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Chromosome Study on Vascular Plants of the Kurile Islands

Nina S. Probatova, Vyacheslav Yu. Barkalov, Elvira G. Rudyka and Svetlana A. Shatalova

Laboratory of Vascular Plants, Institute of Biology and Soil Sciences, Far Eastern Branch of Russian Academy of Sciences, 690022, Vladivostok, Russia

Abstract Chromosome numbers for 67 vascular plant species of 59 genera and 35 families from the Kurile Islands are given. First chromosome counts are presented for *Draba grandis* Langsd., *Euonymus alata* (Thunb.) Siebold, *Ixeridium kurilense* Barkalov, *Papaver miyabeanum* Tatew., *Pterocypsela elata* (Hemsl.) Shih and *Rhodiola sachalinensis* Boriss. At present, in the Kurile Islands, chromosome numbers have been counted for 175 species, accounting for about 13% of the total number of vascular plant species. In addition, *Elymus tsukushiensis* Honda and *Digitaria ciliaris* (Retz.) Koel. are reported from the Kuriles for the first time.

Key words: chromosome numbers, vascular plants, Kurile Islands, taxonomy, biogeography.

The Kurile Islands, extending from south to north for about 1200 km, represent a connective link ("Kurile Bridge") between the Kamchatka Peninsula and Japan. The history of the vascular flora of the Kurile Islands has been complicated by tectonic processes, repeated connections of these regions, great climatic changes from south to north, partial glaciations (particularly in the northern Kuriles), the great influence of the Pacific Ocean and the Sea of Okhotsk, and permanent volcanic activities.

The vascular flora of the Kuriles consists of about 1370 species, of which nearly 30% are distributed in both the North and the South Kuriles. The vascular flora of the Russian Far East is relatively well studied in terms of karyology, since the first karyo-geographic expedition of A. P. Sokolovskaya to Sakhalin in 1957 (Sokolovskaya, 1960). So far, we have knowledge of chromosome numbers for about 50% of vascular plant species analyzed from local material. However, the Kuriles have been poorly investigated in terms of karyology.

Chromosome numbers of vascular plants from the Kurile Islands have been studied by a number of authors: Gurzenkov and Gorovoy (1971), Sokolovskaya and Probatova (1973a; 1973b; 1974a; 1974b; 1975; 1976), Zhukova (1983), Probatova and Sokolovskaya (1982; 1986; 1989), Gurzenkov and Pavlova (1984), Volkova and Boyko (1986), Rudyka (1986; 1988; 1990), Pavlova et al. (1989), Malakha (1990); Probatova et al. (1989; 1991; 1996), Gurzenkov (1995).

This paper gives original chromosome counts for 67 plant species, made on Kurilean specimens. Chromosome numbers of *Draba grandis* Langsd., *Euonymus alata* (Thunb.) Siebold, *Ixeridium kurilense* Barkalov, *Papaver miyabeanum* Tatew., *Pterocypsela elata* (Hemsl.) Shih and *Rhodiola sachalinensis* Boriss. are reported here for the first time.

Materials and Methods

The material examined came from the following islands: Chirpoi, Ekarma, Iturup, Kunashir, Matua, Paramushir, Rashua, Simushir, Shiashkotan, Shikotan, Shumshu and Yankicha.

Counts were made on paraffin preparations of root tips fixed by N. S. Probatova in Navashin's fluid in the field and on squashed preparations of root tips fixed with Carnoy's solution, in a greenhouse in Vladivostok, where Kurilean plants were growing. Chromosome counts made by E. G. Rudyka are indicated by R., those made by S. A. Shatalova are indicated by S. Some plants were grown from seeds taken from herbarium specimens. Preparations were stained with iron hematoxylin or acetocarmine. Unpublished data obtained by the late A. P. Sokolovskaya

(indicated by A. S.) are also included. First counts are indicated with an asterisk (*). Voucher specimens are preserved in the Far East Regional Herbarium, the Institute of Biology and Soil Sciences, Far East Branch of the Russian Academy of Sciences, Vladivostok (VLA).

The plant names and geographical distribution of the species studied are given mainly according to Vascular Plants of the Soviet Far East, Vols. 1–8 (Kharkevich, 1985–1996), and to Czerepanov (1995).

Annotated List of Plants with Chromosome Numbers Studied

Family Aceraceae

1. *Acer mayrii* Schwer.

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

Voucher specimen. VLA 8028, Iturup Island, Dobroye Nachalo Bay, coniferous forest (*Abies sachalinensis*+*Picea ajanensis*), 15.VIII.1999, coll. V. Barkalov.

Distribution. Sakhalin, South Kuriles; Japan.

Note. The chromosome number 2n=26 is known for *A. mayrii* (Bolkhovskikh et al., 1969). Our count is consistent with the previous reports.

Family Alliaceae

2. *Allium strictum* Schrad.

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

Voucher specimens. VLA 7377, Paramushir Island, Shelekhova Bay, lower part of Shelekhovka R., meadow, 18.VII.1997, coll. V. Barkalov; VLA 7849, Shumshu Island, near Baykovo, meadow on the slope, 31. VII. 1999, coll. V. Barkalov.

Distribution. Eurasian.

Note. The same chromosome number 2n=32 (4x) was reported for this species from Kamchatka (Sokolovskaya, 1963), but another, 2n=48 (6x), was found in the Kolymskoye Upland of the Magadansky region (Vesselukhina, 1976). There is a series of chromosome numbers within this species, reported in the world literature: 2n=16, 32, 40, 48 (Bolkhovskikh et al., 1969; Goldblatt, 1981, 1988; Frizen, 1988; Agapova et al., 1990; Goldblatt and Johnson, 1991, 1996).

Family Apiaceae

3. *Hydrocotyle ramiflora* Maxim.

Chromosome number. 2n=24 (R. & S.).

Voucher specimen. VLA 6798, Kunashir Island, Alyokhino, moist place near cold spring, 11.VIII.1987, coll. N. Probatova.

Distribution. South Kuriles; China, Japan. Introduced to Caucasus.

Note. The chromosome number 2n=24 was previously reported from Alyokhino, Kunashir Island (Gurzenkov and Gorovoy, 1971).

Family Araliaceae

4. *Aralia cordata* Thunb.

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

Voucher specimen. VLA 7866, Iturup Island, Dobroye Nachalo Bay, coniferous forest (*Abies sachalinensis*+*Picea ajanensis*), on the margin, 15.VIII.1999, coll. V. Barkalov.

Distribution. Sakhalin, South. Kuriles; Korea (?), Japan.

Note. Although Sokolovskaya (1960) reported the chromosome number 2n=28–30 for *A. cordata*, it was subsequently shown by Provatova and Sokolovskaya (1986), who reexamined the material from Sakhalin (the same paraffin preparations used by Sokolovskaya), that the count 2n=24 was correct. However, from Japan and Korea, the count 2n=48 for this species was given by Nishikawa (1985) and Sun et al. (1988) respectively. It is possible that the Korean material might represent a close relative, *A. continentalis* Kitag.

Family Asteraceae

5. *Arctanthemum arcticum* (L.) Tzvel. subsp. *arcticum*

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

Voucher specimen. VLA 8007, Ekarma Island, Cape Liutyj, on coastal rocks, 1.VIII. 1999, coll. V. Bulgakov.

Distribution. Eastern Europe; Siberia, Far East; North America.

Note. The genus *Arctanthemum is* a mono-

typic halophytic genus. The sole representative of the genus, *A. arcticum*, occurs in the sea coasts of the Arctic and Pacific Oceans, and it is divided in three subspecies. In the South Kuriles, *A. a. kurilense* (Tzvel.) Tzvel., is distributed.

For *A. arcticum s.l.* the chromosome number 2n=18 is reported from Chukotka (Zhukova, 1966), Koryakia (Sokolovskaya, 1968), Sakhalin (Probatova and Sokolovskaya, 1984a), and Japan (Nishikawa and Kobayashi, 1989).

6. *Arnica unalaschcensis* Less.

Chromosome number. 2n=38 (R.).

Voucher specimen. VLA 7783, Iturup Island, Chassovoy Peninsula, Tryokhpalyj Mys, 29.VII.1998, coll. M. Ilyjushko.

Distribution. Kamchatka, Commander Islands, Kuriles; Japan; Aleutians.

Note. The chromosome number 2n=38 was reported by Sokolovskaya (1968) based on plants collected in the Bering Island, Commander Islands. The same number 2n=38 was reported from Japan by Arano (1963) and Nishikawa (1986).

7. *Cirsium kamtschaticum* Ledeb.

Chromosome number. 2n=68 (R.).

Voucher specimen. VLA 8030, Kunashir Island, Alyokhina Bay, on the slope, by the spring, 19.VIII.1999, coll. V. Barkalov.

Distribution. Koryakia, Kamchatka, Commander Islands, Sakhalin, Kuriles; Japan; North America.

Note. Although the chromosome number 2n=70 was reported for *Cirsium kamtschaticum* based on the material from Sakhalin and Kamchatka by Sokolovskaya (1960; 1963), the present study shows that the count 2n=68 is correct. From Japan, Nishikawa (1982; 1988) reported the same count.

8. *Ixeridium kurilense* Barkalov

Chromosome number. 2n=30 (A.S.)*; first report for this species.

Voucher specimen. VLA 6787, Kunashir Island, 2 km south of Yuzhno-Kurilsk, wet meadow, 13. VIII. 1987, coll. N. Probatova.

Distribution. Known only from Kunashir Island, South Kuriles. Occurring on wet habitats, but rare.

Note. This yellow-flowered species was recently described from Kunashir Island by Barkalov (1992). The species differs from *I. dentatum* in having thin stolons, auriculate basal leaves and chromosome number 2n=30. For *Ixeridium dentatum* the count 2n=20 has been reported by Sokolovskaya et al. (1985) from Sakhalin and by Probatova et al. (1989) from the South Kuriles (Kunashir Island). However, the situation is much more complicated in Japan, from where 2n=14, 21, 24, 28, 42 have been reported in many publications for *Ixeris dentata* complex (see Bolkhovskikh et al., 1969; Goldblatt, 1988; Goldblatt and Johnson, 1991, 1994, 1996).

9. *Petasites amplus* Kitam.

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

Voucher specimen. VLA 7874, Simushir Island, Brawton Bay, along the rivulet, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Sakhalin, Kuriles; Japan. Introduced to Europe and North America.

Note. The chromosome number 2n=ca. 60 was reported for *Petasites amplus* by Sokolovskaya (1960) from Sakhalin. Later, Funamoto et al. (1981) gave the counts 2n=60 and 67 (60+7B) from Japan under the name of *P. japonicus* var. *giganteus*. We have confirmed the counts 2n=60 for this species based on the material from Simushir Island.

10. *Phalacroloma annuum* (L.) Dumort.

Chromosome number. 2n=18, 27 (R.).

Voucher specimen. VLA 8086, Kunashir Island, Alyokhina Bay, along the hot spring, 19. VIII. 1999, coll. V. Barkalov.

Distribution. North American apomictic species, invasive in the Kuriles (occurs in Kunashir Island). Also introduced to Europe and Asia. Naturalized recently in the south of Primorsky Territory in the Russian Far East.

Note. It has been found that the previously reported chromosome numbers of this species by Rudyka (1988: 2n=18+0−9B, as *Erigeron annuus*) and Probatova and Sokolovsk-

aya (1990: 2n=27) are not correct. The same specimen (VLA6635) has been reexamined by Rudyka, and the count is mostly 2n=18 (rarely 2n=27). This specimen from Kunashir became an intrusive weed of live collections in the south of Primorsky Territory (Kiparissovo), since 1986.

11. *Pterocypsela elata* (Hemsl.) Shih

Chromosome number. 2n=18 (R.)*; first report for this species.

Voucher specimen. VLA 7983, Kunashir Island, Alyokhina Bay, on the slope, by the rivulet, 19. VIII. 1999, coll. V. Barkalov.

Distribution. South Kuriles; China, Japan, South Asia.

12. *Tripleurospermum tetragonospermum* (Fr. Schmidt) Pobed.

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

Voucher specimen. VLA 7982, Paramushir Island, Puysharia Bay, sea coast, 30. VII. 1999, coll. V. Barkalov.

Distribution. Along sea coasts in Sakhalin and Kuriles, in south of the Primorsky Territory; Korea and Japan.

Note. The same count 2n=18 for *Tripleurospermum tetragonospermum* was reported based on the material from Popov Island in the Peter the Great Bay, the Sea of Japan (Probatova and Sokolovkaya, 1983a) and Sakhalin (Probatova et al., 1984), under the name of *Matricaria tetragonosperma.*

Family Brassicaceae

13. *Cochlearia oblongifolia* DC.

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

Voucher specimen. VLA 7872, Ekarma Island, Cape Liutyj, on coastal rocks, 1. VIII. 1999, coll. A. Leleyj.

Distribution. North Pacific?

Note. The same number 2n=14 for *Cochlearia oblongifolia* was reported from the south of Magadansky Region (Olskyj District) and from the Khabarovsky Territory (Ajan) by Berkutenko and Gurzenkov (1976).

14. *Draba grandis* Langsd.

Chromosome number. 2n=14–16 (S.)*; first report for this species.

Voucher specimen. VLA 6859, Iturup Island, Cape Iodnyj, coastal rocks, 14. VIII. 1988, coll. V. Barkalov.

Distribution. Beringian. The species is known from Chukotka, Middle Kuriles, Iturup Island; Alaska and the Aleutians.

Note. This is a rare and very peculiar halophytic plant. The status of this species was recently clarified by Berkutenko (1995).

15. *Rorippa palustris* (L.) Bess.

Chromosome number. 2n=32 (A.S.).

Voucher specimen. VLA 5869, Paramushir Island, Shelekhova Bay, on seashore, 18. VIII. 1979, coll. V. Barkalov.

Distribution. Cosmopolitan.

Note. Rorippa palustris is the correct name for Siberian and Far Eastern plants (Joncell, 1971). The chromosome number 2n=32 was reported also from Chukotka (Zhukova and Petrovsky, 1977) and from Japan (Nishikawa, 1985; under the name of *R. islandica*).

Family Campanulaceae

16. *Peracarpa circaeoides* (Fr. Schmidt) Feer

Chromosome number. 2n=30 (R.).

Voucher specimen. VLA 8003, Simushir Island, Brawton Bay, in *Alnaster fruticosa* thickets with tall herbs, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Kamchatka (s.), southern Sakhalin, Kuriles; Japan, Korea, Taiwan.

Note. Although Sokolovskaya (1960) reported the chromosome number 2n=ca. 28 for *Peracarpa circaeoides*, we have confirmed that the count 2n=30 is correct.

For the second species of the genus, *P. carnosa* (Wall.) Hook. f. et Thoms., the count 2n=30 was also given by Hara and Kurosawa (1965) and Kurosawa (1966).

Family Caryophyllaceae

17. *Stellaria ruscifolia* Pall. ex Schlecht.

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

Voucher specimen. VLA 8037, Ekarma Island, Cape Liutyj, on coastal rocks, 1. VIII. 1999, coll. A. Leleyj.

Distribution. Eastern Siberia (Yakutia), Russian Far East; Japan, Aleutians, Alaska.

Note. The previous reports of the chromosome number 2n=26 for this species were: Sakai (1934); Matveeva and Tikhonova in Bolkhovskikh et al. (1969); and Zhukova and Petrovsky (1987). Peterson (1935; 1936) gave the number 2n=ca. 50.

Family Celastraceae

18. *Euonymus alata* (Thunb.) Siebold

Chromosome number. 2n=ca. 40 (A.S.)*; first report for the species.

Voucher specimen. VLA 6773, Kunashir Island, Cape Alyokhina, mixed forest, 11. VIII. 1987, coll. N. Probatova.

Distribution. Southern Sakhalin, South Kuriles; China, Japan.

Family Convolvulaceae

19. *Calystegia soldanella* (L.) R. Br.

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

Voucher specimen. VLA 7275, Kunashir Island, Lagunnaya Bay, near seashore, 31. VII. 1987, coll. N. Probatova.

Distribution. Coastal species, distributed throughout the world: in the Russian Far East it is known from the south of Sakhalin and Primorsky Territory and from the South Kuriles.

Note. The same chromosome number 2n=22 was already reported from the southern Primorsky Territory (Probatova et al., 1984).

Family Crassulaceae

20. *Rhodiola sachalinensis* Boriss.

Chromosome number. 2n=22 (R.)*; first report for the species.

Voucher specimen. VLA 7917, Ekarma Island, Cape Liutyj, coastal rocks, 1. VIII. 1999, coll. V. Bulgakov.

Distribution. Sakhalin, South Kuriles; Japan.

Family Cucurbitaceae

21. *Gynostemma pentaphyllum* (Thunb.) Makino

Chromosome number. 2n=66 (R.). The chromosome number was reexamined.

Voucher specimen. VLA 6912, Kunashir Island, Tretyakovo, in the valley of Tretyakovka R., 27. VIII. 1989, coll. Yu. Zhuravlyov.

Distribution. East and South Asia. This species is known from Kunashir Island.

Note. Although Probatova et al. (1991) reported the count 2n=64 for *Gynostemma pentaphyllum* based on the material from Kunashir Island, a reexamination has revealed that the count 2n=66 is correct. In addition, the numbers 2n=22 and 2n=66 were reported from China (Li et al., 1989) and Japan (Ito et al., 1991) respectively.

Family Cyperaceae

22. *Fimbristylis subbispicata* Nees et Meyen

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

Voucher specimen. VLA 6808, Kunashir Island, 16 km from Yuzhno-Kurilsk to Mendeleyevo, protected zone of the nature reserve "Kurilskyj", 2 km south of Cape Stolbchatyj, near hot springs, 12. VIII. 1987, coll. N. Probatova.

Distribution. South Kuriles; Korea, Japan, India. It occurs near hot springs in Kunashir Island.

Note. The counts 2n=10 and n=5 were reported for *Fimbristylis subbispicata* from Japan (Tanaka, 1939) and India (Rath and Patnaik, 1978) respectively.

Family Empetraceae

23. *Empetrum sibiricum* V. Vassil.

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

Voucher specimen. VLA 7780, Shumshu Island, Babushkina Bay, 10. VIII. 1997, coll. M. Ilyjushko.

Distribution. Eastern Siberia, Russian Far East; Korea, Japan, North America. Distributed throughout the Kuriles.

Note. There is no unequivocal published information on the chromosome number of

Empetrum sibiricum from the Russian Far East. Considering the confusing taxonomy of the species (cf. Tzvelyov, 1991), it is possible that the chromosome number might have been reported under the name *E. nigrum* by Zhukova (1969: 2n=26) from eastern Chukotka.

Family Fabaceae

24. *Trifolium repens* L.

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

Voucher specimen. VLA 7880, Simushir Island, Brawton Bay, Kraternyj, disturbed meadow, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Eurasian. Introduced throughout the world (and in the Kuriles too).

Note. The chromosome number 2n=32 for *Trifolium repens* has been reported by a number of authors (Bolkhovskikh et al., 1969; Goldblatt, 1981; 1985; 1988; Agapova et al., 1990; Goldblatt and Johnson, 1991; 1994). The count 2n=28 was observed in the material from Sakhalin (Sokolovskaya et al., 1989).

Family Geraniaceae

25. *Geranium erianthum* DC.

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

Voucher specimen. VLA 7375, Shumshu Island, Boljshoye Lake, near mouth of Bettobu R., sand dunes, 23. VII. 1997, coll. V. Barkalov.

Distribution. Northeast Asia and northwestern North America.

Note. The chromosome number 2n=28 was already reported from Sakhalin (Sokolovskaya, 1960), Chukotka (Zhukova, 1980, 1982) and North America (Dawe and Murray, 1979). However, the number 2n=30 is known from Japan (Sakai, 1935).

Family Hemerocallidaceae

26. *Hemerocallis esculenta* Koidz.

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

Voucher specimen. VLA 8047, Iturup Island, Dobroye Nachalo Bay, at forest margin, 15. VIII. 1999, coll. V. Barkalov.

Distribution. Sikhote-Alinj (northeastern part; rare), Sakhalin, South Kuriles; Japan.

Note. The chromosome number 2n=22 was already reported by Probatova and Sokolovskaya (1988) from Sakhalin.

Family Iridaceae

27. *Iris setosa* Pall. ex Link

Chromosome number. 2n=38 (R.).

Voucher specimen. VLA 7376, Paramushir Island, Shelekhova Bay, lower part of Shelekhovka R., meadow, 18.VII.1997, coll. V. Barkalov.

Distribution. Eastern Siberia, Far East; Aleutians, Alaska.

Note. Most authors (e.g., Bolkhovskikh, 1969; Goldblatt, 1984; Agapova et al., 1990) have reported the count 2n=38 for *Iris setosa*. The same count was shown in the populations from Chukotka (Zhukova, 1980), the lower part of the Amur River (Sokolovskaya and Probatova, 1985) and Japan (Nishikawa, 1988). The counts 2n=32–36 and 34–36, reported from Sakhalin and Kamchatka by Sokolovskaya (1960, 1963) and 2n=36 from Russkyj Island by Rudyka (1995) might be incorrect.

Family Juncaceae

28. *Juncus bufonius* L.

Chromosome number. 2n=50, 54, 56 (R.).

Voucher specimen. VLA 6741, Kunashir Island, Yuzhno-Kurilsk, along the rivulet, 30. VII. 1987, coll. N. Probatova.

Distribution. Holarctic; introduced to many other regions.

Note. The chromosome numbers 2n=52 and 34 were reported for this species from Chukotka (Yurtzev and Zhukova, 1978) and Jakutia (Zhukova and Petrovsky, 1987) respectively. There is a series of chromosome numbers known in this species: 2n=30, 52, ca. 60, 80, ca. 100, 106, 108, 110, and 120 (Bolkhovskikh et al., 1969; Goldblatt, 1981, 1984; Goldblatt and Johnson, 1994).

29. *Luzula capitata* (Miq.) Kom.

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

Voucher specimen. VLA 7805, Shikotan Island, Dimitrova Bay, 13. VIII. 1998, coll. M. Ilyjushko.

Distribution. Kamchatka (s.), Sakhalin, Kuriles; Japan.

Note. For this species the chromosome number 2n=12 was reported from Japan by Kusanagi (1962).

30. *Luzula parviflora* (Ehrh.) Desv.

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

Voucher specimen. VLA 8029, Shiashkotan Island, Obvaljny Mys, maritime slope, 2. VIII. 1999, coll. V. Barkalov.

Distribution. Holarctic.

Note. The chromosome number 2n=24 was already reported for *L. parviflora* from Kolymskoye Upland and Chukotka by Zhukova (1969; 1980).

Family Lamiaceae

31. *Prunella asiatica* Nakai

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

Voucher specimen. VLA 7858, Iturup Island, Lessozavodskyj Isthmus, on margin of forest road, 15. VIII. 1999, coll. V. Barkalov.

Distribution. Kamchatka (s.), Amur River basin, Primorsky Territory, Sakhalin, South Kuriles; China, Korea, Japan and Aleutians.

Note. The counts 2n=28 and 2n=28–30 were reported for *Prunella asiatica* from Japan (Suzuka and Koriba, 1949) and from Ussurijski nature reserve, Primorsky Territory (Gursenkov, in Probatova et al., 1991) respectively. Rudyka (1990) gave the count 2n=24 from Kunashir Island, under the name of *Prunella japonica* Makino. There is no doubt that Rudyka's specimen of *P. japonica* actually represented *P. asiatica*, instead of *P. vulgaris* (=senior subjective synonym of *P. japonica*), because only *P. asiatica* occurs in the Kuriles. Rudyka's count might be erroneous.

Family Liliaceae

32. *Cardiocrinum cordatum* (Thunb.) Makino

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

Voucher specimen. VLA 7844, Iturup Island, Odesskyj Bay, on margin of *Abies sachalinensis* forest, in tall herbs community, 15. VIII. 1999, coll. V. Barkalov.

Distribution. Sakhalin (s.), South Kuriles; Japan.

Note. The chromosome number 2n=24 was reported for this species from Sakhalin (Sokolovskaya, 1960; Sokolovskaya and Probatova, 1985; under the name of *C. glehnii*).

Family Limoniaceae

33. *Armeria scabra* Pall. ex Schult.

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

Voucher specimen. VLA 8049, Shumshu Island, Cape Cheebujnyj, on tundra, 31. VII. 1999, coll. V. Barkalov.

Distribution. Holarctic?

Note. The chromosome number 2n=18 has been reported for *A. scabra* (or sometimes under the name of *A. arctica*) from Chukotka, Vrangel Island, Siberia, and etc. (Bolkhovskikh et al., 1969; Agapova et al., 1993).

Family Orchidaceae

34. *Cypripedium macranthon* Sw.

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

Voucher specimen. VLA 7374, Shumshu Island, in vicinity of Boljshoye Lake, near mouth of Bettobu R., coastal sand dunes with *Leymus mollis* and *Rosa rugosa*, 23. VII. 1997, coll. V. Barkalov.

Distribution. Eastern Europe and Asia.

Note. The second author (V. Barkalov) has found that the population from Shumshu Island has a number of peculiar features for *Cypripedium macranthon*: plants small; flowers deep wine-colored; lip large. In addition, its ecology seems to be different from the typical form. Future study may eventually reveal that it represents a separate species. The population from Shumshu Island is consistent with those from other regions in the chromosome number 2n=20 (Goldblatt, 1981; 1988), as well as that from the Primorsky Territory (Probatova and Sokolovskaya, 1984a).

Family Papaveraceae

35. *Papaver alboroseum* Hult.

Chromosome number. 2n=28 (R. & S.).

Voucher specimen. VLA 7541, Paramushir Island, at mouth of Shelekhovka R., on vol-

canic gravel mixed with sand, 20. VII. 1997, coll. V. Barkalov.

Distribution. Koryakia, Kamchatka, North Kuriles (Atlassova, Paramushir and Onekotan Islands); Alaska.

Note. The chromosome number 2n=28 has been reported for this species by Knaben (1959a; 1959b), Dawe and Murray (1981; Alaska), Zhukova and Petrovsky (1987; Kamchatka) and Safonova (1991; cultivated plants, origin not indicated).

36. *Papaver miyabeanum* Tatew.

Chromosome number. 2n=28 (R.)*; first report for this species.

Voucher specimen. VLA 8012, Simushir Island, Brawton Bay, on gravel near seashore, 8. VIII. 1999, coll. V. Barkalov.

Distribution. South Kuriles; Japan.

Family Parnassiaceae

37. *Parnassia palustris* L.

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

Voucher specimen. VLA 7980, Simushir Island, Brawton Bay, Kraternyj, wetland by lake, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Holarctic.

Note. The chromosome numbers 2n=18 and 36 have been reported for this species by many authors (Bolkhovskikh et al., 1969; Goldblatt, 1981; 1984; 1985; 1988; Agapova et al., 1993). Rudyka (1990) and Nishikawa (1985) reported the number 2n=18 from Kunshir Island and Hokkaido respectively.

Family Poaceae

38. *Agrostis flaccida* Hack.

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

Voucher specimen. VLA 8027, Iturup Island, Dobroye Nachalo Bay, meadow, 15. VIII. 1999, coll. V. Barkalov.

Distribution. Kamchatka (s.), Sakhalin (?), Kuriles; Japan.

Note. The chromosome number 2n=14 was previously reported for *A. flaccida* from Paramushir Island (Severo-Kurilsk) by Sokolovskaya and Probatova (1974a) and from Kunashir Island (Yuzhno-Kurilsk and Cape Alyokhina) by Probatova et al. (1989) and Rudyka (1990). This is the unique diploid (2x) species of the genus *Agrostis* in the Russian Far East flora. Although other chromosome numbers (2n=28 and 56) were reported from Japan under the name of this species, the plants examined by Japanese authors might belong to species of the genus other than *A. flaccida.*

39. *Calamagrostis hakonensis* Franch. et Savat.

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

Voucher specimen. VLA 6805, Kunashir Island, 16 km from Yuzhno-Kurilsk to Mendeleyevo, coniferous-broadleaved forest, 12. VIII. 1987, coll. N. Probatova.

Distribution. South Kuriles (Kunashir Island); Japan.

Note. Rudyka (1990) reported the number 2n=42 for *C. hakonensis* from Kunashir Island (nature reserve "Kurilskyj"). This species is polymorphic in the chromosome number, showing 2n=28, 42, 44–45, 49, 50, 56, 63–66, 70, 77 (Tateoka, 1953, 1976, 1984).

40. *Calamagrostis sachalinensis* Fr. Schmidt

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

Voucher specimen. VLA 6858, Kunashir Island, 13 km from Golovnino to Sernovodsk, forest margin, on slope, 7. VIII. 1987, coll. N. Probatova.

Distribution. Kamchatka (rare), Sakhalin, Middle and South Kuriles, Sikhote-Alinj (high mountains, Khor River basin); Japan.

Note. The chromosome number 2n=56 reported for *C. sachalinensis* by Rudyka (1990) from Kunashir Island should be referred to *C. hakonensis*, because the vaucher specimen (VLA 6805) studied by her was found to represent *C. hakonensis*, instead of *C. sachalinensis.*

This is a polymorphic species. The chromosome numbers reported from Sakhalin were 2n=28 and 42 (Probatova and Sokolovskaya, 1983b). Tateoka (1976) reported 2n=28, 42, and 56 from Japan.

41. *Digitaria ciliaris* (Retz.) Koel.

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

Voucher specimen. VLA 7850, Kunashir Island, Alyokhina Bay, near hot spring, 19. VIII. 1999, coll. V. Barkalov.

Distribution. Cosmopolitan (in warm and temperate regions). In the Russian Far East this species was hitherto known from the south of Primorsky Territory, as a rare plant. It is new for the flora of the Kuriles.

Note. This is a very polymorphic species, with a series of chromosome numbers: 2n= 18, 36, 54 and 72 (Bolkhovskikh et al., 1969; Goldblatt, 1981, 1984, 1985; Goldblatt and Johnson, 1994). Sokolovskaya and Probatova (1977b) reported the chromosome number 2n =54 from Vladivostok.

42. *Elymus tsukushiensis* Honda

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

Voucher specimen. VLA 6795, Kunashir Island, 17 km from Yuzhno-Kurilsk to Mendeleyevo, protected zone of the nature reserve "Kurilskyj", near hot springs on way to Cape Stolbchatyj, 12. VIII. 1987, coll. N. Probatova.

Distribution. This species is known from China and Japan, but there has been no previous record from Russia. N. N. Tzvelyov (personal communication) confirmed recently the ocurrence of this species in the Primorsky Territory (Khassanskyj District, Ryazanovka, coll. T. I. Neczayeva-VLA). Only one location (mentioned above) is hitherto known in Ku-nashir Island.

Note. The plants examined here belong to *E. tsukushiensis* var. *transiens* (Hack.) T. Osada. The chromosome number 2n=42 has been reported for this species, including the varieties (Goldblatt and Johnson, 1991; 1996). However, the count 2n=28 has also been reported for the species from Japan and China (Matsumura and Sakamoto, 1955; Lu and Bothmer, 1990a; 1990b).

43. *Glyceria depauperata* Ohwi

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

Voucher specimen. VLA 7867, Kunashir Island, Alyokhina Bay, lower part of Alyokhina R., along river bank, 19. VIII. 1999, coll. V. Barkalov.

Distribution. South Kuriles; Japan.

Note. Glyceria depauperata was reported for the first time from the Kuriles (Iturup Island) by Probatova (1970), and subsequently its chromosome number 2n=20 from Iturup Island (Goryachyje Kluchi) was published by Sokolovskaya and Probatova (1973b) and from Kunashir Island (Yuzhno-Kurilsk and Alyokhino) by Probatova et al. (1989). The same chromosome number was reported from Japan by Tateoka (1954).

44. *Milium effusum* L.

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

Voucher specimen. VLA 6914, Kunashir Island, Cape Alyokhina, coniferous-broad-leaved forest, 11. VIII. 1987, coll. N. Probatova.

Distribution. Holarctic (but absent in northwestern part of North America).

Note. The chromosome number 2n=28 has been reported for *Milium effusum* from various parts of the world (Bolkhovskikh et al., 1969; Goldblatt, 1981, 1988; Goldblatt and Johnson, 1996). Indeed, the same count has been shown in the material from Sakhalin (Sokolovskaya, 1960) and Primorsky Territory (Probatova and Sokolovskaya, 1981a). Sokolovskaya and Strelkova (1960) reported the number 2n=14 from the European Arctic, and there would seem to be little doubt that their count was based on incorrectly identified material.

45. *Poa macrocalyx* Trautv. et C. A. Mey.

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

Voucher specimen. VLA 6823, Kunashir Island, Golovnino, sea coast near mouth of Khlebnaya R., 1. VIII. 1987, coll. N. Probatova.

Distribution. Widely distributed along seashores in the North Pacific.

Note. There is a series of chromosome numbers within *P. macrocalyx* from the Kuriles: 2n=42 (Paramushir Island: Sokolovskaya and Probatova, 1976; Kunashir Island: Probatova et al., 1989), 2n=42, 56–59 (Iturup Island: Sokolovskaya and Probatova, 1973a),

2n=56 (Iturup Island: Sokolovskaya and Probatova, 1973a), 2n=70 (Paramushir Island: Sokolovskaya and Probatova, 1976; Kunashir Island: Probatova et al., 1989). In total, for this species, 2n=42, 49, 56, 63–64, 70 and ca. 100 have been reported from the Russian Far East (Sokolovskaya and Probatova, 1968, 1973a, 1976; Probatova and Sokolovskaya, 1984b). The Japanese populations show the numbers 2n=42–46, 49, 58, 63, ca. 70, 84, etc. (Tateoka, 1973, 1980).

46. *Poa malacantha* Kom.

Chromosome number. 2n=56 (A.S.).

Voucher specimens. VLA 5395, Paramushir Island, Zelyonaya R., near Mt. Vetrenaya, 600–700 m alt., dry slope, 10. VIII. 1978, coll. V. Barkalov; VLA 5595, Paramushir Island, Shelekhova Bay, Mt. Kamennik, volcanic field, 17.VIII.1979, coll. V. Barkalov.

Distribution. North Pacific.

Note. The specimen VLA 5595 probably is of hybrid origin, between species of the sections *Poa* (*P. malacantha*) and *Stenopoa*. Such hybrids may occur near sea coasts and on volcanic fields in the north of the Russian Far East.

P. malacantha is a very polymorphic species. A series of chromosome numbers has been revealed: 2n=56, 62, 63, 70, 76, ca. 80 (Sokolovskaya and Probatova, 1968, 1973a; Zhukova and Petrovsky, 1975; Zhukova, 1980; Rudyka, 1990).

The close relative known from Japan, *P. shinanoana* Ohwi, has the chromosome numbers 2n=63–98 (Tateoka, 1985).

47. *Poa palustris* L.

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

Voucher specimen. VLA 7879, Simushir Island, Brawton Bay, wetland, 8. VIII. 1999, coll. V. Barkalov; VLA 8083, Iturup Island, Odesskyj Bay, moist place at the forest margin, 15. VIII. 1999, coll. V. Barkalov; VLA 8078, Kunashir Island, Pesczanoye Lake, swampy coast of lake, 17. VIII. 1999, coll. V. Barkalov.

Distribution. Holarctic.

Note. Most authors have reported the chromosome number 2n=28 for this species (Bolkhovskikh et al., 1969; Goldblatt, 1981, 1984; Goldblatt and Johnson, 1991, 1994). Regarding the populations in the Russian Far East, the same number has been reported from Iturup Island and Sakhalin (Sokolovskaya and Probatova, 1973a) and Kamchatka (Sokolovskaya and Probatova, 1968).

48. *Poa platyantha* Kom.

Chromosome number. 2n=ca. 70 (A.S.).

Voucher specimen. VLA 5398, Paramushir Island, Zelyonaya R., 500 m alt., moist slope, near river, 10. VIII. 1978, coll. V. Barkalov.

Distribution. Endemic to Kamchatka and North Kuriles.

Note. This is a very polymorphic species. A series of chromosome numbers has been shown in this species: 2n=42, 64, 70, 72, and 84 (Sokolovskaya and Probatoba, 1968, 1973 a).

49. *Puccinellia distans* (Jacq.) Parl.

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

Voucher specimen. VLA 5397, Shumshu Island, Baykovo, on pier, 25. VII. 1978, coll. V. Barkalov.

Distribution. Europe to Central Asia. Introduced elswhere.

Note. The chromosome number 2n=28 is not typical for *P. distans*, in which 2n=42 is common (Goldblatt, 1981, 1984, 1985, 1988). We have not find morphological difference between plants of the two cytotypes.

50. *Stenofestuca pauciflora* (Thunb.) Nakai

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

Voucher specimen. VLA 6796, Kunashir Island, 17 km of Yuzhno-Kurilsk to Mendeleyevo, on the way to Cape Stolbchatyj, near hot springs, 12. VIII. 1987, coll. N. Probatova.

Distribution. South Kuriles (Kunashir Island); China, Japan.

Note. The monotypic genus *Stenofestuca* (Honda) Nakai (tribe Bromeae Dumort.) is distributed in the non-tropical area of the Chino-Japanese floristic region. The forest perennial. *S. pauciflora* occurs on Kunashir Island in valley forests near hot springs, but is very rare. The chromosome number 2n=14 has

been reported for this species (under the name of *Bromus remotiflorus*) by Japanese authors (Moriya and Kondo, 1950; Ono and Tateoka, 1953; Tateoka, 1954).

Family Polygonaceae

51. *Acetosa lapponica* (Hiit.) Holub.

Chromosome number. 2n=14, 15 (R. & S.).

Voucher specimens. VLA 8002, Rashua Island, grassland nearby Beloye Lake, 4. VIII. 1999, coll. V. Barkalov; VLA 8059, Chirpoi Island, Pesczanaya Bay, on volcano slope, meadow, 10. VIII. 1999, coll. V. Barkalov; VLA 8109, Simushir Island, Brawton Bay, meadow in marine terrace, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Holarctic?

Note. The chromosome number 2n=14 has been reported from Chukotka (Zhukova, 1982) and Kamchatka (Probatova and Sokolovskaya, 1989).

52. *Polygonum arenastrum* Boreau

Chromosome number. 2n=20 (R.)*; new cytotype for the species.

Voucher specimen. VLA 6867, Kunashir Island, south of Cape Alyokhina, sea coast, 10. VIII. 1987, coll. N. Probatova.

Distribution. Holarctic.

Note. For *P. arenastrum*, two chromosome numbers, 2n=40 and 60 have been reported previously (Bolkhovskikh et al., 1969; Goldblatt, 1981, 1985; Strid, 1986). The present count 2n=20 represent a new cytotype for this species.

Family Primulaceae

53. *Primula fauriei* Franch.

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

Voucher specimen. VLA 7873, Simushir Island, Brawton Bay, near Kraternyj, meadow, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Moneron Island, South Kuriles; Japan.

Note. Rudyka (1990) reported the chromosome number 2n=18 for *Primula matsumurae* from Kunashir Island. However, we refer Rudyka's *P. matsumurae* to *P. fauriei* Franch., because *P. matsumurae* Petitm. has not been recorded from the Russian Far East with certainty. The count 2n=18 has been reported for *P. fauriei* (Bolkhovskikh et al., 1969).

Family Ranunculaceae

54. *Aconitum maximum* Pall. ex DC.

Chromosome number. 2n=32 (S.).

Voucher specimen. VLA 7378, Paramushir Island, Shelekhova Bay, lower part of Shelekhovka R., meadow, 18. VII. 1997, coll. V. Barkalov.

Distribution. Kamchatka, Commander Islands, Kuriles; Japan; Alentians, Alaska.

Note. The chromosome number 2n=32 was already reported for *A. maximum* from Kamchatka by Sokolovskaya (1963).

55. *Caltha sibirica* (Regel) Makino

Chromosome number. 2n=70 (A.S.).

Voucher specimen. VLA 6747, Kunashir Island, 2 km south to Yuzhno-Kurilsk, in drainage channel, 30. VII. 1987, coll. N. Probatova.

Distribution. Siberia and Far East.

Note. The specimen here referred to as *Caltha sibirica* (VLA 6747) was misidentified as *C. minor* Mill. by Probatova et al. (1989). *C. sibirica* is a widely distributed and polymorphic species, being close to *C. palustris*. A series of chromosome numbers has been reported for C. palustris complex, 2n=16, 28, 32, 56, 64, and 70 (Goldblatt, 1981; 1988). From the Russian Far East, the following counts have been found: 2n=28 from the Amur River basin (Probatova and Sokolovskaya, 1981b); 2n=56 from Kamchatka (Sokolovskaya, 1963); and 2n=70 from Sakhalin (Sokolovskaya, 1960).

56. *Coptis trifolia* (L.) Salisb.

Chromosome number. 2n=18 (S.)

Voucher specimen. VLA 7843, Paramushir Island, Puysharia Bay, Riffovaya, among *Pinus pumila* associated with *Sphagnum* spp., 30. VII. 1999, coll. V. Barkalov.

Distribution. North Pacific.

Note. The first chromosome count for this species from the Russian Far East was made from Kamchatka by Sokolovskaya (1963).

The chromosome number 2n=18 is revealed to be constant for the species (Love and Love, 1966, 1982; Kurita, 1956; Nishikawa, 1982).

57. *Ranunculus transochotensis* Hara

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

Voucher specimen. VLA 7981, Simushir Island, Brawton Bay, meadow, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Sakhalin (s.), South Kuriles; Japan.

Note. For this species the chromosome number 2n=28 was reported by Malakha (1989, 1990) from Kunashir Island. Goldblatt and Johnson (1991) erroneously cited the number as 2n=24.

Family Rosaceae

58. *Agrimonia viscidula* Bunge

Chromosome number. 2n=56 (R.)

Voucher specimen. VLA 8066, Iturup Island, Dobroye Nachalo Bay, mixed forest, near lake, 15. VIII. 1999, coll. V. Barkalov.

Distribution. Eastern Siberia, Russian Far East; China, Korea, Japan.

Note. The chromosome number 2n=56 was reported for *Agrimonia viscidula* from Kunashir Island by Probatova et al. (1989) under the name of *Agrimonia japonica* (a junior synonym of *A. viscidula*).

59. *Fragaria iinumae* Makino

Chromosome number. 2n=28 (R.)*; new cytotype for the species.

Voucher specimen. VLA 8048, Iturup Island, Dobroye Nachalo Bay, on margin of coniferous forest, 15. VIII. 1999, coll. V. Barkalov.

Distribution. Sakhalin (s.), South Kuriles; Japan.

Note. For *Fragaria iinumae* only the count 2n=14 is hitherto known from Sakhalin (Sokolovskaya, 1960) and Japan (Kurosawa and Hara, 1960; Iwatsubo and Naruhashi, 1989; Oda and Nishitani, 1989). The present count 2n=28 represents a new cytotype for this species.

60. *Fragaria yezoensis* Hara

Chromosome number. 2n=14 (S).

Voucher specimen. VLA 7999, Matua Island, Dvoynaya Bay, meadow, 3. VIII. 1999, V. Barkalov; VLA 8081, Simushir Island, Bzawton Bay, Kzaternyj, wet meadow, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Southern Sakhalin, South Kuriles; Japan.

Note. Probatova et al. (1989) reported the chromosome number 2n=14 for this species from Kunashir Island. From Japan the same chromosome number has been reported by Kurosawa and Hara (1960), Oda and Nisitani (1989) and Iwatsubo and Naruhashi (1989; under the name of *F. nipponica* var. *yezoensis* (Hara) Kitamura).

61. *Potentilla megalantha* Takeda

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

Voucher specimen. VLA 8060, Yankicha Island, Kraternaya Bay, on sea coast, 5. VIII. 1999, coll. V. Barkalov.

Distribution. Kamchatka (s.; unique locality), Commander Islands, Sakhalin, Kuriles; Japan, Aleutians.

Note. The same chromosome number for this species was already reported from Japan by Shimotomai (1930a, 1930b).

62. *Potentilla miyabei* Makino

Chromosome number. 2n=28 (R.)*; new cytotype for the species.

Voucher specimen. VLA 8061, Chirpoi Island, Pesczanaya Bay, volcano slope, on volcanic soil, 10. VIII. 1999, coll. V. Barkalov.

Distribution. Kuriles; Japan.

Note. The chromosome number of *Potentilla miyabei* has been represented only by the report of Sakai (1935; 2n=56). The present count 2n=28 is the new cytotype for the species.

Family Scrophulariaceae

63. *Veronica stelleri* Pall. ex Link

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

Voucher specimen. VLA 7984, Shiashkotan Island, Cape Obvaljny, maritime slope, 2. VIII.

1999, coll. V. Barkalov.

Distribution. North Pacific.

Note. Our count, 2n=18, is consistent with the two previous reports, one from Kamchatka (Sokolovskaya, 1963), and another from Japan (Sakai, 1935).

Family Sparganiaceae

64. *Sparganium glomeratum* (Laest.) L. Neum.

Chromosome number. 2n=30 (R.).

Voucher specimen. VLA 7848, Kunashir Island, Peschanoye Lake, along the rivulet, 17. VIII. 1999, coll. V. Barkalov.

Distribution. Holarctic.

Note. The chromosome number of this species has been represented only by the report of Lohammar, in Love and Love (1942: 2n=30), from Scandinavia.

Family Taxaceae

65. *Taxus cuspidata* Siebold et Zucc. ex Endl.

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

Voucher specimen. VLA 7877, Simushir Island, Brawton Bay, in *Betula ermanii* forest, 8. VIII. 1999, coll. V. Barkalov.

Distribution. Primorsky Territory, Sakhalin (s.), South Kuriles; China, Korea, Japan.

Note. The chromosome numbers 2n=24 or 24–26 were reported for this species from Japan (Amano, 1943; Matsura and Suto, 1935), though there has been no report from the Russian Far East.

Family Trilliaceae

66. *Trillium camschatcense* Ker-Gawl.

Chromosome number. 2n=10, 10+1−2B (R.).

Voucher specimen. VLA 7855, Yankicha Island, Kraternaya Bay, on the slope, in the tall herbs community, 5. VIII. 1999, coll. V. Barkalov; VLA 7861, Kunashir Island, Alyokhino, on the slope along the rivulet, among Duschekia maximowiczii and the tall herbs, 19. VIII. 1999, coll. V. Barkalov; VLA 7863, Paramushir Island, Puysharia Bay, on slope, in *Alnaster fruticosa* thickets, 30. VII. 1999, coll. V. Barkalov.

Distribution. Northwestern Pacific.

Note. In the Russian Far East, the chromosome number 2n=10 has been reported from Kunashir Island, South Kuriles (Grif and Sveshnikova, 1975; Probatova et al., 1989), Sakhalin (Sokolovskaya, 1960; under the name *Trillium kamtschaticum*) and Kamchatka (Sokolovskaya, 1963; under the name *Trillium kamtschaticum*). Based on the karyotype study of the genus *Trillium*, Grif et al. (1985) suggested that populations in Kunashir and Sakhalin Islands could be separated from *T. camschatcense* as a distinct species, though they did not propose a new specific name. The same chromosome number is known from other regions outside the Russian Far East (e.g., Ornduff, 1968; Bolkhovskikh et al., 1969; Goldblatt, 1981).

Family Violaceae

67. *Viola* aff. *verecunda* A. Gray

Chromosome number. 2n=20 (A.S.).

Voucher specimen. VLA 6739, Kunashir Island, 7 km south of Yuzhno-Kurilsk, wet place, 29. VII. 1987, coll. N. Probatova.

Note. Bezdeleva (1987) suggested that the populations in the South Kuriles and Sakhalin might represent an undescribed species, being similar to *Viola verecunda* A. Gray which is known from the Amur River basin and the Primorsky Territory.

General Remarks

Now in the Kuriles chromosome numbers are known for 175 species of vascular plants comprising 124 genera and 48 families. This accounts for 12.8% of the total number of species of the Kurilean flora.

Thirty species from the Kurilskyj nature reserve on Kunashir Island (a unique nature reserve in the Kuriles) were studied, as well as some rare and endangered species from the regional and federal Red Data Books. These are: *Gynostemma pentaphyllum, Schizophragma hydrangeoides, Poa radula, Laportea bulbifera, Hydrangea petiolaris, H. paniculata, Muhlenbergia curviaristata, Skimmia repens*, and *Schisandra chinensis.*

Further chromosome studies of the Kuriles vascular flora are in progress.

A comparison with the flora of Sakhalin,

where more than 250 species have been studied karyologically, will be done in future.

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千島産維管束植物の染色体の研究

Nina S. Probatova, Vyacheslav Yu. Barkalov, Elvira G. Rudyka and Svetlana A. Shatalova

Laboratory of Vascular Plants, Institute of Biology and Soil Sciences FEB RAS 690022, Vladivostok, Russia

千島列島に産する 35 科 59 属 67 種の維管束植物の染色体数を報告した. *Draba grandis* Langsd., *Euonymus alata* (Thunb.) Siebold, *Ixeridium kurilense* Barkalov, *Papaver miyabeanum* Tatew. *Pterocypsela elata* (Hemsl.) Shih and *Rhodiola sachalinensis* Boriss の 6 種について, 始めて染色体数を報告した. 現在までに, 千島産の維管束植物 175 種について染色体数が報告されてきたが, これは千島から知られている維管束植物の全種数の 13%に相当する.

さらに, *Elymus tsukushiensis* Honda および *Digitaria ciliaris* (Retz.) Koel. の 2 種を千島列島から初めて記録した.