Botanica Pacifica. A journal of plant science and conservation. 2021. 10(1): 109–119
DOI: 10.17581/bp.2021.10103

Botanica Pacifica plant chromosome data 1

Nina S. Probatova[1]* (ed.), Tatyana V. An'kova[2], Sergey G. Kazanovsky[3], Olga V. Kotenko[4], Zoya V. Kozhevnikova[1], Denis A. Krivenko[3], Maria V. Kryukova[5], Tatyana N. Motorykina[5], Elena Yu. Zykova[2]

Nina S. Probatova [1]* (ed.)
e-mail: probatova@biosoil.ru
ORCID 0000-0002-3279-4824

Tatyana V. An'kova [2]
e-mail: ankova_tv@mail.ru
ORCID 0000-0003-3661-0719

Sergey G. Kazanovsky [3]
e-mail: skazanovsky@mail.ru
ORCID 0000-0003-4453-0006

Olga V. Kotenko [4]
e-mail: olgagladilina@mail.ru
ORCID 0000-0001-8840-4234

Zoya V. Kozhevnikova [1]
e-mail: kozhevnikova@biosoil.ru
ORCID 0000-0002-2924-0281

Denis A. Krivenko [3]
e-mail: krivenko.irk@gmail.com
ORCID 0000-0003- 2658-1723

Maria V. Kryukova [5]
e-mail: flora@ivep.as.khb.ru
ORCID 0000-0003-1500-6993

Tatyana N. Motorykina [5]
e-mail: tanya-motorykina@yandex.ru
ORCID 0000-0001-5044-8469

Elena Yu. Zykova [2]
e-mail: elena.yu.zykova@gmail.com
ORCID 0000-0002-1847-5835

[1] Federal Scientific Center of the East Asia Terrestrial Biodiversity, FEB RAS, Vladivostok, Russia

[2] Central Siberian Botanical Garden SB RAS, Novosibirsk, Russia

[3] Siberian Institute of Plant Physiology & Biochemistry SB RAS, Irkutsk, Russia

[4] Amur Branch of the Botanical Garden-Institute FEB RAS, Blagoveshchensk, Russia

[5] Institute of Water and Ecology Problems FEB RAS, Khabarovsk, Russia

*corresponding author

Manuscript received: 09.11.2020
Review completed: 16.12.2020
Accepted for publication: 25.12.2020
Published online: 28.12.2020

Table of contents

ABSTRACT

The chromosome numbers (2*n*) are presented for 82 vascular plant species of 61 genera from 31 families: Amaranthaceae: *Amaranthus*, *Atriplex*; Apiaceae: *Angelica*, *Pimpinella*, *Torilis*; Araceae: *Calla*; Asteraceae: *Bidens*, *Hieracium*, *Lactuca*, *Leontodon*, *Solidago*; Boraginaceae: *Cerinthe*, *Lappula*; Brassicaceae: *Fibigia*; Campanulaceae: *Platycodon*; Caryophyllaceae: *Dianthus*, *Eremogone*; Cupressaceae: *Cupressus*; Ericaceae: *Rhododendron*; Euphorbiaceae: *Euphorbia*; Fabaceae: *Acacia*, *Astragalus*, *Galega*, *Lotus*, *Robinia*, *Trifolium*, *Vicia*; Grossulariaceae: *Ribes*; Iridaceae: *Iris*; Lamiaceae: *Leonurus*, *Lycopus*; Liliaceae: *Lilium*; Nelumbonaceae: *Nelumbo*; Onagraceae: *Chamaenerion*; Orobanchaceae: *Pedicularis*; Paeoniaceae: *Paeonia*; Papaveraceae: *Chelidonium*, *Glaucium*, *Papaver*; Plantaginaceae: *Plantago*; Poaceae: *Achnatherum*, *Calamagrostis*, *Digitaria*, *Eragrostis*, *Glyceria*, *Milium*, *Phleum*, *Poa*, *Puccinellia*; Polygonaceae: *Persicaria*, *Rumex*; Primulaceae: *Anagallis*; Ranunculaceae: *Delphinium*, *Pulsatilla*; Rosaceae: *Potentilla*, *Sibbaldia*, *Spiraea*; Rubiaceae: *Asperula*; Urticaceae: *Parietaria*; Valerianaceae: *Valeriana*; Violaceae: *Viola*. The species studied are from East Europe (Ukraine), Siberia (Irkutsk Region, Novosibirsk Region, Republic of Buryatia), Caucasus (Abkhazia, Armenia, Azerbaijan, Georgia, Russia), Middle Asia (Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan) and the Russian Far East (Amur Region, Khabarovsk Territory, Primorye Territory). Most of the species are diploids, with different basic numbers (*x*). Species with variable ploidy also were revealed. The CN data are accompanied with the brief information on ecology and distribution of the species studied.

Keywords: chromosome numbers, cytotypes, vascular plants, Abkhazia, Armenia, Azerbaijan, Georgia, Russia, Kazakhstan, Kyrgyzstan, Turkmenistan, Ukraine, Uzbekistan, *Milium tzvelevii*, new combination

РЕЗЮМЕ

Пробатова Н.С. (ред.), Анькова Т.В., Казановский С.Г., Котенко О.В., Кожевникова З.В., Кривенко Д.А., Крюкова М.В., Моторыкина Т.Н., Зыкова Е.Ю. Botanica Pacifica: числа хромосом растений 1. Сообщаются числа хромосом (2*n*) для 82 видов сосудистых растений из 61 рода и 31 семейства: Amaranthaceae: *Amaranthus*, *Atriplex*; Apiaceae: *Angelica*, *Pimpinella*, *Torilis*; Araceae: *Calla*; Asteraceae: *Bidens*, *Hieracium*, *Lactuca*, *Leontodon*, *Solidago*; Boraginaceae: *Cerinthe*, *Lappula*; Brassicaceae: *Fibigia*; Campanulaceae: *Platycodon*; Caryophyllaceae: *Dianthus*, *Eremogone*; Cupressaceae: *Cupressus*; Ericaceae: *Rhododendron*; Euphorbiaceae: *Euphorbia*; Fabaceae: *Acacia*, *Astragalus*, *Galega*, *Lotus*, *Robinia*, *Trifolium*, *Vicia*; Grossulariaceae: *Ribes*; Iridaceae: *Iris*; Lamiaceae: *Leonurus*, *Lycopus*; Liliaceae: *Lilium*; Nelumbonaceae: *Nelumbo*; Onagraceae: *Chamaenerion*; Orobanchaceae: *Pedicularis*; Paeoniaceae: *Paeonia*; Papaveraceae: *Chelidonium*, *Glaucium*, *Papaver*; Plantaginaceae: *Plantago*; Poaceae: *Achnatherum*, *Calamagrostis*, *Digitaria*, *Eragrostis*, *Glyceria*, *Milium*, *Phleum*, *Poa*, *Puccinellia*; Polygonaceae: *Persicaria*, *Rumex*; Primulaceae: *Anagallis*; Ranunculaceae: *Delphinium*, *Pulsatilla*; Rosaceae: *Potentilla*, *Sibbaldia*, *Spiraea*; Rubiaceae: *Asperula*; Urticaceae: *Parietaria*; Valerianaceae: *Valeriana*; Violaceae: *Viola*. Исследованный материал – происхождением из Восточной Европы (Украина), Сибири (Новосибирская область, Иркутская область, Республика Бурятия), Кавказа (Абхазия, Азербайджан, Армения, Грузия, Россия), Средней Азии (Казахстан, Кыргыстан, Туркменистан, Узбекистан) и Дальнего Востока России (Амурская область, Хабаровский край, Приморский край). Большинство исследованных видов – диплоиды, при различных основных (базовых) числах хромосом (*x*). Выявлены виды с переменной плоидностью. Установленные числа хромосом сопровождаются сведениями об экологии и ареалах исследованных растений.

Ключевые слова: числа хромосом, цитотипы, сосудистые растения, Абхазия, Армения, Азербайджан, Грузия, Казахстан, Кыргыстан, Туркменистан, Россия, Узбекистан, Украина, *Milium tzvelevii*, новая комбинация

This is a new format for Botanica Pacifica chromosome number (CN) data publication. It continues publishing of new CN countings, from many territories of Russia and other countries. The previous issues were: Probatova et al. 2012, 2014 etc., Korobkov et al. 2014 etc.

All materials with chromosome studies should be submitted electronically to: Nina S. Probatova, probatova@biosoil.ru.

The following citation format is recommended:

An'kova, T.V. & E.Yu. Zykova 2021. Alien species in the Novosibirsk City, Russia. In: Botanica Pacifica plant chromosome data 1 (N.S. Probatova, ed.). Botanica Pacifica 10(1):00–00.

Alien species in the Novosibirsk City, Russia

Tatyana V. An'kova & Elena Yu. Zykova

Funding: Central Siberian Botanical Garden SB RAS (AAAA-A17-117012610055-3) and Russian Foundation for Basic Research, project No. 19-04-00546.

Vouchers in NS.

AMARANTHACEAE

Amaranthus albus L., **2*n* = 32.** "Novosibirsk, Akademgorodok, at the Berdskoe highway, on the railway embankment, 18 Sep 2016, *E. Zykova 1016/EZ251*". North American native species, almost cosmopolite as invasive. In the Novosibirsk Region, the species is rare. Its CN 2*n* = 32 is obviously constant (see Bolkhovskikh et al. 1969, Marhold et al. 2007). First CN data for Russia. Tetraploid (4*x*), *x* = 8.

Atriplex sagittata Borkh., **2*n* = 18.** "Novosibirsk, Akademgorodok, at the Berdskoe highway, on railway embankment, 18 Sep 2016, *E. Zykova 1016/EZ242*" (Fig. 1A). Euro-Mediterranean, invasive elsewhere. In the Novosibirsk Region it is common in most districts. In Russia this CN was determined from Novosibirsk Region (Lomonosova & Krasnikov 1992), Krasnoyarsk Territory and Republic of Khakassia. Diploid (2*x*), *x* = 9.

Atriplex tatarica L., **2*n* = 18.** "Novosibirsk, Akademgorodok, at the Berdskoe highway, weedy plot near the building, 18 Sep 2016, *E. Zykova 1116/EZ244*". East Europe, Caucasus, Central Asia; as invasive – elsewhere. In the Novosibirsk Region it is common in most districts. The diploid and tetraploid (?) CNs were noticed earlier in the Novosibirsk Region (Lomonosova & Krasnikov 1992), but only diploid CN – from the Republic of Kalmykia (Lomonosova 2013) and elsewhere (Bolkhovskikh et al. 1969, Agapova et al. 1990, Marhold et al. 2007). Diploid (2*x*), *x* = 9.

ASTERACEAE

Lactuca serriola L., **2*n* = 18.** "Novosibirsk, Akademgorodok, the territory of the campus of Novosibirsk State University, along the paths, 18 Aug 2016, *E. Zykova 0916/EZ236*" (Fig. 1B). Euro-Mediterranean; cosmopolitan as invasive. Common invasive species in the region and elsewhere in Russia, its CN has been studied many times in Russia and in the Novosibirsk Region, too (Rostovtseva & Ligus 1978). Diploid (2*x*), *x* = 9. The CN is constant.

Solidago canadensis L., **2*n* = 18.** "Novosibirsk, Akademgorodok, Zolotodolinskaya Str., along the path on the way to botanical garden, 21 Sep 2016, coll. *E. Zykova 1216/EZ164*" (Fig. 1C). North American native species, expanded throughout Eurasia as cultivated (ornamental plant) and as invasive. First discovery in the Novosibirsk Region – at the end of the 20th century; now it can be found as invasive everywhere. First CN report from Siberia. Diploid (2*x*), *x* = 9. The close relative species, *S. gigantea* Aiton (also occurs in the Primorye Territory, cultivated and invasive) has tetraploid CN 2*n* = 36 (Rudyka 1995).

LAMIACEAE

Leonurus quinquelobatus Gilib., **2*n* = 18.** "Novosibirsk, Akademgorodok, the territory of the campus of Novosibirsk State University, along the road, 18 Aug 2016, *E. Zykova 0916/EZ240*"; "Novosibirsk, Akademgorodok, Zolotodolinskaya Str., along the path to the botanical garden, 21 Sep 2016, *E. Zykova 1216/EZ165*" (Fig. 1D). European-West Asian species; penetrated into Siberia and the Far East. Active species in the Novosibirsk Region. The same CN was given from Novosibirsk Region (Krasnikov 1991), Krasnoyarsk Territory and Irkutsk Region. Diploid (2*x*), *x* = 9.

Rare species of the Amur Region, Russia

Olga V. Kotenko

Funding: Scientific program "Introduction and preservation *ex situ* and *in vitro* of genetic resources of plants from East Asia – AAAA–A17–117021310192–0.

Vouchers in ABGI.

APIACEAE

Angelica anomala Avé-Lall., **2*n* = 22.** "Amurskaya Oblast', Bureyskii Raion, Bureya River, Sukhie Protoki, 50°13'00"N 130°14'44"E, 147 m a.s.l., 6 Sep 2013, *G.F. Darman 10*". East Siberia, Russian Far East, Japan, Northeast China, Korean Peninsula. Rare species in the Amur Region. The diploid CN 2*n* = 22 (*x* = 11) was reported for plants from the Primorye Territory (Agapova et al. 1990, Probatova 2014). First CN count for the Amur Region.

CAMPANULACEAE

Platycodon grandiflorus (Jacq.) A. DC., **2*n* = 18.** "Amurskaya Oblast', Blagoveshchenskii Raion, 8-th km of the route Blagoveshchensk–Svobodny, the oak forest edge, 50°31'33"N 127°49'11.5"E, 197 m a.s.l., 10 Sep 2017, *O.V. Kotenko 1*". East Siberia, Russian Far East, China, Japan, Korean Peninsula. The same CN has been determined in specimens from Primorye Territory (Probatova 2014), Amur Region (Korobkov et al. 2013), Trans-Baikal Territory (Chepinoga 2014), as well as from China and Japan. Diploid (2*x*), *x* = 9. The CN is constant.

GROSSULARIACEAE

Ribes diacantha Pall., **2*n* = 16.** "Amurskaya Oblast', Tambovskii Raion, Krasnoe Lake, floodplain of the Amur River, the edge of disturbed forest, 49°59'52"N 127°29'51"E, 118 m a.s.l., 5 Aug 2005, *G.F. Darman, V.M. Starchenko & T.N. Veklich* 17". East Siberia, Russian Far East, Mongolia, China, Japan, North Korea. Rocky slopes, river banks. In the Amur Region – the northern limit of the species distribution. Earlier, the CN (2*n* = 16) have been reported from Trans-Baikal Territory (Probatova et al. 2011, 2012). The CN

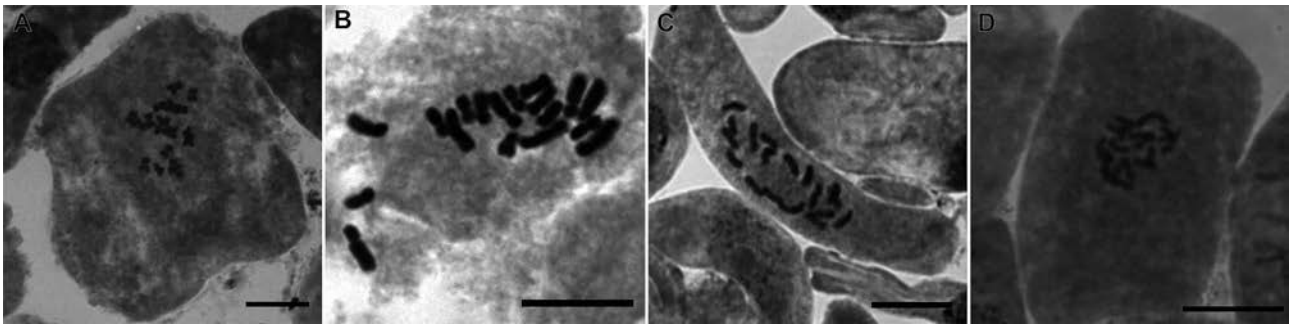

Figure 1 Mitotic metaphase chromosomes: A – *Atriplex sagittata* Borkh., 2n = 18; B – *Lactuca serriola* L., 2n = 18; C – *Solidago canadensis* L., 2n = 18; D – *Leonurus quinquelobatus* Gilib., 2n = 18; Scale bars = 10 μm

of *R. diacantha* now is determined for the first time for the Russian Far East. Diploid (2*x*), *x* = 8. The CN is constant.

IRIDACEAE

Iris laevigata Fisch., **2*n* = 32.** "Amurskaya Oblast', Blagoveshchenskii Raion, Mukhinka nature protected area, 50°55'93"N 127°65'07"E, 138 m a.s.l., in swamp, 25 Aug 2018, *O.V. Kotenko 34*". East Siberia, Russian Far East, China, Japan. The CN 2*n* = 32 was observed in specimens from the Republic of Buryatia and Primorye Territory (several times; see Chepinoga 2014, Probatova 2014). Besides, the CNs 2*n* = 28 and 36 were reported from China, 2*n* = 32 and 34 – from Japan and from India, respectively; these CNs, except 2*n* = 32, may belong to other species. Here is the first CN determination for *I. laevigata* from the Amur Region. The genus *Iris* Tourn. ex L. is polybasic (Májovský et al. 1987).

LILIACEAE

Lilium buschianum G. Lodd., **2*n* = 24.** "Amurskaya Oblast', Blagoveshchenskii Raion, near Snezhinka tourist base, near gravel road Blagoveshchensk-Belogorye, 50°39'14"N 127°65'15"E, 231 m a.s.l., dry slope, 12 Sep 2017, *O.V. Kotenko 49*"; "Amurskaya Oblast', Blagoveshchensk city, near ash dump of thermal station, 135 m a.s.l., 50°28'92"N 127°46'07"E, roadside, 11 Sep 2018, *O.V. Kotenko 60*". East Siberia, Russian Far East, Mongolia, Northeast China, Korean Peninsula. Sporadic in the Amur Region. The CN 2*n* = 24 was determined from Primorye Territory and Amur Region (Shatokhina 2006, Probatova 2014), sometimes 2*n* = 24 + 1–2B (Agapova et al. 1990).

Lilium distichum Nakai, **2*n* = 24.** "Amurskaya Oblast', Arkharinskii Raion, in vicinity of Kundur settlement, 49°07'11.0"N 130°50'59.7"E, 163 m a.s.l., disturbed deciduous forest along the slope, 28 May 2008, *G.F. Darman & I.V. Kozyr 56*". Russian Far East, Northeast China, Korean Peninsula, Japan. In the Amur Region – only in Arkhara District, the foothills of Malyi Khingan Ridge, where NW limit of its area of distribution is. The CN 2*n* = 24 in specimens from the Primorye and Khabarovsk Territories (Probatova et al. 2009, Probatova 2014) has been revealed. Earlier, 2*n* = 24 was identified for this species from the Amur Region (Probatova et al. 2011). The same CN was identified in plants from China, and from Korea – 2*n* = 24 + 1B.

Lilium pumilum Delile, **2*n* = 24.** "Amurskaya Oblast', Svobodnenskii Raion, near Petropavlovka village, 51°09'41"N 126°56'20"E, 154 m a.s.l., at the foot of dry rocky slope, among herbs, 21 Sep 2017, *O.V. Kotenko 23*". East Siberia, Russian Far East, Mongolia, Northeast China, Korean Peninsula. The CNs 2*n* = 24 and 2*n* = 24 + 0–2B have been detected in specimens from Primorye Territory (Probatova 2014), and 2*n* = 24 – for specimens from Irkutsk Region and the Republic of Buryatia (Chepinoga 2014). We confirmed the CN determined earlier from the Amur Region (Shatokhina 2007). 2*n* = 2*x*, *x* = 12.

NELUMBONACEAE

Nelumbo komarovii Grossh., **2*n* = 16.** "Amurskaya Oblast', Konstantinovskii Raion, Osinovoe Lake, 49°36'45"N 128°12'21"E, 116 m a.s.l., 20 Sep 2017, *I.A. Kreschenok 18*". Russian Far East, China, Japan, Korean Peninsula. In Amur Region – the northern limit of its area of distribution. Regressive species. The CN 2*n* = 16 is known for this species from the Primorye Territory (Bolkhovskikh et al. 1969, Probatova 2014) and Amur Region (Probatova et al. 2011). Diploid (2*x*), *x* = 8.

OROBANCHACEAE

Pedicularis striata Pall., **2*n* = 16.** "Amurskaya Oblast', Blagoveshchenskii Raion, near Snezhinka tourist base, 50°39'14"N 127°65'15"E, 231 m a.s.l., dry slope, 23 Oct 2017, *O.V. Kotenko 14*". East Siberia, Russian Far East, Mongolia, Northern China, Japan. This is the NE limit of its distribution. In Amur Region it was registered in Magdagacha, Svobodnyi and Blagoveshchensk Districts. Two CN determinations in this species existed: from the Buryatia Republic and Trans-Baikal Territory, both 2*n* = 16 (Chepinoga 2014). The CN is determined for the first time from the Russian Far East. Diploid, 2*n* = 2*x*; *x* = 8.

PAEONIACEAE

Paeonia lactiflora Pall., **2*n* = 10.** "Amurskaya Oblast', Blagoveshchenskii Raion, 8th km of the route Blagoveshchensk–Svobodny, 50°36'41"N 127°51'68"E, 197 m a.s.l., edge of oak forest, 23 Aug 2017, *O.V. Kotenko 26*"; "Amurskaya Oblast', Svobodnenskii Raion, Kostyukovka village, 223 m a.s.l., 51°18'44"N 127°40'51"E, oak forest, 22 Jul 2018, *O.V. Kotenko 54*". East Siberia, Russian Far East, Mongolia, China, Japan. In the Amur Region, the species occurs in most areas except Tynda, major part of Zeya and in Selemdzha Districts. The CN 2*n* = 10 was determined in specimens from the Primorye Territory (Probatova 2014). The same CN was known from Mongolia, China, and Japan. The first CN data from the Amur River basin. Diploid (2*x*); *x* = 5.

PAPAVERACEAE

Papaver rubroaurantiacum Fisch. ex Lundstr., **2*n* = 56.** "Amurskaya Oblast', Magdagachinsky Raion, vicinity of Chernyaevo village, near weather station, high riverside of the Amur River, 52°47'65"N, 125°59'73"E, 217 m a.s.l., 10 Aug 2004, *G.F. Darman & V.M. Starchenko 19*". Siberia, Russian Far East, Mongolia, China. Mountain-steppe species. Sporadic n the Amur River valley. On stony slopes, riverside rocks. Eastern limit of the species distribution. Before we knew only one CN report for *P. rubroaurantiacum*: 2*n* = 14, from Trans-Baikal Territory, Urul'ga River (Probatova et al. 2013), erroneously given as 2*n* = 28, moreover, this was referring by mistake to another publication in the book on the Baikal Siberian flora chromosome numbers (Chepinoga 2014). This is the first determination of CN for the Russian Far East. Variable ploidy: 2*x*, 8*x*, (*x* = 7).

RANUNCULACEAE

Delphinium grandiflorum L., **2*n* = 16.** "Amurskaya Oblast', Svobodnenskii Raion, vicinity of Petropavlovka village, 51°09'41"N 126°56'20"E, 154 m a.s.l., foot of dry rocky slope, 21 Sep 2017, *O.V. Kotenko 21*". Siberia, Russian Far East, Mongolia, China, Japan, Korean Peninsula. Mountain-steppe species; on riverside rocks and dry insolated slopes. Rare in the Amur Region. The CN 2*n* = 16 has been reported for this species many times from the Baikal Siberia and also 2*n* = 20 (Chepinoga 2014), but the last one needs to be verified. Earlier, 2*n* = 16 was detected in the plants from the Amur Region (Shatokhina 2006). The CN 2*n* = 16 was reported in this species from Mongolia and China. Diploid (2*n* = 2*x*), *x* = 8.

Pulsatilla turczaninovii Krylov & Serg., **2*n* = 16.** "Amurskaya Oblast', Svobodnenskii Raion, near Moskvitino village, 51°14'06"N 127°58'19"E, 184 m a.s.l., dry slope, 13 Jun 2017, *G.F. Darman 50*". Siberia, Russian Far East, Mongolia, China. Dry stony slopes, upland meadows, *Pinus* forest margins. Rare species in the Amur Region. Studies on this species from the Amur Region (Volkova & Ulanova 1986), Primorye Territory and Siberia (Agapova et al. 1993, Probatova 2014) have shown 2*n* = 16. The same CN was identified in plants from Mongolia. Diploid, 2*n* = 2*x*; *x* = 8.

Primorye Territory, Russia

Nina S. Probatova & Zoya V. Kozhevnikova

Vouchers in VLA.

POACEAE

Achnatherum pekinense (Hance) Ohwi (*A. extremiorientale* (H. Hara) Keng ex P. C. Kuo), **2*n* = 24.** "Primorskii Krai, Vladivostok city, Russkii Isl., near Pospelovo, 43°00'28"N 131°54'51"E, ca. 20 m a.s.l., 13 Sep 2016, *A.E. Kozhevnikov & Z.V. Kozhevnikova 13064*". East Asia. Forest edges. Diploid (2*x*), *x* = 12. Earlier the same CN was revealed in the Amur Region and 3 times – in Primorye Territory, all as for *A. extremiorientale* (Probatova 2014). Diploid (2*x*), *x* = 12.

Digitaria asiatica Tzvelev, **2*n* = 18.** "Primorskii Krai, Nadezhdinskii Raion, 1–2 km N of the holiday village Klyuchevoi, massif "Etalon", 43°24'19"N 131°58'06"E, 80–100 m a.s.l., on roadside and as a weed on the plots, 7 Sep 2016, *A.E. Kozhevnikov & Z.V. Kozhevnikova 13072*". East Asia; adventive in some regions. This species replaces its close relative *D. ischaemum*. There are several CN counts for *D. asiatica*, from Amur Region, Khabarovsk and Primorye Territories; the CN is constant (Probatova 2014). Diploid (2*x*), *x* = 9.

Digitaria ischaemum (Schreb.) Muhl., **2*n* = 36.** "Primorskii Krai, Partizanskii Raion, ca. 0.5 km SSE of Volchanets settlement, 42°54'28"N 132°46'13"E, ca. 2 m a.s.l., seacoast, moist plots, 29 Sep 2016, *A.E. Kozhevnikov & Z.V. Kozhevnikova* 13061". European species, invasive in many regions. Adventive in the Russian Far East, but not frequent. Tetraploid (4*x*), *x* = 9. There are several CN counts from Primorye Territory and other regions of Russia (Tzvelev & Probatova 2019). The CN is constant.

Eragrostis minor Host, **2*n* = 40.** "Primorskii Krai, Nadezhdinskii Raion, 1–1.5 km SW of the holiday village Klyuchevoi, right edge of the valley of Shmitovka River, 43°23'22"N 131°58'50"E, ca. 30 m a.s.l., terrace of the floodplane, the margin of deciduous forest with shrubs, 18 Sep 2016, *A.E. Kozhevnikov & Z.V. Kozhevnikova 13063*". Euro-Mediterranean (?), invasive in many regions and countries of the world. Variable ploidy (?), but in most cases 2*n* = 40 is observed. Tetraploid (*x* = 10). In the Russian Far East this species is not frequent (Tzvelev & Probatova 2019). First CN count for the Primorye Territory.

Glyceria triflora (Korsh.) Kom., **2*n* = 20.** "Primorskii Krai, Shkotovskii Raion, ca. 3 km E of Shkotovo settlement, riverside in the valley of the Shkotovka River, near the vehicular bridge, 43°19'12"N 132° 25'11"E, ca. 30 m a.s.l., 3 Aug 2016, *A.E. Kozhevnikov & Z.V. Kozhevnikova 13068*". Siberia, Middle Asia, Far East. One of the most common and largely distributed *Glyceria* species in the Russian Far East. Multiple CN reports from Russia and namely from the Russian Far East (Tzvelev & Probatova 2019). Diploid (2*x*), *x* = 10. The CN is constant.

Poa skvortzovii Prob. (≡ *P. pseudonemoralis* Skvortsov), **2*n* = 42.** "Primorskii Krai, Nadezhdinskii Raion, 1–1.5 km SW of the holiday village Klyuchevoi, right edge of the valley of Shmitovka River, 43°23'22"N 131°58'50"E, ca. 30 m a.s.l., terrace of the floodplane, the margin of deciduous forest with shrubs, 30 Jun 2016, *A.E. Kozhevnikov & Z.V. Kozhevnikova 13066*". Central Asia (Mongolia), East Asia. Forest edges, dry slopes. One of the most common *Poa* species in the south of the Russian Far East. Variable ploidy: 2*n* = 28, 35, 42, 56, but the CN 2*n* = 42 is obviously more common (Probatova 2014).

PRIMULACEAE

Anagallis arvensis L., **2*n* = 40.** "Primorskii Krai, Vladivostok city, Russkii Isl., coast of Ajaks Bay, territory of the campus of the Far East Federal University, 43°01'41"N 131°53'52"E, 5–10 m a.s.l., open NE slope, a weed on the lawn, 10 Aug 2016, *A.E. Kozhevnikov & Z.V. Kozhevnikova 13088*". Europe, America, Africa, Middle East, etc. – Mediterranean (?), but almost cosmopolitan as invasive. Fallow lands, vaste places, sand dunes, weed in plantations and in the gardens. The CN 2*n* = 40 was reported by multiple authors (Bolkhovskikh et al. 1969, Agapova et al. 1993, Marhold et al. 2007, Nishikawa 2008). The species CN is well studied in the world, but for first time – from Russia, and it is reported also for the first time in the flora of the Russian Far East (previously unrecorded plant). Tetraploid (4*x*), *x* = 10.

Caucasus (Abkhazia, Armenia, Georgia and Russia)

Nina S. Probatova & Denis A. Krivenko

Funding: Russian Foundation for Basic Research, project No. 19-04-00658.

APIACEAE

Torilis arvensis (Huds.) Link, **2*n* = 12.** "Armenia, Erevan City, Tsitsernakaberd Park, 40°11'22"N 44°29'04", 1080 m a.s.l., in shrubs, 29 Jul 2019, *D.A. Krivenko et al. 13522*" (IRK, VLA). Euro-Mediterranean, as invasive penetrated to North America, China, Japan, South Asia. Weedy places, roadsides, dry slopes. Many CN determinations: 2*n* = 12 (Bolkhovskikh et al. 1969, Májovský et al. 1987, Agapova et al. 1990, Marhold et al. 2007). The CN is constant. Diploid (*x* = 6). Polybasic genus: *x* = 6 and 8. In the East Asian species *T. japonica* (Houtt) DC. – 2*n* = 16, *x* = 8 (Probatova 2014).

ASTERACEAE

Leontodon biscutellifolius DC., **2*n* = 8.** "Georgia, Samtskhe-Dzhavakheti Krai, Akhaltsikhskii municipality, right riverside of the Kura River, on the way of Greli village to the monastery Sapara, 41°36'54"N 43°00'27"E, 1290 m a.s.l., graded steppe slope, 23 Jul 2019, *D.A. Krivenko et al. 13503*" (IRK, VLA). Euro-Mediterranean (South Europe, Caucasus, Asia Minor). Steppe communities, clearings, forest edges. Poorly studied species. We found only one report – 2*n* = 8 (Bolkhovskikh et al. 1969, Agapova et al. 1990). Diploid (2*x*), *x* = 4.

BORAGINACEAE

Cerinthe minor L., **2*n* = 18.** "Georgia, Samtskhe-Dzhavakheti Krai, Akhaltsikhskii municipality, right riverside of the Kura River, at the monastery Sapara, 41°36'7.39"N 43°01'50.37"E, 1300 m a.s.l., among herbs and shrubs, 23 Jul 2019, *D.A. Krivenko et al. 13511*" (IRK, VLA). Northwest, Middle and South Europe, Black Sea Coast, Caucasus. Rare species. Steppe communities. Multiple CN counts: 2*n* = 18 (Bolkhovskikh et al. 1969, Agapova et al. 1990, Marhold et al. 2007). Diploid (2*x*), *x* = 9.

Lappula barbata (M. Bieb.) Gürke, **2*n* = 24.** "Russia, Republic of Daghestan, Dokuzparinskii District, Great Caucasian Ridge, 4.5 km WSW of Kurush settlement, left riverside of Mullarchai River – the Chekhychai River Basin, opposite of Ragdan Mt., 41°16'08"N 47°46'51"E, 2450 m a.s.l., steppe meadow, 14 Aug 2019, *D.A. Krivenko 13469*" (IRK, NSK, VLA); "Russia, Republic of Daghestan, Dokuzparinskii District, Great Caucasian Ridge, 3 km WSW of Kurush settlement, Mullarchai River before inflow of Ragdanchai River (the Chekhychai River Basin), opposite of Ragdan Mt., 43°15'50"N 47°47'58"E, 2380 m a.s.l., forb meadow on riverside, 16 Aug 2019, *D.A. Krivenko 13479*" (IRK, VLA); "Russia, Kabardino-Balkaria Republic, Cherekskii District, Great Caucasian Ridge, Cherekskoe gorge, Verkhn'aya Balkaria settlement, left riverside of Chaynashki River, left riverside of the Cherek Balkarskii River, 43°07'54"N 43°26'15"E, 1280 m a.s.l., waste ground with ruderal vegetation, 8 Aug 2019, *D.A. Krivenko 13482*" (IRK, NSK, VLA). **2*n* = 48.** "Russia, Kabardino-Balkaria Republic, El'brus District, Skalistyi Range of the Great Caucasian Ridge, Baksanskoe gorge, right riverside of the Baksan River, S outskirts of Bylym settlement, 43°27'34"N 43°01'14"E, 1070 m a.s.l., abrupt rocky steppe slope, 7 Aug 2019, *D.A. Krivenko 13449*" (IRK, NSK, VLA). South Europe, Caucasus, Central Asia. Stony slopes.

Lappula consanguinea (Fisch. et C.A. Mey.) Gürke, **2*n* = 24.** "Russia, Kabardino-Balkaria Republic, El'brus District, Bokovyi Range of the Great Caucasian Ridge, Baksanskoe gorge, left riverside of the Baksan River, 18 km eastwards of El'brus Mt., near El'brus settlement, 43°16'02"N 42°39'07"E, 1670 m a.s.l., steppe mountain slope, 7 Aug 2018, *D.A. Krivenko 13483*" (IRK, VLA); "Georgia, Samtskhe-Dzhavakheti Krai, Akhaltsikhskii municipality, right riverside of the Kura River, on the way from Greli settlement to monastery Sapara, 41°36'20"N 43°01'49"E, 1310 m a.s.l., roadside, 14 Aug 2019, *D.A. Krivenko 13477*" (IRK, VLA); "Georgia, Samtskhe-Dzhavakheti Krai, Akhaltsikhe, at the S entry to Borzhomi gorge, left riverside of the Kura River, near the castle Atskuri, 41°42'26"N 43°08'19"E, 1300 m a.s.l., forb steppe meadow with ruderal vegetation, 23 Jul 2019, *D.A. Krivenko et al. 13481*" (IRK, VLA). South Europe, Caucasus, Siberia, Central Asia. Fallows, fields, wastelands, mostly as a weed. Tetraploid (4*x*), *x* = 6.

Lappula squarrosa (Retz.) Dumort., **2*n* = 24.** "Russia, Kabardino-Balkaria Republic, El'brus District, Bokovyi Range of the Great Caucasian Ridge, Baksanskoe gorge,

left riverside of the Baksan River, 18 km eastwards of El'brus Mt., N outskirts of El'brus settlement, 43°15'47"N 42°38'58"E, 1770 m a.s.l., steppe mountain slope, 7 Aug 2018, *D.A. Krivenko 13458*" (IRK, VLA). Holarctic. Dry steppe slopes, coastal pebbles, fallows, stony roadsides, wastelands. We confirm the variable ploidy in *L. barbata*: 4*x*, 8*x*; *x* = 6 (Bolkhovskikh et al. 1969) and present a new cytotype in *L. squarrosa*: 2*n* = 24 (in this species only 2*n* = 48 was known before – Májovský et al. 1987, Marhold et al. 2007, Chepinoga 2014).

BRASSICACEAE

Fibigia clypeata (L.) Medik., **2*n* = 16.** "Russia, Krasnodarskii Krai, outskirts of Novorossiysk city, in vicinity of Shirokaya Balka settlement, near the A.I. Maystrenko boarding house, 44°39'31.18"N 37°42'29"E, 68 m a.s.l., *Juniperus–Carpinus–Quercus* forest on stony slope, open rocky plot, 25 Sep 2019, *S.G. Kazanovsky 13497*" (IRK, VLA). Mediterranean. Oak forest edges, clearings, stony slopes. Poorly studied species. 2*n* = 16 (Bolkhovskikh et al. 1969). Diploid (2*x*), *x* = 8.

CAPRIFOLIACEAE

Valeriana erotica Christenh. et Byng, **2*n* = 28.** "Georgia, Samtskhe-Dzhavakheti Krai, Akhaltsikhskii municipality, right riverside of the Kura River, on the way of Greli village to the monastery Sapara, 41°36'20"N 43°01'49"E, 1310 m a.s.l., roadside, 23 Jul 2019, *D.A. Krivenko et al. 13542*" (IRK, VLA). East Mediterranean and Transcaucasus. This is the first CN report for *V. erotica*. Tetraploid CN (4*x*), *x* = 7).

CARYOPHYLLACEAE

Dianthus cruentus Griseb., **2*n* = 30.** "Armenia, Vayotsdzorskaya Oblast', right riverside of the Arpa River, 9 km NE of Malishka village, the crater of the Vayots Sar (Tapaci-Dalik) Volcano, 39°47'42.6"N 45°29'48.0"E, 2557 m a.s.l., stony forb steppe meadow, 21 Jul 2019, *D.A. Krivenko et al. 13498*" (IRK, VLA). Euro-Mediterranean. Mountain steppes and meadows. The same CN was known for the species: 2*n* = 30 (Bolkhovskikh et al. 1969). Diploid (2*x*), *x* = 15.

Eremogone gypsophiloides (L.) Fenzl, **2*n* = 22.** "Armenia, Vayotsdzorskaya Oblast', right riverside of the Arpa River, 9 km NE of Malishka village, crater of the Vayots Sar Volcano (Tapaci-Dalik), 39°47'42.6"N 45°29'48.0"E, 2557 m a.s.l., stony forb steppe meadow, 21 Jul 2019, *D.A. Krivenko et al. 13500*" (IRK, VLA). Euro-Mediterranean. Dry hills and calcareous rocks, 600–1400 m a.s.l. We found only 2 CN reports, from Armenia too (as *Arenaria gypsophiloides*): 2*n* = 22. Diploid (2*x*), *x* = 11.

CUPRESSACEAE

Cupressus sempervirens L., **2*n* = 22.** "Abkhazia, Gagrskii Raion, vicinity of Psou sanatorium, 43°22'54"N 40°03'02"E, 3 m a.s.l., in planting of greenery, 21 Jul 2013, *D.A. Krivenko 52354"* (IRK). This species has a native range from the E Mediterranean to Iran; introduced into Southern Europe, North Africa and Black Sea coast. The diploid (2*x*, *x* = 11). CN in species is constant as well as in the genus *Cupressus* L. (Muratova & Kruklis 1988).

EUPHORBIACEAE

Euphorbia seguieriana Neck., **2*n* = 18.** "Armenia, Vayotsdzorskaya Oblast', Teksarskii ridge, right riverside of the Arpa River, 2 km NE of Malishka village, 39°45'48"N 45°25'03"E, 1500 m a.s.l., 21 Jul 2019, *D.A. Krivenko et al. 13524*" (IRK, VLA). Central and West Europe, Caucasus, Southwest Asia, to the east – West Siberia. On sands, stony calcareous soils. Polybasic genus and, probably, species: 2*n* = 16, 18 (Májovský et al. 1987, Marhold et al. 2007), and 2*n* = 40 (Sokolovskaya & Probatova 1980: Daghestan, Sary-Kum sand dune): x = 8, 9, 10? Poorly studied species. The CN 2*n* = 18 seems to occur more frequently. Further studies are needed.

FABACEAE

Acacia dealbata Link, **2*n* = 26.** "Abkhazia, Gagrskii Raion, Tsandryphsh urban-type settlement, Psou sanatorium, 43°22'46"N 40°03'07"E, 6 m a.s.l., in planting of greenery, 20 Jul 2013, *D.A. Krivenko 52582*" (IRK). Species is native to Australasia. It's cultivated as a decorative tree in gardens of the Mediterranean region and on Black Sea coast (Palibin 1945, Lock 1989). In most literary sources, diploid (2*x*), *x* = 13 chromosome number of 2*n* = 26 is given for this species from the native range and introduction (Rice et al. 2015). In natural populations from Australia are triploids (2*n* = 3*x* = 39) and tetraploids (2*n* = 4*x* = 52) identified (Blakesley et al. 2002). It is worth noting that triploid cytotypes were identified by flow cytometry. This requires new evidence through classical chromosome counting methods. At the same time, identification of triploid cytotypes is an important task, because management of *A. dealbata* is difficult due to its tendency to escape from the culture and invade native forests (Turnbull et al. 1998, Chitanava 2004). One solution might be to plant triploid trees if they prove to have low fertility.

Astragalus glycyphyllos L., **2*n* = 16.** "Abkhazia, Gudautskii Raion, northern spurs of Gagra Mts., Gegsky Falls, left side of valley of the Gega River, 6 km from confluence with Yupshara river, 43°26'08"N 40°26'32"E, 530 m a.s.l., in cracks bedrock carbonate rocks, 23 Jul 2013, *D.A. Krivenko 52572*" (ALTB, IRK). Europe, Caucasus and adjacent territories of Turkey and Iran, Siberia and adjacent territories of Kazakhstan. It grows in forests and at their edges. The CN is constant. Diploid (2*x*), *x* = 8.

Galega officinalis L., **2*n* = 16.** "Abkhazia, Gagrskii Raion, Tsandryphsh urban-type settlement, near an abandoned mansion of the 18th and 19th centuries, 43°22'57"N 40°03'14"E, 8 m a.s.l., weedy-ruderal plant groups, 21 Jul 2013, *D.A. Krivenko 52578*" (ALTB, IRK, LE, MW). Native range is Central and South Europe to W Pakistan; introduced into North and Central Africa, America. Meadows, in forests and on their edges, etc. The CN is constant. Diploid (2*x*), *x* = 8.

Lotus corniculatus L., **2*n* = 24.** "Abkhazia, Gagrskii Raion, Tsandryphsh urban-type settlement, on Oktyabrskaya Str., 43°22'56"N 40°03'09"E, 3 m a.s.l., weedy-ruderal plant groups, 19 Jul 2013, *D.A. Krivenko 52590*" (ALTB, IRK). Native range is Temperate Eurasia, Macaronesia to NE and E Tropical Africa, SW Arabian Peninsula. It is introduced to many countries and to other continents, including Australia and America. Polymorphic species. Along with the most common tetraploid cytotype (4*x*, *x* = 6), which was found likewise in Primorskii Krai (Probatova 2014), the diploid (2*x*) and hexaploid (6*x*) cytotypes are also known (Rice et al. 2015).

Robinia pseudoacacia L., **2*n* = 22.** "Abkhazia, Gagrskii Raion, Tsandryphsh urban-type settlement, 43°22'43"N 40°03'39"E, 2 m a.s.l., sea shore, 20 Jul 2013, *D.A. Krivenko 52585*" (IRK). Native to the E of North America. This species was introduced in Europe from the beginning of the 17th century. Currently, it is cultivated as an ornamental and forest protection plant in Europe, Asia, America, Australia and Africa. *R. pseudoacacia* is prone to escaping from cultivated plantations and is thus an invasive species in many countries of temperate zone of both Hemispheres (Vinogradova et al. 2014). Diploid (2*x*), *x* = 11. The same CN in the literature occurs constantly, in old sources also 2*n* = 20 are given (Rice et al. 2015).

Trifolium arvense L., **2*n* = 14.** "Abkhazia, Gagrskii Raion, Tsandryphsh urban-type settlement, on Oktyabrskaya Str., 43°22'56"N 40°03'09"E, 3 m a.s.l., weedy-ruderal plant groups, 19 Jul 2013, *D.A. Krivenko 52586*" (ALTB, IRK, MW). Europe, North Africa, Caucasus, Asia (Siberia, Central Asia, Far East), America and Australia. Probably, native to the Mediterranean region. All other locations are secondary. Most authors indicate the diploid (2*x*, *x* = 7) CN for this species (Rice et al. 2015), but tetraploid (4*x*) CN are also known (Zohary & Heller 1984).

PAPAVERACEAE

Glaucium flavum Crantz, **2*n* = 12.** "Russia, Krasnodarskii Krai, outskirts of Novorossiysk city, in vicinity of Shirokaya Balka settlement, near the A.I. Maystrenko boarding house,

Black Sea coast, at the bottom of stony slope, near the beach, 44°39'11.7"N 37°42'35.5"E, 6 m a.s.l., 24 Sep 2019, *S.G. Kazanovsky*" *13538* (IRK, VLA). Euro-Mediterranean, as a weed – in North America. Sea shores. From Crimea – $2n$ =12 (Agapova et al. 1993). Diploid ($2x$), in the genus *Glaucium* Mill. $x = 6$.

Chelidonium majus L., **$2n$ = 12.** "Abkhazia, Gudautskii Raion, valley of the Lashipse and Yupshara Rivers, Ritsa Lake – the Bzyb' river basin, to E from Gagrskii Ridge, 43°28'53"N 40°32'29"E, 950 a.s.l., steep wooded slope to the Yupshara river, 23 Jul 2013, *D.A. Krivenko* 32850" (IRK). Native range is in Macaronesia, Europe to Eastern Siberia, Mediterranean to N Iran; introduced into America. *Ch. majus* from the E of Baikal Lake to Far East is replaced by the allopatric species *Ch. asiaticum* (H.Hara) Krahulc. The CN $2n$ = 12 in *Ch. majus* vs. CN $2n$ = 10 in *Ch. asiaticum*. The genus *Chelidonium* L. is polybasic (x = 5 and 6). Diploid.

POACEAE

Digitaria ciliaris (Retz.) Koeler, **$2n$ = 36.** "Russia, Republic of Daghestan, Makhachkala City, Kirovskii Raion, Leninkent settlement, 2d microdistrict, 8th line, 42°58'38"N 47°21'51"E, 90 m a.s.l., weedy-ruderal plant communities, 19 Aug 2019, *D.A. Krivenko 13474*" (IRK, VLA). Almost cosmopolitan, in tropical and subtropical countries of both hemispheres, adventive in temperate regions. Common in Caucasus. Along roadsides and as a weed. Polyploid ($4x$, $6x$; x = 9), very polymorphous, with variable ploidy ($2n$ = 36 and $2n$ = 54, etc.). These two cytotypes also were known from the Russian Far East (Probatova et al. 2007, Tzvelev & Probatova 2019).

ROSACEAE

Potentilla recta L., **$2n$ = 28.** "Georgia, Samtskhe-Dzhavakheti Krai, Akhaltsikhskii municipality, right riverside of the Kura River, on the way of Greli village to the monastery Sapara, 41°36'20"N 43°01'49"E, 1310 m a.s.l., roadside, 23 Jul 2019, *D.A. Krivenko et al. 13504*" (IRK, VLA). South Europe and SW Siberia, Caucasus, SW Asia; calcareous slopes, steppe plant communities; somewhere to the north as alien plant. Polymorphic species. Variable ploidy. The tetraploid CN $2n$ = 28 is more common for this species, and hexaploids ($2n$ = 42) also are frequent, sometimes aneuploids ($2n$ = 21 and $2n$ = 35) occur, but $2n$ = 14 scarcely belongs to this species (Bolkhovskikh et al. 1969, Agapova et al. 1993, Marhold et al. 2007).

RUBIACEAE

Asperula diminuta Klokov, **$2n$ = 44.** "Russia, Republic of Daghestan, Kumtorkalinskii Raion, left riverside of the Shura-Ozen' River, south part of the Sary-Kum sandy hill, 43°00'06"N E047°13'44"E, 120 m a.s.l., on sands, 10 Aug 2019, *D.A. Krivenko 13531*" (IRK, VLA). Caucasus (Armenia, Azerbaidzhan, Daghestan and Georgia). Sandy places and dunes. This is the first CN report for *A. diminuta*. Tetraploid ($4x$), x = 11.

URTICACEAE

Parietaria judaica L., **$2n$ = 26.** "Armenia, Erevan city, Tsitsernakaberd Park, 40°11'21"N 44°29'15"E, 1060 m a.s.l., weedy-ruderal plant community, 29 Jul 2019, *D.A. Krivenko et al. 13506*" (IRK, VLA). Europe, Caucasus. Weedy plots. The same CN $2n$ = 26 was reported several times for this species, especially from Georgia (Bolkhovskikh et al. 1969). Diploid ($2x$), x = 13. The CN is constant, but the genus *Parietaria* L. is polybasic (Májovský et al. 1987).

Baikal Siberia, Russia

Nina S. Probatova, Sergey G. Kazanovsky & Denis A. Krivenko

ARACEAE

Calla palustris L., **$2n$ = 36.** "Republic of Buryatia, Pribaikal'skii Raion, Goryachinsk village, Goryachinskii thermal spring, 52°59'14.6"N 108°16'27.4"E, 488 m a.s.l., in water, 28 Aug 2019, *O.Yu. Zavgorodnyaya 13541*" (IRK, VLA). Almost Holarctic. Riversides and swampy lakesides; in water and bogs. Tetraploid ($4x$), x = 9. Siberian and Far Eastern populations reveal $2n$ = 36, $4x$ (Probatova et al. 2007), but they differ by ploidy level from European populations, where $2n$ = 72 ($8x$), sometimes also $2n$ = 60, 63, 69, 70 (Bolkhovskikh et al. 1969, Agapova et al. 1990). This might be an indication of taxonomical heterogeneity of the genus, which was considered to be monotypic. But from Canada the tetraploid CN $2n$ = 36 has been reported also (Löve & Ritchie 1966 – cit. from Probatova et al. 2007), and in the Baikal Siberia, besides $2n$ = 36, there was one octoploid ($2n$ = 72) report (Chepinoga 2014). In the past *C. palustris* was an object of special study (Dudley 1937). The geographical distribution of chromosome "races" with different ploidy deserves special study. $2n = 4x$, x = 9 (Májovský et al. 1987). Tetraploid populations obviously are more ancient.

ASTERACEAE

Bidens radiata Thuill., **$2n$ = 48.** "Republic of Buryatia, Pribaikal'skii Raion, Goryachinsk village, Goryachinskii thermal spring, 52°59'14.6"N 108°16'27.4"E, 488 m a.s.l., along the side of the spring and in water, 28 Aug 2019, *O.Yu. Zavgorodnyaya 13546*" (IRK, VLA). Eurasian. Riversides, lakesides. In water. The tetraploid CN ($4x$, x = 12) is constant (Bolkhovskikh et al. 1969, Agapova et al. 1990, Chepinoga 2014).

Lactuca tatarica C.A. Mey., **$2n$ = 18.** "Republic of Buryatia, Selenginskii Raion, near the railway station Sul'fat, Solenoe Lake, 51°21'46"N 106°34'33"E, 593 m a.s.l., SE swampy lakeside, 30 Jul 2014, *S.G. Kazanovsky 13289*" (IRK, VLA). Euro-Siberian-Central Asian, as invasive elsewhere (e.g., in the Russian Far East). Many CN reports: $2n$ = 18 is constant (diploid, x = 9).

ERICACEAE

Rhododendron dauricum L., **$2n$ = 26.** "Irkutskaya Oblast', Ol'khonskii Raion, Ol'khon Isl., near Kharantsy village, 53°13'33"N 107°24'28"E, 464 m a.s.l., *Pinus* + *Rhododendron* + green mosses forest, 14 Aug 2014, *S.G. Kazanovsky 13302*" (IRK, VLA). East Siberia, Amur River basin. In light forests, *Larix* swamps and on rocks. $2n$ = 26 (Probatova 2014: Primorye Territory – Mt. Oblachnaya, Sikhote-Alin'). Diploid ($2x$), x = 13. First CN count from Siberia.

LAMIACEAE

Lycopus europaeus L., **$2n$ = 22.** "Republic of Buryatia, Pribaikal'skii Raion, Goryachinsk village, Goryachinskii thermal spring, 52°59'14.6"N 108°16'27.4"E, 488 m a.s.l., 28 Aug 2019, *O.Yu. Zavgorodnyaya 13529*" (IRK, VLA). Euro-Siberian (?), as invasive in the regions of Asia, North Africa and North America. Riversides, lakesides. The east limit of its natural distribution is at Baikal Lake, where it occurs near thermal springs. Multiple CN reports give $2n$ = 22 (Chepinoga 2014 – from the Baikal Siberia, and many others); besides this CN is typical for the genus *Lycopus* L. Diploid ($2x$), x = 11.

ONAGRACEAE

Chamaenerion latifolium (L.) Sweet, **$2n$ = 36.** "Republic of Buryatia, Barguzinskii Raion, middle part of Baikal Lake, Zabaikal'skii national park, Bol'shoi Ushkanyi Isl., 53°51'15"N 108°39'25"E, 466 m a.s.l., 3 Sep 2019, *O.Yu. Zavgorodnyaya 13539*" (IRK, VLA). Eurasia, North America. Mountain tundras, dry tundra meadows, on sands and pebbles. In this species two CNs are known – $2n$ = 36 and $2n$ = 72, as well as in Siberia and in the Russian Far East (Agapova et al. 1993, Chepinoga 2014, etc.). Variable ploidy ($6x$, $12x$), x = 6. Further studies on geographical distribution of these cytotypes are needed.

PLANTAGINACEAE

Plantago major L., **$2n$ = 12.** "Republic of Buryatia, Severo-Baikal'skii Raion, NW coast of Baikal Lake, Khakussy Bay, Frolikhinskii state nature preserve, Khakusskii thermal spring, 55°21'34.2"N 109°49'42.2"E, 538 m a.s.l., 31 Aug 2019, *O.Yu. Zavgorodnyaya 13520*" (IRK, VLA). Cosmopolite. Riversides, roadsides, on sands and pebbles. Well studied species in Baikal Siberia (Chepinoga 2014): the diploid CN $2n$ = 12 (x = 6), reported many times, from other regions too, is constant.

POACEAE

Calamagrostis* × *andrejewii Litv., **2*n* = 28.** "Irkutskaya Oblast', Slyudyanskii Raion, W coast of Baikal Lake, 94th km of the Krugobaikal'skaya railway, right riverside of the Pylovka River, 51°48'10.92"N 104°34'14.05"E, 750 m a.s.l., in forest, 13 Sep 2018, *O.Yu. Zavgorodnyaya 13446*" (VLA). NE Europe, Siberia. Forest edges. The species is not unanimously recognized (Tzvelev & Probatova 2019), quite probably it is a hybrid between two next species, not recent hybrid, but ancient. 2*n* = 28 (Probatova et al. 2008), from the Baikal Siberia. Here is the second CN report for this species. Tetraploid (4*x*), *x* = 7 (Májovský et al. 1987).

Calamagrostis arundinacea (L.) Roth, **2*n* = 28.** "Irkutskaya Oblast', Slyudyanskii Raion, W coast of Baikal, 94th km of the Krugobaikal'skaya railway, 51°48'46.44"N 104°33'44.64"E, 565 m a.s.l., in forest, 14 Sep 2018, *O.Yu. Zavgorodnyaya 13444*" (VLA). NE Europe, Caucasus, Siberia, up to Baikal Siberia. In forests, forest clearings, among shrubs, subalpine meadows. 2*n* = 28 – many CN counts from Europe, Caucasus and Siberia (Tzvelev & Probatova 2019).

Calamagrostis obtusata Trin., **2*n* = 28.** "Irkutskaya Oblast', Slyudyanskii Raion, W coast of Baikal, 94th km of the Krugobaikal'skaya railway, right riverside of the Pylovka River, a.s.l., 51°48′29.14"N 104°34'10.20"E, 636 m in forest, 12 Sep 2018, *O.Yu. Zavgorodnyaya*" *13447* (VLA). NE Europe, but mostly Siberia. Forest edges. 2*n* = 28 (several CN reports from Siberia – Tzvelev & Probatova 2019).

Phleum pratense L., **2*n* = 42.** "Irkutskaya Oblast', Nizhneilimskii Raion, 5 km E of Novaya Igirma settlement, 57°08′28"N 104°03′23"E, 346 m a.s.l., roadside, 15 Aug 2012, *S.G. Kazanovsky 13438*" (IRK, VLA). Almost Holarctic, but introduced or invasive in the Russian Far East. Meadows, forest edges, light forests, waste plots, roadsides, or cultivated. Well studied species, the CN reports from many regions, also from Siberia (Tzvelev & Probatova 2019). Hexaploid (6*x*), *x* = 7. The CN is constant.

POLYGONACEAE

Persicaria scabra (Moench) Moldenke, **2*n* = 22.** "Republic of Buryatia, Barguzinskii Raion, middle part of the Baikal Lake, Zabaikal'skii national park, Bol'shoi Ushkanyi Isl., 53°51′15"N 108°39′25"E, 466 m a.s.l., 3 Sep 2019, *O.Yu. Zavgorodnyaya 13516*" (IRK, VLA). Holarctic. Sand banks, weedy plots. Variable ploidy (?). 2*n* = 22 and 2*n* = 44 (Bolkhovskikh et all. 1969, Agapova et al. 1993), *x* = 11. The diploid CN 2*n* = 22 seems to occur more often.

ROSACEAE

Potentilla acervata Soják, **2*n* = 14.** "Irkutskaya Oblast', Irkutskii Raion, SW coast of Baikal Lake, Bay Khargino, 52°19'13"N 105°46'36"E, 463 m a.s.l., lakeside, 28 Aug 2018, *O.Yu. Zavgorodnyaya 13365*" (BAIK, IRK, VLA). East Siberia, Amur River basin. Meadows, steppes. The same diploid CN – 2*n* = 14 (*x* = 7) was observed earlier in the Baikal Siberia plants (Chepinoga 2014).

Potentilla martjanowii Polozhij (= *P. conferta* Bunge s. l.), **2*n* = 28.** "Irkutskaya Oblast', Irkutskii Raion, SW coast of Baikal, Bay Khargino, 52°19'13"N 105°46'36"E, 463 m a.s.l., lakeside, 28 Aug 2018, *O.Yu. Zavgorodnyaya 13368*" (BAIK, VLA). South-Siberian steppe species. First CN report for the species. The close relative species, Siberian–Central Asian meadow-steppe species *P. conferta* (*P. martjanovii* often is regarded as its synonym) shows 2*n* = 42 and 2*n* = 56 (Chepinoga 2014). Tetraploid (4*x*), or variable ploidy, too?

Sibbaldia procumbens L., **2*n* = 14.** "Irkutskaya Oblast', Slyudyanskii Raion, the Snezhnaya River basin, in vicinity of the Pik Tal'tsinskii Mountain, upper course of the Tal'tsy River, 51°21'19.2"N 104°36'16.6"E, 1096 m a.s.l., alpine belt, alpine meadow, 10 Aug 2015, *S.G. Kazanovsky 13288*" (IRK, STU, VLA). Holarctic. Mountain meadows. Many CN reports in the literature, and from Baikal Siberia (Chepinoga 2014): 2*n* = 14. Diploid (2*x*), *x* = 7.

Spiraea flexuosa Fisch. ex Cambess., **2*n* = 36.** "Irkutskaya Oblast', Kazachinsko-Lenskii Raion, Kharakhikta River, 55°33'59"N 107°16'19"E, 631 m a.s.l., riverside shrubbery (*Salix* spp., *Spiraea* spp., *Ribes* spp., *Pentaphylloides fruticosa*),11 Aug 2014, *S.G. Kazanovsky 13282*" (IRK, VLA). Siberia, Far East. Light forests, forest margins, among shrubs on riversides, stony slopes. We found only one CN report for this species: 2*n* = 36 (Oginuma et al. 2004), but the origin of its voucher specimen is unclear. Tetraploid (4*x*), *x* = 9.

VIOLACEAE

Viola gmeliniana Schult., **2*n* = 24.** "Republic of Buryatia, Tunkinskii Raion, right riverside of the Margasan River, 51°38'39.99"N 102°54'19.81"E, 777 m a.s.l., *Pinus* steppe grass-forb forest, 22 Aug 2015, *S.G. Kazanovsky*" *13286* (IRK, VLA). East Siberia, Far East. Sandy riversides and lakesides, forest margins and clearings, dry slopes. There are CN counts from East Siberia and Primorskii Krai (Chepinoga 2014, Probatova 2014, etc.) The tetraploid CN is constant (*x* = 6). Polybasic genus, but *x* = 6 is rather common for its species.

Khabarovsk Territory, Russia

Nina S. Probatova, Tatiana N. Motorykina & Maria V. Kryukova

Vouchers in VLA.

APIACEAE

Pimpinella saxifraga L., **2*n* = 36.** "Khabarovskii Krai, Nikolaevskii Raion, left riverside of the Amur River, the valley near ostium, Mago settlement, meadows on the open slopes in central part of the settlement, 15 Aug 2018, *M.V. Kryukova 13340*" (Fig. 2A: 1). Euro-Mediterranean (?), up to South Siberia, invasive in the Russian Far East. Roadsides, disturbed meadows, in settlements. Polymorphous species: 2*n* = 18, 36, 40 (Bolkhovskikh et all. 1969, Agapova et al. 1993, Marhold et al. 2007). The cytotype 2*n* = 40 seems to be more common. Polybasic genus (*x* = 8, 9, 10 – Májovský et al. 1987) and perhaps also species. First CN count from the Russian Far East, where this alien plant is rare.

ASTERACEAE

Hieracium tatewakii (Kudô) Tatew. & Kitam. (= *H. tilingii* Üksip), **2*n* = 27.** "Khabarovskii Krai, Nikolaevskii Raion, the ostium of the Amur River, near Tschnyrrakh settlement, S slope, mixed forest with Mongolian oak, 12 Aug 2018, *M.V. Kryukova 13329*" (Fig. 2A: 2). East Siberia (?), Aldan, Amur (lower course), Okhotia, Amgun', North Sakhalin. There was only one CN report for the species, but erroneously 2*n* = 28 (correctly – 2*n* = 27): Rostovtseva 1979, from Khabarovsk Territory (Susanino). Triploid (3*x*).

FABACEAE

Vicia pseudo-orobus Fisch. & C.A. Mey., **2*n* = 12.** "Khabarovskii Krai, Lazo Raion, forb meadow, 23 Aug 2017, *T.N. Motorykina 13330*" (Fig. 2A: 3). East Siberian-Far Eastern species. Meadows, among shrubs, stony slopes, forest margins. 2*n* = 12 and 2*n* = 12 + 0–2B (Probatova 2014 – from Primorye Territory; Chepinoga 2014 – from Baikal Siberia). First CN count from Khabarovsk Territory. Diploid (2*x*), *x* = 6.

POACEAE

Puccinellia kurilensis (Takeda) Honda, **2*n* = 42.** "Khabarovskii Krai, Tuguro-Chumikanskii Raion, Nikolaya Bay, E coast, rubbly place at the ostium of the rivulet, near the base "Gorbushka", 8 Aug 2016, *M.V. Kryukova 13332*" (Fig. 2A: 4). West Pacific. Sea coasts. The same – hexaploid CN (6*x*) was revealed from Kamchatka and Primorye Territories, Sakhalin Region (Tzvelev & Probatova 2019). First CN data from Khabarovsk Territory.

POLYGONACEAE

Rumex confertus Willd., **2*n* = 40.** "Khabarovskii Krai, Nikolaevskii Raion, N part of the Amurskii estuary, lower course of the Nygai River, coastal forb meadow, 13 Aug 2018, *M.V.*

Kryukova 13338" (Fig. 2A: 5). Euro-Mediterranean, up to West Siberia, invasive in the Russian Far East and elsewhere. Waste places, roadsides and as a weed. Variable ploidy: 4*x*, 6*x* (*x* = 10). Also 2*n* = 60 (Probatova 2014, from Primorye Territory). First CN data from Khabarovsk Territory.

ROSACEAE

Potentilla chinensis Ser., **2*n* = 14.** "Khabarovskii Krai, Khabarovskii Raion, Bol'shoi Ussuriyskii Isl., forb meadow, 25 Aug 2017, *T.N. Motorykina 13343*" (Fig. 2A: 6). Amur River basin, Primorye Territory, China, Japan. Dry meadows, steppes, and on the rocks. Diploid (2*x*), the CN is constant.

Potentilla intermedia L., **2*n* = 28.** "Khabarovskii Krai, Lazo Raion, Pereyaslavka settlement, meadow under the bridge, 29 Aug 2014, *T.N. Motorykina 13339*" (Fig. 2A: 7). **2*n* = 42.** "Khabarovskii Krai, Nanayskii Raion, Slavyanka settlement, roadside, 25 Aug 2016, *T.N. Motorykina 13082*" (Fig. 2A: 8). Euro-Siberian species, invasive in the Russian Far East. Variable ploidy (4*x*, 6*x*).

Potentilla paradoxa Nutt., **2*n* = 28.** "Khabarovskii Krai, Solnechnyi Raion, in vicinity of the lake Evoron, surface mine at the way to the hunting base, 16 Jul 2017, *M.V. Kryukova 13331*" (Fig. 2A: 9); "Khabarovskii Krai, Poliny Osipenko Raion, Osipenko settlement, moist meadow at the store, 24 Jul 2013, *L.A. Antonova 13116*" (Fig. 2A: 10). Asian-North American species, invasive in some regions. One of the most common species of *Potentilla* L. in the Russian Far East. River banks, roadsides, vaste places, in settlements. Tetraploid (4*x*), the CN is constant.

Potentilla saviczii Schischk. & Kom (= *P. inquinans* Turcz.), **2*n* = 14.** "Khabarovskii Krai, Ayano-Mayskii Raion, upper course of the Maya River, 4 km above Kamennyi Spring, 21 Jul 2016, *M.N. Vernoslova 13341*" (Fig. 2A: 11). Siberian – Far Eastern species. Stony slopes, slide-rocks. The species is more common in the Amur River basin, but rare in Primorye Territory. First CN report from the Russian Far East. Diploid (2*x*), the CN is constant.

Potentilla semiglabra Juz., **2*n* = 28.** "Khabarovskii Krai, Khabarovskii Raion, Bol'shoi Ussuriyskii Isl., roadside, 12 Aug 2001, *T.N. Motorykina 13084*" (Fig. 2A: 6); "Khabarovskii Krai, Khabarovskii Raion, Bol'shoi Ussuriyskii Isl., forb meadow, 25 Aug 2017, *T.N. Motorykina 13342*" (Fig. 2A: 6). East Siberian-Far Eastern species, also in Mongolia, North-East China. Meadows (sometimes – disturbed), steppes, riverbanks. Variable ploidy: 2*n* = 28 (4*x*) and 2*n* = 56 (8*x*).

Potentilla tergemina Soják, **2*n* = 28.** "Khabarovskii Krai, Khabarovsk city, roadside near the school № 3, 13 Aug 2013, *T.N. Motorykina 12795*" (Fig. 2A: 12). Siberian-Far Eastern species. More common in the Amur River basin. Meadows, steppes. Many CN counts from the Russian Far East and Baikal Siberia. Tetraploid (4*x*). The CN is constant.

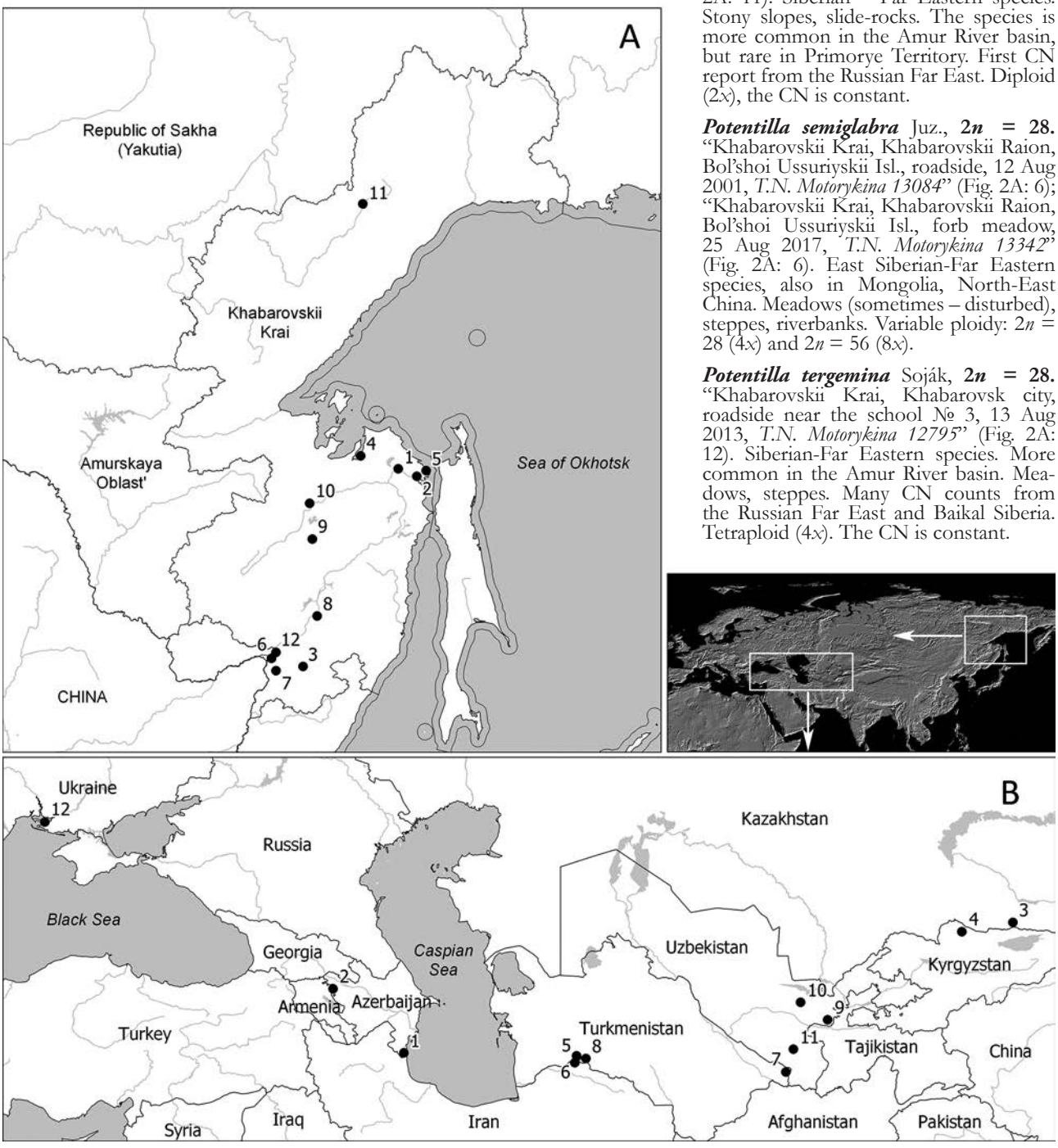

Figure 2 Study area in Khabarovsk Territory (A) and chromosome study of *Milium vernale* aggr. (B)

Contribution to chromosome studies on *Milium vernale* aggr. (Poaceae)

Nina S. Probatova

Vouchers in VLA.

The genus *Milium* L. consists of c. 10 species from 2 sections, in the temperate regions of Eurasia, North America and North Africa; 5 species occur in Russia (Tzvelev & Probatova 2019). In earlier times it was accepted with 6 species, 6 subspecies and 2 varieties (Probatova 1977, 1978, Probatova et al. 2000), but now the former subspecies of *M. vernale* s. l. are considered in the species rank (Tzvelev 1993): it was taken into consideration that the genus *Milium* represents a complex of chromosome numbers as $2n = 8$, 10, 14, 18, 22, 28, 42: this is the very interesting and unique small polybasic genus, which illustrates different events of evolutionary transformation of caryotypes: the basic CNs of $x = 4, 5, 7, 9, 11$, probably with allopolyploid events in the history of its taxa (Bennett & Thomas 1991, Bennett et al. 1992, Probatova et al. 2000). The ancestral basic number was obviously 7 (Sokolovskaya & Probatova 1976).

The majority of *M. vernale* aggr. taxa differ essentially by the spikelets and the lemmas sizes, as well as by the shape of panicles. Most of them have distinct geographical ranges. Their main characteristics are different CNs, but they are all diploids. The CNs are constant.

Milium alexeenkoi (Tzvelev) Tzvelev, **$2n = 14$.** "Azerbaijan, Lenkoranskii Raion, 20 km S of Lenkoran' town, 3 km of the Girkanskii nature reserve' base, the mountain forest edge, 4 Jun 1972, *N.S. Probatova & V.P. Seledets 3700*" (Fig. 2B: 1). West Caspian. On pebbles, stony slopes, forest clearings. Described from Azerbaijan. Earlier this plant was published as *M. vernale* (Sokolovskaya & Probatova 1976). There also were CN counts ($2n = 14$) for *M. alexeenkoi* from Azerbaijan and Dagestan (Probatova 1977, Krivenko et al. 2013). The species differs from all the rest by minor spikelets and lemmas: spikelets 1.8–2.4(–2.5) mm lg., multiple, densely arranged on panicle branches; lemmas 1.5–1.7 mm.

Milium intermedium (Prob.) Tzvelev, **$2n = 18$.** "Armenia, Megri, Zangezurskii Ridge, near Artsvaberd, the light *Juniperus* forest, 9 Jun 1978, *E.Ts. Gabrielyan 5272*" (Fig. 2B: 2). North Africa, Central and South Europe, Black Sea coast, Transcaucasia (incl. Armenia), Asia Minor. Stony slopes, sands and pebbles, forest clearings. Described from Algeria. The CN was studied earlier from Krasdodarskii Krai, the Black Sea coast near Anapa (Probatova 1979, Probatova & Sokolovskaya 1978 – as *M. vernale* subsp. *intermedium*). Very polymorphous species. Spikelets (2.8–)3.2–3.5(–3.7) mm, the longest (lower) panicle branches are more than ½ of the panicle length; lemmas 2.3–2.6 mm. Variable are: the length of the upper leaf blade, the shape of the glumes top (acuminate or obtuse), character of spinules on the glumes, etc. As to spikelets, glumes and lemma sizes, it occupies an intermediate position between *M. vernale* s. str. and West Mediterranean *M. montianum* Parl., with $2n = 22$: $x = 11$ (Bennett & Thomas 1991, Bennett et al. 1992).

Milium tzvelevii (Prob.) Prob., comb. et stat. nov. ≡ *M. vernale* M. Bieb. subsp. *tzvelevii* Prob., 1977, Novosti Sist. Vyssh. Rast. 14: 10, **$2n = 18$.** "Kazakhstan, in suburbs of Alma-Ata city, SE slope of Kok-Tyube Mt., steppe-meadow with shrubs, 17 Jul 1978, *N.S. Probatova & V.P. Seledets 5280*" (Fig. 2B: 3); "Kyrgyzstan, suburbs of Frunze [Bishkek] city, near Chon-Aryk, NE slope of submountains of Kyrgyz Alatau, mountain steppe, in planting of trees and shrubs, 4 Aug 1978, *N.S. Probatova & V.P. Seledets 5285*"(Fig. 2B: 4); "Turkmenistan, Kara-Kalinskii Raion, 8 km N of Duzly-Depe village, the valley Jylgynly, pebbly bed, 27 Apr 1972, *N.S. Probatova & V.P. Seledets 3869*" (Fig. 2B: 5); "Turkmenistan, Kara-Kalinskii Raion, in vicinity of Duzly-Depe village, left riverside of the Sumbar River, lower part of the slope, 18 May 1972, *N.S. Probatova & V.P. Seledets 3699*" (Fig. 2B: 6); "Turkmenistan, Chardzhouskaya Oblast', near Svintsovyi Rudnik settlement, W macroslope of Kugitang Ridge, 1300 m a.s.l., forb *Amygdalus* community, 22 Apr 1978, *N.P. Litvinova 5582*" (Fig. 2B: 7); "Turkmenistan, Kopet-Dag, Turkmeno-Khorasanskie Mts, S macroslope, 7 km SW of Arvaz Pass, stony-melkozem E slope, 1700 m a.s.l., *Juniperus turcomanica* + *Polygonatum sewerzowii* + *Dactylis glomerata* plant community, 27 May 1974, *S.S. Ikonnikov 4519*" (Fig. 2B: 8); "Turkmenistan, *P. Chopanov 4394*"; "Uzbekistan, Dzhizakskaya Oblast', the spurs of Turkestanskii Ridge, the valley of Zaamin-su, 2 km S of Jettkichu village, W slope, among shrubs with *Acer*, 18 May 1978, *N.P. Litvinova 5571*" (Fig. 2B: 9); "Uzbekistan, Dzhizakskaya Oblast', the Koitash Ridge, 2 km N of Saurbel Peak, on the rocks, 11 May 1978, *N.P. Litvinova & Yu.G. Elsukov 5570*" (Fig. 2B: 10); "Uzbekistan, Kashkadarjinskaya Oblast', up to the Lengar gorge, 4 km E, calcareous rocks, ephemero-bluegrass *Artemisia* community, 2 May 1978, *N.P. Litvinova & E.V. Nikitenko 5586*" (Fig. 2B: 11). East Mediterranean. In light mountain *Juniperus* forests, along the streams in the ravines. Described from Turkmenistan. The CN has been counted earlier from Turkmenistan, on 5 specimens (Sokolovskaya & Probatova 1976 – as *Milium vernale* and Probatova 1977 – as *M. vernale* subsp. *tzvelevii*). Rather polymorphous species. Spikelets 2.5–2.8 mm, the longest (lower) panicle branches by 2–6 in lower node, equal to ½ of the panicle length, almost contracted or poorly distant from the panicle axis; lemmas 1.8–2.1 mm. Anthers 1.3–1.6 mm. As to morphological features, *M. tzvelevii* is close to *M. vernale* s.str., but it has small spikelets and lemmas, contracted panicles and $2n = 18$.

Milium vernale M.Bieb. s.str., **$2n = 10$.** "Ukraine, Khersonskaya Oblast, Golopristanskii Raion, Chernomorskii nature reserve, Ivano-Rybal'chanskaya dacha, 21 May 1961, *G. Kuznetsova & V. Protopopova 4514*" (Fig. 2B: 12). S and SE Europe, Black Sea coast, Caucasus, Asia Anterior. Described from "Caucasus". Light shrubby communities, forest edges, broadleaved forests (mostly oak forests), on sands, stony slopes. Spikelets 2.7–3.2 mm, lemmas 1.9–2.1 mm, but panicles are spreading, their branches broadly deviate from the panicle axis. Previous CN counts were from Crimea (published under "*Milium vernale*": Petrova 1975, Sokolovskaya & Probatova 1976).

CONCLUSION

First chromosome data are presented here for *Potentilla martjanovii*, *Valeriana erotica* and *Asperula diminuta*. For Armenia this is the first CN determination in *Milium intermedium*; for Kazakhstan, Kyrgyzstan, Uzbekistan – first CN counts in *Milium tzvelevii*. For *Amaranthus albus* and *Anagallis arvensis* there are first CN determations from Russia; *Rhododendron dauricum*, *Solidago canadensis* – firstly studied from Siberia; for *Pedicularis striata*, *Ribes diacantha*, *Pimpinella saxifraga*, *Potentilla saviczii* and *Papaver rubroaurantiacum* the CNs are given the first time from the Russian Far East; for *Angelica anomala*, *Iris laevigata* – first CN data for Amur Region, for *Rumex confertus*, *Puccinellia kurilensis* and *Vicia pseudo-orobus* – from Khabarovsk Territory, for *Eragrostis minor* – from Primorye Territory. The new cytotypes are revealed in *Papaver rubroaurantiacum* ($2n = 56$) and *Lappula squarrosa* ($2n = 24$). For *Paeonia lactiflora* – first CN data from the Amur River basin. The diploids (their basic numbers $x = 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15$) prevail: in total 48 spp. (58 %). Variable ploidy observed or suggested in 14 spp. New nomenclatural changing for *Milium tzvelevii* (Prob.) Prob. is first proposed.

ACKNOWLEDGEMENTS

The authors are grateful to E.G. Rudyka for assistance in chromosome counting and to D.Sc. S.V. Ovchinnikova for identifying specimens of *Lappula* spp., also to collectors: G.F. Darman and I.A. Kreshchenok, for providing the plant material (the seeds and live plants) for the study in the Amur Region.

LITERATURE CITED

Agapova, N.D., K.B. Arkharova, L.I. Vakhtina, E.A. Zemskova & L.V. Tarvis 1990. *Chromosome numbers of flowering plants in the USSR flora: Aceraceae–Menyanthaceae families*. Nauka, Leningrad, 509 pp. (in Russian). [Агапова Н.Д., Архарова К.Б., Вахтина Л.И., Земскова Е.А., Тарвис Л.В. 1990. Числа хромосом цветковых растений флоры СССР: семейства Aceraceae–Menyanthaceae. Л.: Наука. 509 с.].

Agapova, N.D., K.B. Arkharova, L.I. Vakhtina, E.A. Zemskova & L.V. Tarvis 1993. *Chromosome numbers of flowering plants in the USSR flora: Moraceae–Zygophyllaceae families*. Nauka, St. Petersburg, 430 pp. (in Russian). [Агапова Н.Д., Архарова К.Б., Вахтина Л.И., Земскова Е.А., Тарвис Л.В. 1993. Числа хромосом цветковых растений флоры СССР: семейства Moraceae–Zygophyllaceae. СПб: Наука. 430 с.].

Bennett, S.T. & S.M. Thomas 1991. Karyological analysis and genome size in *Milium* (Gramineae) with special reference to polyploidy and chromosomal evolution. *Genome* 34(6):868–878.

Bennett, S.T., A.Y. Kenton & M.D. Bennett 1992. Genomic *in situ* hybridization reveals the allopolyploid nature of *Milium montianum* (Gramineae). *Chromosoma* 101(7):420–424.

Blakesley, D., A. Allen, T.K. Pellny & A.V. Roberts 2002. Natural and induced polyploidy in *Acacia dealbata* Link. and *Acacia mangium* Willd. *Annals of Botany* 90(3):391–398.

Bolkhovskikh, Z.V., V.P. Grif, O.I. Zakharyeva & T.S. Matveeva 1969. *Chromosome numbers of flowering plants*. Nauka, Leningrad, 926 pp. (in Russian). [Болховских З.В., Гриф В.П., Захарьева О.И., Матвеева Т.С. 1969. Хромосомные числа цветковых растений. Л.: Наука. 926 с.].

Chepinoga, V.V. 2014. *Chromosome numbers of plant species from Baikal Siberia*. Nauka, Novossibirsk, 419 pp. (in Russian). [Чепинога В.В. 2014. Хромосомные числа растений флоры Байкальской Сибири. Новосибирск: Наука. 419 с.].

Chitanava, S.M. 2004. *Flora of Colchis. Materials to the checklist of the flora of wild vascular plants*. OOOAS, Sukhum, 240 pp. (in Russian). [Читанава С.М. 2004. Флора Колхиды. Материалы к конспекту флоры дикорастущих сосудистых растений. Сухум: ОООАС. 240 с.].

Dudley, M.G. 1937. Morphological and cytological studies of *Calla palustris*. *Botanical Gazette* 98(3):556–571.

Korobkov, A.A., V.V. Kotseruba, N.S. Probatova, A.V. Shatokhina & E.G. Rudyka 2013. IAPT/IOPB chromosome data 15 (K. Marhold, ed.). *Taxon* 62(5):1075–1077, E11–E15.

Korobkov, A.A., V.V. Kotseruba & N.S. Probatova 2014. Chromosome numbers of some species of *Artemisia* L. from Altai region, South Siberia. *Botanica Pacifica* 3(1):61–66.

Krasnikov, A.A. 1991. Chromosome numbers of some species of vascular plants from Novossibirskaya Oblast'. *Botanicheskii Zhurnal* 76(3):476–479 (in Russian). [Красников А.А. 1991. Числа хромосом некоторых видов сосудистых растений из Новосибирской обл. // Ботанический журнал. Т. 76, № 3. С. 476–479].

Krivenko, D.A., V.V. Kotseruba, S.G. Kazanovsky, A.V. Verkhozina & O.D. Chernova 2013. IAPT/IOPB chromosome data 16 (K. Marhold, ed.). *Taxon* 62(6):1356–1358, E4–E8.

Lock, J.M. 1989. *Legumes of Africa: A check-list*. Royal Botanic Gardens, Kew, 619 pp.

Lomonosova, M.N. 2013. IAPT/IOPB chromosome data 16 (K. Marhold, ed.). *Taxon* 62(6):1358, E8–E10.

Lomonosova, M.N. & A.A. Krasnikov 1992. Chromosome numbers in the members of the genus *Atriplex* (Chenopodiaceae). *Botanicheskii Zhurnal* 77(6):99–100 (in Russian). [Ломоносова М.Н., Красников А.А. 1992. Числа хромосом у представителей рода *Atriplex* (Chenopodiaceae) // Ботанический журнал. Т. 77, № 6. С. 99–100].

Májovský, J., A. Murin, V. Feráková, M. Hindáková, T. Schwarzová, A. Uhríková, M. Váchová & J. Záborský 1987. *Karyotaxonomický prehl'ád flory Slovenska*. Veda, Bratislava, 436 pp.

Marhold, K., P. Mártonfi, P. Mered'a jun. & P. Mráz (eds) 2007. *Chromosome number survey of the ferns and flowering plants of Slovakia*. Veda, Bratislava, 650 pp.

Muratova, E.N & M.V. Kruklis 1988. *Chromosome numbers of gymnosperm plants*. Nauka, Novosibirsk, 118 pp. (in Russian). [Муратова Е.Н., Круклис М.В. 1988. Хромосомные числа голосеменных растений. Новосибирск: Наука. 118 с.].

Nishikawa, T. (ed.) 2008. *Chromosome atlas of flowering plants in Japan*. National Museum of Nature & Science, Tokyo. 706 pp.

Oginuma, K., I.V. Tatarenko & K. Kondo 2004. Karyomorphology of eight species of *Spiraea* (Rosaceae) in Russia. *Chromosome Science* 8(1):23–28.

Palibin, I.V. 1945. *Acacia* Willd. In: *Flora of the USSR, vol. 11* (B.K. Shishkin, ed.), pp. 11–13, Izdatel'stvo AN SSSR, Moscow & Leningrad (in Russian). [Палибин И.В. 1945. *Acacia* Willd. // Флора СССР, т. 11 / под ред. Б.К. Шишкина. М.; Л.: Изд-во АН СССР. С. 11–13].

Petrova, O.A. 1975. On the basic chromosome numbers in the genus *Milium* L. *Botanicheskii Zhurnal* 60(3):393–394 (in Russian). [Петрова О.А. 1975. Об основных числах хромосом в роде *Milium* L. // Ботанический журнал. Т. 60, № 3. С. 393–394].

Probatova, N.S. 1977. Contribution to taxonomy of the genus *Milium* L. (Poaceae). *Novosti sistematiki vysshykh rastenii* 14:6–14. (in Russian) [Пробатова Н.С. 1977. К систематике рода *Milium* L. (Poaceae) // Новости систематики высших растений. Т. 14. С. 6–14].

Probatova, N.S. 1978. Infraspecific taxonomy of *Milium vernale* Bieb. *Tezisy dokladov VI Delegatskogo syezda Vsesoyuznogo botanicheskogo obshchestva* (Kishinyov, 12–17 Sept. 1978). Leningrad, 1978. P. 309–310. (in Russian). [Пробатова Н.С. Внутривидовая систематика *Milium vernale* Bieb. // Тез. докл. VI Делегатского съезда Всесоюз. ботан. о-ва (Кишинев, 12–17 сент. 1978 г.). Л., 1978. С. 309–310].

Probatova, N.S. 1979. On some grasses from Caucasus. *Novosti sistematiki vysshykh rastenii* 16:35–37. (in Russian) [Пробатова Н.С. 1979. О некоторых злаках Кавказа // Новости систематики высших растений. Т. 16. С. 35–37].

Probatova, N.S. 2014. *Chromosome numbers in vascular plants of the Primorskii Krai (Russian Far East)*. Dal'nauka, Vladivostok, 343 pp. (in Russian). [Пробатова Н.С. 2014. Хромосомные числа сосудистых растений Приморского края (Дальний Восток России). Владивосток: Дальнаука. 343 с.].

Probatova, N.S. & A.P. Sokolovskaya 1978. Chromosome numbers and taxonomy of some grasses from Caucasus. *Botanicheskii Zhurnal* 63(8):1121–1131 (in Russian). [Пробатова Н.С., Соколовская А.П. 1978. Хромосомные числа и таксономия некоторых злаков Кавказа // Ботанический журнал. Т. 63, № 8. С. 1121–1131].

Probatova, N.S., E.G. Rudyka & S.L. Gromik 2000. Karyotaxonomy of the genus *Milium* L. and some related genera of grasses (Poaceae). *V.L. Komarov Memorial Lectures* 46: 105–146. (in Russian). [Пробатова Н.С., Рудыка Э.Г., Громик С.Л. 2000. Кариосистематика рода *Milium* L. и близких родов злаков (Poaceae) // Комаровские чтения. Вып. 46. С. 105–146].

Probatova, N.S., V.Yu. Barkalov & E.G. Rudyka 2007. *Caryology of the flora of Sakhalin and the Kurile Islands. Chromosome*

numbers, taxonomic and phytogeographical comments. Dal'nauka, Vladivostok, 392 pp. (in Russian) [Пробатова Н.С., Баркалов В.Ю., Рудыка Э.Г. Кариология флоры Сахалина и Курильских островов. Числа хромосом, таксономические и фитогеографические комментарии. Владивосток: Дальнаука, 2007. 392 с.].

Probatova N.S. & V.P. Seledets 2008. IAPT/IOPB chromosome data 5 (K. Marhold, ed.). *Taxon* 57(2):555–558, E7–16.

Probatova, N.S., V.P. Seledets, E.G. Rudyka, A.A. Gnutikov, Z.V. Kozhevnikova & V.Yu. Barkalov 2009. IAPT/IOPB chromosome data 8 (K. Marhold, ed.). *Taxon* 58(4): 1284–1288, E11–20.

Probatova, N.S., S.G. Kazanovsky, E.G. Rudyka, V.Yu. Barkalov, V.P. Seledets, & V.A. Nechaev 2011. IAPT/IOPB chromosome data 12 (K. Marhold, ed.). *Taxon* 60(6): 1790–1794, E49–E59.

Probatova, N.S., V.Yu. Barkalov & E.G. Rudyka 2012. Chromosome numbers for vascular plants from Sakhalin, Moneron and the Kuril Islands (North-East Asia). *Botanica Pacifica* 1(1):121–126.

Probatova, N.S., S.G. Kazanovsky, E.G. Rudyka, A.A. Gnutikov & A.V. Verkhozina 2013. IAPT/IOPB chromosome data 15 (K. Marhold, ed.). *Taxon* 62(5):1080–1081, E23–E26.

Probatova, N.S., E.G. Rudyka, V.P. Seledets & T.N. Motorykina 2014. Chromosome numbers in vascular plants from the Russian Far East: Amurskaya Oblast', Khabarovskii Krai, Primorskii Krai. *Botanica Pacifica* 3(2):129–134.

Rice, A., L. Glick, S. Abadi, M. Einhorn, N.M. Kopelman, A. Salman-Minkov, J. Mayzel, O. Chay & I. Mayrose 2015. The chromosome counts database (CCDB) – a community resource of plant chromosome numbers. *New Phytologist* 206(1):19–26.

Rostovtseva, T.S. 1979. Chromosome numbers of some species of the family Asteraceae Dumort. *Botanicheskii Zhurnal* 64(4):582–589 (in Russian). [Ростовцева Т.С. 1979. Числа хромосом некоторых видов семейства Asteraceae Dumort. // Ботанический журнал. Т. 64, № 4. С. 582–589].

Rostovtseva, T.S. & S.A. Ligus 1978. Caryological study of some species of the flora of Siberia. In: *Systematics and geography of Siberia* (I.M. Krasnoborov, ed.), pp. 24–27 (in Russian). [Ростовцева Т.С., Лигус С.А. 1978. Кариологическое изучение некоторых видов флоры Сибири // Систематика и география Сибири / под ред. И.М. Красноборова. С. 24–27].

Rudyka, E.G. 1995. Chromosome numbers in some species of vascular plants from the south of the Russian Far East. *Botanicheskii Zhurnal* 80(2):87–90 (in Russian). [Рудыка Э.Г. 1995. Числа хромосом некоторых видов сосудистых растений юга Российского Дальнего Востока // Ботанический журнал. Т. 80, № 2. С. 87–90].

Shatokhina, A.V. 2006. Chromosome numbers of some representatives of the flora from Amur Region. *Botanicheskii Zhurnal* 91(3):487–509 (in Russian). [Шатохина А.В. 2006. Числа хромосом некоторых представителей флоры Амурской области // Ботанический журнал. Т. 91, № 3. С. 487–509].

Shatokhina, A.V. 2007. Chromosome numbers for some rare species of vascular plants from Amur Region. *Botanicheskii Zhurnal* 92(7):1082–1086 (in Russian). [Шатохина А.В. 2007. Числа хромосом некоторых редких для Амурской области видов сосудистых растений // Ботанический журнал. Т. 92, № 7. С. 1082–1086].

Sokolovskaya, A.P. & N.S. Probatova 1976. Contribution to karyological characteristics of the genera *Milium* L. and *Holcus* L. (Poaceae). *Botanicheskii Zhurnal* 61(7):969–973. (in Russian). [Соколовская А.П., Пробатова Н.С. 1976. К кариологической характеристике родов *Milium* L. и *Holcus* L. (Poaceae) // Ботанический журнал. Т. 61, № 7. С. 969–973].

Sokolovskaya, A.P. & N.S. Probatova 1980. Chromosome numbers of some plants from the Sary-Kum sand dune (Dagestan Autonomous Republic). *Botanicheskii Zhurnal* 65(8):1169–1172 (in Russian). [Соколовская А.П., Пробатова Н.С. 1980. Числа хромосом некоторых растений с песков Сары-Кум (Дагестанская АССР) // Ботанический журнал. Т. 65, № 8. С. 1169–1172].

Turnbull, J.W., H.R. Compton & K. Pinyopusarerk (eds) 1998. *Recent developments in acacia planting: proceedings of an international workshop held in Hanoi (October 27–30, 1997)*. Australian Centre for International Agricultural Research, Canberra, 383 pp.

Tzvelev, N.N. 1993. Notes on grasses (Poaceae) from Caucasus // *Botanicheskii zhurnal* 78(10):83–95 (in Russian). [Цвелёв Н.Н. 1993. Заметки о злаках (Poaceae) Кавказа // Ботанический журнал. Т. 78, № 10. С. 83–95].

Tzvelev, N.N. & N.S. Probatova 2019. *Grasses of Russia*. KMK Scientific Press, Moscow, 646 pp. (in Russian). [Цвелёв Н.Н., Пробатова Н.С. Злаки России. М.: Товво науч. изд. КМК. 646 с.].

Vinogradova, Yu.K., A.G. Kuklina & E.V. Tkacheva 2014. *Invasive plant species of the family Fabaceae: Lupinus, Galega, Robinia, Amorpha, Caragana*. ABF, Moscow, 304 pp. (in Russian). [Виноградова Ю.К., Куклина Е.В., Ткачева Е.В. 2014. Инвазионные виды растений семейства бобовых: люпин, галега, робиния, аморфа, карагана. М.: АБФ. 304 с.].

Volkova, S.A. & K.P. Ulanova 1986. Chromosome numbers of some species of the Nelumbonaceae and Ranunculaceae families from the Far East of the USSR. *Botanicheskii Zhurnal* 71(12):1692 (in Russian). [Волкова С.А., Уланова К.П. 1986. Числа хромосом некоторых видов семейств Nelumbonaceae и Ranunculaceae с Дальнего Востока СССР // Ботанический журнал. Т. 71, № 12. С. 1692].

Zohary, M. & D. Heller 1984. *The genus Trifolium*. Ahva Printing Press, Jerusalem, 606 pp.