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Phytocenotic and resource characteristics of *Rheum tataricum* L.f. in the Northern Aral region

The article presents the results of a study on the phytocenotic characteristics and resource assessment of *Rheum tataricum* L.f. in the Northern Aral region. *Rh. tataricum* has significant resource potential and is the most widespread species of the genus *Rheum* L. on the territory of Kazakhstan. Under the arid climate conditions of the Northern Aral region, *Rh. tataricum* demonstrates high adaptability and resistance to extreme environmental conditions. The purpose of the study is to inventory the commercial thickets and evaluate the raw material base of tatar rhubarb in the territory of the Northern Aral region for further use as a natural resource. Field studies were conducted, along with assessments of the yield of tatar rhubarb, the operational stock of the root, the volume of possible annual stocks of air-dry raw material. A comparative analysis of contemporary and retrospective data was also conducted. Five massifs were identified, ranging from 0.08 to 8751 hectares. It was found that on the area of 535.75 hectares occupied by *Rh. tataricum*, the total operational stock of the air-dry underground biomass is 455.6 tons, with a possible annual processed volume of 75.94 tons of air-dry roots. Industrial harvesting of the underground part of *Rh. tataricum* is possible in compliance with the recommended volume of annual harvesting of raw materials in the territory of the Northern Aral region.

Keywords: tatar rhubarb, commercial thickets, yield, stock of raw materials, operational reserve, Northern Aral region, arid lands, anthropogenic habitats.

Introduction

Rheum tataricum L.f. has significant resource potential and is the most widespread species of the genus *Rheum* L. on the territory of Kazakhstan. Under the arid climate conditions of the Northern Aral region, *Rh. tataricum* demonstrates high adaptability and resistance to extreme environmental conditions. However, despite its raw material importance, there is no current data on the resource study of this species in the Northern Aral region.

Tatar rhubarb (*Rheum tataricum*) is a perennial herbaceous plant belonging to the Polygonaceae family, a geophyte, an ephemeroid. Its life cycle, from the opening of overwintering buds and leaf formation to the seeding and the withering of aboveground organs, takes 40–45 days [1, 2]. The root system is represented by the main taproot that begins branching into 4-5 lateral roots at a depth of 40 cm. The depth of lateral root placement depends on soil composition [3]. The plant produces 2-3 sturdy stems with a grooved surface that densely branch from the middle. Tatar rhubarb possesses the following characteristics: rounded leaves which are heart-shaped at the base; three visible veins; leaf underneath and the leafstalk are covered with small villi; the upper leaf surface is glabrous; yellowish flowers have 3–5 brown veins and 5 equal perianth lobes; three-angled fruits, which are heart-shaped, finely wrinkled and dark brown, nuts are winged. Its blooming period takes place in April-May; fructification period occurs from May to early June [1, 2]. Its widespreading area is desert and semi-desert plains. Beyond our country the species grows in the eastern and southern parts of European Russia, Ukraine, Uzbekistan and China (Xinjiang) [4].

The raw material of *Rh. tataricum* is the underground part, which is included in the State Register of Medicines of the Republic of Kazakhstan [5]. It contains carbohydrates, organic acids, phenols, catechins, tannins, anthraquinones, and higher aliphatic hydrocarbons [5]. The root of tatar rhubarb has a significantly higher tannin content compared to the aboveground parts [6]. The maximum tannin concentration in the roots is observed during the early budding phase [7]. In the underground part, tannins account for up to 25.7 % [8]. It is used in medicine as a hemostatic, astringent, anti-inflammatory, laxative, antitumor, vitamin [7]. Additionally, *Rh. tataricum* contains vitamins C, K, and PP [8].

Also, *Rh. tataricum* is a forage plant. During the early spring shortage of forage resources, the succulent leaves of *Rh. tataricum* serve as an important source of nutrition for camels, sheep, goats and horses [7]. These leaves contain a small amount of fiber (20 %), 6 % sugar, 19.6 % protein, and 5 % fat [9].

Rh. tataricum does not create pure thickets, but it is found in significant areas among sagebrush, *Haloxylon ammodendron*(C.A. Mey.) Bunge ex Fenzl, *Oreosalsola arbusculiformis* (Drobow), *Atriplex cana* Ledeb. communities. According to literature, the yield of tatar rhubarb in the Northern Aral region is 5.1 centners per hectare (c/ha) of above-ground weight and 50 c/ha of underground weight [9].

The first data on industrial reserves of *Rh. tataricum* in the Aral region were obtained by S.A. Nikitin, who in 1943 identified huge thickets of this plant near the Chelkar railway station. In subsequent years, the widespread distribution of *Rh. tataricum* in the region was noted by botanists such as N.V. Pavlov, N.I. Rubtsov, and S.R. Schwartzman [10].

Significant reserves of this species in the Aral region were identified in the 1960s as a result of research conducted by researchers of the Plant Resources Department of the Institute of Botany of the Sciences Academy of the Kazakh SSR [10]. In the studied area, 12 arrays of *Rh. tataricum* thickets with a total area of up to 268,000 hectares with a large supply of tannin-rich raw materials were identified. The gross reserves of raw root was 121,000 tons, and the production stock was up to 31,500 tons of dry roots.

Raw material reserves are known to be exposed to constant fluctuations due to the particular year ecological conditions, age species structure, anthropogenic impact, irrational harvesting, etc. [11]. It is necessary to understand that monitoring the condition of medicinal and promising for medicine wild plants is important for preserving their resource potential.

This article discusses the results of a study of the territory of the Northern Aral region in order to inventory commercial thickets and the raw material base of tatar rhubarb.

Materials and Methods

The objects of research are the natural populations of *Rh. tataricum*.

The resource survey of the territory was carried out by a route reconnaissance method [12] and in accordance with the generally accepted "Methodology for determining the reserves of medicinal plants" [13].

Geobotanical descriptions were conducted at each site containing resource objects [12]. For this purpose, special geobotanical forms are used, which provided detailed descriptions of the main landscape components: relief, soils, vegetation and their condition. Particular attention was given to investigating the spatial structure of plant communities and its connections to relief, soils, and moisture levels. The following aspects were considered for describing the plant communities: 1) floristic composition; 2) total projective coverage; 3) phenophase; 4) abundance of species by the Drude scale; 5) species distribution patterns. The impact of both natural and anthropogenic factors on vegetation was also considered.

During describing the plant communities certain herbarium samples were collected. Unknown plant species were identified by means of "Illustrated Guide for Identification of Plants of Kazakhstan" (2 volumes) [14] and "Flora of Kazakhstan" (9 volumes) [15]. The taxonomy of the species are given according to the Internet resource "Plants of the World Online" [4].

Raw material reserves were assessed in specific thickets using the method of clipping (usually on square plots) and model bushes (on transects). Additionally, the operational reserves of the species' raw material were calculated [13]. All the data obtained were compiled into an inventory statement.

Results and Discussion

The research was conducted in April 2024 in the Shalkar district of Aktobe region and the Aral district of Kyzylorda region. Taking into account the botanical and geographical demarcation the investigated territory is located in the Northern-Turanian province of the Western-Northern-Turanian subprovince, which belongs to the Iran-Turanian subarea of the Sahara-Gobi desert area [16].

The surroundings of the Tereskent botanical field station (Shokysu railway station), as well as the territories located near the villages Saksaulsk and Akespe were surveyed (Fig. 1).

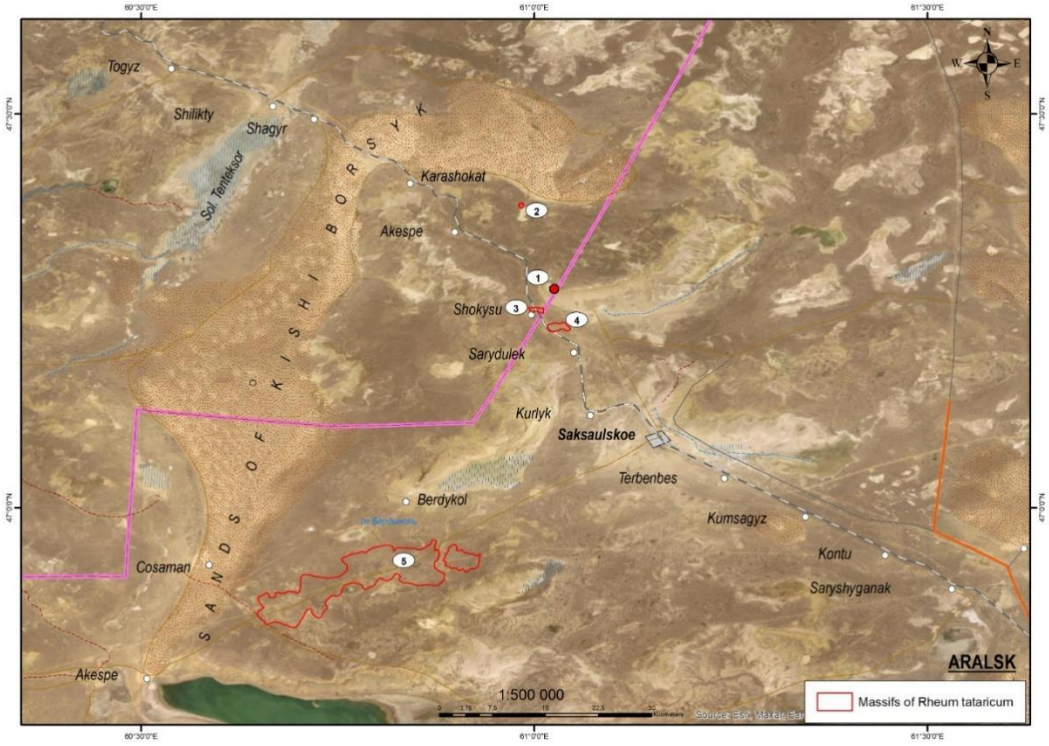

Figure 1. Locations of the identified *Rheum tataricum* massifs

To determine the yield of the aboveground and underground phytomass of tatar rhubarb, 5 massifs with different areas and projective coverage of the resource species were surveyed. The area of the massifs was initially determined in the field, and later it was adjusted based on satellite images.

In each massif, 5 sample sites of 5x5 sq. m. were laid. On each plot, the number of model plants of large (L), medium (M) and small (S) sizes was counted, after which the average density of the thicket and the projective coverage of *Rh. tataricum* were determined based on the area occupied by the model plants (Table 1).

Table 1

Quantitative indicators of model plants

Model plants	Parameters of model plants (sq. m)	The density on the site 5x5 sq. m	The amount of plants per ha	Projective coverage of tatar rhubarb (%)
1	2	3	4	5
Massif 1				
Large	0,53x0,43	3	1200	6,5
Medium	0,45x0,32	6	2400	
Small	0,30x0,16	2	800	
Massif 2				
Large	0,80x0,59	4	1600	10
Medium	0,54x0,30	3	1200	
Small	0,34x0,16	2	800	
Massif 3				
Large	0,90x0,55	3	1200	44
Medium	0,55x0,50	26	10400	
Small	0,40x0,25	24	9600	
Massif 4				
Large	0,65x0,75	6	2400	32
Medium	0,64x0,45	16	6400	
Small	0,31x0,22	6	2400	

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Continuation of Table 1

1	2	3	4	5
Massif 5				
Large	0,55x0,45	2	800	5
Medium	0,45x0,30	5	2000	
Small	0,30x0,15	1	400	

The yield assessment of *Rh. tataricum* was during the budding and flowering phases on the sample plots. In the field, the raw weight of the aboveground and underground phytomass of each model plant was determined. After weighing, the samples were packed in kraft paper for drying to air-dry condition, with final weight determined in laboratory conditions.

Table 2 presents integral data for each studied massif of tatar rhubarb, including projective coverage, raw and air-dry weight of model plants, % of shrinkage.

Table 2

Characteristics of *Rheum tataricum* massifs in the Northern Aral region

Location of the thickets (massif number)	The name of the community	General projective coverage / projective coverage of tatar rhubarb (%)	Raw weight of model plants		Air-dry weight of model plants	
			weight of aboveground part (g)	weight of underground part (g)	weight of aboveground part (g) / shrinkage (%)	weight of underground part (g) / shrinkage (%)
Massif 1 Aktobe region, Shalkar district, at the top of the plateau	ephemeroid-lichen-anabasis	60-70 / 6,5	565	2275	68 / 12,0	910/ 40
Massif 2 Aktobe region, Shalkar district, pre-suspension strip near the temporary lake (between the railway stations Shokysu and Karashokat)	sagebrush-ephemeroid	60 / 10	885	2505	92 / 10,4	870 / 35
Massif 3 Aktobe region, Shalkar district, surroundings of the Shokysu railway station	sagebrush-ephemeroid-rhubarb	65-70 / 44	690	2205	86 / 12,5	880 / 35
Massif 4 Kyzylorda region, Aral district, surroundings of Shokysu railway, 2.4 km south of Shokysu railway station	sagebrush-ephemeroid	60-65 / 32	1015	2580	116 / 11,4	990 / 38
Massif 5 Kyzylorda region, Aral district, on the road between the villages of Akespe and Berdykol	sagebrush-ephemeroid	40-45 / 5	595	1222	75 / 12,6	550 / 45

The data from Tables 1 and 2 were used to determine the area occupied by *Rh. tataricum* in each massif, to recalculate the reserves of raw materials in centners per hectare (c/ha), the operational stocks of the root and the volume of possible annual processed of raw materials (Table 3).

Table 3

Stocks of air-dry raw materials of *Rheum tataricum* in the identified massifs

No of massif	The area of the thicket, ha		Yield of air-dry raw materials, c/ha		Operational stock of air-dry raw materials, metric tons	Volume of possible annual processed air-dry raw material, metric tons
	total	occupied by the tatar rhubarb	aboveground	underground		
1	0,08	0,005	0,85±0,11	0,34±0,04	–	–
2	25,5	2,55	1,29±0,16	12,43±1,61	2,35	0,4
3	74,0	32,6	3,06±0,4	23,49±3,05	56,69	9,45
4	197,0	63,0	4,33±0,56	41,47±5,39	193,35	32,22
5	8751,0	437,6	0,85±0,11	6,27±0,81	203,21	33,87

On the first massif, located at the top of the plateau, the total area was 0.08 ha, of which 0.005 ha were occupied by *Rh. tataricum*. The yield of air-dry raw materials of the above-ground part was 0.85±0.11 c/ha, of the underground part — 0.34±0.04 c/ha. Since the area of this massif is less than one hectare, annual harvesting of air-dry roots from this massif is not feasible.

The second massif is located in a sandy belt near a temporary lake, with a total area of 25.5 ha, of which 2.55 haare occupied by rhubarb. This massif is situated on an anthropogenically disturbed area used for livestock grazing. The level of degradation of the site is average. The yield of air-dry aboveground biomass was 1.29±0.16 c/ha, and for underground biomass, it was 12.43±1.61 c/ha. The operational stock of air-dry root is 2.35 tons. The volume of possible annual processed of air-dry root was 0.4 tons.

The third massif is located near the village of Shokysu (Fig. 2). The total area of the massif is 74.0 ha, of which 32.6 haare occupied by *Rh. tataricum*. A high level of degradation was noted, mainly due to livestock grazing. The yield of air-dry aboveground biomass was 3.06 ± 0.4 c/ha, and for underground biomass, it was 23.49±3.05 c/ha. The operational reserve of air-dry root is 56.69 tons. The volume of possible annual processed of air-dry root was 9.45 tons.

A B

Figure 2. The third massif of tatar rhubarb: A — model plant; B — the territory of the survey

The fourth massif is located 2.4 km southeast of Shokysu, near a road. The total area of the massif is 197 ha, of which 63 haobserved. The yield of air-dry aboveground biomass was 4.33±0.56 c/ha, and for underground biomass, it was 41.47±5.39 c/ha. The operational stock of air-dry root is 193.35 tons. The volume of possible annual processed of air-dry root was 32.22 tons.

On the fifth massif, located along the road between the villages of Akespe and Berdykol, the total area was 8,751 ha, of which *Rh. tataricum* occupied 437.6 ha. The level of anthropogenic disturbance of the site

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is average with strong foci, characterized by livestock grazing, technogenic, and road degradation. The yield of air-dry aboveground biomass was 0.85±0.11 c/ha, and for underground biomass, it was 6.27±0.81 c/ha. The operational reserve of air-dry root on the fifth massif was the largest and amounted to 203.21 tons, while the volume of possible annual processed of air-dry root was 33.87 tons.

An assessment of the anthropogenic disturbance of *Rh. tataricum* massifs showed that thickets with commercial reserves are formed in anthropogenic habitats (massifs 3 and 4 in the surroundings of the Shokysu railway station), where grazing pressure and road digression are observed. This is primarily due to the fact that *Rh. tataricum* is a plant with a short vegetative cycle (ephemeroid). As previously noted, during its short growing season (March-April), the species completes all the phenophases. By May the dried panicles with seeds are dispersed by the wind, and the seeds find micro-niches for germination in spring. In heavily disturbed areas, where indigenous pasture species (*Artemisia terrae-albae, Anabasis salsa, Bassia prostrata, Agropyron fragile, Krascheninnikovia ceratoides*, etc.) are eaten almost all year round and degradation frees ecological niches, *Rh. tataricum* uses free space to form large rosettes of 3–5 leaves in early spring with a projective coverage of 32 % to 44 % in these communities. In moderately disturbed areas (massifs 1, 2, 5), the projective coverage of *Rh. tataricum* varies from 5 % to 10 %. In zonal slightly disturbed communities with fully occupied ecological niches, the participation of this resource species in the total projective coverage of communities is less than 5 %.

A comparative analysis of contemporary and retrospective data was conducted, using the article of N.F. Kashkarova [7] on the Chokusu (Shokysu) massif, which located in close proximity to the railway station (Table 4).

Table 4

Comparative characteristics of the *Rheum tataricum* massif near the Chokusu railway station (L, M, S — model plants)

Plant association	Area of the massif / area occupied by *Rheum tataricum* (ha)	The density of the specimen / ha	Yield of raw root (t/ha)
1963			
Artemisia terrae–albae–Rheum tataricum	26000 / 15700	1500–1800	1,4–6,5
Anabasis salsa–Rheum tataricum		1000–1600	0,5–0,8
Rheum tataricum–Artemisia terrae–albae		500–800	0,3–0,8
2024			
Artemisia terrae–albae– ephemeroid*–Rheum tataricum*	271 / 95,6	1200 L + 10400 M + 9600 S	6,71
Artemisia terrae-albae– ephemeroid		2400 L + 6400 M + 2400 S	10,91

A comparison of the data revealed that the area of the massif decreased due to the expansion of the settlement. On the other hand, the density of *Rh. tataricum* per hectare increased, which affected the yield of the raw root.

Regarding the Shokysu massif, Kashkarova N.F. stated in her article that, due to its convenient location near the railway station, significant reserves of *Rh. tataricum*, and the availability of drinking water, this massif represents a valuable and promising site for organization of a procurement point [7].

As a result of the study, it was found that *Rh.tataricum* occurs in the following types of plant communities within the surveyed area: ephemeroid-lichen-anabasis, sagebrush-ephemeroid, sagebrush-ephemeroid-tatarrhubarb. The floristic composition of plant communities was determined for each massif (Table 5). The studied communities contain 32 species of vascular plants and one species of lichen. Among the associated species were often found: *Alyssum desertorum* Stapf, *Artemisia terrae-albae* Krasch., *Descurainia sophia* (L.) Webb ex Prantl, *Ranunculus falcatus* L., *R. platyspermus* Fisch. ex DC., *Tulipa biflora* Pall.

Table 5

The floristic composition of plant communities of the studied thickets of *Rheum tataricum*

Families / Species	Massifs / Abundance by Drude				
	1	**2**	**3**	**4**	**5**
Amaranthaceae Juss.					
Anabasis aphylla L.	-	-	sol	sol	-
*Anabasis salsa (*Ledeb.) Benth. ex Volkens	sp-cop_1	-	-	-	sol
Bassia prostrata (L.) Beck	sol	-	-	-	-
Ceratocarpus arenarius L.	-	-	-	-	-
Girgensohnia oppositiflora (Pall.) Fenzl	-	-	-	-	-
Pyankovia brachiata (Pall.) Akhani & Roalson	-	-	-	-	-
Soda foliosa (L.) Akhani	-	-	-	-	-
Apiaceae Lindl.					
Prangos odontalgica (Pall.) Herrnst. & Heyn	-	-	-	sol	-
Asparagaceae Juss.					
Asparagus breslerianus Schult. & Schult.f.	sol	-	-	-	-
Asteraceae Bercht. & J. Presl					
Artemisia semiarida (Krasch. & Lavrenko) Filatova	-	sp	-	-	sp
Artemisia terrae-albae Krasch.	-	-	sol-sp	sp-cop_1	sol
Takhtajaniantha pusilla (Pall.) Nazarova	sol-sp	-	-	-	-
Berberidaceae Juss.					
Leontice incerta Pall.	sol	-	-	-	-
Boraginaceae Juss.					
Lappula spinocarpos (Forssk.) Asch. ex Kuntze	sol	sol-sp	sol	-	-
Brassicaceae Burnett					
Alyssum dasycarpum Stephan ex Willd.	sol	-	-	-	-
Alyssum desertorum Stapf	sol	sp-cop_1	cop_1	sol	sp
Descurainia sophia (L.) Webb ex Prantl	sol	sol	sol	sol	-
Lepidium perfoliatum L.	sol	-	-	-	sp
Megacarpaea megalocarpa (Fisch. ex DC.) Schischk. ex B.Fedtsch.	sol	-	-	-	-
Strigosella africana (L.) Botsch.	-	-	sol	sol	-
Chorispora tenella (Pall.) DC.	-	-	sol	-	-
Cyperaceae Juss.					
Carex pachystylis J.Gay	-	sp	-	-	-
Geraniaceae Juss.					
Geranium linearilobum DC.	-	-	-	sol	-
Liliaceae Juss.					
Gagea reticulata (Pall.) Schult. & Schult.f.	-	sol	-	-	-
Tulipa biflora Pall.	sol-sp	sol	sol	-	sol
Poaceae Barnhart					
Agropyron desertorum (Fisch. ex Link) Schult.	-	-	-	-	-
Eragrostis minor Host	-	-	sol	sol-sp	sol-sp
Eremopyrum bonaepartis (Spreng.) Nevski	-	-	-	-	sp
Eremopyrum orientale (L.) Jaub. & Spach	sp	-	-	sol	-
Eremopyrum triticeum (Gaertn.) Nevski	-	-	sol	-	-
Poa bulbosa L.	sol-sp	sol	sol	-	-
Polygonaceae Juss.					
Atraphaxis spinosa L.	-	-	-	-	sol
Rheum tataricum L.f.	sol-sp	sp	cop_1	sp-cop_1	sp
Ranunculaceae Juss.					
Ranunculus falcatus L.	sol-sp	-	sol	sol	-
Ranunculus platyspermus Fisch. ex DC.	sol	sol	sol	sol	-
Thalictrum isopyroides C.A. Mey.	sol-sp	-	-	-	-
Circinaria affinis (Eversm.) Sohrabi(lichen)	cop_1	-	-	-	-

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Conclusions

A contemporary assessment of the resource potential of *Rh. tataricum* in the Northern Aral region has revealed five massifs ranging in size from 0.08 to 8,751 hectares. It was found that in the area of 535.75 hectares occupied by *Rh. tataricum*, the total operational stock of the air-dry underground biomass is 455.6 tons, with a possible annual processed volume of 75.94 tons of air-dry roots. Industrial harvesting of the underground part of *Rh. tataricum* is possible in compliance with the recommended volume of annual harvesting of raw materials in the territory of the Northern Aral region. The collection and harvesting of rootstocks from plants at least 4 years old are carried out after the aboveground parts have died off, leaving younger plants for the regeneration of the thickets. *Rh. tataricum* raw material can be harvested on the same thicket every 4-5 years [17].

The floristic composition of the *Rh. tataricum* communities which forming thickets includes 32 species of vascular plants and 1 lichen species, with the most frequent associated species being *Alyssum desertorum, Artemisia terrae-albae, Descurainia sophia, Ranunculus falcatus, R. platyspermus, Tulipa biflora.*

An assessment of the anthropogenic disturbance of *Rh. tataricum* massifs revealed that thickets with commercial reserves are formed in anthropogenic altered habitats (massifs 3 and 4 near the Shokysu railway station), which are characterized by grazing pressure and road degradation.

A comparative analysis of current and retrospective data from 1963 on the Chokusu (Shokysu) massif, located near the railway station, showed a reduction in the area of the massif, which is associated with the expansion of the settlement and the increase in the number of residential buildings. At the same time, the density of *Rh. tataricum* per hectare increased, which positively affected the yield of the raw roots.

The new data on the stocks of raw materials of *Rh. tataricum* in the Northern Aral region can serve as a basis for developing a rational and scientifically grounded system of procurement of medicinal raw materials in the region. *Rh. tataricum* is a valuable natural resource, which with a competent approach, can make a significant contribution to the development of various industries. However, it is important to note that without a scientific approach and sustainable use of natural thickets of *Rh. tataricum*, its reserves could be quickly depleted.

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Ж.Қ. Салмуханбетова, Л.А. Димеева

Солтүстік Арал маңындағы татар рауғашының (*Rheum tataricum* L.f.) фитоценоздық және ресурстық сипаттамасы

Мақалада Солтүстік Арал маңындағы татар рауғашының (*Rheum tataricum* L.f.) фитоценоздық ерекшеліктері мен ресурстық сипаттамасын бағалау бойынша зерттеу жұмыстарының нәтижелері келтірілген. *Rh. tataricum* — ресурстық потенциалы жоғары Қазақстан аумағындағы *Rheum* туысының ішіндегі кеңінен таралған түрлердің бірі. Татар рауғашы Солтүстік Арал маңының аридті климаты жағдайындағы қоршаған ортаның қолайсыз жағдайларына жоғарғы деңгейде бейімделушілік пен төзімділік көрсетті. Зерттеу жұмысының мақсаты — Солтүстік Арал маңы территориясындағы татар рауғашының өндірістік қамыстарын инвентаризациялау және шикізат қорын бағалау. Далалық зерттеу жұмыстары, татар рауғашының өнімділігін есептеу, тамырдың эксплуатациялық қорын және шикізатты даярлаудың жылдық мүмкін болатын көлемін анықтау, сонымен қатар, қазіргі және ретроспективті мәліметтерді салыстырмалы талдау жұмыстары жүргізілді. Ауданы 0,08-8751 га аралығындағы 5 массив анықталды. Зерттеу жұмысы нәтижесінде татар рауғашы алып жатқан 535,75 га ауданда жеңіл-құрғақ күйіндегі жерасты мүшелерінің жалпы эксплуатациялық қоры 455,6 т, ал жеңіл-құрғақ күйіндегі тамырды даярлаудың жылдық мүмкін болатын көлемі 75,94 т құрады. Солтүстік Арал маңында татар рауғашының жылдық шикізатты даярлаудың ұсынылған көлемін сақтаған жағдайда, жерасты мүшелерінің өндірістік қорларын дайындау мүмкіндігі бар екендігі анықталды.

Кілт сөздер: татар рауғашы, өндірістік қамыстар, өнімділік, шикізат қоры, эксплуатациялық қор, Солтүстік Арал маңы, аридті жерлер, антропогенді тіршілік орталары.

Ж.К. Салмуханбетова, Л.А. Димеева

Фитоценотическая и ресурсная характеристика ревеня татарского (*Rheum tataricum* L.f.) в Северном Приаралье

В статье представлены результаты исследования фитоценотических особенностей и оценки ресурсной характеристики ревеня татарского (*Rheum tataricum* L.f.) в Северном Приаралье. *Rheum tataricum* обладает значительным ресурсным потенциалом и является наиболее распространенным видом рода *Rheum* L. на территории Казахстана. В условиях аридного климата Северного Приаралья ревень татарский демонстрирует высокую приспособляемость и устойчивость к экстремальным условиям окружающей среды. Цель исследования — инвентаризация промысловых зарослей и оценка сырьевой базы ревеня татарского на территории Северного Приаралья для дальнейшего использования в качестве природного ресурса. Проведены полевые исследования, подсчет урожайности ревеня татарского, определение эксплуатационного запаса корня и объема возможной ежегодной заготовки сырья, а также сравнительный анализ современных и ретроспективных данных. Выявлено 5 массивов площадью от 0,08 до 8751 га. Установлено, что на площади занимаемой ревенем 535,75 га суммарный эксплуатационный запас воздушно-сухой подземной части составляет 455,6 т при возможном объеме ежегодной заготовки - 75,94 т воздушно-сухого корня. На территории Северного Приаралья возможны про-

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мышленные заготовки подземной части ревеня татарского при соблюдении рекомендуемого объема ежегодной заготовки сырья.

Ключевые слова: ревень татарский, промысловые заросли, урожайность, запас сырья, эксплуатационный запас, Северное Приаралье, аридные земли, антропогенные местообитания.

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