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## New species and noteworthy findings for flora of the Urals and adjacent territories

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**Summary.** The article provides information about rare and newly described species for the flora of the Urals and adjacent territories, namely: *Astragalus saphronovae* Kulikov, *Atraphaxis decipiens* Jaub. et Spach., *Carex amgunensis* F. Schmidt, *Galium densiflorum* Ledeb., *Jovibarba globifera* (L.) J. Parn., *Najas minor* All., *Potamogeton nodosus* Poir., *Pseudorchis albida* (L.) Á. Löve et D. Löve, *Salix myrsinites* L., *Veronica agrestis* L. Essays include the information on the species ecology and short taxonomic notes.

## Новые виды и наиболее интересные находки для флоры Урала и прилегающих территорий

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**Ключевые слова:** Актюбинская область, Свердловская область, систематика, Удмуртская республика, Ханты-Мансийский автономный округ – Югра, Челябинская область, экология.

**Аннотация.** В статье приводятся сведения о произрастании редких и новых видов для флоры Урала и прилегающих территорий: *Astragalus saphronovae* Kulikov, *Atraphaxis decipiens* Jaub. et Spach., *Carex amgunensis* F. Schmidt, *Galium densiflorum* Ledeb., *Jovibarba globifera* (L.) J. Parn., *Najas minor* All., *Potamogeton nodosus* Poir., *Pseudorchis albida* (L.) Á.Löve et D.Löve, *Salix myrsinites* L., *Veronica agrestis* L. Очерки включают сведения об экологии видов и краткие таксономические заметки.

### Introduction

The flora of the Urals has been studied for a relatively long time. Naturalists of the 18th century including D. G. Messerschmidt, I. G. Gmelin, G. V. Steller, I. P. Falk, P. S. Pallas, I. I. Lepyokhin and others collected numerous specimens and made seminal floristic observation. The systematic study of the flora of the Urals began in the late 19th – and early 20th centuries; some prominent research scientists of the flora of the Urals during this period were E. Hoffman, F. Ruprecht, V. S. Sergeev, O. E. Kler, P. G. Helm, P. N. Krylov, A. Ya. Gordyagin, S. I. Korzhinsky, P. V. Suizev, I. M. Krascheninnikov, B. N. Gorodkov, V. S.

Govorukhin, P. L. Gorchakovsky and a number of others. The most important summaries on the flora of the Urals are somewhat scant (Krylov, 1927–1939; Goworuchin, 1937; Gorchakovskiy, 1966, 1975; Opredelitel sosudistykh ..., 1994) and have already outdated in many ways. Thus, a new “Flora of the Urals” is required. In the past two decades, a number of regional “Keys for plant identification” and “Florals” for different subregions of the Urals have appeared, which substantially compensates for this deficiency (for example, Illyustrirovannyi opredelitel ..., 2007; Tarasova, 2007; Martynenko, Gruzdev, 2008; Naumenko, 2008; Ryabinina, Knyazev, 2009; Kulikov, 2010; Baranova, Puzyrev, 2012; etc.).

Currently, the project “Flora of the Urals and Adjacent Territories” has been launched, its strategies have been defined, and the boundaries of this “Flora” have been outlined in general (Melnikov et al., 2018; Melnikov, 2019). Botanists from all republics, regions and krais (territories) of the study area joined in this project. Within the framework of the “Flora of the Urals”, in this article we report on newly described species and noteworthy floristic finds within the Ural region as a whole.

All the species presented in the article are indigenous to the flora of the Urals in general, except for three species, which are adventive for the Sverdlovsk Region (*Jovibarba globifera* (L.) J. Parn., *Potamogeton nodosus* Poir., *Veronica agrestis* L.) and the Udmurtian Republic (*V. agrestis*).

### Materials and methods

The materials were obtained during expeditionary work and excursions in the period from 2012 to 2020 on the territory of the the Khanty-Mansi Autonomous Area – Yugra, Udmurtian Republic, Sverdlovsk, Chelyabinsk and Aktobe Regions, which are within the boundaries of the planned “Flora of the Urals and adjacent territories” (Melnikov, 2019). The collection of herbarium material was carried out by the route method. The coordinates of the locations were determined by GPS receivers (Garmin series) with an error of up to 100 m; for a number of cases, the coordinates were retrieved from satellite maps of the Yandex service with an error of up to 200 m. Identification of the species was carried out on the basis of modern “Floras” affecting the studied area and taxonomic monographs, for individual species consulted with taxonomists (publications and authors of definitions are indicated in the species essay). Taxa names are given according to “The World Checklist of Vascular Plants” (URL: <https://wcvp.science.kew.org>), except for cases of disagreement in the interpretation of the taxa status (here we relied on the opinion of the monographs). The cited samples are stored at SUBGI UFSC RAS<sup>1</sup>, UFA<sup>2</sup>, SVER, TMN, UDU, UFU, LE herbaria. The species are arranged in the text alphabetically.

<sup>1</sup> South Ural Botanical Garden-Institute of the Ufa Federal Scientific Center of the Russian Academy of Sciences.

<sup>2</sup> Herbarium acronyms are given according to the Index Herbarium database (<http://sweetgum.nybg.org/science/ih/>).

## Results and discussion

### New records for the flora of the Urals and Adjacent Territories

*Astragalus saphronovae* Kulikov (Fabaceae)

**Contributor:** Ya. M. Golovanov

#### Distribution and habitat

The species were described from the northern part of the western edge (‘chink’) of the Ustyurt Plateau, within the Mangistau Oblast of Kazakhstan (Kulikov, 2014), where it grows on fine-earth-gravelly slopes as part of agropyreto-artemisetum communities. Until now, it has only been known from the type locality. We found the species in an isolated location 500 km north of the type locality area at the foot of chalk hills within talus of chalk rocks. It is recorded for the first time within the Aktobe Region of the Republic of Kazakhstan.

#### Taxonomic notes

The sect. *Cystodes* Bunge (syn. *Vesicarii* DC.), which includes *A. saphronovae*, consists of about 15 species common in Central and South Asia, the Middle East, Western Asia, and Southern Europe (Ghahremani, 2004). In Middle Asia this section initially included two species: *A. medius* Schrenk and *A. albicaulis* DC. (Vasilyeva, 1961). Later, this section included *A. zingeri* Korsh., an endemic species for the Middle Volga and Trans-Volga regions (Vasilyeva, 1987). In modern classification of the genus (Podlech, 1999; Sytin, 2009; Podlech, Zarre, 2013), the sect. *Cystodes* is included in the sect. *Dissitiflori* DC. (syn. section *Xiphidium* Bunge). The species of the sect. *Cystodes* differ from those of the sect. *Dissitiflori* by a swollen calyx at fruition and the unpressed pubescence of the fruits (Ghahremani, 2004).

*A. saphronovae* is similar to the desert-steppe species of the same section, which is more widespread in the region – *A. medius* Schrenk. It differs from it in having much higher, erect, strongly lignified perennial shoots (by the nature of the life form, it is more similar to those of the sect. *Dissitiflori*, such as *A. brachylobus* DC. and *A. cornutus* Pall.), elongated loose racemes (even more elongated in fruiting phase) and particularly in fruit form – much longer and narrower (14–25 mm long and 2.5–3 mm wide) than *A. medius* (10–18 mm long and 4–5 mm wide), which is a sign of similarity with representatives of the sect. *Dissitiflori* (Kulikov, 2014). For a number of species (for example, *A. zingeri*, *A. aktubensis*), a hypothesis has been made about their hybrid origin (Kulikov, 2014),

and in general, for the sect. *Dissitiflori*, reticulate evolution has been shown (Bartha et al., 2013).

**Examined specimens (new record):** “Republic of Kazakhstan, Aktobe Region, Khobdinsky district, chalk mountains 16 km north-east of the village of Zhantalap (324 m above sea level), 50°24'58.1"N, 56°3'11.6"E. 21 V 2019. Ya. M. Golovanov”. Identified by M. S. Knyazev (Herbarium of SUBGI UFSC RAS, UFA).

*Atraphaxis decipiens* Jaub. et Spach  
(Polygonaceae)

**Contributor:** N. V. Zolotareva

**Distribution and habitat**

The species was first described from the Kazakh Upland (Kashina, 1992). The main part of the range is concentrated in Kazakhstan (Lovelius, 1978), but the species was also recorded in the Orenburg Region in Sol-Iletskiy, Akbulakskiy (Ryabinina, Knyazev, 2009), Gayskiy, Novosergievskiy, Perevolotskiy districts (data from the SVER herbarium). Within the territory of Siberia, two finds are known in the Russko-Polyansky district of the Omsk Region (Koropachinskiy, Vstovskaya, 2002) and in the Ulug-Khem district of the Republic of Tuva (Shauro et al., 2006). It grows singularly in steppes on stony-gravelly soils (Koropachinskiy, Vstovskaya, 2002), often on chalk outcrops (Ryabinina, Knyazev, 2009), sometimes on gravelly solonchets (data from the SVER herbarium). It was not previously known from the territory of the Chelyabinsk Region (Kulikov, 2010). The location identified by us is 190 km northeast of the nearest locality near the village Novopetrovskaya, Gaysky district, Orenburg Region (collection by M. S. Knyazev, SVER). A new species for the flora of the Chelyabinsk Region, the given location is the most northern collection for the region.

**Taxonomic notes**

The genus *Atraphaxis* L. includes about 30 species distributed from the eastern part of the Mediterranean, and from the Balkan Peninsula to Mongolia, but mainly occurs in Middle, Central and Southwest Asia (Lovelius, 1978; Tzvelev, 1996). Within the territory of the Southern Urals in the Orenburg Region, four species of this genus are found, to the north (in the Chelyabinsk Region and the Republic of Bashkortostan) previously only one species was known – *A. frutescens* (L.) K. Koch (Opredelitel vysshikh ..., 1989; Kulikov, 2010).

*A. decipiens* differs from *A. frutescens* by having small (5–9 mm long) and narrow (1–2 mm wide)

linear or linear-lanceolate leaves with revolute margins and inconspicuous lateral veins, short (2–2.5 cm long) and few-flowered inflorescences, with bright pink sepals at fruition (Ryabinina, Knyazev, 2009; Kulikov, 2010).

**Examined specimens (new record):** “Chelyabinsk Region, Bredinsky district, left bank of the river Syntasty 3.5 km north-west of the village of Andreevsky (52°23'36.5"N, 60°44'44.9"E), poor herboso-festucetum valesiacae steppe in the upper part of the slope of a small hill, on gravelly solonchets. 14 VI 2020. N. V. Zolotareva” (SVER).

*Carex amgunensis* F. Schmidt (Cyperaceae)

**Contributors:** N. V. Zolotareva, E. N. Podgavskaya

**Distribution and habitat**

The species area covers Western and Eastern Siberia, the Far East, Mongolia and Northeastern China (Egorova, 1999), but some relict localities are known from the Urals (Kulikov, 2010; Knyazev et al., 2017). It grows in dry light coniferous (mainly larch and pine) forests at woodland edges, on dry stony and steppe slopes; in the forest belt of mountains, less often on the plains (Egorova, 1999). Until now, no more than five localities were known in the Northern Urals (near the city of Karpinsk and along the Sosva river in the Sverdlovsk Region) (Krasnaya kniga ..., 2018) along with two localities from the South Urals (in the Miass and Karabash urban districts of the Chelyabinsk Region) (Krasnaya kniga ..., 2017a). In the Middle Urals, the species was recorded for the first time. The location identified by us is located 130 km north of the nearest locality on Shigirskiye Sopki near the village of Slyudorudnik, Karabash urban district of the Chelyabinsk Region (Krasnaya kniga ..., 2017a).

**Taxonomic notes**

*Carex amgunensis* is within sect. *Acrocystis* Dumort. This section includes about 45 species, of which 17 are found in Europe and Asia, about 25 species are endemic to North America and one to South America (Egorova, 1999). In the flora of the Urals, the section includes five species (Egorova, 1999; Kulikov, 2010; Knyazev et al., 2017), of which *C. amgunensis* is closest to *C. ericetorum* Pollich, but it is well distinguished by a short (0.6–0.8(1) cm long) and narrow-linear (1–2 mm wide) few-flowered staminate spikelet, spherical pistillate spikelets (0.5 cm long), of which the upper is located on the same level with the staminate spikelet, larger perigynia (3.5–4(4.5) mm long) each with an



elongated beak (1–1.2 mm long), narrower (1.5–2 mm wide) and softer leaf blades and purple-brown sheaths (Kulikov, 2010).

**Examined specimens (new records):** “Sverdlovsk Region, Yekaterinburg city, environs of the Palkino railway station, granite rocks «Kamennaya Chasha», 56°51'59.6"N, 60°22'48.8"E, under the rocks. 18 VII 2020. N. V. Zolotareva, E. N. Podgaevskaya” (SVÉR); the same city, “environs of the Severka settlement, outcrops of the Severskie Rocks granites (56°51'50.5"N, 60°18'26.5"E), under the rocks. 17 VII 2020. N. Zolotareva, E. N. Podgaevskaya” (SVÉR).

*Galium densiflorum* Ledeb. (Rubiaceae)

**Contributor:** V. A. Glazunov

**Distribution and habitat**

The species is distributed in the Arctic from the northern Malozemelskaya tundra in the west to Chukotka in the East (including the Polar Urals, Yamal), in the southeast of Western Siberia (including Altai), in Central and Eastern Siberia, in Eastern Kazakhstan, in the Far East, Mongolia and China (var. *saurense* (Litvinov) Tzvelev – pubescent variety) (Igoshina, 1966; Naumova, 1996; Rastitelnyy pokrov ..., 2006; Pinzhennina, 2020; *Galium densiflorum* ..., 2021).

It grows in the lower zones of alpine areas on stony slopes, rocks and in the lower zones in open steppe meadows, among bushes, river banks and flooded meadows (Krylov, 1939; Pobedimova, 1978; Naumova, 1996). The species is characterized by habitats with a periodic deficit of moisture in the soil, although it also occurs on moderately humid dry-meadow areas of the slopes of river terraces and high floodplain (Tzvelev, 1987). N. N. Tzvelev (1986, 1987) assigned it to the group of arctic-montane species.

This is the first find in the Subpolar Urals and the southernmost in the Urals (the distance to the nearest find in the Polar Urals is about 240 km). A new species for the Khanty-Mansi Autonomous Area – Yugra.

**Taxonomic notes**

*G. densiflorum* is part of the type section (sect. *Galium*) and belongs to the relationship of *G. verum* L. and *G. ruthenicum* Willd., *G. wirtgenii* F. W. Schultz (Pobedimova, 1958, 1978; Ehrendorfer et al., 1976; Tzvelev, 1986). The aggregate *G. verum* is sometimes considered as one species (*G. verum* s. l.) (Ehrendorfer et al., 1976) with several subspecies, and *G. densiflorum*, *G. wirtgenii* and *G. ruthenicum* are treated as synonyms, or at least questionable

taxa. However, recent studies of this group showed the stability of a number of morphological characters in the above species. *G. densiflorum* differs from *G. verum* and *G. ruthenicum* by having a very narrow paniculate inflorescence, leaves with revolute margins, the lower branches of the inflorescence, which are shorter than the internodes and equal to the leaves that are not reduced in the inflorescence, in having styles split to  $\frac{3}{4}$  of its length (in *G. verum*, the style is bipartite and split to the very base, in *G. ruthenicum* and *G. wirtgenii*, the styles are split only to the middle), and differs from *G. wirtgenii* in densely hairy ovaries and fruits (Pobedimova, 1958; Tzvelev, 1986; Pinzhennina (Balde), 2014).

**Examined specimens (new record):** “Khanty-Mansi Autonomous Area – Yugra. Subpolar Urals, north of the river Tykotlova, 65°17'54.6"N, 62°5'4.5"E, on a carbonate rock, solitary, blooming. 12 VII 2018. V. A. Glazunov” (TMN).

*Jovibarba globifera* (L.) J. Parn. s. str. (*Sempervivum globiferum* L.) (Crassulaceae)

**Contributors:** N. V. Zolotareva, E. N. Podgaevskaya

**Distribution and habitat**

The species occurs in Central and Eastern Europe, from central Germany to the eastern Carpathians, in the west and northwest of the European part of Russia (Favarger et al., 1993). The eastern limit of the species range passes through the Nizhny Novgorod and Penza Regions, where single localities have been documented, and the species is included in the regional Red Data Books (Krasnaya kniga ..., 2013, 2017b; Vasjukov, Saksonov, 2020). Further, east to the Urals, there are no natural localities of the species: in the Samara, Ulyanovsk Regions and Republic of Mordovia it is cultivated as an ornamental plant (Plantae vasculares ..., 2010; Saksonov, Senator, 2012; Rakov et al., 2014), in the flora of Chuvash Republic, Republic of Tatarstan, Republic of Mari El, Udmurtian Republic, Kirov Region it is absent (Abramov, 1995; Bakin et al., 2000; Tarasova, 2007; Baranova, Puzyrev, 2012; Gafurova, 2014). In the Urals, the species was not previously recorded either, representatives of the genus *Jovibarba* Opiz are absent in the flora of the Sverdlovsk, Chelyabinsk and Orenburg Regions, Perm Territory, Republic of Bashkortostan (Opredelitel vysshikh ..., 1989; Kulikov, 2005; Illyustrirovannyi opredelitel ..., 2007; Ryabinina, Knyazev, 2009; Knyazev et al., 2019). In the primary area, it grows on dry sandy soils, carbonate outcrops, pine forests and dry meadows (Favarger et al., 1993;

Bjalt, 2001). The location of the species identified by us is probably associated with its escape from cultivation – collective gardens are located 0.5 km away. A new species and genus for the flora of the Sverdlovsk Region, as well as for the territory of the Urals.

#### Taxonomic notes

The genus *Jovibarba* Opiz includes from two to six species (depending on the understanding of the volume of the species) in Central, Eastern and Southern Europe (Favarger et al., 1993; Bjalt, 2001). In the flora of the Urals, *J. globifera* is morphologically closest to species of the genus *Orostachys* Fisch., from which it differs in the presence of stolons and the absence of a spinule on the tops of leaves (in *J. globifera*, the leaves are ciliate along the margin) (Bjalt, 2001; Kulikov, 2010).

**Examined specimens (new record):** “Sverdlovsk Region, Yekaterinburg city, environs of the railway Palkino station, right bank of Reshetka River (56°52'5.3"N, 60°22'30.1"E), small outcrops of granite surrounded by a herboso-calamagrostietum epigei meadow. 18 VII 2020. N. V. Zolotareva, E. N. Podgaevskaya” (SVER).

*Najas minor* All. (*Caulinia minor* (All.) Coss. et Germ.) (Hydrocharitaceae)

**Contributors:** N. Yu. Grudanov, A. S. Tretyakova

#### Distribution and habitat

*Najas minor* is an indigenous Eurasian southern boreal forest-steppe species. It is found in Western, Central, Northern (south) and Eastern (south, including the Caucasus) Europe, North Africa, Western (Turkey, Syria, Lebanon, Iran, Iraq), Middle (Kazakhstan and Uzbekistan), Central (Afghanistan, Pakistan), South (northern India) and East (China, Korean Peninsula, Japan) Asia, southern regions of Siberia and the Far East. It is an invasive species in North America (Merkulowicz, 1941; Tzvelev, 1979; Triest, 1988; *Conspectus florum* ..., 2005; *Najas minor* ..., 2021). Within the territory of the region, the species was collected in the 19th century in the Perm Region (in the cities of Perm and Ocher; Suizev, 1912; Goworuchin, 1937; Ovesnov, 1997), in the Tyumen Region – lake Gryaznoe to the north of the village Peganovo, Berdyuzhsky district; lake Aiginskoye, 9 km north-east of the village Shcherbak; lake Kuchakovo, Nizhnetavdinsky District (Khozyainova, Glazunov, 2001; Zasukha, Likhovidova, 2001; Naumenko et al., 2011; Glazunov, Nikolaenko, 2015). This species

is presented for the first time in the Sverdlovsk Region. It is an annual that reproduces exclusively by seeds. Seed transfer is carried out by hydrochory, as well as by endo- and epizoochory (Triest, 1988; Birykova et al., 2017). It occurs in shallow, relatively warm stagnant water bodies (floodplain lakes, river backwaters, less often mainland lakes and ponds) but can also grow in streams and rivers. *N. minor* prefers an alkaline condition (pH 6.0–9.3 with an optimal range of about 6.6–7.2). It occurs at a depth of up to 5 m with an optimum of about 0.5–2 m and temperatures up to 8 °C, and can inhabit brackish waters with salinity up to 0.3 ppt (Krasnaya kniga ..., 2008; *Global Invasive* ..., 2013). There are conflicting opinions regarding the turbidity of water and its eutrophication. So, for the Tyumen Region, it is indicated (Kapitonova, 2017) that the species is characterized by low competitiveness, does not withstand water pollution or turbidity, while for the USA, it is indicated that it is resistant to turbidity and eutrophication, and this gives it competitive advantages and contributes to the replacement of native species (*Global Invasive* ..., 2013). Considering its relict nature (Birykova et al., 2017) and its extremely rare localities in the Ural region, it can be agreed that the species is at the limit of its ecological range.

#### Taxonomic notes

*N. minor* belongs to the subgenus *Caulinia* (Willd.) A. Br. ex Rendle (considered by some authors as part of the independent genus *Caulinia* Willd. (Tikhomirov, 2015)), in sect. *Euvaginatae* Magnus. It differs from the similar species *N. flexilis* (Willd.) Rostk. et W. L. E. Schmidt (from sect. *Americanae* Magnus) by having leaves suddenly (rather than gradually) narrowed towards the base of the blade, brittle leaves (rather than flexible), narrower leaf blades (0.3–0.5 mm wide, excluding the teeth, not 0.4–1.2 mm wide) with spaced teeth along the edge, narrower (about 0.5 mm wide, not 0.6–0.8 mm wide) fruits, a seed envelope with a clearly visible sculpture of rectangular cells (but not with a smooth surface) (Kulikov, 2010). In the Far East (Eastern China, Japan) and in South Asia (northern India, Nepal), it is replaced by the closely related species *N. oguraensis* Miki. *N. minor* differs from the latter species in having single-sporangiate (rather than tetra-sporangiate) anthers 0.56–1.3 mm long (*N. oguraensis* 1.3–1.8 mm long), seeds 1.74–2.74 mm long (in *N. oguraensis* 2.6–3.5 mm long) and, on average, two times smaller epidermal cells of the leaf and slightly smaller leaf sizes (6.5–35 mm long, 0.13–0.7 mm wide in *N. minor* and 7–43 mm

long, 0.1–0.66 mm wide in *N. oguraensis*) (Triest, 1988; Midorikawa et al., 2020). *N. minor* is highly variable in leaf shape, especially in the length of the leaf teeth. In some Asian specimens, the midrib is spiked on the underside of the leaf (for example, Litwinow 3118 (LE)) (Triest, 1988).

**Examined specimens (new record):** “Russia, Sverdlovsk Region, Sukholozhsky district, the vicinity of Reftinsky village, warm waters of the Reftinskaya SDPP [State District Power Plant], 57°06′01.4″N, 61°43′09.7″E. 24 VIII 2019. N. Yu. Grudanov, A. S. Tretyakova” (UFU).

*Ortilia obtusata* (Turcz.) H. Hara (Pyrolaceae)

**Contributor:** N. I. Naumenko

**Distribution and habitat**

*O. obtusata* is a predominantly mountain forest and tundra species (Kobeleva, 1977) distributed in the mountain forests of Siberia (east of Western Siberia, Central and Eastern Siberia, the Northern Urals and the European Arctic (Busch, 1952); also indicated from the mountainous regions of the Caucasus and Central Asia, Mongolia, Tibet, the Himalayas, and North America (Skvortsov, 1980, 1981; Malyshev, 1997). Within the territory of the European part of Russia, the species is documented from the Arctic and Dvino-Pechersk floristic regions (Skvortsov, 1960, 1981). It grows in light green-moss and herb-green-moss coniferous and mixed forests, herbaceous and shrub tundras, in subalpine meadows, occurs not only on acidic, but also on basic and medium silicate rocks, calcareous sandstones and shales (Skvortsov, 1980; Malyshev, 1997). For the territory of the Udmurtian Republic, it was not previously documented (Baranova, Puzyrev, 2012). The location identified by us represents a significant separation (about 500 km to the south) from the southern boundary of the species distribution in the European part of Russia (60–65°N), as well as from known localities on the eastern slope of the Urals in the Sverdlovsk Region (about 440 km to southwest) (Skvortsov, 1960; Knyazev et al., 2018). A new species for the flora of the Udmurtian Republic, the given location is the most southern for the region.

**Taxonomic notes**

The genus *Ortilia* Rafin. includes two or three species (depending on the point of view on the volume of the species): *O. secunda* (L.) House, *O. kareliniana* (A. K. Skvortsov) Holub, and *O. obtusata*, which have a boreal Holarctic range (Skvortsov, 1960, 1980), common in the Arctic and temperate forest areas of the mountains and plains of the Northern Hemisphere. Within the boundaries

of the Udmurtian Republic and the adjacent regions of the Urals and the Cis-Urals, only one species was previously known – *O. secunda* (Illustrirovannyi opredelitel ..., 2007; Baranova, Puzyrev, 2012), which is widespread in the lowland forests of Eurasia (Busch, 1952).

It is described in the rank of variety (*Pyrola secunda* (L.) Garcke var. *obtusata* Turcz.) by N. S. Turczaninow from Tunkinskiye Goltsy (Eastern Siberia). *O. obtusata* is taxonomically closer to *O. kareliniana*. It differs from *O. secunda* in the noticeably smaller size of the plant: stems 3–15 cm high; opaque, dark green above and light below, broadly ovate, oval or rounded, rounded at the top of the leaves 1–2.5 cm long and 1–2 cm wide (*O. secunda* leaves slightly glossy, green, almost monochromatic above and below, ovoid, pointed, 2–5 cm long and 1–4 cm wide), as well as shorter (1.5–4 cm long), open, few-flowered inflorescences with 4–5 (up to 10) flowers per raceme (*O. secunda* has up to 25 flowers per raceme).

Comparison with herbarium material from Eastern Siberia (LE, LECB) confirmed the conspecificity of the samples from the Udmurtian Republic to the samples of *O. obtusata*.

**Examined specimens (new records):**

“Udmurtian Republic, Kezsky district, environs of the village of Guleishur (57°48′31.4″N, 53°22′13.8″E), sphagnum pine forest in the valley of the river Cheptsya. 25 VII 2019. N. I. Naumenko, A. N. Puzyrev” (UDU); “Udmurtian Republic, Kezsky district, environs of the village Malyy Polom (57°44′52.2″N, 53°29′25.7″E), sphagnum swamp forest. 06 VIII 2020. N. I. Naumenko, A. N. Puzyrev” (UDU).

*Potamogeton nodosus* Poir. (Potamogetonaceae)

**Contributors:** N. Yu. Grudanov, A. S. Tretyakova.

**Distribution and habitat**

The species has a rather extensive area. It is distributed in Europe to the north to the Baltic and North Seas and to the taiga zone, in Africa, in Anterior, Middle, Central, South and Southeast Asia, North, Central and South America, in the north and west of Australia (Dandy, 1980; Kaplan, Symoens, 2005; *Potamogeton nodosus* ..., 2021). This species occurs in water bodies and streams with slightly alkaline water rich in minerals (Kaplan, Symoens, 2005).

In the European part of Russia, it grows mainly in the chernozem zone, but in recent decades, the species began to expand its area in northern and



northeastern directions (Shcherbakov et al., 2008; Mayevskiy, 2014). For the Sverdlovsk Region, this is the first documented occurrence (Opredelitel sosudistykh ..., 1994; Knyazev et al., 2017). Apparently, the species is adventive in the region, because it is significantly (over 550 km) north of the known localities in the Orenburg Region (Ryabinina, Knyazev, 2009), does not occur in the adjacent areas of the Kurgan and Chelyabinsk Regions (Ovesnov, 1997; Naumenko, 2008; Kulikov, 2010), and only occurs in the unnaturally warm water of the Reftinskaya SDPP in the studied region. For the Middle Urals, this species is presented for the first time.

#### Taxonomic notes

It differs from the similar *P. natans* L. in the absence of a mobile, usually pale, articulation of the petiole and leaf blade, submerged leaves with a developed lanceolate translucent leaf blade (and not reduced to the petiole), shorter fruitlets (up to 4.2 mm long), a well-marked sharp keel, and a straight (rather than curved) styloidium (Dandy, 1980; Lisitsyna et al., 2009).

#### Examined specimens (new record):

“Sverdlovsk Region, Sukholozhsky district, the vicinity of of Reftinsky village, discharge channel of the Reftinskaya SDPP, in the water near the coast (57°06'01.4"N, 61°43'09.7"E). 24 VII 2019. N. Yu. Grudanov” (UFU).

*Pseudorchis albida* (L.) Á. Löve et D. Löve (*Leucorchis albida* (L.) E. Mey.) (Orchidaceae)

**Contributors:** E. D. Lapshina, V. A. Glazunov

#### Distribution and habitat

Distributed in the east of North America, in Greenland, in Western and Central Europe (mainly in mountainous areas such as the Alps, Pyrenees, south of the Dinaric Highlands) and Northern Europe (British Isles, Fennoscandia), Iceland, in the northern regions of Eastern Europe (Murmansk, Arkhangelsk, Vologda Regions, the Komi Republic), in the north of the Urals and Western Siberia (Moore, 1980; *Pseudorchis albida* ..., 2021). In the Urals, it is the rare species and is recorded in the northern taiga and tundra zone of the Subpolar and Polar Urals and the Cis-Urals area (from the lower reaches of the Pechora to the upper reaches of the Vychegda (Mamayev et al., 2004). The nearest location is known from the vicinity of the village of Neroyka (Khanty-Mansi Autonomous Area – Yugra) (Korikova, Tyurin, 2018), 140 km south-west of the new find, and another locality has been documented over 200 km south-south-

west of this find in the Northern Urals, in the upper reaches of the Volya River (Tyurin, Baykalova, 2012). It grows in a wide range of soil conditions: from acidic waterlogged substrates of sphagnum bogs to alkaline drained soils on gypsum karsts (Jersáková et al., 2011; Varlygina et al., 2014). In the Urals, it occurs in sparse coniferous and birch forests, forest edges, damp and swampy meadows, and in mountain tundra (Mamayev et al., 2004). The species is significantly reduced in abundance almost throughout its area (Jersáková et al., 2011). It is included in the Red Data Book of the Khanty-Mansi Autonomous Area – Yugra (Krasnaya kniga ..., 2013) with status 2 and in the Red Data Book of the Komi Republic (Krasnaya kniga ..., 2019) with status 3.

#### Taxonomic notes

Monotypic (or oligotypic) genus. Sometimes a closely related species *P. straminea* (Fernald) Soják is recognized (Bateman et al., 2017), whose populations in Northern Europe clearly differ from *P. albida*, but to the south, the morphological boundaries between them are erased (the differences are mainly in dimensional characters). Thus, it has been proposed to consider these two taxa as morphotypes of the same species (Varlygina et al., 2014). However, Bateman et al. (2017) consider the smaller sizes of plant organs from northern populations as adaptive characters to the habitat and the populations attributed to *P. straminea* as a young sister species.

**Examined specimens (new records):** “Khanty-Mansi Autonomous Area – Yugra. Subpolar Urals, north of the river Tykotlova, 65°18'19"N, 62°8'15"E, spruce-cedar-birch subshrub-green moss forest, solitary, 12 VII 2018, E. D. Lapshina” (TMN); *ibid.*, “65°18'7.4"N, 62°4'48.7"E, spruce-birch dwarf birch-green moss-sphagnum forest, solitary. 12 VII 2018. V. A. Glazunov” (TMN).

*Salix myrsinites* L.

**Contributor:** V. A. Glazunov

#### Distribution and habitat

The species is common in Western, Northern and Eastern (north and north-east) (north of Great Britain, Fennoscandia, Kola Peninsula and north of Karelia, Bolshezemelskaya tundra, in the Northern, Subpolar and Polar Urals) Europe and Western Siberia (eastern slope of the Polar Urals) (Belyaeva et al., 2006; Rastitelnyy pokrov ..., 2006; *Salix myrsinites* ..., 2021). Within the administrative boundaries in the Urals, it is found in the Sverdlovsk Region, the Komi Republic and the Yamalo-Nenets



Autonomous Area. It prefers basic rocks, mostly on limestones, on well-moistened substrates along banks of streams, on swamp outskirts, hollows, and on conglomerations of boulders (Skvortzov, 1966; Belyaeva et al., 2006). This find is a new species for the Khanty-Mansi Autonomous Area – Yugra.

#### Taxonomic notes

A. K. Skvortzov (1966) considered populations from the Pyrenees, Alps and Carpathians as independent species (*S. breviserrata* Flod., *S. alpina* Scop.). In the south of Siberia (Altai, Sayany, Sokhondo, Barguzinsky ridge), *S. myrsinites* is replaced by a closely related species *S. rectijulis* Ledeb. The latter species is distinguished by the falling leaves of the last season, rather than remaining on the shoots. (Skvortsov, 1999).

**Examined specimens (new record):** “Khanty-Mansi Autonomous Area – Yugra. Subpolar Urals, north of the river Tykotlova, 65°17'34"N, 62°8'44"E, along streambank, abundant. 10 VII 2018. V. A. Glazunov” (definition confirmed by I. V. Belyaeva) (TMN).

#### *Veronica agrestis* L.

**Contributors:** A. N. Puzyrev, N. Yu. Grudanov, P. V. Kondratkov, A. S. Tretyakova

#### Distribution and habitat

*V. agrestis* is distributed mainly in Western and Central Europe, avoids the extreme northern territories, and is a rather rare invasive species for many areas of the world including Eastern Europe (Baltics, Belarus, Ukraine, Nord, Central and South Russian regions), the Caucasus, Iran, Siberia, Eastern China, North and South America, South Africa, Australia, and New Zealand (Flora Nizhnego Dona ..., 1985; Tabaka et al., 1988; Mosyakin, Fedoronchuk, 1999; Opredelitel vysshikh ..., 1999; Mayevskiy, 2014; *Veronica agrestis* ..., 2021).

There is one indication for Siberia in the city of Tomsk (Kosachev, Ebel, 2010). For the flora of the Ural region, only one find is indicated each for the Republic of Bashkortostan in the Ufa city (Noskov, 1931, cited in Muldashev et al., 2017), for the Chelyabinsk Region in Solnechny settlement (Kulikov, 2010), for the Perm Territory (Illyustrirovanny opredelitel ..., 2007). These are the first collection of this species from the territory of the Sverdlovsk Region and the Udmurtian Republic.

#### Taxonomic notes

*V. agrestis* is a ruderal-segetal annual plant, belongs to the subgenus *Pocilla* (Dumort.) Martínez-Ortega, Albach et Fischer. The species complex of *V. agrestis*, *V. opaca* Fr. and *V. polita* Fr. is consid-

ered as sibling species. It differs from *V. opaca* and *V. polita* in the absence of simple hairs in the pubescence of the capsule (only glandular hairs are present), in a whitish, pale blue or pinkish corolla (in *V. opaca* and *V. polita*, corollas are generally bright blue), from *V. opaca*, it differs in less pubescent sepals, an obcordate capsule (in *V. opaca*, it is obreniform), and from *V. polita* – in lanceolate obtuse rather than ovoid acicular sepals (Drabble, Little, 1931; Walters, Webb, 1972; Yelenevsky, 1978). *V. agrestis*, unlike the other two species, is a tetraploid ( $2n = 28$ ), not a diploid.

**Examined specimens (new records):** “Udmurtian Republic, Sharkansky district, Lyalshur village, in the courtyard of the Lyalshur secondary school. On a flower garden near the school building, widely, blooms, bears fruit. 30 VII 2012. A. N. Puzyrev, Yu. N. Batanogova” (UDU); “Udmurtian Republic, Yakshur-Bodya district, village Yakshur-Bodya, on a flower garden near the building of an elementary school opposite the bus station. 15 VIII 2013. A. N. Puzyrev, N. A. Prozorova” (UDU); Ibid., “Weed on the flower garden, on the paths and in the crevice at the edge of the sidewalk. 21 VIII 2014. A. N. Puzyrev, N. A. Prozorova” (UDU); “Udmurtian Republic, Uvinsky district, the village of Novy Multan, in the courtyard of the Novomultan special correctional general education residential school of the VIII type. In the gap at the sidewalk, near the flower garden, several specimens. 22 VIII 2015. A. N. Puzyrev, K. N. Lipina” (UDU); Ibid. “In planting beets, widely. 22 VIII 2015. A. N. Puzyrev, K. N. Lipina” (UDU, LE); Ibid. “Weed on the flower garden near the school building, widely. 22 VIII 2015. A. N. Puzyrev, K. N. Lipina” (UDU, LE); Ibid. “In planting beets, often. 22 VIII 2015. A. N. Puzyrev, K. N. Lipina” (UDU); “Udmurt Republic, village of Yakshur-Bodya, in courtyard of a secondary school (Pushinoy str., 61), near the building of an elementary school. On a flower garden among *Lobularia* and other ornamental plants. 09 VIII 2016. A. N. Puzyrev, N. A. Prozorova” (UDU, LE); “Udmurtian Republic, the city of Votkinsk, in the courtyard of the ecological and biological center (Chaikovskogo str., 6). Weed in the orchard, near the compost heap. 24 VIII 2017. A. N. Puzyrev, E. N. Baralgina” (UDU); Ibid. “On the path between planting onions. 24 VIII 2017. A. N. Puzyrev, E. N. Baralgina” (UDU); “Sverdlovsk Region, Alapaevsky district, the vicinity of the village Novoyamovo, sowing peas (59°54'46.3"N, 61°43'23.7"E). 26 VII 2019. N. Yu. Grudanov, P. V. Kondratkov, A. S. Tretyakova” (UFU).

### Conclusions

In the course of the studies carried out in some regions of the Urals and adjacent territories, a number of rare and new species for these territories were discovered: *Astragalus saphronovae* Kulikov, *Atraphaxis decipiens* Jaub. et Spach., *Carex amgunensis* F. Schmidt, *Galium densiflorum* Ledeb., *Jovibarba globifera* (L.) J. Parn., *Najas minor* All., *Potamogeton nodosus* Poir., *Pseudorchis albida* (L.) Á. Löve et D. Löve, *Salix myrsinites* L., *Veronica agrestis* L. The materials will be useful for maintaining the Red Data Books and floristic lists of the Aktobe, Sverdlovsk and Chelyabinsk Regions, as well as for the Udmurtian Republic and Khanty-Mansi Autonomous Area.

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