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Study of raw material resources of *Thymus marschallianus* at the territory of the Central Kazakhstan

In article the analysis of distribution and raw materials of areal part of *Thymus marschallianus* at the territory of the Karaganda region is carried out. It is revealed that the thyme lives in thyme, spiraea-thyme, herba varia-filipenduls-thyme, shrubby — herba varia — thyme, cereal — herba varia — thyme and herba varia — thyme communities. The species usually grows on slopes of hills, along springs, on meadows, in the lowhill decreases, on edges the separate forests, in thickets of bushes. Thyme populations in Mountains Ulytau, Mountains Karkaraly, Mountains Buyratau are noted. The set the area of thickets of *Thymus marschallianus* at the territory of the Karaganda region is estimated at 85,8 hectares, an operational stock — 40,6 tons, the volume of possible annual collecting raw materials — 17,52 tons. It is possible to conduct collecting raw materials on the 1st site 1 time in 3 years.

Keywords: *Thymus marschallianus*, raw material, resources, Central Kazakhstan, herbs.

Studying of new herbs and their introduction in medical practice is an important problem of development of the pharmaceutical and medical industry of Kazakhstan [1].

The existing range of medicinal vegetable raw materials of the Pharmacopoeia of Kazakhstan [2, 3] not fully satisfies requirements of pharmacy. It should be noted that in Kazakhstan about 6000 species of vascular plants grow, among them about 1000 species have medicinal properties [4]. In official medicine about 115 species are applied.

Species of thyme — *Thymus* L. have practical interest, their above-ground parts is used in traditional and official medicine as expectorant and antimicrobial means in the form of liquid extract, essential oil and is a part of the medicine «Pertussin» [5]. According to literary data researches on anti-oxidic [6–8], antimicrobial [9–11], spasmolytic [12, 13], antiviral activities and also acaricide effect are found [14, 15]. The Pharmacopoeia of Kazakhstan [3] has included 2 species — *Thymus vulgaris*, *Thymus serpyllum* though there are more than 20 species which also have useful properties.

For expansion of the range of thymes it is necessary to include other species of thymes possessing sufficient raw material resources in the territory of Kazakhstan in medical use.

The purpose of the real research is to estimate spreading and raw material resources of *Thymus marschallianus* at the territory of the Central Kazakhstan.

Methodology

Object of a research were natural populations of *Thymus marschallianus*; field departures conducted during the summer period of 2016–2017 years.

Studying of resources was conducted by method of registration platforms according to methodical instructions of I.L. Krylova and A.I. Schröter and other authors [16–18]. The size of one registration platform

was 1 sq.m, on one community they were put by from 30 to 50 pieces. On registration platforms counted the number of commodity individuals, selected samples for the weight analysis. The territory of communities was reduced to a geometrical figure, measured the parties and calculated the area.

Calculation of volume of annual possible collecting raw materials was made, proceeding from biological features of herb that is 40 % of an operational stock.

Results and discussion

Plants of *Thymus* genus widely meet in the territory of Kazakhstan. So, according to the reference book by S. Abdullina [19], in Kazakhstan 22 species of thymes grow: *Th. altaicus* Klok. et Schost., *Th. crebri-folius* Klok., *Th. dmitrievae* Gamajun., *Th. gubelinensis* Iljin, *Th. himalaicus* Ronn., *Th. incertus* Klok., *Th. irtyschensis* Klok., *Th. karatavicus* A. Dmitr. ex Gamajun., *Th. kirgisorum* Dubjan., *Th. lanulosus* Klok. et Schost., *Th. lavrenkoanus* Klok., *Th. marschallianus* Willd., *Th. mongolicus* (Ronn.) Ronn., *Th. narymensis* Serg., *Th. petraeus* Serg., *Th. proximus* Serg., *Th. rasitatus* Klok., *Th. roseus* Schipcz., *Th. schischkinii* Serg., *Th. sibiricus* (Serg.) Klok. et Schost., *Th. stepposus* Klok. et Schost., *Th. transcaspicus* Klok. From them 11 species grow at the territory of the Central Kazakhstan.

The biggest geographical distribution and extensive thickets are revealed for the sake of appearances *Thymus marschallianus*.

Marshall thyme (*Thymus marschallianus*, *Lamiaceae* family) usually grows on slopes of hills, along springs, on meadows, in the lowhills decreases, on edges of separated forests, in thickets of bushes (Fig.). Thyme populations in Mountains Ulytau, Mountains Karkaraly, Mountains Buyratau (Ulytausky, Karkaralinsky and Osakarovsky districts of the Karaganda region) are noted.

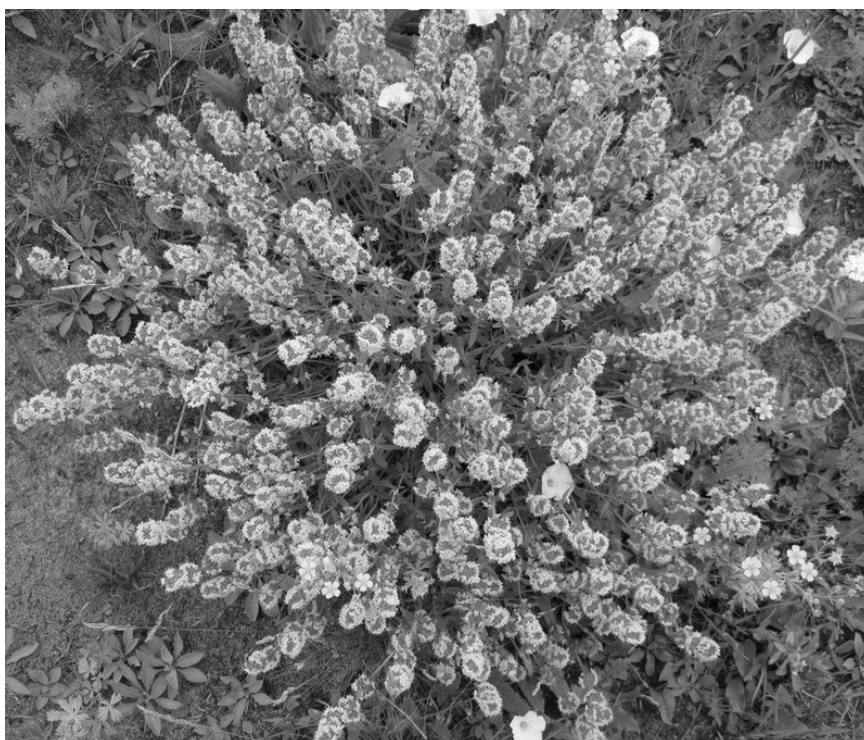


Figure. *Thymus marschallianus* in flowering phase

In Mountains Ulytau Marshall thyme meets in 2 communities: thyme (*Thymus marschallianus*) and speraeae-thyme (*Thymus marschallianus* — *Spiraea hypericifolia*).

The general projective herbage coverings in both communities have made 80–90 %. The Hstorey level in the first community isn't expressed; in the second — it is possible to allocate 2 tiers: top shrubby (height of 70–80 cm), consisting of *Spiraea hypericifolia*; lower grassy (up to 25 cm high), made of *Thymus marschallianus*, *Artemisia pontica*, *Potentilla bifurca*, *Ziziphora clinopodioides*, *Herniaria glabra* and *Bromopsis inermis*.

The occurrence of plants was from 0,5 to 3,4 pieces on 1 sq. m, productivity of elevated bodies from 62,0 to 164,8 kg/hectare (Table).

Productivity and raw stocks of *Thymus marschallianus* at the territory of the Central Kazakhstan (in terms of air and dry raw materials)

Name of community	Square of community, hectar	Productivity, kg/hectar	Operational stock, tons	Volume of annual possible collecting raw materials, tons
Mountains Ulytau				
Thyme	9,6	62,0±4,0	0,6	0,4
Spiraea — thyme	13,2	164,8±8,0	2,2	1,3
Total:	22,8		2,8	1,7
Mountains Karkaraly				
Herba varia — filipendula — thyme	5,2	260±6,0	1,35	0,68
Shrubby — herba varia — thyme	11,4	320±3,0	3,65	1,83
Cereal — herba varia — thyme	8,3	160±2,0	1,33	0,67
Herba varia — thyme	6,7	100±10,0	0,67	0,34
Total:	31,6		7,0	3,52
Mountains Buyratau				
Herba varia — thyme	31,4	982±83,0	30,8	12,3
Total:	31,4		30,8	12,3
ALL:	85,8		40,6	17,52

This species lives in Mountains Karkaraly on steppe, meadow sites, is rarer on slopes of mountains. Forms the following types of communities: herba varia — filipendula — thyme (*Thymus marschallianus* — *Filipendula ulmaria* — *Herba varia*), shrubby — herba varia — thyme (*Thymus marschallianus* — *Herba varia* — *Spiraea hypericifolia*), cereal — herba varia — thyme (*Thymus marschallianus* — *Herba varia* — *Festuca valesiaca* + *Stipa capillata*) and herba varia — thyme (*Herba varia* — *Thymus marschallianus*).

The herba varia — filipendula — thyme community is dated to steppe flat East side of Mountains Karkaraly. Aspect of vegetation is motley-green. A projective covering of herbage high is about 45–50 %, from them Marshall thyme is not less than 30 %. To dominants in community *Thymus marschallianus*, co-dominant is *Filipendula ulmaria*, *Gallim verum* acts.

The area of community average has made 5,2 hectares, productivity of elevated bodies of 2,6±0,6 centner/hectare (Table). The operational raw material inventory has made 1350 kg, the volume of possible preparations — 680 kg.

Shrubby — herba varia — thyme community grows on shrubby thickets. Aspect of vegetation is motley-green. A projective covering of herbage about 50–55 %, from them Marshall thyme up to 35 %.

To dominants in community *Thymus marschallianus*, a co-dominant of *Spiraea hypericifolia* acts. In community 3 vegetable tiers are allocated: top (up to 80–90 cm) it is presented by bushes of *Spiraea hypericifolia*, *Rosa laxa*, *Rosa spinosissima*. Average is presented by height (from 45 to 64 cm) tall grasses of *Medicago falcata*, *Filipendula ulmaria*, *Calamagrostis epigeios* and others; the lower tier (up to 25 cm) other members of vegetable community.

The area of this community in Mountains Karkaraly is estimated at 11,4 hectares, the productivity of raw materials is defined in 3,2±0,3 centner/hectare. The volume of possible preparations of raw materials was 1830 kg from an operational stock of 3650 kg (Table).

Cereal — herba varia — thyme community grows on granite gentle slopes of hills. The general projective covering of a vegetable cover isn't big — about 30–35 %, directly Marshall thyme of 12,5 %. The tiers are expressed very poorly. Dominant in community is *Thymus marschallianus*, co-dominants are *Festuca valesiaca*, *Stipa capillata*, *Calamagrostis epigeios*.

The productivity of elevated bodies of a thyme is calculated in 1,6±0,2 centner/hectare. The operational stock on the area of 8,3 hectares has made 1330 kg. Volume of possible preparations of raw materials is 670 kg (Table).

The herba varia — thyme community is dated to the steppe-meadow places. The general projective covering of herbage of 30–38 %, from them Marshall thyme is no more than 10–11 %. Aspect of vegetation is motley-green. To dominant in community is *Artemisia pontica*, co-dominants are *Chaerophyllum prescottii*, *Thymus marschallianus*, *Arenaria asiatica* acts.

The area of community is determined in 6,7 hectares at average yield of 1,0±0,1 centner/hectare. The operational stock is calculated in 670 kg, the volume of possible preparations in 340 kg (Table).

In Mountains Buyratau *Thymus marschallianus* grows on steppe and meadow and steppe sites, and forms independent thickets on slopes of hills, on stony sites, in meadow and shrubby and the new river thickets.

It forms herba varia — thyme (*Thymus marschallianus* — *Herba varia*) communities. The general projective covering of herbage of 40–45 %, a projective covering of *Thymus marschallianus* has made 19–20 % of them. Aspect of vegetation is motley. *Thymus marschallianus* is dominant in community, co-dominant is *Festuca valisiaca*. The productivity of a grass has averaged 98,2±8,3 of kg/hectare. The operational stock on the area of 31,4 hectares has made 30,8 tons, the volume of annual possible collecting — 12,3 tons (Table).

Thus, the set the area of thickets of thyme of Marshall at the territory of the Karaganda region is estimated at 85,8 hectares, an operational stock is 40,6 tons, the volume of possible annual collecting raw materials is 17,52 tons. It is possible to conduct collecting raw materials on the 1st site 1 time in 3 years.

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А.М. Ахметалимова, П.З. Оразбаева, М.Ю. Ишмуратова, С.А. Ивасенко, К. Гловняк

Орталық Қазақстан аумағында *Thymus marschallianus* өсімдіктерінің ресурстарын зерттеу

Мақалада Қарағанды облысының аумағында Маршалл жебіршөбінің таралуы мен шикізаты талданды. Жебіршөп өсімдігі жебіршөпті, тобылғы-жебіршөпті, әртүрлішөпті-жұлдызгүлді-жебіршөпті, бұтақты-әртүрлішөпті-жебіршөпті, астықтұқымдасты-әртүрлішөпті-жебіршөпті, әртүрлішөпті-жебіршөпті қауымдастықтарында өсетіндігі анықталды. Түр, әдетте, бұлақтар бойымен, шалғындарда, тау беткейлерінде, тоғай шеттерінде өседі. Жебіршөп популяциясының Ұлытау таулары, Қарқаралы таулары, Бұйратау тауларында тіркелген. Қарағанды облысындағы Маршалл жебіршөбі қопасының шикізат ықтималдылығы 85,8 га, эксплуатациялық қоры 40,6 т, шикізаттың жинаудың жылдық жинау көлемі 17,52 т бағаланып отыр. Бірінші учаскедегі шикізатты жинау үш жылда бір рет жүргізілуі мүмкін.

Кілт сөздер: *Thymus marschallianus*, өсімдік шикізаты, ресурстар, Орталық Қазақстан, дәрілік өсімдіктер.

А.М. Ахметалимова, П.З. Оразбаева, М.Ю. Ишмуратова, С.А. Ивасенко, К. Гловняк

Изучение растительных ресурсов *Thymus marschallianus* на территории Центрального Казахстана

В статье проведен анализ распространения и сырьевых запасов травы тимьяна Маршалла на территории Карагандинской области. Выявлено, что тимьян обитает в составе тимьяновых, таволгово-тимьяновых, разнотравно-лабазниково-тимьяновых, кустарниково-разнотравно-тимьяновых, злаково-разнотравно-тимьяновых и разнотравно-тимьяновых сообществах. Вид обычно произрастает по склонам сопок, вдоль родников, на лугах, в межсочных понижениях, по опушкам колковых лесов, в зарослях кустарников. Отмечены популяции тимьяна в горах Улытау, Карқаралы, Бұйратау. Совокупность площадей зарослей тимьяна Маршалла на территории Карагандинской области оценена в 85,8 га, эксплуатационный запас — 40,6 тонны, объем возможного ежегодного сбора сырья — 17,52 тонны. Сбор сырья на 1-м участке можно вести 1 раз в 3 года.

Ключевые слова: *Thymus marschallianus*, растительное сырье, ресурсы, Центральный Казахстан, лекарственные растения.

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