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The History of Donyztau flora and vegetation research

Abstract: The investigation of the modern content of vegetation is impossible without the analysis of the history of vegetational cover study. The article reveals the historical aspect of Donyztau vegetational cover study and also scans the literature containing the information on the vegetation and plant life of Donyztau, provides the analysis of the region's vegetation species described by different authors. Donyztau is located on the territory of Baiganinski raiyon of Aktubinskaya oblast. Donyztau chink is regarded as a part of Usturt's northern part and refers to floristic region 13. Northern Usturt. The Donyztau plant life was being studied by a great deal of scientists but many of them studied more immense areas of Usturt. As far as Donyztau separately taken there was no special floristic research of the territory. Floristically Donyztau still refers to little studied areas of the Republic. During the long period the regional plant life was not the subject for special research. The present materials may serve as basis for the further study of the said district's plant life.

Keywords: nature of Donyztau, flora, vegetation, history.

The study of vegetational cover effected by different factors is one of the directions of immediate interest in modern botany.

The study of the flora modern content is impossible without the analysis of the vegetational cover research history as just the histories of floristic studies reflect the completeness of studies and testify to the scope of data collected from the given territory. Much importance is given to the review of prominent national and foreign authors studies who contributed much to the exploration of flora of Kazakhstan.

The work objective is the analysis of the Donyztau flora based on materials of works presented in articles, monographs and collection of studies of national and foreign authors.

Literature sources were used as materials for the analysis of the Donyztau flora study, floristic data on Donyztau territory were summarized.

The exploration area – Donyztau – is located on the territory of Baiganin district of Aktobe region and Zhylyoi district of Atyrau region and borders with the northern part of Ustyurt plateau and Caspian lowland. The plateau stretches 90 km long and 20 km wide from the south-west to the north-east and refers to the semidesert zone. Big salt lake (sor) Donyztau (more than 40 km long, 5 km wide) stretches along the cliff (chink). The maximum height of the chink is 180-190 m., up to 215m., the minimum heights for the locality 13-15 m. below the sea are fixed on the sor at the bottom of the chink [1].

The topography of the chink is mostly of slip-of and abrasive genesis. Though the chink is not characterized with a sufficient catchment area there are occasional exudations and seepage of subsoil waters and in longer and deeper valleys there are talwegs providing water stream flow at least a season [2].

The exploration area is located on the steeply sloping and undulating surface of an accumulation-denudation plain within Ustyurt plateau in the natural zone of arid steppes and semideserts with harsh continental arid climate.

The climate of the region refers to the climatic type of steppes and semideserts of boreal type. The general characteristics of this type of climate are sharp temperature contrasts, severe cold winter and hot summer, rapid transition from winter to summer and short spring period, instability and shortage of atmospheric precipitation, much aridity of air, intensive evaporation, instability of (annual) climatic indexes and much solar warmth. The region is characterized with plenty of warmth and dominance of fair dry weather. The annual scope of sunshine hours makes up 2300-2500.

The coldest month is January with average air temperature 15,2 °C below zero, the absolute minimum is 42,0 °C below zero. The hottest month is July with average air temperature 23,9 °C above zero, the absolute maximum is 43,0 °C above zero.

Atmospheric precipitation is the main factor of groundwater recharge. The annual precipitation amount changes all over the area within 195-262mm.

Much deficiency of humidity, high temperatures determine huge evaporation of water surface. The annual accumulative value of evaporation from water surface reaches 1200-1500mm., exceeding the annual precipitation amount 5-6 times. Summer precipitation is completely off with evaporation [3, 32p].

The Donyztau chink area is located in the natural zone of arid steppes and semideserts with soil-plant associations characteristic for them.

The soil cover was being studied thoroughly by V.V. Nikitin (1926), I.P.Gerasimov (1930), G.D. Dolenko (1930), S.A.Shuvalov (1949, 1964) V.I.Nagornaya (1951). Steppe and semidesert, low-humic grey soils (sierosems) and chestnut soils are generally solonchic, occasionally strongly saline. The mechanical composition of soils is of loamy character [4].

The history of Donyztau flora study is inseparably connected with the accumulation of actual data on exploration of the Ustyurt flora in whole as the Donyztau chink is viewed as part of the Ustyurt northern chink and in frames of floristic zoning accepted in the publication «The Flora of Kazakhstan» is floristic zone 13. The northern Ustyurt [5, 32 p].

The study of the Ustyurt flora commenced in the first half of the XIX century when F.F. Berg and E.A.Eversman (1825-1826 years) organized an expedition. E.A.Eversman describes the semidesert zone of the Western Kazakhstan calling it «bare steppe». The main feature of «bare steppes» in E.A.Eversman's opinion is the distribution of wormwoods which «grow here much less, not so thick as in northern steppes, grow in single units and do not cover soil. And bleak silt or clay gives the steppes dreary and desertic view.» [6]. He was the first who made up the systematic description of vegetation and fauna between the Urals, the Caspian and Aral seas. His works gave birth to the floristic, faunal and ecological study of steppes, semideserts and deserts of the Western Kazakhstan.

In 1842 Baziner crossed Ustyurt along the western coast of the Aral sea and described the vegetation of the region. In 1847 the expedition was organized to study the area located between the Caspian and Aral seas. The expedition included N.P.Barbot de Marty, V.D.Alekshin, M.N.Bogdanov, O.A.Grimm, N.I.Andrusov. In 1857 Ustyurt plateau was visited by I.G.Borschov and N.A.Severtsev who were a part of complex expedition and gave the systematic description of the vegetation [7].

In 1885 V.Zhilin described the Churuk haloxylon desert in his essay [8, 124p].

The data on the Ustyurt vegetation are presented in the works of I.G.Borschov (1865), V.Zhigalin (1886), A.M. Nikolsky (1900), V.A.Dublyansky (1904,1906), M.G. Popov (1925, 1927), Ye. P. Korovin, N.I. Granitov (1949). As per the investigations of I.V. Ovchinnikov (1957, 1971), V.V. Blagoveschensky (1968), Ye.I.Rachkovskaya (1986) the type of the vegetation refers to the desertic type of vegetation within the Iranian-Turanian desert subregion of xerophile, hyper-xerophile, micro- and mesothermic plants' community of various life forms - semishrubs, shrubs and also permanent grasses and yearlings [9].

In 1913 geobotanist M.G.Popov visited Ustyurt plateau. In 1941 geobotanist N.T.Ageyeva worked on study of pastures of Ustyurt huge sand massifs. In 1950 an expedition was organized under her direction that resulted in the specification of the Ustyurt flora content [10].

According to S.V.Viktorov the vegetation cover of the North-Ustyurt district (Viktorov, 1971) is dominated with communities with predomination of polyn belozemelnaya or zhusan (*Artemisia teirae-albae*) and itsigek (*Anabasis aphylla*) on high plains. Slopes are covered with types of mortyk (*Eremopyrum orientale*, *E.triticeum*). Besides these communities are typical with polyn belozemelnaya, ebelek (*Ceratocarpus utriculosus*), pieplant Tatarian (*Rheum tataricum*), and also a range of ephemerooids, ephemeral plants and long term saltworts such as bulbous bluegrass (*Poa bulbosa*), rinopetalum (*Rhinopetalum Karelinii*), kruplodnik (*Megacarpaea megalocarpa*), klimokoptera (*Climocoptera brachiata*), Shrenk's tulip (*Tulipa Schrenkiana*), the bottom is dominated with feather grass tysik (*Stipa sareptana*), yerkek (*Agropyron fragile*) and other plants [11, 132 p].

According to results of B. Sarybayev's research activities (1968-1989 rr) the flora of the region has little horsetails, gymnosperms and ephedras. Attention is to be given to the ratio of dicotyledon and monocotyledon plants in the Usturt flora that quite brightly reveals some important features. The general number of dicotyledon plants in the Usturt flora makes up 15%, ferns and gymnosperms make up only 1%. The dominating types are presented with Chenopodiaceae family, the variety of huger families such as *Fabaceae*, *Polygonaceae*, *Caryophyllaceae*, *Liliaceae*, *Asteraceae*, *Poaceae*. There are bright presentations of *Artemisia*, *Salsola*, *Atriplex* genus. B.Sarybayev (1994) notes in his work that saltmarshes of the northern Usturt are characterized with presence of the lavender-saltwort (*Kalidium capsicum*, *Limonium suffruticosum*), the kokpek (*Atriplex cana*), the camphor-fume (*Camphorosma monspeliacum*). The zonule genus around saltmarsh depressions are dominated with halostachys-saltwort (*Kalidium foliatum*, *Halostachys caspica*) communities with sufficient participation of *Salsola gemmascens*. Large areas are covered with polyn belozemelnaya (*Artemisia teirae-albae*) with itsigek (*Anabasis aphylla*), balancing with saxaul (biyurgun)-polyn belozemelnaya communities. The content of belozemelnaya polyn and biyurgun communities of the given zone is characterisitic with *Rheum tataricum*, general for desert steppes and northern deserts [12].

Among the works on the Northern Usturt flora the work of D.M.Tazhetdinov (2013) is of the most interest that is devoted to the study of new forms the Ustyurt flora and it distinguishes the following species: *Tulipa schrenkii*, *Allium decipiens*, *Stipa capillata*, *Stipa lessingiana*, *Alopecurus aequalis*, *Calamagrostis epigeios* среди *Agropyron repens*, *Puccinellia diffusa*, *Secale sylvestra*. In his opinion 11 species of biyurgun are found on the Ustyurt plateau (*Anabasis L.*)[13].

Separate investigation is devoted to the study of wild counterparts of the Northern Ustyurt cultivated plants by A.A.Imanbayeva, M.Yu.Ishmuratova. They gave the description of 51 species of wild counterparts of cultivated plants, among them: *Allium caspium*, *Allum sabulosum*, *Amaranthus retre flexus*, *Asparagus bresleranus* [14].

Analyzing the history of the Ustyurt-Donyztau flora and vegetation exploration we note that in this respect the Ustyurt plateau and adjacent areas are more or less explored. As for Donyztau there was not special floristic research work on the area.

Some available sketchy data referring to the southern part of the Donyztau area are taken as the result of the Ustyurt and Caspian lowland flora study by different scientists. Most of these results are out of date now and do not reflect sufficiently the modern state of the region's flora and vegetation. So we can state that Donyztau in the floristic respect is still underexplored area of the Republic. That's why the timeliness of having special studies of flora and vegetation of this unique area is evident, it is imposed mainly by reasonable use of plant resources and protection of rare and declining species of the Donyztau flora.

Список литературы

- 1 Казахстан. национальная энциклопедия. -Алматы: Қазақ энциклопедиясы, 1994.
- 2 Смелянский И. Чинк Донызтау. -2012.- URL: <http://www.plantarium.ru> (дата обращения 25.05.2012)
- 3 Байганин ауданы. Анықтамалық кітап.-Ақтөбе, 2008.-С.32-34
- 4 Балясный В.И. Почвы саксаульников Северного Приаралья и Устюрта (в связи с проблемой фитомелиорации пастбищ): автореферат диссертации на соискание ученой степени кандидата биол.наук.-Москва, 1981.-28 с
- 5 Флора Казахстана. В 9-х т.-Алма-Ата, 1956. - Т.1.- С.32
- 6 Чигалов В.П. Первые результаты изучения природы Устюрта экспедицией Ф.Ф.Берга и Э.А.Эверсманном в 1826 году // Астраханский вестник экологического образования. Серия история. Исторические науки-2017. -Т.4. №42.-С.15-25.
- 7 Андрусов Н.И. Труды Арало-Каспийской экспедиции // Материалы для геологии Закаспийской области. Выпуск VII.-Юрьев: Типография Маттисона, 1905.-184 с.
- 8 Жилин С.Г. Третичные флоры Устюрта. -Л.:Наука, 1974.-124 с.
- 9 Сафронова И.Н. Растительность Мангышлака: Автореферат диссертации доктора биол.наук.-Санкт-Петербург, 1991.-55 с.
- 10 Агеева Н.Т. Анализ флоры казахстанского Устюрта и Мангышлака // Труды КазГУ. Выпуск 7.-Алма-Ата, 1974.-С.5-7.
- 11 Викторов С.В. Пустыня Устюрт и вопросы ее освоения. -М.: Наука, 1971.-132с.
- 12 Сарыбаев Б. Флора и растительность плато Устюрт и перспективы их использования: автореферат диссертации доктора биол.наук.-Ташкент, 1994 г.-48 с.

- 13 Тажетдинова Д.М. Новые виды флоры Устюрта из однодольных // Известия национальной академии наук республики Узбекистана, 2013.-С.23-26
- 14 Иманбаева А.А., Ишмуратова М.Ю., Дуйсенова М.И., Туякова А.Т. К изучению видового состава диких сородичей культурных растений Мангистауской области // Вестник Карагандинского государственного университета. Серия Биология -2015.-С.44-52

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Доңызтау флорасы мен өсімдіктерін зерттеу тарихы

Аннотация: Өсімдік жамылғысын зерттеу тарихына талдау жасамай, флораның қазіргі құрылымын зерттеу мүмкін емес. Мақалада Доңызтаудың өсімдік жамылғысын зерттеудің тарихи аспектісі көрсетіліп, сол аудан флорасына зерттеу жүргізген ғалымдардың еңбектеріне талдау жүргізілген.

Доңызтау Ақтөбе облысы, Байганин ауданының территориясының оңтүстік бөлігінде орналасқан. Доңызтау шоқысы Үстірттің солтүстік шоқыларының бөлігі ретінде қарастырылып, флористикалық аудандастыру бойынша 13.Солтүстік Үстірт ауданына жатады. Көптеген ғалымдардың Үстірт флорасын зерттеу жұмыстарында Доңызтаудың өсімдік жамылғысы туралы жалпы мәліметтерді көруге болады. Бірақ Доңызтауда арнайы флористикалық зерттеулер толық жүргізілмеген. Мақалада берілген мәліметтер болашақ жүргізілетін зерттеу жұмыстарына негіз бола алады.

Түйін сөздер: Доңызтау табиғаты, флора, өсімдіктер, тарих.

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История изучения флоры и растительности Доңызтау

Аннотация: Исследование современного состава флоры невозможно без анализа истории изучения растительного покрова. В статье показаны исторический аспект изучения растительного покрова Доңызтау, а также проведен обзор публикации, которые содержат информацию о флоре и растительности Доңызтау, проанализированы описанные различными авторами виды флоры региона. Доңызтау находится на территориях Байганинского района Актюбинской области. Чинк Доңызтау рассматривается как часть Северного чинка Устюрта и относится флористическим районом 13.Северный Устюрт. Изучение растительного мира Доңызтау велось огромным числом ученых, но многие из них исследовали более обширные территории Устюрта. Что касается отдельно Доңызтау, то там специальных флористических исследований не проводились. Доңызтау в флористическом отношении все еще относится к малоисследованной области Республики. На протяжении долгого периода флора региона не являлась предметом специального изучения. Данные материалы могут служить основой для последующего изучения флоры указанного района.

Ключевые слова: природа Доңызтау, флора, растительность, история.

References

- 1 “Kazakhstan” Natcional’ nayia jenciklopedya [“Kazakhstan” National encyclopedia] (Kazakh encyclopedia, Almaty, 1994). [in Kazakh]
- 2 Smelyianskij. Chink Doniztau [Chink of Doniztau]. Available at: <http://www.plantarium.ru> _23 May 2012 (accessed 3.02.2018)
- 3 Baiganin audany. Anyktamalyk kitap [Baiganin district] (Reference book, Aktobe, 2008). [in Kazakh]
- 4 Balyiasny V.I. Pochvy saksaul’nikov Severnogo Priaral’ya I Ustyurta (v svyazi s problemoi fitomelioracij pastbish). Avtoreferat diss. [Soils of saxaul of the Northern Aral Sea region and Ustyurt (in connection with the problem of phytomelioration of pastures). Thesis of the candidate of biological sciences].(Moscow, 1981. 28 p.) [in Russian]
- 5 Flora Kazakhstana. V 9-x t. [Flora of Kazakhstan. In 9 v-s], 1, Almaty, 1956. 32 p. [in Russian]
- 6 Chigalov V.P. Pervyye rezul’taty izucheniya prirody Ustyurta jekspeditsiyey F.F.Berga i E.A.Yeversmena v 1826 godu [The first results of Ustyurt’s nature study by the expedition of F.F.Berg and E.A.Eversman in 1826], Astrakhanskiy vestnik ekologicheskogo obrazovaniya. Seriya Istoriya. Istoricheskie nauki [Astrachan bulletin of ecological education. History series. Historical sciences], (4), 15-25 (2017). [in Russian]
- 7 Andrusov N.I. Trudy Aralo-Kaspiyskoy jekspeditcii [Works of the Aralian-Caspian expedition], Materialy dlya geologii Zakaspiyskoy oblasti [Materials for the geology of the Transcaspian region], VII, 184 p (Printing House of Mattison, Yuryev, 1905) [in Russian]
- 8 Zhilin S.G. Tretichnye flory Ustyurta [Tertiary floras of Ustyurt] (Nauka, Leningrad, 1974, 124 p) [in Russian]
- 9 Safronova I.N. Rastitel’nost’ Mangyshlaka. Avtoreferat dissertatsii doktora biol.nauk [The vegetation of the Mangyshlak. Thesis of the Doctor of Biological Sciences], St-Petersburg, 1991. 55 p [in Russian]
- 10 Ageyeva N.T. Analiz flory kazakhstanskogo Ustyurta i Mangyshlaka [The analysis of flora of Kazakh Ustyurt and Mangyshlak], Trudy KazGU [Works of Kazakh State University], 7, Almaty, 1974. pp.5-7 [in Russian]
- 11 Viktorov S.V. Pustynya Ustyurt i voprosy eye osvoenye [Ustyurt Desert and issues of its development] (Nauka, Moscow, 1971, 132 p) [in Russian]

- 12 Sarybayev B. Flora i rastitel'nost' plato Ustyurt i perspektivy ikh ispol'zovaniya. Avtoreferat dissertatsii doktora biol.nauk [The flora and vegetation of Ustyurt plateau and prospects for their use. Thesis for a Doctor's of Biology Degree], Tashkent, 1994, 48 p [in Russian]
- 13 Tazhetdinova D.M. Novyye vidy flory Ustyurta iz odnodol'nykh [New forms of the Ustyurt flora amongst monocotyledons], Izvestiya natsional'noi akademii nauk respubliky Uzbekistana [News of the Republic of Uzbekistan National Academy of Science], 2013. pp.23-26 [in Russian]
- 14 Imanbayeva A.A., Ishmuratova M.Yu., Duisenova M.I., Tuyakova A.T. K izucheniyu vidovogo sostava dikich sorodichei kul'turnykh rastenii Mangistauskoj oblasti [To the study of species composition of wild counterparts of cultivated plants grown of Mangistau region], Vestnik Karagandinskogo gosudarstvennogo universiteta. Seriya Biologiya [Bulletin of the Karaganda State University. Biology series], 44-52 (2015) [in Russian]

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