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Author(s)	Probatova, Nina S.; Barkalov, Vyacheslav Yu.; Rudyka, Elvira G.; Pavlova, Nonna S.
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Further Chromosome Studies on Vascular Plant Species from Sakhalin, Moneron and Kurile Islands

Nina S. Probatova, Vyacheslav Yu. Barkalov, Elvira G. Rudyka and Nonna S. Pavlova

Laboratory of Vascular Plants, Institute of Biology and Soil Science, Far Eastern Branch of Russian Academy of Sciences, Vladivostok 690022, Russia
e-mail: probatova@ibss.dvo.ru

Abstract Chromosome numbers for 86 vascular plant species of 69 genera and 32 families, from Sakhalin, Moneron and Kurile Islands, are given. The chromosome numbers are reported here for the first time for the following 17 species: *Arabis japonica*, *Artemisia punctigera*, *Calamagrostis urelytra*, *Callianthemum sachalinense*, *Cerastium sugawarae*, *Dianthus sachalinensis*, *Lonicera tolmatchevii*, *Melandrium sachalinense*, *Myosotis sachalinensis*, *Oxytropis austrosachalinensis*, *O. helenae*, *O. sachalinensis*, *Polemonium schizanthum*, *Ranunculus hultenii*, *Rubus pseudochamaemorus*, *Scrophularia grayana* and *Senecio dubitabilis*. In addition, for *Alchemilla gracilis*, *Allium ochotense*, *Caltha fistulosa*, *Chrysosplenium kamtschaticum*, *Draba cinerea*, *Echinochloa occidentalis*, *Erysimum pallasii*, *Sagina crassicaulis* and *Stellaria fenzlii*, new cytotypes were revealed. At present, in Sakhalin, Moneron and the Kurile Islands chromosome numbers have been counted for 536 species. Chromosome numbers are now known for 48 species from Moneron.

Key words: chromosome numbers, vascular plants, Sakhalin, Moneron, Kurile Islands, taxonomy, phytogeography.

Introduction

This is our third contribution, concerning new chromosome counts on the vascular plants from the Kurile Islands, Sakhalin and Moneron Islands, mainly as the results of IKIP and ISIP expeditions. The first paper have been published in Japan earlier (Probatova *et al.* 2000), the second - in the Volume 1 of "Biodiversity and Biogeography of the Kuril Islands and Sakhalin" (Probatova *et al.* 2004). In the present paper chromosome counts for 86 species are given, they were selected as new or noteworthy for some reasons. For 17 species there was no published information on the chromosome numbers before. In addition, for 9 species new chromosome numbers (new cytotypes) are reported here.

Materials and Methods

Counts were made mostly by E.G. Rudyka (R.), on squashed preparations of root tips fixed with Carnoy's solution, taken from plants in the greenhouse of the Institute of Biology & Soil Science FEB RAS, Vladivostok, where alive plants collected by V.Yu.

Barkalov in the field, were preserved. Some plants were grown from seeds taken from herbarium specimens. One count was made by S.A. Shatalova (Sh.). Preparations were stained with iron hematoxylin. Some unpublished or critical data obtained by the late Dr. A.P. Sokolovskaya (A. S.) are also included. First counts are indicated with an asterisk (*). Introduced (alien) species are indicated with (+). Voucher specimens are preserved in the Herbarium VLA, Vladivostok (few of them - in LEU, St.-Petersburg). The plants were identified by V.Yu. Barkalov and N.S. Probatova, *Gypsophila* and *Oxytropis* spp. - by N.S. Pavlova. The plant names and geographical distribution of the species studied are given in most cases according to Vascular Plants of the Soviet Far East, Vols. 1-8 (Kharkevich 1985-1996), and to S.K. Cherepanov (1995). For some species new data on species distribution on the islands are provided by V.Yu. Barkalov. The notes to the species and the manuscript were prepared by N.S. Probatova, as well as translation.

Annotated List of Plants with Chromosome Numbers Studied

FAMILY ALLIACEAE

1. *Allium ochotense* Prokh.

Chromosome number. $2n=32$ (R.).

Voucher specimen. VLA 8282, Urup Island, Tetyajeva Bay, tall herbs community near maritime slope, 8.VIII.2000, coll. V. Barkalov.

Chromosome number. $2n=40$ (R.).

Voucher specimen. VLA 8211, Kuriles, Chirpoi Island, Peschanaya Bay, in *Alnaster fruticosus* community, near waterfall, 10.VIII. 1999, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles. West Pacific. In forests.

Note. Chromosome number $2n=32$ in *A. ochotense* was already known on the Russian Far East, from Kamchatka Peninsula (Sokolovskaya 1963 - as "*A. victoralis*"). We revealed a new cytotype, with $2n=40$. The closely related species *A. victoralis* L. ($2n=16$, see Agapova *et al.* 1990) does not occur in the Russian Far East. *A. ochotense* is the most common species of *Allium* on the Kuriles.

FAMILY ARACEAE

2. *Calla palustris* L.

Chromosome number. $2n=36$ (A. S.).

Voucher specimen. VLA 6262, Sakhalin, Korsakovsky District, in vicinity of Solovyovka settlement, swampy forest glade, 19.IX.1982, coll. N. Probatova and E. Rudyka.

Distribution. Sakhalin, South Kuriles. Holarctic. On swamps.

Note. The chromosome number $2n=36$ ($4x$) was known in *C. palustris* from the Primorsky Territory (Sokolovskaya and Probatova 1985; Shatalova 2000; Probatova *et al.* 2001), as well as from Siberia, Obj River basin (see Agapova *et al.* 1990), and also $2n=36$ was reported from Canada (Löve and Ritchie 1966). Nevertheless, from Europe mostly $2n=72$ ($8x$) is reported, and sometimes also $2n=60$, 63, 69, 70 (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1990; Goldblatt 1981, 1988; Goldblatt and Johnson 1990, 1991, 1994). So, the Far Eastern and Siberian populations of *C. palustris* (as well as Canadians) differ in ploidy levels from European ones, and these territories obviously are more ancient parts of the species geographical area. It possibly indicates some taxonomic heterogeneity of *C. palustris* within its area of distribution. Moreover, the situation with chromosome numbers in *C. palustris* in West Europe is not clear. A special paper on morphology and cytology of *Calla palustris* was published earlier (Dudley 1937), but we were not able to see it, unfortunately. More attention must be paid to a geographical distribution of different cytotypes in *C. palustris*.

FAMILY ASTERACEAE

3. *Artemisia punctigera* Krasch. ex Poljak.

Chromosome number. $2n=18^*$ (A. S.).

Voucher specimen. LEU 273, Sakhalin, in vicinity of Okha town, by the woodside of *Pinus pumila*, sandy place, 20.VII.1957, coll. A. Sokolovskaya.

Distribution. North Sakhalin. Endemic. Forest margins and meadows.

Note. This herbarium specimen (preserved in Herbarium of the St.-Petersbourg State University- LEU) initially was identified by its collector as "*A. borealis* var. *Purschii*" (Sokolovskaya 1960). Later it was specified as *A. punctigera* by V.Yu. Barkalov. *A. punctigera* have been described from Sakhalin (Nabilj Bay).

4. *Crepis chrysantha* (Ledeb.) Turcz.

Chromosome number. $2n=c.16$ (R.).

Voucher specimen. VLA 8940, Sakhalin, Nabiljsky Range, Chamginsky Pass, the upper part of the rivulet (the right affluent of Khrebtovy Spring), the spot elevation "1511 m", break-stone deposits on the top of the mountain, 8.VIII.2002, coll. V. Barkalov.

Distribution. Sakhalin; north of the Russian Far East; East Europe, Asia. Montane tundras.

Note. Previously this specimen has been misidentified as "*C. hokkaidoensis* Babc." (Probatova *et al.* 2004). Later it was revised by V.Yu. Barkalov who revealed that *C. chrysantha* does occur in Sakhalin, too, though Sakhalin plants are not typical. For polymorphic species *C. chrysantha* there were many chromosome counts in the literature, almost all of them – from Russia, in particular – from Siberia and the Russian Far East (Chukotka, Kamchatka): $2n=8$, $8+0-1B$, 12, 16; among them, $2n=8$ is the most common (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1990; Goldblatt 1981, 1984, 1985; Goldblatt and Johnson 1991, 1996). The tetraploid cytotype, $2n=16$, which is known from East Sayan Mts, Baikal Region (Krogulevich 1978), in Chukotka (Zhukova 1980, 1982) and now – in Sakhalin, could be of hybrid origin.

5. *Crepis hokkaidoensis* Babc.

Chromosome number. $2n=8$ (R.).

Voucher specimen. VLA 9669, Moneron Island, Chuprova Bay, on rocks, near the waterfall, 15.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin, Moneron, South Kuriles; Japan. Rocky habitats.

Note. This is the first chromosome count for *C. hokkaidoensis* from the Russian Far East: our earlier report (from Sakhalin) must be referred to another species – *C. chrysantha* (see *Note* above). There were few counts for *C. hokkaidoensis*, from Japan: $2n=8$ (see Bolkhovskikh *et al.* 1969; Ikeda, 1988). Our count is consistent with the previous ones.

6. +*Phalacrolooma annuum* (L.) Dumort.

(*Erigeron annuus* (L.) Pers.)

Chromosome number. $2n=27$ (R.).

Voucher specimen. VLA 9682, Sakhalin, Neveljsky District, 7 km southwards from Shebunino settlement, the lower part of Kitosija River, meadow in the valley, 4.VIII.2004, coll. V. Barkalov.

Distribution. South Sakhalin, South Kuriles (Kunashir Island); now - the south of the Primorsky Territory. Introduced. A North American species, introduced into many countries of Europe, Asia, Central America.

Note. This is the first chromosome report for this species from Sakhalin. Previously *Ph. annuum* was studied from Kunashir Island ($2n=18$, 27 – Probatova *et al.* 2000). Apomictic species. In the literature most authors give for “*Erigeron annuus*” $2n=27$, sometimes – $2n=18$, 26 , 54 (Bolkhovskikh *et al.* 1969; Goldblatt 1981, 1984; Goldblatt and Johnson 1990, 1994).

7. *Saussurea duiensis* Fr. Schmidt

Chromosome number. $2n=26$ (R.).

Voucher specimen. VLA 9122, Sakhalin, Makarovsky District, near Maguntan mud volcano, swampy Larix forest, 20.IX.2003, coll. V. Barkalov.

Distribution. Sakhalin. Endemic (?). Forest margins, wet meadows.

Note. There was only one chromosome number report for *S. duiensis* before ($2n=26$), from Kholmsky District, Sakhalin (Gurzenkov 1973 - as “*S. shiretokoensis*”). *S. duiensis* is an insular species, and it belongs to a very polymorphic complex, *S. amurensis* Turcz. aggr., in which the diploid chromosome number $2n=26$ was observed in continental species *S. amurensis* s. str. in the Amur River basin, but polyploid cytotypes (especially, with $2n=52$) are more common (see Agapova *et al.* 1990; Sokolovskaya and Probatova 1986; Probatova, Rudyka *et al.* 2004). Thus, the diploid chromosome number of *S. duiensis*, which is close relative to *S. amurensis* s. str., could prove up the existence of some connections between the Amur River basin and Sakhalin, in the past.

8. +*Senecio dubitabilis* C. Jeffrey et Y.L. Chen (*S. dubius* Ledeb., non Beck.)

Chromosome number. $2n=20^*$ (R.).

Voucher specimen. VLA 8468, Sakhalin, Nogliki settlement, 21.IX.1999, coll. A. Smirnov.

Distribution. Sakhalin (invasive plant, only one locality hitherto known). Mostly South Siberia and Central Asia, in the Russian Far East – as invasive, hitherto known in the upper part of Amur River basin.

Note. We have not found any chromosome report for *S. dubitabilis* in the literature. For closely related species, European-Mediterranean *S. vernalis* Waldst. et Kit., which also have been found as invasive in the north of Sakhalin, $2n=20$ was known (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1990; Goldblatt 1981, 1984; Goldblatt and Johnson 1994).

9. *Sonchus asper* (L.) Hill

Chromosome number. $2n=18$ (R.).

Voucher specimen. VLA 8759, Moneron Island, in

vicinity of the former settlement Staritsky, sea coast, on sands and gravels, near the waterfall, 23.VIII.2001, coll. V. Barkalov.

Distribution. Sakhalin, South Kuriles. Nearly cosmopolitan. On banks.

Note. *S. asper* have been studied also on the islands of Peter the Great Bay, the Primorsky Territory (Probatova and Sokolovskaya 1981), as well as in Japan, Hokkaido (Nishikawa 1984); $2n=18$. This diploid chromosome number $2n=18$ is the most common in the literature for *S. asper* (see Bolkhovskikh *et al.* 1969; Goldblatt 1981, 1984, 1985, 1988; Goldblatt and Johnson 1991, 1994, 1996, 1998); rarely $2n=32$ – 36 occur, but they hardly belong to *S. asper*.

10. *Sonchus oleraceus* L.

Chromosome number. $2n=32$ (R.).

Voucher specimen. VLA 9698, Moneron Island, Chuprova Bay, marine terrace, by the rivulet, on disturbed habitats, 20.VII.2004, coll. V. Barkalov.

Distribution. South Sakhalin, South Kuriles. Nearly cosmopolitan. On banks and as a weed.

Note. *S. oleraceus* is well studied throughout the world. Most authors give $2n=32$, e.g., from Japan, Hokkaido (Nishikawa 1984), very rare – $2n=16$ and 64 ; however, sometimes also $2n=18$, 36 were reported (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1990; Goldblatt 1981, 1984, 1985, 1988; Goldblatt and Johnson 1990, 1991, 1994, 1996, 1998, 2000, 2003). More evidence for two basic chromosome numbers ($x=8$ and 9) within *S. oleraceus* is desirable.

11. *Stenotheca tristis* (Willd. ex Spreng.) Schljak. (*Hieracium triste* Willd. ex Spreng.)

Chromosome number. $2n=18$ (R.).

Voucher specimen. VLA 8393, Kuriles, Kharimkotan Island, Severguina volcano, the meadow, 28.VII.2000, coll. V. Barkalov.

Distribution. North Kuriles; North Pacific. Alpine meadows.

Note. Earlier chromosome reports for this species ($2n=18$) were from Kamchatka (Sokolovskaya 1963, 1968 – as “*Hieracium triste*”), as well as from North America (see Goldblatt 1981).

12. *Synurus deltoides* (Ait.) Nakai

Chromosome number. $2n=26$ (R.).

Voucher specimen. VLA 9124, Sakhalin, in vicinity of Maguntan mud volcano, the after-fire meadow in the forest (*Calamagrostis*, mixed with various herbs), 20.IX.2003, coll. V. Barkalov.

Distribution. Sakhalin; Amur River basin, Korea, Japan. Forest edges.

Note. The species is poorly investigated: only two chromosome reports existed, both - from the south of Primorsky Territory ($2n=26$ – Gurzenkov 1973; Probatova and Sokolovskaya 1981).

FAMILY BORAGINACEAE

13. *Myosotis sachalinensis* M. Pop.

(*M. sylvatica* var. *sachalinensis* (M. Pop.) Tolm.; *M. sylvatica* auct., quoad pl. sachal.)

Chromosome number. $2n=14^*$ (A. S.).

Voucher specimen. VLA 99, Sakhalin, in vicinity of Novo-Alexandrovsk settlement, the transitional zone between stone birchwood and *Picea-Abies* forest, along the rivulet, 17.VI.1957, coll. A. Sokolovskaya.

Chromosome number. $2n=28^*$ (R.).

Voucher specimen. VLA 9636, Moneron Island, Chuprova Bay, in the tall herbs community, 14.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles. The species is known also from Sikhote-Alinj Range. Most probably, it occurs in Japan, too. In forests.

Note. *M. sachalinensis* belongs to *M. sylvatica* Ehrh. ex Hoffm. aggr. It was described from Sakhalin (near Kholmsk). No chromosome information for *M. sachalinensis* existed before. For *M. sylvatica* various chromosome numbers are reported in the literature: $2n=14, 18, 20, 22, 24, 32, 48$; among them, more common are $2n=18, 20$, but $2n=14$ is rare, and $2n=28$ have not been revealed before (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1990; Goldblatt 1981, 1984, 1988; Goldblatt and Johnson 1990, 1994, 1996).

FAMILY BRASSICACEAE

14. *Arabis japonica* (A. Gray) A. Gray

(*A. stelleri* auct.)

Chromosome number. $2n=16^*$ (R.).

Voucher specimen. VLA 9753, Sakhalin, Neveljsky District, 7 km southwards from Shebunino settlement, near the mouth of Kitosija River, meadow on the marine terrace, 5.VIII.2004, coll. V. Barkalov.

Distribution. Sakhalin, South Kuriles; Japan. Sea coasts.

Note. Earlier we reported for "*A. stelleri*" $2n=16$, from Sakhalin and Kuriles, Zelyony Island (Probatova *et al.* 2004), but now we consider these specimens as *A. japonica*. A closely related species, *A. stelleri* DC. have been studied from Kamchatka: $2n=32$ (Zhukova, Petrovsky 1984). To the opinion of V.Yu. Barkalov, *A. stelleri* s. str. grows in Kamchatka (*locus classicus* of the species!), in the North Kuriles and North Sakhalin, but in South Sakhalin and South Kuriles *A. japonica* occurs. The diploid ($2x$) chromosome number $2n=16$ shows that the southern part of geographical area of *A. stelleri* complex is obviously more ancient.

15. *Barbarea orthoceras* Ledeb.

Chromosome number. $2n=16$ (R.).

Voucher specimen. VLA 9685, Sakhalin, Neveljsky District, 5 km southwards from Shebunino settlement, maritime slope, near the rivulet, 5.VIII.2004, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; East Siberia, Russian Far East, North America. Riversides, banks and meadows.

Note. Recently *B. orthoceras* was studied on the Kuriles (Onekotan Island) by S. Volkova *et al.* (2003), more ancient counts were made from Chukotka and also from other parts of its area of distribution, besides the Russian Far East: in all cases – $2n=16$ (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1990; Ornduff 1968; Goldblatt 1984, 1985).

16. *Cardamine impatiens* L.

Chromosome number. $2n=16$ (R.).

Voucher specimen. VLA 9678, Moneron Island, Chuprova Bay, in the stony birch wood, on the edge of *Picea* forest, 20.VII.2004, coll. V. Barkalov.

Distribution. South Sakhalin, Moneron, South Kuriles; Europe, Asia. Riversides and banks, sometimes on sea coasts.

Note. *C. impatiens* was studied in the Primorsky Territory (Cape Peschany opposite Vladivostok): $2n=16$ (Probatova and Sokolovskaya 1988). The same chromosome number was reported in the literature, but one count was $2n=32$ (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1990; Goldblatt 1981, 1984, 1988; Goldblatt and Johnson 1998, 2003).

17. *Cardaminopsis lyrata* (L.) Hiit.

(*Arabis lyrata* L.; *A. kamtschatica* (Fisch.) Ledeb.)

Chromosome number. $2n=16$ (R.).

Voucher specimen. VLA 8392, Kuriles, Urup Island, Chernoburka Bay, on the gravel along the river, 9.VIII.2000, coll. V. Barkalov.

Distribution. Sakhalin, the Kuriles. North Pacific. On rocks and screes.

Note. *C. lyrata* have been studied caryologically several times in the Russian Far East (East Chukotka, Kamchatka, Koni Peninsula near Magadan): $2n=16$ and 32 (Berkutenko *et al.* 1984; Zhukova and Petrovsky 1984). Nevertheless, from the North American part of the species distribution area mostly $2n=16$ is reported (see Bolkhovskikh *et al.* 1969; Goldblatt 1984, 1985). The special attention is to be paid to a possible ecological preference or geographical distribution of diploid and tetraploid cytotypes of *C. lyrata*.

18. *Draba cinerea* Adams.

Chromosome number. $2n=16$ (R.).

Voucher specimen. VLA 9112, Sakhalin, Schmidt Peninsula, near the mouth of Taliki River, stony slope, on the rocks by the top of the mountain, 14. VIII. 2001, coll. V. Barkalov.

Distribution. Sakhalin (Schmidt Peninsula). Holarctic. On the rocks.

Note. *D. cinerea* have been studied several times in the Russian Far East (Chukotka, Wrangel Island, some other localities in Magadansky Region): $2n=48$ (most reports), very rare – $2n=56, 64$ (see Agapova *et al.* 1990). In the world literature for *D. cinerea* numerous authors give the same, polyploid chromosome numbers (also from North America), and besides, $2n=80$ (see Bolkhovskikh *et al.* 1969; Ornduff 1968; Goldblatt 1985; Goldblatt and

Johnson 1994, 1996, 2000). We revealed for the first time the diploid chromosome number $2n=16$ ($2x$) in *D. cinerea*. It is noteworthy that diploid cytotype was revealed near the southern limit of the species distribution area. We suggest the diploid cytotype could be considered as relict: it is quite possible that the species have been originated initially in this Okhotian, - insular part of the Northern Hemisphere, and migrated, by its polyploid cytotypes (especially $2n=48$, $6x$).

19. *Draba kurilensis* (Turcz.) Fr. Schmidt
(*Draba borealis* auct., p.p.)

Chromosome number. $2n=32$ (R.).

Voucher specimens. VLA 9705, Moneron Island, Chuprova Bay, on the rocks, near the waterfall, 15.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin, Moneron, Kuriles; Japan. Coastal rocky habitats.

Note. The tetraploid cytotype ($2n=32$) was revealed again, now – in Moneron Island. Previously it was reported by us from the Kuriles: Matua and Shiashkotan Islands (Probatova et al. 2004). The diploid cytotype ($2n=16$) is still known only from Sakhalin (Gurzenkov 1973). *D. kurilensis* belongs to the North Pacific complex *D. borealis* DC. aggr., but for *D. borealis* s. str. only high polyploid levels are known: $2n=64$, 80 (see Bolkhovskikh et al. 1969; Agapova et al. 1990). Chromosome numbers could obviously provide some reasons to consider *D. kurilensis* as a separate species, more ancient entity in comparison to high polyploid (northern) cytotypes of *D. borealis* aggr.

20. *Erysimum pallasii* (Pursh) Fern.

Chromosome number. $2n=28$ (R.).

Voucher specimens. VLA 8693, Sakhalin, Schmidt Peninsula, Boljshaya Longri River, on the slope of the mountain, 16.VIII.2001, coll. V. Barkalov; VLA 8690, Sakhalin, Schmidt Peninsula, Severnyj Bay, Nala River, southwards from Cape Elizavety, on the scree, 7.VIII.2001, coll. V. Barkalov.

Distribution. North Sakhalin; the Russian Far East, Siberia, North America. On rocks and screes.

Note. Many authors give for *E. pallasii* $2n=24$, c.28, 36, 42, among them – counts from the Russian Far East (Chukotka, Wrangel Island, Kolyma River basin) and also from Siberia (see Bolkhovskikh et al. 1969; Agapova et al. 1990); most common are $2n=24$ and 36. Taking into account this consideration, new evidences of polybasic situation ($x=6$, 7) in *E. pallasii* are needed.

FAMILY CAPRIFOLIACEAE

21. *Lonicera tolmatchevii* Pojark.

Chromosome number. $2n=18^*$ (R.).

Voucher specimen. VLA 9878, Sakhalin, Tymovsky District, outskirts of Slava settlement, left side of Tymj River, the valley *Salix-Chosenia* forest, 17.VII.2000, coll. A. Taran.

Distribution. Sakhalin (Tymj River basin). Endemic. Valley forests.

Note. A rare species, with black fruits. No chromosome information existed before. For majority of *Lonicera* species studied $2n=18$ is common, rarely – $2n=36$, and the rarest is $2n=54$; as to $2n=24$, the citation was erroneous, because the plants studied belong to *Lilium medeoloides* var. *kurilensis* (see Bolkhovskikh et al. 1969).

22. *Weigela middendorffiana* (Carr.) C. Koch

Chromosome number. $2n=36$ (R.).

Voucher specimen. VLA 9123, Sakhalin, Makarovskiy District, near railway station Tsapko, the upper part of Svetlovka River, in birchwood, 11.IX.2003, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles. West Pacific. In forests.

Note. For *W. middendorffiana* there was only one chromosome number report ($2n=36$: Sokolovskaya 1960, as “*Diervilla middendorffiana*”, from Chekhova Mt., South Sakhalin). The same chromosome number was revealed in *W. praecox* (Lemoine) Bailey, from the Primorsky Territory (Sokolovskaya and Probatova 1985).

FAMILY CARYOPHYLLACEAE

23. *Cerastium sugawarae* Koidz. et Ohwi

Chromosome number. $2n=36^*$ (R.).

Voucher specimen. VLA 9752, Moneron Island, Chuprova Bay, on the slope, by the screes, 15.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin, Moneron; endemic (?). Rocks and meadows.

Note. No chromosome information existed before for *C. sugawarae*, as well as for its close relative from the islands of Peter the Great Bay (Primorsky Territory), the latter is known under the name *C. furcatum* Scham. et Schlecht ($2n=36$, unpublished). Plants from Moneron differ notably from *C. furcatum*.

24. *Dianthus sachalinensis* Barkalov et Probat. [2006, Flora of the Russian Far East: Addenda et Corrigenda: 444].

(*D. collinus* auct. fl. sachal.)

Affinitas. A *D. repenti* Willd. haec species plantae colore glaucescenti, caespitibus laxioribus, foliis latioribus (3–6 mm, non 1.5–3 mm lt.) in paribus quinis–novenis (non solitariis–quaternis), squamis floralibus calyce duplo brevioribus (non aequalibus vel sesqui brevioribus), nec non habitatione maritima differt.

Typus: “Insula Sachalin, distr. Ochinskij, pag. Lugi, in arena maritima, 11. VIII. 2001, coll. V. Yu. Barkalov” (VLA).

Chromosome number. $2n=30^*$ (R.).

Voucher specimen. VLA 8774, Sakhalin, Okhinsky district, near Lugi settlement, coastal sand dunes, 11.VIII.2001, coll. V. Barkalov.

Distribution. North Sakhalin. Endemic. Sandy coastal places, maritime slopes.

Note. For a closely related species *D. repens* Willd. the majority of the authors reported $2n=60$ (see Agapova et al. 1990).

25. *Gypsophila paniculata* L.

Chromosome number. $2n=34$ (R.).

Voucher specimen. VLA 8469, Sakhalin, Nogliksky District, Nogliki settlement, near the forest farm, 29.IX.1999, coll. A. Smirnov.

Distribution. Sakhalin (introduced, rare: first record!); south of Primorsky Territory (rare); Europe, West Asia.

Note. In the literature we found for *G. paniculata* $2n=34$, $2x$ (most reports), but also $2n=36$ and 68 (see Bolkhovskikh *et al.* 1969; Goldblatt 1981; Goldblatt and Johnson 1996).

26. *Melandrium sachalinense* (Fr. Schmidt) Kudo

Chromosome number. $2n=48^*$ (R.).

Voucher specimen. VLA 9654, Moneron Island, Chuprova Bay, break-stone and silt slope, under the rocks, 15.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin. Endemic. On rocks and screes. Described from Sakhalin (Dui).

Note. There was no chromosome information for *M. sachalinense*. This is the only one indigenous species of the genus *Melandrium* Roehl in Sakhalin. Two other species - *M. album* (Mill.) Garcke and *M. noctiflorum* (L.) Fries are invasive, and they are diploids, $2n=24$ (Probatova *et al.* 1986, 1996). The tetraploid chromosome number $2n=48$ was revealed for *M. firmum* (Siebold et Zucc.) Rohrb. in the Amur River basin (Probatova and Sokolovskaya, 1995).

27. *Moehringia lateriflora* (L.) Fenzl.

Chromosome number. $2n=48$ (R.).

Voucher specimen. VLA 8217, Kuriles, Chirpoi Island, Peschanaya Bay, meadow on the slope of marine terrace, 5.VIII.2000, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; East Europe, Asia, North America. In forests, sometimes – coastal meadows.

Note. This species was poorly investigated cytologically. There was one count from Sakhalin, $2n=c. 50-52$ (Sokolovskaya 1960) and $2n=36$ – from the Primorsky Territory, Vladivostok (Gurzenkov 1995). However, $2n=48$ was reported by P.G. Zhukova (1967) from West Chukotka, and the same chromosome number $2n=48$ was also known from North America (see Goldblatt 1985). *M. lateriflora* is the highest polyploid in the genus, very polymorphic, and it has the largest area of distribution.

28. *Sagina crassicaulis* S. Wats.

Chromosome number. $2n=18-22$ (R.).

Voucher specimen. VLA 8397, Kuriles, Brat Chirpojev Island, Uglovaya Bay, maritime slope, break-stone and silt places with scarce vegetation, 4.VIII.2000, coll. V. Barkalov.

Chromosome number. $2n=22$ (R.).

Voucher specimen. VLA 8082, Kuriles, Yuriy Island, Shirokaya Bay, sea coast, on the screes, 20.VIII.1998, coll. M. Iljushko and Yu. Zhuravlyov.

Distribution. South Sakhalin, South Kuriles; North Pacific. Sea coasts.

Note. For *S. crassicaulis* chromosome numbers $2n=46$

and 66 were reported, from North America (see Goldblatt 1984). So, we revealed a new, – diploid cytotype for this species. It is probable that on Kuriles we have the most ancient part of the area of distribution for *S. crassicaulis*. The diploid chromosome number $2n=22$ is well known for a close relative Holarctic species, *S. saginoides* (L.) Karst. (see Goldblatt, 1981, 1984; Goldblatt and Johnson, 1990, 1996), represented mostly on the North Kuriles (and this species is not strictly coastal).

29. *Stellaria fenzlii* Regel

Chromosome number. $2n=26$ (R.).

Voucher specimen. VLA 9139, Sakhalin, Schmidt Peninsula, Pervyj Brat Mt., on the slope, near the borrow pit, 11.VIII.2003, coll. V. Barkalov.

Chromosome number. $2n=26, 52$ (R.).

Voucher specimen. VLA 7862, Kuriles, Kunashir Island, Alyokhina Bay, on the slope, by the rivulet, in the tall herbs community, 19.VIII.1999, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; West Pacific. In forests.

Note. Only one report hitherto existed in the literature for *S. fenzlii*: $2n=c.40$, this chromosome number was counted on two collections from South Sakhalin (Sokolovskaya 1960). We think $2n=52$ would be more correct for Sokolovskaya's specimens.

FAMILY CHENOPODIACEAE

30. *Atriplex subcordata* Kitag.

(*A. gmelinii* auct., p.p.)

Chromosome number. $2n=36$ (A. S.).

Voucher specimen. VLA 6172, Sakhalin, Korsakovsky District, near Solovyovka village, sea coast, 19.IX.1982, coll. N. Probatova and E. Rudyka.

Distribution. Sakhalin, Kuriles; West Pacific. Coastal species.

Note. Only two reports were published for *A. subcordata*, both – from Japan: $2n=36$ (Jinno 1956 - see in Bolkhovskikh *et al.* 1969) and $2n=54$, from Hokkaido (Nishikawa 1981). Later, Nishikawa (1986) reported $2n=36$ for "*Atriplex gmelinii*", from Hokkaido. The existence of hexaploid (6x) cytotype in *A. subcordata* needs more evidence. In the Primorsky Territory (near the mouth of Rudnaya River) we also revealed $2n=36$ in *A. subcordata* (Sokolovskaya, unpublished). *A. subcordata* is the species with more southern area of distribution, than *A. gmelinii* C. A. Mey. According to M.S. Ignatov (1987), in the North Kuriles both species occur, but on South Kuriles and in the Primorsky Territory only *A. subcordata* is presented. Probably, the same is true for Korean Peninsula, as well as for Japan.

FAMILY CONVALLARIACEAE

31. *Maianthemum dilatatum* (Wood) Nels. et Macbr.

Chromosome number. $2n=32$ (R.).

Voucher specimens. VLA 9082, Sakhalin, Makarovsky District, in vicinity of Maguntan mud volcano, Larix forest, 20.IX.2003, coll. V. Barkalov; VLA 8218, Kuriles, Chirpoi Island, Peschanaya Bay, meadow on the slope

of marine terrace, 5.VIII.2000, coll. V. Barkalov.

Chromosome number. $2n=36$ (R.).

Voucher specimens. VLA 7864, Kuriles, Shiashkotan Island, near the Cape Obval'nyj, meadow on maritime slope, 2.VIII.1999, coll. V. Barkalov; VLA 8262, Kuriles, Simushir Island, Browton Bay, Vostochnaya Kleshnya Peninsula, maritime slope, among various herbs, 2.VIII.2000, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; East Asia, North America. In forests, but also (not rare) – meadows near sea coasts.

Note. A.P. Sokolovskaya (1960) reported from Sakhalin (north and south) $2n=36$ (as “*Majanthemum bifolium*”). In total, for *M. dilatatum* three cytotypes are known from the literature: $2n=32$, 36, 54. From Kamchatka $2n=36$ and 54 were reported (Sokolovskaya 1963). In the Primorsky Territory (Russky Island) we revealed $2n=54$ (unpublished). From Korea and from Japan (Hokkaido) $2n=36$ was known (Lee 1967; Nishikawa 1979). All the three cytotypes were also reported from Japan (see Bolkhovskikh *et al.* 1969). The most common is, obviously, $2n=36$, and the rarest – $2n=32$.

FAMILY CRASSULACEAE

32. *Rhodiola integrifolia* Rafin.

(*R. atropurpurea* (Turcz.) Trautv. et C. A. Mey.)

Chromosome number. $2n=22$ (R.).

Voucher specimen. VLA 8319, Kuriles, Shumshu Island, in vicinity of Baykovo settlement, coastal rocks, 24.VII.2000, coll. V. Barkalov.

Distribution. North Kuriles; North Pacific. Montane tundras.

Note. In the Russian Far East this species was studied under the name “*Rhodiola atropurpurea*”, from Chukotka (Zhukova 1965a) as well as from Kamchatka (our data, unpublished): $2n=22$. Besides, from Chukotka $2n=c.38$ was reported (Zhukova and Tikhonova 1973), and from North America – $2n=36$ (Dawe and Murray 1979 – as “*Sedum integrifolium*”). The diploid chromosome number $2n=22$ is very common for various *Rhodiola* species (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1990).

33. *Rhodiola sachalinensis* Boriss.

Chromosome number. $2n=22$ (R.).

Voucher specimen. VLA 8815, Moneron Island, in vicinity of the former settlement Staritsky, on the slope, by the rocks, 23.VIII.2001, coll. V. Barkalov.

Distribution. Sakhalin, Moneron, Kuriles; Japan. On rocks. Described from Sakhalin (Dui).

Note. This species was studied only once, – from the Kuriles, Ekaron Island: $2n=22$ (Probatova *et al.* 2000). For closely related species, *Rh. rosea* L. from Chukotka the same chromosome number $2n=22$ is known (Zhukova 1966).

FAMILY ERICACEAE

34. *Rhododendron aureum* Georgi

Chromosome number. $2n=26$ (R.).

Voucher specimen. VLA 8414, Urup Island, Tetyajevo Bay, on the slope, among *Pinus pumila*, 8.VIII.2000, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; East Siberia, Far East. Mountain forests and tundras.

Note. This chromosome number $2n=26$ for *Rh. aureum* was known from Chukotka, as well as from East Siberia (see Agapova *et al.* 1990); however, from the upper part of the Amur River basin (Bekel'deul Mt.) the tetraploid chromosome number $2n=52$ has been reported (Gurzenkov 1973).

FAMILY FABACEAE

35. *Hedysarum sachalinense* B. Fedtsch.

(*H. hedysaroides* auct., p.p.)

Chromosome number. $2n=16$ (R.).

Voucher specimen. VLA 9160, Sakhalin, Makarovskiy District, in vicinity of Tikhij settlement, the slope near the mouth of Tikhaya River, on the screes, 20.VIII.2003, coll. V. Barkalov.

Distribution. Sakhalin. Endemic (?). Coastal rocks. The species was described from Sakhalin (Dui).

Note. There was only one chromosome report for *H. sachalinense*: $2n=16$ (Gurzenkov 1973). To N.S. Pavlova's opinion, this species might occur in Japan, too.

36. *Oxytropis austrosachalinensis* Vass. ex N.S. Pavlova (*O. megalantha* auct.)

Chromosome number. $2n=32^*$ (R.).

Voucher specimen. VLA 7600, Sakhalin, Poronajskiy District, 2 km westwards from the Cape Sheljtinga, Vostochno-Sakhalinskyye Mts, Slannikova Mt., subalpine belt, break-stone slope, near the top of the mountain, 16.VIII.1991, coll. N. Pavlova.

Distribution. Sakhalin (east: Makarovskiy and Poronajskiy Districts). Endemic. On rocks and screes. Described from Sakhalin (Karakulchan Range, east coast near Zaozjornoye settlement).

Note. This is the second record of this rare species on Sakhalin. No chromosome information existed before. Tetraploid (4x).

37. *Oxytropis helenae* N.S. Pavlova

Chromosome number. $2n=64^*$ (R.).

Voucher specimen. VLA 7611, Sakhalin, Poronajskiy District, in vicinity of Sheljtinga Bay, Slannikova Mt., subalpine belt, stony slope, near the top of the mountain, 16.VIII.1991, coll. N. Pavlova.

Distribution. Sakhalin. Endemic. On rocks, subalpine meadows, maritime slopes. Described from Sakhalin (Schmidt Peninsula).

Note. This is the second record of this rarest species on Sakhalin and the first chromosome count for the species. Octoploid (8x).

38. *Oxytropis sachalinensis* Miyabe et Tatew.

Chromosome number. $2n=16^*$ (R.).

Voucher specimen. VLA 7603, Sakhalin, Poronajsky District, 2 km westwards from the Cape Sheljtinga, Vostochno-Sakhalinskyye Mts, Slannikova Mt., subalpine belt, on the plateau, 18.VIII.1991, coll. N. Pavlova.

Distribution. Sakhalin (north and east). Endemic. Mountains and high marine terraces. On rocks and montane meadows. Described from Sakhalin (Kawashima Mt., east coast of Sakhalin).

Note. This species is close relative to *O. ajanensis* (Regel et Tii.) Bunge (*O. semiglobosa* Jurtz.), and for the latter species the diploid chromosome number $2n=16$ was reported, too (Yurtsev and Zhukova 1972).

FAMILY GENTIANACEAE

39. *Gentiana axillariflora* Lévl. et Vaniot.

Chromosome number. $2n=26$ (A. S.).

Voucher specimens. VLA 5844, Sakhalin, Korsakovsky District, 5 km southeastwards from Ozyjorsk settlement, near Boljshoye Vavajskoye Lake, 5.X.1980, coll. N. Probatova; VLA 6219, Sakhalin, Anivsky District, in vicinity of the former village Peschanskoye (near Aniva town), swampy forest, 14.IX.1982, coll. N. Probatova and E. Rudyka.

Distribution. Sakhalin, South Kuriles; Japan. Wood edges and post-forest meadows.

Note. Only one chromosome report for this species existed, also from South Sakhalin: $2n=26$ (Sokolovskaya 1960). However, it is quite probable that some reports ($2n=26$) for the "varieties" of *G. triflora* Pall. from Japan are to be referred to *G. axillariflora*. The relationships between these species still remain not clear.

40. *Gentiana triflora* Pall.

Chromosome number. $2n=26$ (R.).

Voucher specimen. VLA 9144, Sakhalin, Makarovsky District, in vicinity of the railway station Tsapko, wet meadow, 12.IX.2003, coll. V. Barkalov.

Distribution. Sakhalin, South Kuriles; East Siberia, Far East. Meadows.

Note. This is the first count in *G. triflora* from the Russian Far East, but this chromosome number $2n=26$ was also revealed in Baikal Siberia, as well as in Japan (see Agapova *et al.* 1990; Nishikawa 1981).

FAMILY HOSTACEAE

41. *Hosta rectifolia* Nakai

(*H. sachalinensis* Koidz.)

Chromosome number. $2n=60$ (R.).

Voucher specimens. VLA 9060, Sakhalin, Dolinsky District, 8 km eastwards from Dolinsk, swampy meadow, 23.VIII.2003, coll. V. Barkalov; VLA 8196, Kuriles, Urup Island, Tetyajeva Bay, wet meadow, by the rivulet, 8.VIII.2000, coll. V. Barkalov.

Distribution. South Sakhalin, South Kuriles; Japan. Bogs and meadows.

Note. We found in the literature $2n=60$ for *H. rectifolia*

from Japan (Akemine 1935 – see Bolkhovskikh *et al.* 1969). However there also exist $2n=56$, reported from Sakhalin (seeds, *sine loco*) by N.N. Gurzenkov (1993), which seems to be doubtful.

FAMILY JUNCACEAE

42. *Juncus nodulosus* Wahlenb.

Chromosome number. $2n=40$ (A. S.).

Voucher specimen. VLA 6272, Sakhalin, Makarovsky District, Maguntan mud volcano, 15.IX.1982, coll. N. Probatova and E. Rudyka.

Distribution. South Sakhalin, South Kuriles; Europe, Siberia, North America. Riverside banks. Rare species on Sakhalin and the Kuriles.

Note. From the literature we know for *J. nodulosus* the chromosome numbers $2n=40$ and 80 (see Bolkhovskikh *et al.* 1969; Goldblatt 1981). The plants studied by us are not typical, with short pedicels.

FAMILY LOBELIACEAE

43. *Lobelia sessilifolia* Lamb.

Chromosome number. $2n=28$ (R.).

Voucher specimens. VLA 9128, Sakhalin, the valley of Manui River, northwestwards from Vzmorye settlement, boggy *Larix* forest, by the rivulet, 9.IX.2003, coll. V. Barkalov; VLA 8878, Sakhalin, Korsakovsky District, Busse Lake, wet meadow, 16.VIII.2002, coll. Yu. Zhuravlev.

Distribution. Sakhalin, Kuriles; East Siberia, Far East. Bogs and meadows.

Note. The chromosome number $2n=28$ has been revealed several times in the Primorsky Territory, Amur River basin and Kamchatka, as well as in Japan (Sokolovskaya 1963, 1966; Bolkhovskikh *et al.* 1969; Nishikawa 1985), but $2n=14$ from Primorsky Territory, reported by S.A. Shatalova (2000), needs to be confirmed.

FAMILY ONAGRACEAE

44. *Epilobium maximowiczii* Hausskn.

Chromosome number. $2n=36$ (R.).

Voucher specimens. VLA 9111, Sakhalin, Schmidt Peninsula, Severny Bay, Nala River, southwestwards from the Cape Elizavety, by the foot of maritime slope, 7.VIII.2001, coll. V. Barkalov; VLA 8108, Kuriles, Kunashir Island, Alyokhina Bay, near the thermal rivulet, 19.VIII.1999, coll. V. Barkalov.

Distribution. Sakhalin, South Kuriles; West Pacific. Bogs and banks.

Note. There was only one chromosome report for *E. maximowiczii* ($2n=36$ – Probatova and Sokolovskaya 1990, from South Sakhalin).

FAMILY ORCHIDACEAE

45. *Ephippianthus sachalinensis* Reichenb. fil.

(*E. schmidtii* Reichenb. fil.)

Chromosome number. $2n=36$ (R.).

Voucher specimen. VLA 8284, Kuriles, Urup Island, Aleutka Bay, stony birch wood with *Sasa* spp. on the slope, by the rivulet, 7.VIII.2000, coll. V. Barkalov.

Distribution. Sakhalin, Middle and South Kuriles. Rare. Around the Sea of Japan. In forests. Described from Sakhalin (Dui).

Note. The species was not much investigated before, but some chromosome numbers – $2n=36$, 40, 42 were known for “*E. schmidii*”, from Japan (see Bolkhovskikh *et al.* 1969).

46. *Neottia asiatica* Ohwi

Chromosome number. $2n=18$ (A. S.).

Voucher specimen. VLA 105, Sakhalin, Sussunajsky Range, eastwards from Yuzhno-Sakhalinsk, on the way to the pass, *Abies* forest, 19.VI.1957, coll. A. Sokolovskaya.

Distribution. South Sakhalin, South Kuriles (Kunashir Island). West Pacific? In forests.

Note. On this voucher specimen A.P. Sokolovskaya wrote: “ $2n=c.18?$ ”, but in her paper she gave for this species $2n=20$ (Sokolovskaya 1960). Later, from the Primorsky Territory (VLA 318, from “Kedrovaya Padj” nature reserve) Sokolovskaya (1966) reported for “*Neottia asiatica*” $2n=36$, but this voucher specimen was re-identified by V. Yu. Barkalov as *N. papilligera* Schlechter. So we concluded that the plant from Sakhalin really had $2n=18$, and not $2n=20$. No other chromosome counts were found in the literature. In the genus *Neottia* Guett. the chromosome numbers $2n=36$, 40, 42 are known (see Bolkhovskikh *et al.* 1969; Goldblatt 1984). In *N. camtschatea* (L.) Reichenb. fil., which is also presented in the Russian Far East, $2n=40$ was reported from Siberia (Krogulevich 1978), but this needs more evidence. In *N. nidus-avis* (L.) Rich. many authors give only $2n=36$.

FAMILY PAPAVERACEAE

47. *Chelidonium asiaticum* (Hara) Krachulkova

Chromosome number. $2n=10$ (R.).

Voucher specimen. VLA 9681, Sakhalin, Neveljsky District, 5 km southwards from Shebunino settlement, on silt and screes in the foot of maritime slope, 5.VIII.2004, coll. V. Barkalov.

Distribution. Sakhalin, South Kuriles; south of the Russian Far East; China, Korea, Japan. Described from Japan.

Note. This is the first chromosome count for this species in Sakhalin. *Ch. asiaticum* is obviously the only one native species in East Asia, and it has the chromosome number $2n=10$ (not $2n=12$, like in *Ch. majus* L.), which have been revealed many times in the Primorsky Territory and in the Amur River basin (Probatova and Sokolovskaya 1986; Probatova *et al.* 1996, 1998, 2000; Shatalova 2000). All the reports of $2n=10$ for “*Ch. majus* L.” from the Russian Far East, as well as from China, Korea and Japan (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1993; Goldblatt 1984, 1985; Goldblatt and Johnson 1991, 1998, 2003; in most cases – as “*Ch. majus* var.

asiaticum”) must be referred to *Ch. asiaticum*. As to earlier report of $2n=12$ for “*Ch. franchetianum*” from Japan (see Bolkhovskikh *et al.* 1969), the plant studied might belong to the genus *Glaucium*).

48. *Papaver miyabeianum* Tatew.

Chromosome number. $2n=28$ (R.).

Voucher specimen. VLA 8398, Kuriles, Brat Chirpojev Island, Uglovaya Bay, maritime slope, 4.VIII.2000, coll. V. Barkalov.

Distribution. South and Middle Kuriles; Japan. On the screes.

Note. There was only one chromosome number report for *P. miyabeianum* ($2n=28$ - Probatova *et al.* 2000, from Simushir Island).

FAMILY POACEAE

49. *Calamagrostis extremiorientalis* (Tzvel.) Probat. (*C. epigeios* subsp. *extremiorientalis* Tzvel.)

Chromosome number. $2n=28$ (A. S.).

Voucher specimen. VLA 6216, Sakhalin, Anivsky District, in vicinity of Aniva town, near the former village Peschanskoye, maritime sands, 14.IX.1982, coll. N. Probatova and E. Rudyka.

Distribution. South Sakhalin, South Kuriles; Amur River basin, Korean Peninsula, Japan. Sands and post-forest meadows. Described from Sakhalin (Aniva Bay).

Note. Previous studies on this species were in Sakhalin (Probatova *et al.* 1984), as well as in the Amur River basin, on the islands and continental part of the Primorsky Territory: $2n=28$ (see Agapova *et al.* 1993; Shatalova 2000). No chromosome reports have been found from the neighbouring countries, but it is quite possible that they exist, under the species name “*C. epigeios*”. *C. extremiorientalis* is the East Asian species which belongs to a widely distributed and very polymorphic complex *C. epigeios* (L.) Roth aggr. It is obviously one of the ancient members of this complex, taking into account the stability of chromosome number in *C. extremiorientalis*.

50. *Calamagrostis urelytra* Hack.

(*C. sesquiflora* subsp. *urelytra* (Hack.) Probat.)

Chromosome number. $2n=28^*$ (R.).

Voucher specimen. VLA 9702, Moneron Island, Staritsky Mt., mixed-herbaceous meadow near the top of the mountain, 26.VII.2004, coll. V. Barkalov.

Distribution. Moneron, Kuriles; Japan. Sea coasts: slopes of marine terraces, coastal rocks and sands.

Note. This is obviously the first chromosome count for *C. urelytra*. For its close relative, North Pacific *C. sesquiflora* (Trin.) Tzvel., which typically occurs in montane tundras, the same chromosome number $2n=28$ is known (Sokolovskaya and Probatova 1976, 1977; Zhukova 1980). However, it is quite possible that the chromosome number $2n=28$ for “*C. sesquiflora*” from Japan (Tateoka 1976) should be referred to *C. urelytra*.

51. *Echinochloa occidentalis* (Wiegand) Rydb.

(*E. crusgalli* subsp. *spiralis* (Wasing.) Tzvel.)

Chromosome number. $2n=36$ (R.).

Voucher specimen. VLA 8080, Kuriles, Kunashir Island, Alyokhina Bay, along thermal rivulet, 19.VIII.1999, coll. V. Barkalov.

Distribution. Sakhalin (?), South Kuriles; almost cosmopolitan. This is the first collection of *E. occidentalis* on the Kuriles.

Note. The chromosome number in *E. occidentalis* was counted formerly on specimens from Khanka Lake, the Primorsky Territory: $2n=54$ (Probatova and Sokolovskaya, 1983b). Next counts in *E. occidentalis* were made by us in the east part of Primorsky Territory (the Sea of Japan basin), as well as on the Ussuri River, the Bol'shekhokhtsirsky nature reserve: $2n=36$ (unpublished). No other reports on chromosomes for *E. occidentalis* have been found in the literature. A very polymorphic species.

52. *Elymus woroschilowii* Probat.

(*E. dahuricus* subsp. *pacificus* Probat.)

Chromosome number. $2n=42$ (R.).

Voucher specimen. VLA 8077, Kuriles, Kunashir Island, Alyokhino, sea coast, 19.VIII.1999, coll. V. Barkalov.

Distribution. South Sakhalin, South Kuriles; around the Sea of Japan. Coastal rocks and gravels.

Note. The chromosome number ($2n=42$) was counted in *E. woroschilowii* from the *locus classicus* of *E. dahuricus* subsp. *pacificus* (Gamov Peninsula) and on the islands of Peter the Great Bay (the Primorsky Territory), as well as in Sakhalin (Probatova and Sokolovskaya 1982). Recently, this chromosome number was also reported from China (Sun *et al.* 1992, as *E. dahuricus* subsp. *pacificus*). This coastal species belongs to the *Elymus dahuricus* Turcz. ex Griseb. aggr. *E. woroschilowii* is characterized by more or less glabrous lemmas, narrow convolute leaf blades, glaucescent culms (especially in the nodes), glaucescent leaves and glumes.

53. *Phragmites australis* (Cav.) Trin. ex Steud.

(*Ph. communis* Trin.)

Chromosome number. $2n=48$ (A. S.).

Voucher specimen. VLA 6201, Sakhalin, Korsakovsky District, in vicinity of Solovyovka village, coastal saline lowland, 19.IX.1982, coll. N. Probatova and E. Rudyka.

Distribution. Sakhalin, South Kuriles. Nearly cosmopolitan. Wetlands.

Note. There are many chromosome reports for this species: $2n=36-96$, in many cases – $2n=48$ ($4x$), the most common (see Bolkhovskikh *et al.* 1969; Goldblatt 1981, 1984, 1988; Goldblatt and Johnson 1991, 1996, 1998 *etc.*). We revealed $2n=48$ on Kuriles, Iturup Island (Sokolovskaya and Probatova 1976). The specimen 6201 belongs to var. *humilis* (De Not.) Tzvel.: plants are dwarf, with more or less convolute glaucescent leaf blades, they occur on sea coasts.

54. *Poa alpigena* (Blytt) Lindm.

Chromosome number. $2n=56$ (R.).

Voucher specimen. VLA 9652, Moneron Island, Staritsky Mt., upper part of a slope, mixed-herbaceous meadow, 26.VII.2004, coll. V. Barkalov.

Distribution. North Sakhalin, Moneron (first record!), North Kuriles; most (but northern) part of the Russian Far East. Circumpolar. Meadows in tundras of various types, alpine meadows, riverside banks.

Note. In the Russian Far East this species was studied in Chukotka, Wrangel Island, North Koryakia, Kamchatka: a wide range of chromosome numbers was revealed: $2n=32, 56, 60, 62, 70-72$, the most common are $2n=56$ and $70-72$ (see Agapova *et al.* 1993). In total, for *P. alpigena* $2n=28-127$ have been reported in the world literature (see Bolkhovskikh *et al.* 1969). Very polymorphic species. Populations of *P. alpigena* in Moneron Island might be relict.

55. *Poa neosachalinensis* Probat.

(*P. sachalinensis* auct.)

Chromosome number. $2n=42$ (A. S.).

Voucher specimen. VLA 5829, Sakhalin, Makarovsky District, in vicinity of Zaozjornoye railway station, on the slope, 2.X.1980, coll. E. Kurchenko and L. Dorokhina.

Chromosome number. $2n=63-64$ (R.).

Voucher specimen. VLA 8403, Sakhalin, Smyrnikhovskiy District, Vengueri River basin, riverside sands, 13.VIII.1996, coll. R. Sabirov and N. Sabirova.

Distribution. Sakhalin. Endemic (?). Described from Sakhalin (Sinogorsk). On sands and screes.

Note. *P. neosachalinensis* have been studied cytologically several times: $2n=42, 56, 63-64$ (Sokolovskaya and Probatova 1968, 1973, 1976 – as "*P. sachalinensis*"). Besides, from Japan the chromosome numbers $2n=63, c.64, c.74$ were reported for "*P. sachalinensis*" (Tateoka 1985), but we are not sure that *P. neosachalinensis* does occur in Japan. We still have not seen reliable specimens of *P. neosachalinensis* from Japan.

56. *Poa sibirica* Roshev.

Chromosome number. $2n=14$ (R.).

Voucher specimen. VLA 8784, Sakhalin, Schmidt Peninsula, Taliki River, scree and silt slope covered with vegetation, upper part, near the rocks, 14.VIII.2001, coll. V. Barkalov.

Distribution. North Sakhalin; the Russian Far East, Siberia, East Europe. Meadows. Sporadically everywhere.

Note. In the Russian Far East *P. sibirica* have been studied several times in Chukotka, Kamchatka, North Koryakia, Amur River basin, Primorsky Territory (Zhukova 1969; Sokolovskaya and Probatova 1973 and unpublished data), besides, its chromosome number is known from East Siberia and Altai Mts. (see Agapova *et al.* 1993). Everywhere, the diploid chromosome number $2n=14$ was revealed. *P. sibirica* is the only one diploid species of the genus *Poa* L. in Sakhalin (except *P. trivialis* L., alien). As we supposed, *P. sibirica* is a relict species

on Sakhalin (Sokolovskaya and Probatova 1976). The specimen studied does not look typical, by its dense panicles with almost glabrous branches. The ecology of this plant is not quite typical for this species, either.

57. *Poa turneri* Scribn.

Chromosome number. $2n=63$ (R.).

Voucher specimen. VLA 8215, Kuriles, Chirpoi Island, Peschanaya Bay, the *Leymus mollis* community, 4.VIII.2000, coll. V. Barkalov.

Distribution. Kuriles (North and Middle: Onekotan and Chirpoi Islands); North Pacific. Coastal meadows. The species occurs in the Russian Far East only in Commander Islands and in Kuriles.

Note. For *P. turneri* only one chromosome report existed before: $2n=c.64$ (Probatova and Sokolovskaya 1984a, from Commander Islands: Bering Island). We suppose that in both cases it was the same aneuploid chromosome number $2n=63$. Moreover, we recently revised one more specimen from Bering Island, with $2n=42$ (previously it was misidentified as "*P. macrocalyx* Trautv. et C.A. Mey." in Probatova et al. 1984): now we consider it as belonging to *P. turneri*, either. So, for *P. turneri* we know two cytotypes: $2n=42$ and $63-64$, this situation is quite typical for a species related to *P. macrocalyx* complex.

FAMILY POLEMONIACEAE

58. *Polemonium schizanthum* Klok.

Chromosome number. $2n=18^*$ (R.)

Voucher specimen. VLA 9673, Moneron Island, Staritsky Mt., low herbs meadow near the top of the mountain, 26.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin, Moneron, South Kuriles; West Pacific.

Rocks and meadows.

Note. No information on chromosomes of *P. schizanthum* was in the literature before. This species have been described from Sakhalin (Susuja River basin, between Yuzhno-Sakhalinsk and Lugovoje). According to N.N. Tzvelyov (1995), *P. schizanthum* is vicarious in relation to *P. campanulatum* (Th. Fries) Lindb., in southern regions of East Asia.

FAMILY PORTULACACEAE

59. *Montia fontana* L.

(*M. lamprosperma* Cham.)

Chromosome number. $2n=20$ (R.).

Voucher specimen. VLA 8062, Kuriles, Shishkotan Island, near the Cape Obvaljnyj, along the rivulet, 2.VIII.1999, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; almost Holarctic. On the banks, along rivulets.

Note. For *M. fontana* in the Russian Far East the chromosome number $2n=20$ was reported from Chukotka and $2n=18$ – from the Kolymskoye Upland (Zhukova 1966, 1982; Vesselukhina 1976). Usually for this species $2n=18, 20, 40$ are reported in the literature, under various

names, but more often – $2n=20$ (see Bolkhovskikh *et al.* 1969; Goldblatt 1981; Goldblatt and Johnson 1991, 1994).

FAMILY PRIMULACEAE

60. *Primula cuneifolia* Ledeb.

Chromosome number. $2n=22$ (R.).

Voucher specimens. VLA 8434, Kuriles, Ketoi Island, Diana Bay, meadow in the upper part of a rivulet, 6.VIII.1999, coll. V. Barkalov; VLA 8246, Kuriles, Simushir Island, Browton Bay, former settlement Kraternyj, wet meadow, 2.VIII.2000, coll. V. Barkalov; VLA 8410, Kuriles, Shishkotan Island, Zakatnaya Bay, stony maritime slope, 29.VII.2000, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; North Pacific. Montane meadows.

Note. The species has been studied in Kamchatka and North Koryakia ($2n=22$ – Sokolovskaya 1963, 1968), the same chromosome number was reported from North America (Kelso 1991).

FAMILY RANUNCULACEAE

61. *Aquilegia flabellata* Siebold et Zucc.

Chromosome number. $2n=14$ (R.).

Voucher specimens. VLA 9637, Moneron Island, Chuprova Bay, stony place near sea coast, 17.VII.2004, coll. V. Barkalov; VLA 9129, Sakhalin, 10 km eastwards from Boshnyakovo settlement, in the middle part of Avgustovka River, on the gravel, 25.IX.2003, coll. V. Barkalov.

Distribution. Sakhalin, Moneron, South Kuriles; Japan. Rocky places.

Note. The species was not much investigated cytologically. Previously *A. flabellata* was studied in Japan, and also some Russian authors gave $2n=14$, but without locality (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1993; Goldblatt and Johnson 1994).

62. *Aquilegia parviflora* Ledeb.

Chromosome number. $2n=14$ (R.).

Voucher specimen. VLA 8800, Sakhalin, Schmidt Peninsula, Severnyj Bay, Nala River, southwestwards from Cape Elizavety, stony slope with scarce vegetation, 7.VIII.2001, coll. V. Barkalov.

Distribution. Sakhalin; Russian Far East, East Siberia, Montane meadows.

Note. The chromosome number is probably irregular in *A. parviflora*. As reported from the Amur River (near Sussanino), *A. parviflora* showed $2n=16$ (Rostovtseva 1981). However, $2n=14$ for this species was revealed by several authors (see Bolkhovskikh *et al.* 1969; Goldblatt and Johnson 1994).

63. *Callianthemum sachalinense* Miyabe et Tatew.

Chromosome number. $2n=16^*$ (R.).

Voucher specimen. VLA 9582, Sakhalin, Smirnykhovsky District, the upper part of the Vitnitsa River basin, meadow nearby calcareous rocks, 2001, coll.

A. Taran.

Distribution. Sakhalin. Endemic. A very rare alpine tundra species. It was described from Kawashima Mt. (east coast of Sakhalin) and was hitherto known only from its *locus classicus*.

Note. There was no previous chromosome information for *C. sachalinense* s. str. in the literature. For representatives of the genus *Callianthemum* C.A. Mey. most authors give $2n=16$, but also $2n=32$ (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1993; Goldblatt 1981, 1984, 1988; Goldblatt and Johnson 1991, 1994, 2000).

64. *Caltha fistulosa* N. Schipcz.

Chromosome number. $2n=28$ (R.).

Voucher specimen. VLA 9714, Moneron Island, the upper part of Moneron River, 22.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin, South Kuriles; Japan. Bogs and meadows. Described from Sakhalin (Dui).

Note. This is a new cytotype in *C. fistulosa*. Previous data were from Sakhalin – $2n=32$, 56 (Sokolovskaya 1960; Probatova and Sokolovskaya 1995), from Japan – $2n=32$, 60 (Kurita 1956; Nishikawa 1987, 1988). Polymorphic species.

65. *Ranunculus hultenii* (Worosch.) Luferov

(*R. acris* subsp. *hultenii* Worosch.; *R. novus* auct., p.p.)

Chromosome number. $2n=28^*$ (Sh.).

Voucher specimen. VLA 8340, Kuriles, Paramushir Island, Vassiljeva Peninsula, meadow, 25.VII.2000, coll. V. Barkalov.

Distribution. North Kuriles (Shumshu and Paramushir Islands); West Pacific (Kamchatka, Commander Islands, North Kuriles). Meadows. Endemic of the Russian Far East. Described from Kamchatka Peninsula.

Note. *R. hultenii* belongs to a very polymorphic complex *R. acris* L. aggr. Nevertheless, for *R. acris* L. s. str. (*R. acer* auct.) in the numerous literature mostly the diploid chromosome number $2n=14$ is given, but rarely – $2n=14+1-6B$, 28 and 42 (Bolkhovskikh *et al.* 1969; Agapova *et al.* 1993; Goldblatt 1981, 1984, 1985, 1988; Goldblatt and Johnson, 1998, 2000). V.Yu. Barkalov considers *R. hultenii* to be vicarious of *R. transochotensis* Hara ($2n=28$).

66. *Ranunculus sceleratus* L.

Chromosome number. $2n=56$ (R.).

Voucher specimen. VLA 8775, Sakhalin, Okhinsky District, Muzjma settlement, northwards from Pomrj Bay, swampy shore of the lake, 10.VIII.2001, coll. V. Barkalov.

Distribution. Sakhalin; Holarctic.

Note. Previously this species was studied in South Sakhalin (near Aniva): $2n=56$ (Probatova and Sokolovskaya 1984), as well as in the Primorsky Territory (several times): in all cases $2n=56$ was revealed (Probatova and Sokolovskaya 1983a; Probatova, Sokolovskaya *et al.* 2000; Probatova *et al.* 2001 and unpublished data). However, in the literature there was no such chromosome number for *R. sceleratus* before

us: only $2n=16$, 32, 64, the most common – $2n=32$ (see Bolkhovskikh *et al.* 1969; Goldblatt, 1981, 1984, 1985; Goldblatt and Johnson, 1990, 1994, 1998). From Siberia – Altai, Yakutia, Balkal Region – $2n=64$ was reported, from the Obj River basin – $2n=32$, 64; from the Krasnoyarsky Territory – $2n=16$ (see Agapova *et al.* 1993). From Japan and China for *R. sceleratus* $2n=32$ is known (Kurita 1955; Liao *et al.* 1991; Wang *et al.* 1995). It seems to be quite probable that the Russian Far East populations with $2n=56$ represent some other species, still unknown.

67. *Thalictrum sachalinense* Lecoyer

Chromosome number. $2n=14$ (A. S.).

Voucher specimens. VLA 1, Sakhalin, Anivsky District, near Novo-Alexandrovsk, on the riverside, among tall herbs, 11.VI.1957, coll. A. Sokolovskaya; VLA 31, Sakhalin, in vicinity of Novo-Alexandrovsk, *Picea-Abies-Betula* forest, along the rivulet, 12.VI.1957, coll. A. Sokolovskaya.

Distribution. Sakhalin, South Kuriles; Japan. In forests. Described from Sakhalin (Otechkoro).

Note. Voucher specimens (VLA) for the chromosome number $2n=c.70$, reported by A.P. Sokolovskaya (1960) for “*T. sachalinense*”, belong to *T. minus* L., as they were revised by V.Yu. Barkalov. For *T. sachalinense* we found in the literature the only one report – from Japan, Hokkaido: $2n=14$ (Nishikawa 1985). The species is closely relative to *T. baicalense* Turcz. ex Ledeb., widely distributed in the Russian Far East and in Siberia, with the same chromosome number $2n=14$ (see Agapova *et al.* 1993).

FAMILY ROSACEAE

68. +*Alchemilla gracilis* Opiz

(*A. micans* Bus.; *A. vulgaris* subsp. *micans* (Bus.) Palitz)

Chromosome number. $2n=64$ (R.).

Voucher specimen. VLA 8322, Kuriles, Shumshu Island, in vicinity of Baykovo, near the former settlement Kozyrevsky, meadow on the slope, 24.VII.2000, coll. V. Barkalov.

Distribution. Kuriles (Shumshu and Iturup Islands), as alien; Europe.

Note. We could find in the literature only $2n=c.93-100$ and $2n=c.104-110$, reported for “*A. micans*” (see Bolkhovskikh *et al.* 1969). So, we probably revealed the octoploid ($8x$) cytotype of this species, which is one of the relatively low polyploids in apomictic genus *Alchemilla* L.

69. *Potentilla fragarioides* L.

Chromosome number. $2n=14$ (A. S., R.).

Voucher specimens. VLA 5845, Sakhalin, Korsakovsky District, 4 km westwards from Ozyorsk settlement, marine terrace, on the scree, 4.X.1980, coll. N. Probatova (A.S.); VLA 9642, Moneron Island, the upper part of the Moneron River, dwarf herbs meadow by the top of the mountain, 19.VII.2004, coll. V. Barkalov (R.); VLA 9643, Moneron Island, Chuprova Bay, on screes by the rocks,

near the waterfall, 15.VII.2004, coll. V. Barkalov (R.).

Distribution. Sakhalin, Moneron; Far East, South Siberia. Forest margins, slopes, marine terraces.

Note. Earlier we revealed the chromosome number $2n=14$ in *P. fragarioides* on the islands of Peter the Great Bay, the Primorsky Territory (Probatova and Sokolovskaya 1981). The same, diploid chromosome number was known also from Siberia, Baikal Region (Krogulevich 1978), as well as from Japan (Shimotomai 1930a, b; Iwatsubo and Naruhashi 1991), but $2n=56$ from India probably belongs to some other species (see Bolkhovskikh *et al.* 1969).

70. *Potentilla megalantha* Takeda

(*P. fragiformis* subsp. *megalantha* (Takeda) Hult.)

Chromosome number. $2n=70$ (R.).

Voucher specimens. VLA 8391, Kuriles, Shumshu Island, near Baykovo settlement, coastal rocks, 24.VII.2000, coll. V. Barkalov; VLA 8407, Kuriles, Urup Island, Chernoburka Bay, coastal rocks, 9.VIII.2000, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; West Pacific. Coastal rocks.

Note. *P. megalantha* was studied before on the Kuriles (Ushishir, Yankicha Island: $2n=70$ – Probatova *et al.* 2000). From Japan there were counts made by Shimotomai (1930a, b): $2n=70$. In its close relative species, *P. fragiformis* Willd. ex Schlecht., two cytotypes are known – $2n=42$ and 56 , according to many reports in the literature (see Agapova *et al.* 1993). Taking into consideration these chromosome data, one has more evidence to consider *P. megalantha* as a separate, decaploid ($10x$) species.

71. *Potentilla stolonifera* Lehm. ex Ledeb.

Chromosome number. $2n=14$ (R., A. S.).

Voucher specimens. VLA 8694, Sakhalin, west coast, in vicinity of the former settlement Muzjma, northwards from Pomrj Bay, coastal sands, 10.VIII.2001, coll. V. Barkalov (R.); VLA 6404, Kuriles, Kunashir Island, near Yuzhno-Kuriljisk, sea coast, 4.VIII.1983, coll. V. Barkalov (A. S.).

Distribution. Sakhalin, Kuriles; West Pacific. Sea coasts.

Note. *P. stolonifera* was studied in Kamchatka and North Koryakia ($2n=14$ – Sokolovskaya 1963, 1968; Zhukova and Petrovsky 1985). No more reports were found in the literature.

72. *Rubus chamaemorus* L.

Chromosome number. $2n=56$ (R.).

Voucher specimen. VLA 8798, Sakhalin, west coast, in vicinity of the former settlement Muzjma, northwards from Pomrj Bay, shrubby-mossy-sedge bog, 10.VIII.2001, coll. V. Barkalov.

Distribution. Sakhalin, North and Middle Kuriles; Holarctic. Swampy tundras.

Note. There are many chromosome reports for *R. chamaemorus*: all of them are $2n=56$ (see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1993; Ornduff 1968; Goldblatt

1981, 1984, 1985, 1988; Goldblatt and Johnson 1996, 2003). The species was also studied in Chukotka (Zhukova 1982; Zhukova and Tikhonova 1973).

73. *Rubus pseudo-chamaemorus* Tolm.

(*R. chamaemorus* L. var. *pseudo-chamaemorus* (Tolm.) Worosch.)

Chromosome number. $2n=56^*$ (R.).

Voucher specimen. VLA 9723, Sakhalin, Makarovskiy District, the valley of Manuj River, *Larix* boggy forest, IX.2003, coll. V. Barkalov.

Distribution. South Sakhalin, South Kuriles (Kunashir Island); Japan. Wet meadows. Described from Sakhalin (Dolinsk).

Note. No chromosome information existed before. In V. Yu. Barkalov's opinion, *R. pseudo-chamaemorus* occurs in the south part of Sakhalin: Lamanon Peninsula, valleys of Manui and Najbuti Rivers, Tonino-Anivskiy Peninsula and the north coast of Aniva Bay. Besides, now the reliable specimens of *R. pseudo-chamaemorus* from Japan (Hokkaido) are known. This species shows some features of *R. arcticus* and might be of hybrid origin (*R. chamaemorus* \times *R. arcticus* L.)

74. *Sanguisorba stipulata* Rafin.

(*S. sitchensis* C.A. Mey.)

Chromosome number. $2n=28$ (R.).

Voucher specimen. VLA 8889, Sakhalin, Nabiljisky Range, Chamguinsky Pass, "elevation 1511 m", the upper part of the rivulet, wet meadow on the slope, 8.VIII.2002, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; North Pacific. Montane meadows.

Note. *S. stipulata* was previously studied in the North Sakhalin: $2n=28$ (Sokolovskaya 1960 - as "*S. sitchensis*"), the same chromosome number was reported from North America (Dawe and Murray 1979). No more information was found in the literature for *S. stipulata*.

75. *Sibbaldia procumbens* L.

Chromosome number. $2n=14$ (R.).

Voucher specimen. VLA 9660, Kuriles, Atlassova Island, Alaidskaya Bay, montane meadow on the slope, 25.VIII.2004, coll. V. Verkholat.

Distribution. North Sakhalin, North Kuriles; Holarctic. Montane meadows.

Note. *S. procumbens* has been studied in Chukotka and Kamchatka, as well as in many other parts of its wide area of distribution ($2n=14$ – see Bolkhovskikh *et al.* 1969; Agapova *et al.* 1993; Ornduff 1968; Goldblatt 1984, 1988; Goldblatt and Johnson 1991, 1994, 2000, 2003).

76. *Spiraea media* Franz Schmidt

Chromosome number. $2n=18$ (R.).

Voucher specimen. VLA 9782, Moneron Island, Chuprova Bay, bush by the rocks, 15.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin, Moneron, Kuriles (Shikotan Island); Eurasian. In forest borders.

Note. For *S. media* some chromosome reports existed

in the literature: $2n=10, 18, 20, 36$ (see Bolkhovskikh et al. 1969; Agapova et al. 1993; Goldblatt 1984), the most common is obviously $2n=18$. Very polymorphic species.

77. *Waldsteinia maximowicziana* (Teppner) Probat. (*W. ternata* subsp. *maximowicziana* Teppner; *W. maximowicziana* Juz. 1941, nom. nud.).

Chromosome number. $2n=28$ (R.).

Voucher specimen. VLA 8885, Sakhalin, the upper part of the Tymj River basin, 15 km eastwards from Palevo village, valley forest, 11.VIII.2002, coll. V. Barkalov.

Distribution. Sakhalin; Amur River basin (lower part), the Primorsky Territory; Japan. In forests. Described from Sakhalin (Dolinsk).

Note. In the Russian Far East the chromosome number $2n=28$ was revealed for this taxon in the Primorsky Territory (Vladivostok: Sokolovskaya et al. 1985), as well as on the Amur River basin (near Komsomolsk, unpublished). Nevertheless, in the south of Primorsky Territory we also obtained $2n=14$, in 3 localities (unpublished), and Teppner (1968) reported $2n=42$ (this chromosome number was obtained on plants from the Main Botanical Garden, Moscow; origin unknown). No data from Japan exist until now.

FAMILY RUBIACEAE

78. *Rubia jesoensis* (Miq.) Miyabe et Miyake

Chromosome number. $2n=44$ (A. S.).

Voucher specimen. VLA 169, Sakhalin, Dolinsky District, Ostromyssovka settlement, coast of the Sea of Okhotsk, on sands, 30.VI.1957, coll. A. Sokolovskaya.

Distribution. Sakhalin, Kuriles; West Pacific. Meadows.

Note. On this voucher specimen A.P. Sokolovskaya wrote: " $2n=c.44$ ", but later, in her paper she gave for this species $2n=c.50$ (Sokolovskaya 1960). It would be better to return to her previous count, which was, without doubt, more correct. No more chromosome information for this species was found in the literature. For another species in the flora of the Russian Far East, *R. chinensis* Regel et Maack – $2n=22$ is known, and for the genus *Rubia* L. more often $2n=22, 44$ are reported, rarely $2n=66, 132$ (see Bolkhovskikh et al. 1969).

FAMILY SALICACEAE

79. *Salix fuscescens* Anderss.

Chromosome number. $2n=38$ (A. S.).

Voucher specimen. VLA 6213, Sakhalin, Makarovskiy District, in vicinity of the railway station Pugachevo, Maguntan mud volcano, on matted volcanic mud, 15.IX.1982, coll. N. Probatova and E. Rudyka.

Distribution. Sakhalin, Kuriles; East Siberia, North America. Boggy tundras.

Note. For *S. fuscescens* some earlier chromosome counts existed, from Chukotka ($2n=38$ – see Agapova et al. 1993).

FAMILY SAXIFRAGACEAE

80. *Chrysosplenium kamtschaticum* Fisch.

Chromosome number. $2n=12$ (R.).

Voucher specimen. VLA 8096, Kuriles, Shiashkotan Island, Cape Obvaljnyj, on the slope of a terrace, along the rivulet, 2.VIII.1999, coll. V. Barkalov.

Distribution. South Sakhalin, Kuriles; West Pacific. Riverside habitats.

Note. In *Ch. kamtschaticum* previously $2n=24$ was revealed from Kamchatka (Sokolovskaya et al. 1989), and $2n=22$ – from Japan (Funamoto and Tanaka, 1989, for two varieties). We obtained a new ($2x$) cytotype for this species.

FAMILY SCROPHULARIACEAE

81. *Scrophularia grayana* Maxim. ex Kom.

Chromosome number. $2n=18-20^*$ (R.).

Voucher specimen. VLA 8435, Kuriles, Iturup Island, Dobroye Nachalo Bay, sea coast, on the stony volcanic deposits, 14.VIII.1999, coll. V. Barkalov.

Chromosome number. $2n=20^*$ (R.).

Voucher specimen. VLA 9661, Moneron Island, Chuprova Bay, marine terrace, among tall herbs, at the rivulet, 23.VII.2004, coll. V. Barkalov.

Distribution. South Sakhalin, South Kuriles; around the Sea of Japan. Sea coasts.

Note. These are first chromosome counts for *S. grayana*. The specimen from Iturup Island seems to show the same, diploid chromosome number $2n=20$. But recently we also received for *S. grayana*, studied in the south of the Primorsky Territory, the tetraploid chromosome number $2n=40$ (Probatova et al. unpublished). So, the insular part of the species area of distribution is obviously more ancient, that continental one.

82. *Veronica schmidtiana* Regel

Chromosome number. $2n=34$ (R.).

Voucher specimens. VLA 8712, Moneron Island, southeast part, Asakhi Mt., screes on the slope, under the rocks, 23.VIII.2001, coll. V. Barkalov; VLA 9788, Moneron Island, Chuprova Bay, on the rocks by the rivulet, near waterfall, 15.VII.2004, coll. V. Barkalov.

Distribution. Sakhalin, Moneron, South Kuriles; Japan. Rocks and screes.

Note. These are first chromosome data for *V. schmidtiana* from the Russian Far East. Earlier chromosome counts were made in Japan: $2n=34$ (Sakai, 1935; Yamazaki and Tateoka, 1959 – cited from: Bolkhovskikh et al. 1969). Our counts are consistent with the previous ones. *V. schmidtiana* was described from Sakhalin (Dui). Very polymorphic species.

FAMILY VALERIANACEAE

83. *Patrinia sibirica* (L.) Juss.

Chromosome number. $2n=22$ (R.).

Voucher specimen. VLA 8713, Sakhalin, Schmidt

Peninsula, Boljshaya Longri River, maritime slope, mixed herbs, 16.VIII.2001, coll. V. Barkalov.

Distribution. Sakhalin, South Kuriles; Amur, Okhotia, East Siberia, Mongolia, Japan. On rocks and screes.

Note. This is first chromosome count for *P. sibirica* from the Russian Far East. In the literature we found several reports $2n=22$, most of them – from Siberia (see Agapova *et al.* 1993); besides, $2n=44$ is also reported, from East Sayan Mts. (Krogulevich 1978) and from Mongolia (Murin *et al.* 1984). We suppose that the diploid cytotype ($2n=22$) of *P. sibirica* is distributed much more widely, than younger, tetraploid cytotype ($2n=44$). It would be important to study morphological differentiation of cytotypes of *P. sibirica*.

FAMILY URTICACEAE

84. *Urtica platyphylla* Wedd.

Chromosome number. $2n=52$ (R.).

Voucher specimen. VLA 8823, Moneron Island, southern part, Ussova River, on the slope, in the tall herbs community, 24.VIII.2001, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; West Pacific. In forests and among tall herbs.

Note. *U. platyphylla* have been studied caryologically in South Sakhalin: $2n=c.70$, 76-78, 78 (Sokolovskaya 1960; Geltman 1984; Probatova and Sokolovskaya 1990). But from Japan the chromosome number $2n=52$ was reported (Funabiki 1958), it could be considered as tetraploid ($4x$). We made a conclusion that tetraploid cytotype exist on Moneron Island and in Japan (quite probable, also in the Kuriles), while more younger, hexaploid cytotype ($2n=78$) is represented on Sakhalin.

FAMILY VIOLACEAE

85. *Viola amurica* W. Beck.

Chromosome number. $2n=24$ (A. S.).

Voucher specimen. VLA 17, Sakhalin, in vicinity of Novo-Alexandrovsk, meadow, 12.VI.1957, coll. A. Sokolovskaya.

Distribution. South Sakhalin; the south of Primorsky Territory; North-East China. Wet meadows and slumps.

Note. *V. amurica* was misidentified and its chromosome number ($2n=24$) was published under the wrong species name “*V. verecunda* A. Gray” (Sokolovskaya 1960). Later *V. amurica* was studied in the south of Primorsky Territory (Sokolovskaya and Probatova 1986; Probatova *et al.* 2001 and unpublished data): $2n=24$. No more chromosome reports for this species were found in the literature. This is first record of *V. amurica* in Sakhalin.

86. *Viola verecunda* A. Gray

Chromosome number. $2n=24$ (R.).

Voucher specimen. VLA 9680, Moneron Island, Chuprova Mt., stony birch wood with *Alnaster*, along a grassed road on the slope, 17.VII. 2004, coll. V. Barkalov.

Distribution. South Sakhalin, Moneron, South Kuriles; south of the Russian Far East; North-East China, Korea, Japan. Meadows and slumps. Described from Japan.

Note. *V. verecunda* was studied in the Primorsky Territory (near Vladivostok), as well as (many times) in Japan and Korea (see Bolkhovskikh *et al.* 1969; Probatova, Bezdeleva, Rudyka 2001; Goldblatt 1984; Goldblatt and Johnson 1991). As to chromosome number $2n=24$ from Sakhalin, published by A.P. Sokolovskaya (1960) for “*V. verecunda*”, it must be referred to another species - *V. amurica*, to argue from the voucher specimen (see *Note* to *V. amurica*).

General remarks

Now the chromosome numbers are known for 356 species of vascular plants from Sakhalin, for 257 species from the Kuriles and 48 species - from Moneron. In total, for 536 species from these islands chromosome counts now exist. The compiling of the book on caryology of the flora of Sakhalin and the Kurile Islands now is finished, with full data and analysis.

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