

## Notes to distribution of rare and endemic species of *Allium* L. (Amaryllidaceae) in South Siberia and Mongolia

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The article presents an information about rare and endemic species of *Allium* L. on the territory of South Siberia and Mongolia. Twenty one *Allium* species with different protection status grow in the territory, three of them are protected on state level. New records of rare *Allium pallasii* Murr. in Altai Territory and Republic of Altai are presented in the article for the first time. Distribution of the species in Mongolia is specified. Recommendations to protect *A. pallasii* in the Republic of Altai are suggested.

**Key words:** *Allium pallasii*, Altai Territory, distribution, new record, protection, Red Data Book, Republic of Altai

About 60 *Allium* L. (Amaryllidaceae) species are distributed in the territory of South Siberia in borders of G. A. Peshkova (2001) (Sinitsyna et al., 2016; Seregin et al., 2016; Plants of the World online, 2018). Twenty one of them are included in regional Red Data Books with different protection status (Krasnaya kniga Kemerovskoy..., 2012; Krasnaya kniga Respubliki..., 2012; 2017, 2018; Red Book of Krasnoyarsk..., 2012; The Red Data Book..., 2013; Krasnaya kniga Zabaikalskogo..., 2017). Three species (*A. bellulum* Prokh., *A. neriniflorum* (Herbert) G. Don ex Loudon, *A. pumilum* Vved.) are protected on the federal level (Krasnaya kniga Rossiyskoy..., 2008).

One of the rare *Allium* species is *Allium pallasii* Murr. (sect. *Pallasia* (Tzagolova) F. O. Khassanov, R.M. Fritsch et N. Friesen). The species is an endemic of Altai and Dzungaria and included in Red Data Books of Altai Territory (Sinitsyna, Friesen, 2016) and Novosibirsk Region (Krasnikov, Krasnikova, 2008).

It is necessary to conduct field work and study herbarium collections to find new locations of plants, especially rare and endangered species. The aim of the work was to accurate an information about distribution of *Allium pallasii* in the territory of South Siberia.

### Material and methods

For the work we used an information on *Allium* species from literature sources (Kashchenko, 1951; Vvedensky, 1963; Friesen, 1987, 1988, 1995; Xu, Kamelin, 2000; Krasnikov, Krasnikova, 2008; Sinitsyna, Friesen, 2016; Plants of the World online, 2018), as well as from herbarium collections of Altai State University (ALTB, Barnaul) and Central Siberian Botanical Garden (NS, NSK, Novosibirsk), the largest collections of plant material from South Siberia.

For construction of distribution map of *Allium pallasii* we used MapInfo Professional 7.5.

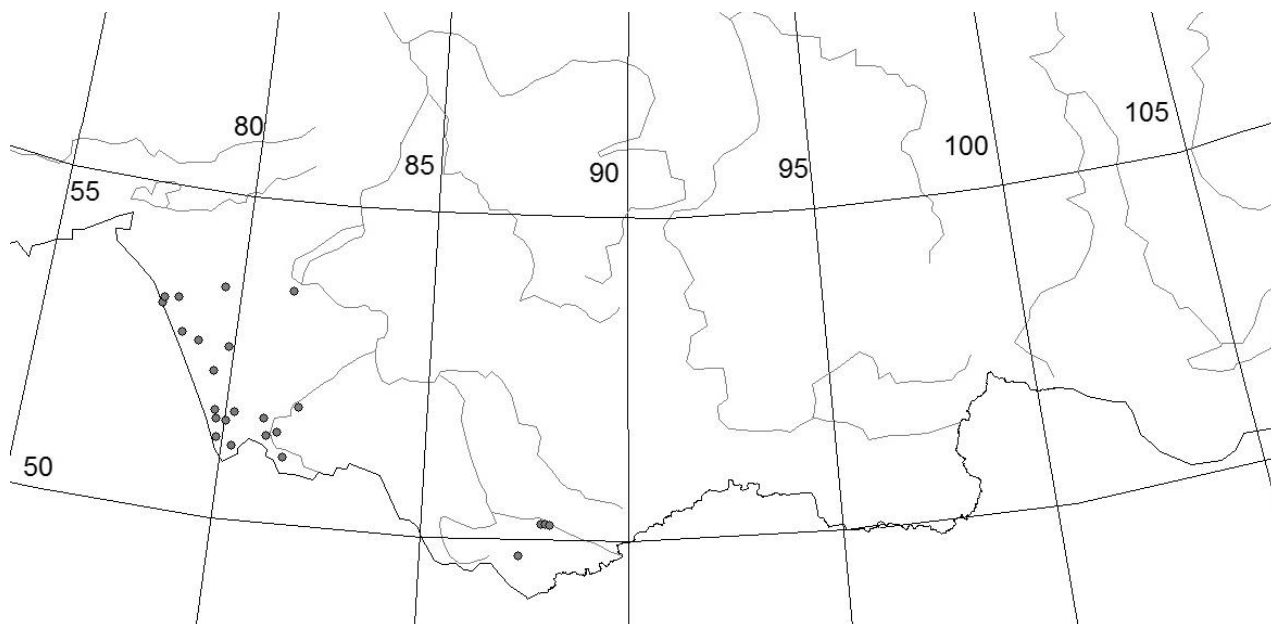
### Results and discussion

Murray (1776, Commentat. Soc. Regiae Sci. Gott. 6: 32) described *A. pallasii* from Siberia ("Sibiriae"). The species is distributed in China (Dzungaria, North Xinjiang) (Xu, Kamelin, 2000), East Kazakhstan, Kyrgyzstan (Central Tien Shan, basin lake Issyk-Kul, rivers Big and Small Kemin, Chui Valley, Kyrgyz Alatau, Chatkal, Talas, Alay) (Kashchenko, 1951), North-West Mongolia, Russia (Altai). It could be found in Tajikistan since it had been found on Alaiskiy ridge at the border of Tajikistan (Vvedensky, 1963).

N. Friesen (1995) included *A. pallasii* in the *Allium* synopsis for Mongolia according with Sančir (1992) without herbarium material and suggested that the species could be found in Dzungarian Gobi.

Here we specify the distribution of *A. pallasii* in Mongolia: "Mongolia, Kobdo aimak, 8 km to the north from vil. Uyench, 46.13 N, 92.03 E, nanofiton steppe. 19 VI 1999. S.V. Smirnov. V 2007. Det. N. Friesen" (ALTB).

In Russia *A. pallasii* is distributed in Altai Territory, Republic of Altai and Novosibirsk Region (Friesen, 1988; Krasnikov, Krasnikova, 2008; Sinitsyna, Friesen, 2016) (fig. 1).



**Figure 1.** Distribution of *Allium pallasii* Murr. in the territory of Russian Federation

In Altai Territory *A. pallasii* has 3A category of protection – rare species. It was pointed 10 districts of the Territory (Sinitsyna, Friesen, 2016). There is the north-western border of the species area in Altai Territory.

The additional record for the territory representing new district is following: “Russia, Altaiskii krai, Blagoveschenskii distr., south-east bank lake Kuchukskoe, 52.675966 N, 79.873544 E, steppe. 03VIII 2016. P.A. Kosachev” (ALTB).

In Novosibirsk Region *A. pallasii* is known only from 1 point – near lake B. Topolnoe. This lake is placed on the border with Altai Territory. In the region the species has 2V status – vulnerable species on the area border (Krasnikov, Krasnikova, 2008).

In Republic of Altai *A. pallasii* was indicated only from Kuray steppe (Friesen, 1988). But after revision of the herbarium material we found a new record of *A. pallasii* in about 70 km from Kurai location: “Republic of Altai, Kosh-Agach district, Koksuy river valley, upwards of mouth, right bank, 49.45 N, 87.16 E. 05 VII 1993. R.V. Kamelin, A.I. Shmakov, P. Golyakov, S. Dyachenko, A. Kiselev, M. Kashcheev. ABC 1172” (ALTB).

In Russia *A. pallasii* is conserved *ex situ* – in Botanical Garden of V. L. Komarov Botanical Institute (St.-Petersburg) (Information-searching system..., accessed 01.12.2018) and in South-Siberian Botanical Garden of Altai State University (Barnaul), but it is not stable in culture. The species is not represented in any nature reserves (Nukhimovskaya et al., 2005), but protected in territory of nature monument “Stepnoy klyuch” (Sinitsyna, Friesen, 2016).

In this time the species is not included in Red Data Book of Republic of Altai (2017). In the Republic *A. pallasii* has the north-eastern border of the area and grows in the rocky steppe under pasture stress. We recommend to include *A. pallasii* to the list of rare and endangered plants of the region with 2V status because of its vulnerability.

## Conclusion

The revision of herbarium material of rare species *A. pallasii* allowed us to accurate the area of distribution in the territory of South Siberia and Mongolia (fig.) and give the recommendation for its protection.

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