Ustyurt medicinal plants and their active ingredients

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Abstract. The article presents the results of a study of medicinal plants of Ustyurt. A brief description of the soil and climatic conditions and vegetation of the Ustyurt plateau is given. Salt marshes are characterized by a halophilic type of vegetation. Gypsum soils are inhabited by a hypsophilic type, the flora of Ustyurt in different years, under the influence of environmental and man-made factors, has undergone a change in the number of species growing on its territories. According to the latest data, 183 species have been identified. The extensive list of plants given in the article shows that the medicinal plants of Ustyurt contain chemical compounds that have various healing properties. The article provides a number of measures for the practical use of medicinal plants growing in Ustyurt.

1 Introduction

On the territory of the Republic of Uzbekistan, about 4,380 species of vascular wild plants grow, of which approximately 1,200 have medicinal properties to one degree or another, which indicates the rich species composition of the flora of Uzbekistan [1-30]. Also, Republic of Karakalpakstan (part of Uzbekistan), especially Ustyurt is a gypsum desert located on a plateau in the centre of the Turan lowland. The area of the plateau is 21.2 million hectares, of which 7.3 million hectares are within the Republic of Karakalpakstan. In the north, the Ustyurt plateau adjoins the Caspian lowland [1]. The Sarykamysh and Assake-Audan hollows are located in the southeastern part. The depressions are characterized by cliffs and coastal ramparts. The eastern part is cut by the Ustyurt chinks which descend to the former Aral Sea. The southern part of the chinks is closer to the cultural oases of the lower reaches of the Amu Darya River. The Karakalpak part of Ustyurt is divided into 4 sub-areas: southern, northern, central and eastern seaside chinks [2].

According to the State Committee for Nature Protection of the Republic of Karakalpakstan, the total fund of irrigated lands is mainly saline soils, including: slightly saline -26.2%, moderately saline - 37.4%, highly saline -35.2%, very highly saline 1, 2%.

In the Republic of Karakalpakstan, the vegetation cover is very diverse. Medicinal, fodder, fruit, tanning, dyeing, essential oil, industrial, ornamental, melliferous and other plants grow here. Medicinal plants occupy a special place. It should be noted that for various reasons, including economic ones, today there is renewed interest in herbal preparations and plants.

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Plants produce a huge number of different substances that affect the body, incl. physiologically active substances (PAS), or biologically active substances (BAS). They are used to treat and prevent almost all diseases. Medicinal plants and herbal preparations obtained from them have a significant advantage over synthetic ones, since they have a longer and milder effect on the body and usually do not accumulate in it x5ъ. Concomitant substances contained in plants often enhance the effect of the main medicinal substance, and allergic reactions are less common. The main number of drugs used to treat liver and cardiovascular diseases are herbal preparations. In this regard, we set the task of giving a resource-acute characteristic of medicinal plants of the Republic of Karakalpakstan for the procurement of raw materials for the needs of the pharmaceutical industry and local pharmacy administration.

2 Materials and Methods

In identifying and addressing issues in Ustyurt Medicinal Plants and Their Active Ingredients we used some research methods:

- Observation Method;
- Comparison Metod;
- Literature Review;
- Content Analysis Method;
- Method of Analysis and Synthesis.

In determining the taxonomic units of the species, were used following materials:

- 11 volumes of the work “Determinant of plants in Central Asia” (1968-2015) [14];
- International Plants Names Index [20];
- Plant of the world online [27]
- “Authors of Plant Names” [28].
- Fluorogenic Analysis of the Natural Flora of Mountain Central Asia. [29].

3 Results and Discussion

3.1. Review

Due to the difference in climatic features, Ustyurt's soils are represented by gypsum, sandy and solonchak soils in different soil conditions. The climate, as in the whole territory of the Southern Priaralie, is sharply continental, with harsh winters, hot dry summers, low precipitation (100-150 mm per year), and strong winds [11].

Depending on soil conditions and precipitation, the vegetation cover varies greatly throughout Ustyurt. Solonchaks are characterised by a halophilic type of vegetation. Gypsum soils are inhabited by gypsophilic type, represented mainly by semi-shrubs and semi-shrubs (*Anabasis salsa* and *Artemisia terrae-albae* and *Salsola arbusciloformis*) (Kabulov, 1990).

The study of vegetation of Karakalpak part of Ustyurt is presented in works of E.P.Korovin, I.I.Granitov[6], I.F.Momotov [7], K.Aitbaev [8], Tursunbaev [9], O.Bondarenko [5], R.Aymuratov, O.Abduraimov, H.Shomurodov, A.Abduraimov, A.Adilov [11], K. Koibagarov [30], and others.

3.2. Results

The flora of Ustyurt has undergone changes in the number of species growing on its territories in different years under the influence of ecological and anthropogenic factors. During the stable functioning of the Aral Sea [5], the flora numbered 330 species. According to recent

data - P.Tazhimuratov, B.Sarybaev, R.Pirzhanova, R.P.Aymuratov, 183 species were established for the period 2007-2015 [11].

When exploring the full range of vegetation on the Ustyurt Plateau, special attention must be paid to medicinal plants.

Medicinal plants are those plants that are used in medical practice to treat or prevent (prevent) diseases of humans or animals. To treat or prevent diseases, medicinal forms (infusions, decoctions, tinctures, extracts and others) are prepared from certain plant organs, medicinal preparations are prepared - herbal remedies, or pure (or amounts) biologically active (main active) substances are obtained and then herbal medicines are prepared from them. For this purpose, those plant organs are used where more biologically active substances accumulate, and they are called medicinal plant raw materials. Herbal medicinal raw materials can be any organ of any plant where the main biologically active substances (BAS) are maximally accumulated: leaves, flowers, the entire above-ground part - grass, buds, fruits, seeds, bark, roots, rhizome, rhizome with roots, tubers, bulbs and other plant organs.

Fig.1. The zone of the Republic of Karakalpakstan [13]

Not all plant chemicals have a specific pharmacological effect on a living organism. Certain individual or group of natural substances have this effect and they determine the main therapeutic effect of the herbal medicinal raw materials used. They are called biologically active (active) substances (BAS).

The ecological range of growth of medicinal plants in the Aral Sea region is very wide, i.e. from water-submerged plants of ponds and lakes to typical desert plants. Our analysis showed that 161 species of medicinal plants grow in the Amu Darya delta. 85 species of medicinal plants grow on the Ustyurt plateau.

Medicinal plants living in the desert zone of the Republic of Karakalpakstan are distinguished by great physiological activity. Having obtained a new result on distribution in new environmental conditions, they will help to use different groups of medicinal plants in a new way. In the context of limited funds from the pharmacological industry, expanding the use of herbal medicines in the pharmacological industry, expanding the use of herbal medicines is extremely relevant, economically justified and profitable.

The main stage in examining the resources of medicinal plant raw materials is the need

to be based on the following aspects: firstly, it is necessary to have information about the biological reserves of raw materials that can be prepared in a certain area of medicinal plant growing areas, and secondly, to have an idea of operational reserves, i.e. e. the amount of raw materials that can be prepared in a given area of medicinal plant arrays and without undermining the possibility of plant renewal and regeneration of populations. The more we know about medicinal plants, the more successfully we will fight various diseases, as well as prevent their occurrence.

When studying the resources of medicinal plant raw materials, a necessary step is to identify the main patterns of association of medicinal plant species with certain plant communities or coenocomplexes. The determination of coenocomplexes of medicinal plants was carried out during a geobotanical survey of the territory using generally accepted geobotanical methods: geobotanical descriptions of association areas.

As a result of the research, it was found that 160 species of medicinal plants grow in the floodplain and delta of the Amu Darya. The next natural area in terms of the number of medicinal plant species is the Ustyurt Plateau. 85 species of medicinal plants grow on the Ustyurt plateau [4]. It can also be noted that many medicinal plants are found occasionally, but form large tracts, and some are widespread, but the reserves of their raw materials are very limited.

Below we have tried to characterize the distribution of official widespread wild medicinal plants on the territory of Karakalpakstan and which can be recommended for the procurement of raw materials.

Medicinal plants can be classified according to the substances they contain: alkaloid-bearing, glucoside-bearing, saponin-bearing, gum-bearing, vitamin- bearing, ester and oil-bearing, tannins and insecticides.

The main active substances of medicinal plants determine their importance.

The alkaloids (atropine, papaverine, ephedrine, caffeine, etc.) have a strong specific physiological effect and are used to treat various diseases. Alkaloid-bearing plants have the greatest distribution.

Glycosides are complex substances consisting of some sugar loosely bound to a non-sugar substance [12]. The large group of cardiac glycosides is the most important.

Saponins are a group of glycosides. Plants containing saponins are used as expectorants, diuretics and strengtheners.

Tannins or tannides, which are found in large or smaller quantities in almost all plants.

Essential oils are mixtures of different volatile substances and have a distinctive smell (camphor, menthol, etc.).

This article provides a list of medicinal plants growing in Ustyurt [15], classifying them according to their content of useful substances (Table 1).

Table 1. List of medicinal plants growing in Ustyurt

No	Name	Explain	Name of scientist, who study
1.	*Ephedra* diascens (*Ephedra diascens* L.),	a shrub, contains the alkaloid ephedrine and its isomer pseudoephedrine	Yerezhepov, 1978
2.	Equiflower (*Thalictrum isopyroides* C.A.Mey.)	a perennial herb - contains alkaloids	Massagetov, 1947; Adylov, 1970
3.	The small-flowered gentian (*Adonis parviflora* Fisch. ex DC.)	an herbaceous plant containing glucosides, adonin, saponins	Kuliev, 1964; Sinkovsky et al., 1968
4.	*Ceratocephala* falcata	an herbaceous annual plant that contains alkaloids and carotene	
5.	*Ceratocephala orthoceras*	an herbaceous annual that contains carotene, the	

		alkaloids anemonin and proto-anemonin and uronic acids	
6.	*Roemeria orientalis* Boiss	an annual herb that contains the alkaloids protopin and remeridin during the flowering phase	Adylov, 1970
7.	*Hypecoum parviflorum*	an annual herbaceous plant; is an alkaloid-bearing plant	Massagetov, 1947; Adylov, 1970
8.	*Fumaria vaillantii*	an annual herb, alkaloid-bearing, containing sugars, glycosides, organic acids and vitamin C	Aliev, 1949; Tariverdiyeva, 1951
9.	*Silene viscaria*	biennial herbaceous plant. It contains saponins and large quantities of vitamin C.	Yerezhepov, 1978
10.	*Atriplex dimorphostegia*	alkaloid- bearing plant	
11.	*Ceratoides fruticulosa* Pazij	a semi-shrub, the leaves contain vitamin C and saponins.	K.D. Muravlanskii et al. 1936; N.V. Pavlov 1947; N.M. Sovetkina 1938.
12.	Sandy hornwort (*Ceratocarpus arenarius* L.	is an annual herbaceous plant, found to contain alkaloids and considered as a saponiferous plant	Massagetov, 1947
13.	Horned marsupial (*Ceratoides utriculosus* Bluk.)	an annual herb, considered a medicinal plant	Yerezhepov, 1978
14.	*Camphorosma lessingii* Litv	a semi-shrub considered medicinal and poisonous	
15.	The Caspian Potash (*Kalidium capsicum* L.)	a shrub, is a salt-bearing, alkaloid-bearing; insecticidal; poisonous plant	Adylov, 1970; Pavlov, 1947; Kotov, 1936
16.	*Halopeplis pigmaea* (Pall.)	Bunge is an annual herb considered alkaloid- bearing	
17.	Sarsazanum *strobilaceum* (*Halocnemum strobilaceum* (Pall.) Bieb.),	a semi- shrub, as an alkaloid; insecticidal plant.	Adylov, 1970; Larin et al., 1951
18.	*Suaeda dendroides* (C.A.Mey) Moq	a shrub, considered an alkaloid- bearing and medicinal plant	
19.	*Suaeda phyzophora* Pall.	a shrub with a large amount of alkaloids	Massagetov, 1947
20.	*Suaeda prostrata* Pall	an annual, alkaloid-bearing medicinal plant.	
21.	*Suaeda transoxana* (Bunge) Boiss	an annual herbaceous plant that contains alkaloids	
22.	*Salsola crassa* Bieb	an annual herbaceous, alkaloid-bearing medicinal plant	
23.	*Salsola dendroides* Pall.	a semi-shrub that contains a sum of alkaloids	Massagetov, 1947; Borovsky et al., 1940
24.	*Salsola gemmescens* Pall.	an alkaloid-bearing semi-shrub	Ataev, 1948
25.	*Salsola incanescens* C.A.Mey,	an annual herbaceous plant, contains small amounts of alkaloids	Massagetov, 1947
26.	*Salsola orientalis* S. G. Gmel.	a semi-shrub. It is considered an alkaloid plant	Muravlyansky, 1946; Glagoleva, 1937
27.	*Salsola paletzkiana* Litv.	a tree, a medicinal, alkaloid-bearing plant	Sokolov, 1949
28.	Richter's saltwort (*Salsola*	a tree or tall shrub, contains	Orekhov, 1934

	richteri (Moq.) Kar. et Litv.)	the alkaloid salsoline, salsolidine and salsomin	
29.	*Aellenia hispidula* (Bunge) Botsch	a semi-shrub, the terrestrial part of the plant containing alkaloids	Adylov, 1970
30.	*Aellenia subaphylla* (C.A.Mey.) Aell.	a semi-shrub and medicinal herb.It contains alkaloids	Orekhov, 1935
31.	Horaninowia irregularis (*Horaninowia anomale* (C.A.Mey) Moq.)	an annual herbaceous plant that contains alkaloids	
32.	*Horaninowia excellens* Iljin	an annual herbaceous alkaloid plant	
33.	*Horaninowia sogdiana* Blag.	an annual herbaceous alkaloid plant	
34.	*Girgensohnia oppositiflora* (Pall.) Fenzl.	an annual herbaceous alkaloid poisonous plant	
35.	The bramble (*Anabasis abrateolata* Eug.)	a perennial herbaceous alkaloid plant	
36.	Leafless birchberry (*Anabasis aphylla* L.)	contains the alkaloids anabasin, aphilin; lupinin-lupicaine.	Akopov, 1958; Sadykov, 1956
37.	Chalkberry (*Anabasis cretacea* Pall.)	a perennial herbaceous plant that contains an alkaloid	
38.	The woolly bunting (*Anabasis eriopoda* (Schrenk) Benth. ex Volkens)	a perennial herbaceous plant; alkaloids have been detected	Massagetov, 1947; Ataev, 1948; Adylov, 1970
39.	The turkestan berry (*Anabasis turkestanika* Eug. Kor.)	a perennial herbaceous plant that contains alkaloids	
40.	Saltwort (*Anabasis salsa* (C.A.Mey.) Benth. ex Volkens)	a medicinal alkaloid plant.	
41.	The bramble (*Anabasis undulata* Iljin)	a perennial herbaceous plant that contains alkaloids as well as oxalic-lemonic and acetic acids.	
42.	Saxaul leafless (*Haloxylon aphyllum* (Minkw.) Iljin.)	a tree, considered an alkaloid-bearing plant.	
43.	White saxaul (*Haloxylon persicum* Bunge)	a tree, is an alkaloid-bearing plant.	Massagetov, 1947
44.	Nanophyton hedgehog (*Nanophyton sibirica* (Pall.) Bunge)	a semi-shrub, considered medicinal; containing alkaloids.	Syrneva, 1950; Abdiniyazova,2018
45.	Halocharis bristlewort (*Halocharis hispida* (C.A.Mey.) Bunge)	an annual herbaceous plant and alkaloids	Adylov, 1970
46.	*Halogeton glomeratus* (Bieb.) C.A.Mey.	an annual herbaceous plant, contains oxalic acid; alkaloids.	Gusynina, 1962; Adylov, 1970
47.	Rhubarb (*Rheum tataricum* L.)	a perennial herbaceous medicinal vitamin- bearing plant.	
48.	Spiny bramble (*Atraphaxis spinosa* L.)	a shrub, considered a medicinal plant.	
49.	Kermek Gmelinii (*Limonium gmelinii* (Willd.) O. Kuntze)	a perennial herbaceous medicinal plant. Alkaloids; tannides.	Massagetov, 1947; Karimov, 1932
50.	Kermek auriculosa (*Limonium otolepis* (Schrenk.) Kuntze)	a perennial herbaceous herb that contains tannides.	
51.	*Goldbachia laevigata* (Bieb.)	an annual herbaceous plant that contains alkaloids	Massagetov, 1947
52.	Leuca marely (*Mattiola*	an annual herbaceous plant	Goryaev, 1952

	chenopodifolia Fisch. et Mey)	that contains an essential oil.	
53.	Chorispora *tenella* (Pall.)	an annual herbaceous plant, considered a vitamin-bearing plant.	
54.	The Syriac flower (*Euclidium syriucum* (L.) R. Br.)	an annual herbaceous plant containing alkaloids and vitamins	Massagetov, 1947
55.	*Litvinowia tenuissima* (Pall.) N. Busch)	an annual herbaceous, alkaloid- bearing plant.	
56.	Toothless cattle (*Crambe edentula* Fisch. et Mey. ex Korsch.)	a perennial herbaceous plant, rare, containing fat and starch.	
57.	Kochi katran ((*Crambe kotschyana* Boiss.)	a perennial herbaceous plant that contains large quantities of fatty oil	Khalmatov, 1964
58.	*Lepidium perfoliatum L.* a biennial herbaceous plant	a medicinal herb, found to contain vitamins, fatty and essential oils and glycosides.	
59.	Heartwort (*Cardaria repens* (Schrenk) Jarm.)	a perennial herbaceous plant, considered medicinal.	
60.	The stiff-haired comb (*Tamarix hispida* Willd.)	a shrub that contains tannins; tannides.	Gammermann et al., 1957; Shalyt, 1951
61.	Frankenia *hirsulata* (*Frankenia hirsulata* L.)	a semi-shrub, considered a medicinal and alkaloid-bearing plant.	
62.	Frankenia pulverulenta (*Frankenia pulverulenta* L.)	an annual herb, considered medicinal and alkaloidal.	
63.	Molochaisum densa (*Euphorbia densa* Schrenk)	an annual medicinal herb.	
64.	Bicarbonate (*Diartron vesiculosum* (Fisch. et Mey.))	an annual herbaceous plant that contains alkaloids.	
65.	The rosehip of May (*Rosa majalis* Herrm.)	a shrubby, vitamin-bearing, essential oil-bearing medicinal plant.	
66.	Hawthorn of the Altai (*Crataegus altaica* Bunge)	a shrub, essential oil, medicinal plant.	
67.	Hultemia persica (*Rosa persica* Michx.)	a shrub, medicinal and vitamin- bearing plant.	
68.	Sandy achene abundantly flowering (*Ammodendron floribundum* Zing.)	a shrub that contains alkaloids.	
69.	White sweet clover (*Melilotus albus* Medic.)	a one- or two-year herbaceous plant. It contains essential oil, coumarins and vitamin C.	
70.	*Melilotus officinalis* Desr.	a biennial herbaceous plant that contains coumarins.	Pimenov, 1971
71.	*Astragalus chivensis* Bunge	a perennial herbaceous plant in which alkaloids.	Massagetov, 1947
72.	The holly-leafed shrub (*Haplophyllum obtusifolium* (Ledeb.))	a semi-shrub that contains essential oil and alkaloids.	Goryaev, 1952
73.	Branched whole-leaf (*Haplophyllum ramosissimum* (Pauls.))	a semi-shrub, classified as an essential oil plant; alkaloids.	Goryaev, 1952; Adylov, 1970
74.	Common Garmala (*Peganum harmala* L.)	a perennial herbaceous plant that contains alkaloids; essential oil and fatty oils	Abdiniyazova, 2018; Ivanov, 1937
75.	Eichwald's nightshade (*Zygophyllum eichwaldii* C.A.Mey.)	a semi-shrub that contains alkaloids.	
76.	Ovigerum parsley	Semishrub, contains alkaloids	Adylov, 1970

	(*Zygopyllum ovigerum* Fisch. et Mey. ex Bung)		
77.	Perennial pinnatum (*Zygophyllum pinnatum* Cham.)	a perennial herbaceous plant that contains the alkaloids Garmin, Garmalom	Gusynin, 1962
78.	*Geranium transversal* (Kar.et.Kir.)	a perennial herb, an essential oil, medicinal plant.	
79.	*Biebersteinia multifida*	a perennial herbaceous plant. It contains tannins, saponins, starch and essential oils.	Pavlov, 1947
80.	Gillyflower (*Seseli glabratum* Willd.)	a perennial herb that contains an essential oil.	
81.	Gillyflower (*Seseli jomuticum* Schischk.)	a perennial herbaceous plant that contains an essential oil.	
82.	*Ferula assa-foetida* L.	is a perennial herbaceous plant. It contains gum resin, which has a large amount of essential oil, as well as gum, starch and seeds contain coumarins	Pimenov, 1971
83.	Ferula caspica (*Ferula caspica* Bieb.)	a perennial herb. It contains essential oil and coumarins.	
84.	Ferula dubjanskyi (*Ferula dubjanskyi* Kor.)	a perennial herbaceous plant containing resin, starch.	
85.	Ferula *Lehmannii* Boiss.	a perennial herbaceous plant that contains an essential oil	Vyshensky, 1935
86.	Ferula syreitscikowii (*Ferula syreitscikowii* K.-Pol.)	a perennial herb containing essential oil in its fruit	Goryaev, 1952
87.	*Shumannia karelinii* (Bunge) Eug. Kor.)	a perennial herbaceous plant, contains essential oil, starch and vitamins.	Vyshinsky, 1935
88.	Dorema sandy (*Dorema sabulosum* Litv.)	a perennial herb whose milky sap contains essential oil, resin and gum.	
89.	*Zozima orientalis* Hoffm.	a perennial herbaceous plant with essential oils found in its fruit.	
90.	Starced chervil (*Scandix stellata* Banks et Soland.)	an annual herbaceous plant, considered an essential oil plant.	
91.	Prescott's moth (*Chaerophyllum prescottii* DC.)	a biennial herbaceous plant, contains the alkaloid cherophilin; coumarin compounds.	Pavlov,1947; Pimenov,1971
92.	Kendyr (*Apocynum venetum* (L.) Woodson var. scabrum)	a perennial herbaceous plant containing the glucoside cimarin; starch, resins and tannins and the seeds contain fatty oil.	Abubakirov, 1965; Khalmatov, 1964
93.	*Asperula humifusa* (Bieb.) Bess	A perennial herb, contains alkaloids	Massagetov, 1947
94.	Shrub broom (*Convovulus fruticosus* Pall.)	shrub, considered an alkaloid, medicinal plant.	
95.	Dodderwood (*Cuscuta cupulata* Engelm.)	an annual climbing plant. It is considered an alkaloid, glucosidic plant.	
96.	Dodderwood (*Cuscuta pellucid* Butk.)	an annual climbing plant, considered an alkaloid, glucoside plant.	
97.	*Cuscuta stapfiana* Palib.	an annual climbing plant that contains alkaloids and glucosides.	

98.	*Tournefortia sogdiana* (Bunge) M. Pop.)	a perennial herbaceous plant, considered medicinal as it contains a mixture of alkaloids.	Adylov,1970
99.	*Heliotropium dasycarpum* Ledeb.	an annual herbaceous plant containing a mixture of alkaloids.	Massagetov, 1947; Adylov, 1970
100.	*Lappula microcarpa* (Ledeb.) Guerke,	an annual herbaceous plant, contains alkaloids.	Adylov, 1970
101.	Asperuga procumbens (*Asperugo procumbens* L.)	an annual herb containing alkaloids.	
102.	*Cynoglossum viridiflorum* Pall.	a perennial herbaceous plant, considered a medicinal plant.	
103.	Sweet and bitter peach (*Solanum dulcamara* L.)	a semi-shrub. Contains glucoalkaloids; leaves and stems contain vitamin C and carotene	Pavlov, 1947
104.	Dereza russica (*Lycium ruthenicum* Murr.)	a shrub that contains the alkaloids bataine, atropine and choline.	
105.	Tiny Bélena (*Hyoscyamus pusillus* L.)	an annual herbaceous herbaceous plant, an alkaloid-bearing medicinal herb.	
106.	Cistanche *trivalvis* (Trautv.) Korsch.	a perennial herbaceous plant containing alkaloids.	
107.	The Persian bezoan (*Thuspeinantha persica* (Boiss.) Brig.)	an annual herbaceous plant that contains essential oils.	
108.	Catnip (*Nepeta cataria* L.)	a perennial herb, is an essential oil plant and also contains vitamin C in the ground part.	
109.	Spiny catnip (*Nepeta pungens* (Bunge) Benth.)	an annual herb that also contains an essential oil.	
110.	*Lagochillus acutiloba* (Ledeb.) Knorrr.	a perennial herbaceous herbaceous plant that contains carotene and ascorbic acid.	
111.	*Karelinia caspia* (Pall.) Less.	a perennial herb, contains alkaloids.	Massagetov, 1947
112.	*Tanacetum santolina* G. Winkl.	a perennial herbaceous plant containing essential oils and flavonoids	Gammermann et al., 1976
113.	Wormwood (*Artemisia arenaria* DC.)	a semi-shrub that is an essential oil, alkaloid and vitamin-bearing plant.	
114.	Saltwort (*Artemisia halophila* Krasch.)	a semi-shrub that containsan essential oil.	Goryaev, 1952
115.	Wormwood (*Artemisia kelleri* Krasch.)	a semi-shrubby, essential oil-bearing plant.	
116.	Artemisia pauciflora (*Artemisia pauciflora* Web. ex Stechm/)	a semi- shrub. It contains essential oil; carotene; santonin.	Goryaev, 1952; Troitsky, 1950; Pavlov, 1947
117.	*Artemisia repens* Pall.	a perennial herbaceous plant containing essential oil, small amounts of alkaloids and glucosides; carotene.	Mikhaylova, 1968; Troitsky, 1950
118.	Artemisia santolina (camphor) (*Artemisia santolina* L.)	asemi-shrub that contains an essential oil.	Goryaev, 1952

119.	Junggar wormwood (*Artemisia songarica* Schrenk.)	a semi-shrub, essential oil plant.	
120.	Wormwood (*Artemisia terrae-albae* Krasch.)	a semi-shrub that contains an essential oil comprising cineol, borneol.	
121.	*Artemisia turanica* Krasch.	a semi-shrub containing essential oil, tannins and resin	Goryaev, 1952
122.	Dubiansky's mordow (*Echinops dubijanskyi* Iljin.)	a perennial herbaceous plant, the fruits contain alkaloids	Gammermann et al. 1976
123.	The Meyer's broom (*Echinops meyerii* Iljin.)	a perennial herbaceous plant, containing a considerable amount of saponin	Gusynin, 1962
124.	Rep. holospermum (*Arctium leiospermum* Juz.)	an annual herb, is an essential oil plant, containing vitamin C and alkaloids	Bankovsky et al., 1947
125.	*Saussurea salsa* (Bieb.) Spreng.	a perennial herb, contains essential oils and contains alkaloids	Massagetov, 1947
126.	The bluebud (*Jurinea cyanoides* DC.)	a perennial herbaceous plant found useful in the soil.	
127.	Cornflower (*Centaurea adpressa* Ledeb.)	a perennial herbaceous plant; alkaloids have been found in its leaves and seeds; vitamin C.	Bankovsky et al., 1947; Vakhrusheva, 1951
128.	Creeping gentian (*Acroptilon repens* (L.) DC.)	perennial herbaceous plant, contains essential oil; saponin, vitamin C.	Grossheim, 1946; Aliev et al., 1947; Khalmatov, 1964
129.	*Amberboa* dwarf (*Amberboa nana* Iljin)	an annual herbaceous, alkaloid-bearing plant.	
130.	Dandelion (*Taraxacum bicorne* Dahlst.)	a perennial herbaceous plant. The roots contain glycosides and the polysaccharide inulin.	
131.	*Lactuca orientalis* Boiss.	a semi-shrub. It is considered an alkaloid-bearing plant.	
132.	Goose onion reticulate (*Gagea reticulate* (Pall.) Schult)	a perennial herbaceous plant. An antiseptic, vitamin-bearing.	
133.	*Allium baissunense* Lipsky	a perennial herbaceous plant that contains saponins.	
134.	Blue onion (*Allium coeruleum* Pall.)	a perennial herbaceous vitamin- bearing plant.	
135.	Sand onion (*Allium sabulosum* Stev.)	a perennial herbaceous plant, the bulbs contain saponin.	
136.	*Ixiolirion tataricum* (Pall.) Herb.	a perennial herbaceous plant containing alkaloids.	Sokolov, 1952; Adylov, 1970
137.	*Asparagus oligophyllus* Baker.	a perennial herb, contains saponins	
138.	*Sclerosiphon songaricum* (Schrenk) Nevski or *Iris songarica*)	a perennial herbaceous plant that is starchy and alkaloid-bearing.	
139.	*Agropyron fragile* (Roth.) Nevski)	a perennial herbaceous plant, considered a vitamin-bearing plant.	
140.	Mortucca orientale (*Eremopyrum orientale* (L.))	an annual herbaceous plant, considered alkaloid-bearing.	
141.	Leontice *incerta* Pall.	a perennial herbaceous plant containing a mixture of alkaloids	Adylov, 1970
142.	*Descurainia Sophia* (L.) Webb ex Prantl,	an annual herbaceous plant, considered alkaloid-bearing.	

Conclusion

Currently, the protection of especially valuable medicinal plants, the reserves of which are declining or are under threat, is of great importance. Each type of wild medicinal flora has its own instructions, which consider the biological characteristics of the plant, the specifics of its ecology and location, the dynamics of regeneration after harvesting, the timing of collection, methods and standards of harvesting that do not interfere with the normal regeneration of the thickets. The protection of a particular species involves the regulation of harvesting, strict control over the licensing fee, the development and implementation of special measures that promote natural regeneration. Also, the extensive list of plants cited shows that Ustyurt plants contain chemical compounds that have various medicinal properties.

For the practical use of medicinal plants native to Ustyurt, we propose the following measures:

1. Detailed mapping of growing areas, identifying the size of their natural stocks.
2. Study their bio-ecological characteristics under their growing conditions and the possibility of introducing the most sought-after species into cultivation.
3. The development of agronomic techniques for their cultivation.
4. Study of the chemical composition, determination of the active ingredients and pharmacological properties.

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