegilops)	1	40-80	Flowering
32.	Eremopyrum	1	50-80	Vegetation

The distribution of plants in the territory is not the same. More than 40 families have been recorded in the region's in results of floristic analysis, with *Poaceae* dominated by 14 species (table 5). Cereal-legumes have a special place in the area flora; they are used both as food, feed and medicine. The *Solanaceae* family is the second in this category by 7 species. *Rosaceae* is in the third place by 6 species. *Alliaceae*, *Amaranthaceae*, *Asteraceae*, *Brassicaceae*, *Euphorbiaceae* families presented each by 4-5 species. *Apiaceae*, *Liliaceae*, *Malvaceae*, *Anacardiaceae*, *Boraginaceae*, *Fabaceae*, *Lamiaceae* families each by 3-4 species, and more than other 20 families by 1 species. Each of the chapters of *Apiaceae*, *Liliaceae*, *Malvaceae*, *Anacardiaceae*, *Boraginaceae*, *Fabaceae*, *Lamiaceae* is represented by 3-4 varieties, and more than 20 chapters represent only one species. Fruit trees, including berries are widely used in the area flora (Table 6).

Table 5 The main crops of plain lands

	Botanical latin name	Family	Local name	Using
1	<i>Hordeum bulbosum</i> L.	<i>Poaceae</i>	Barley	Feed
2	<i>Triticum aestivum</i> L.	<i>Poaceae</i>	Wheat	Food
3	<i>Cicer arvensis</i> L.	<i>Fabaceae</i>	Pea	Food
4	<i>Zea mays</i> L.	<i>Poaceae</i>	Corn	Feed, food
5	<i>Avena barbata</i> Pott ex Link.	<i>Poaceae</i>	Parkinosia	Feed, food
6	<i>Glycyrrhiza glabra</i> L.	<i>Fabaceae</i>	Licorice	Medicinal
7	<i>Vicia angustifolia</i> Reichard	<i>Fabaceae</i>	Lace	Medicinal, food
8	<i>Eragrostis minor</i> Host	<i>Poaceae</i>	Sugar cane	Technical
9	<i>Phragmites altissima</i> (Benth.) Nabile	<i>Poaceae</i>	Sting	Technical
10	<i>Parkinasonia aculeata</i> L.	<i>Fabaceae</i>	Parkinson's	Technical
11	<i>Secale chalidicum</i> Fed.	<i>Poaceae</i>	Rye	Feed, food
12	<i>Phaseolus vulgaris</i> L.	<i>Fabaceae</i>	Lobby	Food, medicinal
13	<i>Aegilops crassa</i> Boiss.	<i>Poaceae</i>	Wheat	Feed
14	<i>Oryzae</i> L. (sp.)	<i>Poaceae</i>	Rice (paddy)	Food
15	<i>Glycine max</i> (L.)Merr.	<i>Fabaceae</i>	Soybean	Feed, technical
16	<i>Poa angustifolia</i> L.	<i>Poaceae</i>	Sweat, teeth, grains	Feed, food
17	<i>Sorghum halepense</i> (L.) Pers.	<i>Poaceae</i>	Stay, broom	Technical
18	<i>Acorus calamus</i> L.	<i>Poaceae</i>	Kajajar	Medicinal
19	<i>Arum consobrinum</i> Schott	<i>Poaceae</i>	Gadab	Food
20	<i>Panicum miliaceum</i> L.	<i>Poaceae</i>	Millet	Feed
21	<i>Pisium sativum</i> L.	<i>Fabaceae</i>	Blue peas	Food

Table 6. The main fruits of plain lands

	Botanical latin name	Family	Local name
1	<i>Morus alba</i> L.	<i>Moraceae</i>	White mulberry
2	<i>Morus nigra</i> L.	<i>Moraceae</i>	Black mulberry
3	<i>Ficus carica</i> L.	<i>Moraceae</i>	Fig
4	<i>Punica granatum</i> L.	<i>Punicaceae</i>	Pomegranate
5	<i>Prunus divaricata</i> Ledeb.	<i>Rosaceae</i>	Plum
6	<i>Pyrus caucasica</i> Fed.	<i>Rosaceae</i>	Pear
7	<i>Sorbus persica</i> Hedl.	<i>Rosaceae</i>	Mountain ash
8	<i>Malus orientalis</i> Uglitzk	<i>Rosaceae</i>	Apple
9	<i>Crataegus monogyna</i> Jasq.	<i>Rosaceae</i>	Horsemeat
10	<i>Juglans regia</i> L.	<i>Juglandaceae</i>	Walnut

## DISCUSSION

Plants serve a number of vital functions in the biosphere. Some control the biogeochemical flow; plays important role in local and global energy balances. Secondly, plants due to the chemical composition have a strong impact on soil properties. Thirdly, they serve as a source of wildlife and energy for most of the animal

species on the planet. Plants using as fossil fuels are especially energy sources and have critical role for the world economy. Perhaps the most important of all is the primary source of oxygen in the atmosphere and allows the development and continuation of aerobic metabolism systems. Finally, herbal medicines and foods are also psychologically important for people and animals that are directly in contact with plants, trees, fuel, shelter and in medicine. The use of plants for human beings is the experience of human populations. The use of plants and the accumulation of knowledge about them are developing together with human culture from generation to generation. The population of the Plain region of Azerbaijan is not so dependent on plants for the treatment of food, fuel and common diseases, but they have ancient knowledge of their use. They

are fully informed about the use of up to 120 species in more than 40 families. *Poaceae* is the dominant families of the region, especially from early spring to summer. About 100 species are used to treat common diseases. It is used as up to 60 species of food. 31 species as feed for animal and 33 species are used for fuel and furniture. Some plants are used as a number of goals. Temperature, ear pain, toothache, asthma and other general illnesses are treated by local herbs. Sneezing, wound healing and so on also are treated by local herbs. Most plants are eaten or their extracts or mixtures are prepared for the treatment of diseases. Occasionally, it is applied abroad, especially in skin diseases. Usually herbs are used as medicines. Occasionally, used as an external agent, especially in skin diseases.

Megaphanerophytes - dominant in lifetime spectrum, then 36 species of therophytes, and then hemicrythophytes, nanophanerophytes and geophytes dominate the early spring flora in the area. Nanophanerophytes and geophytes are each by 10 to 15 species makes up the majority. In the leaf size spectrum, the microphyle class is dominant, and the megaphylus class is followed up. Leptophyl and nanophyl have fewer members.

The vegetation of the region is alarming for forest fires, including the destruction of the Tugai forests. So the forests are quickly destroyed because people's needs for fuel and furniture. In this case, the valuable plant wealth is in danger. Numbers of important herbal species belonging to megaphanerophytes have been reduced as shown results. It is basically shown on *Juniperus* sp. and *Juglans regia*. The production and growth of all other living things are well developed and depend

on the presence of megaphanerophytes. Knowledge and effort are at the forefront of losing plant wealth. Revolutionary steps must be taken to teach people how to follow laws and principles. Only in this way can we maintain our biodiversity.

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