

## Geographical Distribution Patterns of the Ericaceae in Sakhalin and the Kurils

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**Abstract** Distribution patterns of thirty-one species of the Ericaceae native to Sakhalin and the Kuril Archipelago were analyzed quantitatively based on the herbarium specimens deposited in the main Japanese herbaria. *Ledum palustre* s. lat., *Vaccinium vitis-idaea* and *Vaccinium uliginosum* represent the three most abundant species of the Ericaceae in the regions. Many Sakhalin-Kurils indices (S-K indices) of the species of the Ericaceae show negative numbers, and it reflects more predominant arctic-alpine “heath” tundras found in the Kurils than in Sakhalin. Most species with high positive S-K indices meaning a distribution bias toward Sakhalin, have the circumpolar or Northeast Eurasian distribution patterns. On the other hand, most species with low negative S-K indices meaning a distribution bias toward the Kurils, have the distribution patterns confined to Japan and its neighbors, or the North Pacific region.

**Key words:** distribution, Ericaceae, Kurils, Sakhalin, S-K index

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### Introduction

Arctic-alpine and boreal plant species have migrated northward in the interglacial ages and southward in the glacial ages along Sakhalin and/or the Kuril Islands between the Japanese Archipelago and the Eurasian Continent during the Quarternary period. Thus, Sakhalin and the Kurils are fascinating regions to the botanists retaining a keen interest in the plant diversity and phytogeography of Northeast Eurasia (Takahashi 2005).

The Sakhalin-Kurils index (S-K index) clarified the present geographical distribution patterns of gymnosperms in the regions (Takahashi 2004a). Following this former report, the distribution patterns of the Ericaceae are considered in this study. The family is composed of deciduous and evergreen shrubs, which mainly constitute the forest floor stratum, arctic-alpine low “heath” vegetation, and bog vegetation in Sakhalin and the Kuril Islands. The Ericaceae is regarded as one of the important main components of the boreal native flora and vegetation of the regions in question. A clarification of the present distribution patterns of the Ericaceae in Sakhalin and the Kurils will contribute to the historical study of flora and vegetation in Northeast Eurasia.

### Materials and Methods

Thirty-one species of the Ericaceae are native to Sakhalin and the Kuril Islands. Specimens collected from the regions were examined in the main Japanese herbaria; KYO, MAK, SAPS, SAPT, TI and TNS (acronyms following Holmgren et al. 1990; except for SAPT which means the Herbarium of the Botanic Garden, Hokkaido University). Specimens examined are listed in Appendix. Geographical grid or island numbers in Appendix are shown in the maps of Sakhalin (Fig. 1) and the Kurils (Fig. 2).

The number of herbarium specimens excluding duplicate sheets are counted for Sakhalin (S) and the Kurils (K), and also done for three parts of each region (Table 1). The Sakhalin-Kurils index (S-K index) is formulated as  $S-K / S+K$ . The numerical value of this index changes between  $-1.0$  and  $+1.0$ , and a higher positive number indicates more abundant distribution in Sakhalin than in the Kurils (Table 2).

Table 1. A comparison of the number of specimens of the Ericaceae between Sakhalin and the Kurils (KYO, MAK, SAPS, SAPT, TI and TNS).

Taxa	Regions	Southern	Middle	Northern	(Uncertain)	Total
1. <i>Andromeda polifolia</i>	Sakhalin	5	31	11	1	48
	Kurils	20	20	28	-	68
2. <i>Arctericia nana</i>	Sakhalin	-	-	-	-	0
	Kurils	11	24	3	-	38
3. <i>Arctostaphylos uva-ursi</i>	Sakhalin	-	-	7	-	7
	Kurils	-	-	-	-	0
4. <i>Arctous alpina</i>	Sakhalin	13	20	7	-	40
	Kurils	15	43	18	-	76
5. <i>Bryanthus gmelinii</i>	Sakhalin	-	-	-	-	0
	Kurils	5	21	12	-	38
6. <i>Cassiope ericoides</i>	Sakhalin	-	6	-	-	6
	Kurils	-	-	-	-	0
7. <i>Cassiope lycopodioides</i>	Sakhalin	10	-	-	-	10
	Kurils	18	63	17	1	99
8. <i>Chamaedaphne calyculata</i>	Sakhalin	35	35	10	4	84
	Kurils	-	-	-	-	0
9. <i>Cladothamnus bracteatus</i>	Sakhalin	-	-	-	-	0
	Kurils	3	1	-	-	4
10. <i>Gaultheria miqueliana</i>	Sakhalin	-	-	1	-	1
	Kurils	14	14	-	-	28
11. <i>Harrimanella stelleriana</i>	Sakhalin	-	-	-	-	0
	Kurils	1	4	6	-	11
12. <i>Ledum palustre</i> s. lat.	Sakhalin	93	109	21	5	228
	Kurils	54	-	25	-	79
13. <i>Leucothoe grayana</i>	Sakhalin	2	-	-	-	2
	Kurils	24	-	-	-	24
14. <i>Loiseleuria procumbens</i>	Sakhalin	1	13	5	-	19
	Kurils	17	30	30	-	77
15. <i>Menziesia pentandra</i>	Sakhalin	8	-	-	-	8
	Kurils	15	-	-	-	15
16. <i>Phyllodoce aleutica</i>	Sakhalin	-	-	-	-	0
	Kurils	17	30	34	-	81
17. <i>Phyllodoce caerulea</i>	Sakhalin	-	16	9	-	25
	Kurils	3	-	2	-	5
18. <i>Rhododendron adamsii</i>	Sakhalin	-	6	2	-	8
	Kurils	-	-	-	-	0
19. <i>Rhododendron aureum</i>	Sakhalin	26	11	2	1	40
	Kurils	24	50	30	-	104
20. <i>Rhododendron brachycarpum</i>	Sakhalin	-	-	-	-	0
	Kurils	2	-	-	-	2
21. <i>Rhododendron lapponicum</i>	Sakhalin	-	20	2	1	23
	Kurils	-	-	-	-	0

In Sakhalin, “Southern” is the part from <74> to <56>, “Middle” is from <55> to <28>, and “Northern” is from <27> to <4> in the grid (see Fig. 1).

In the Kurils, “Southern” is the region of the Habomais <23>, Shikotan <22>, Kunashir <21> and Iturup <20>, “Middle” is the region from Urup <19> to Makanrushi <05>, and “Northern” is the region of Antsiferova <04>, Paramushir <03>, Shumshu <02> and Atlasova <01> (see Fig. 2).

(Uncertain) means the specimens without accurate localities.

Table 1. continued.

Taxa	Regions	Southern	Middle	Northern	(Uncertain)	Total
22. <i>Rhododendron tschonoskii</i>	Sakhalin	-	-	-	-	0
	Kurils	1	-	-	-	1
23. <i>Therorhodium camtschaticum</i>	Sakhalin	24	9	-	-	33
	Kurils	53	46	34	-	133
24. <i>Therorhodium redowskianum</i>	Sakhalin	-	8	-	-	8
	Kurils	-	-	-	-	0
25. <i>Vaccinium microcarpum</i>	Sakhalin	13	20	4	1	38
	Kurils	6	4	3	-	13
26. <i>Vaccinium ovalifolium</i>	Sakhalin	58	35	3	1	97
	Kurils	18	7	2	-	27
27. <i>Vaccinium oxycoccus</i>	Sakhalin	36	22	11	2	71
	Kurils	33	15	15	-	63
28. <i>Vaccinium praestans</i>	Sakhalin	37	14	2	3	56
	Kurils	46	9	-	1	56
29. <i>Vaccinium smallii</i>	Sakhalin	60	28	-	-	88
	Kurils	21	-	-	-	21
30. <i>Vaccinium uliginosum</i>	Sakhalin	28	48	16	3	95
	Kurils	33	50	31	-	114
31. <i>Vaccinium vitis-idaea</i>	Sakhalin	82	49	14	6	151
	Kurils	61	67	28	-	156

## Results and Discussion

### *Species distribution pattern*

#### ERICACEAE

##### 1. *Andromeda polifolia* L., Sp. Pl.: 393 (1753).

Japanese name: Hime-shakunage.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 83, the second from the upper right.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 51V.

N. Hemisphere: Hultén (1968) p. 727, the upper; Hultén & Fries (1986) Map 1456.

This species is evergreen shrubs with stems decumbent and ascending apically to 30 cm high, growing in wet high moors. It has a broad circumpolar subarctic-boreal distribution in the Northern Hemisphere (Hultén and Fries 1986).

*Andromeda polifolia* occurs in Sakhalin, with fewer occurrences in the southern part and especially more abundant in the middle part of Sakhalin. It is evenly found from the southern to northern parts in the Kurils (Table 1). It shows comparatively high abundance in these regions (S+K= 116), and the S-K index (-0.17) means that *A. polifolia* occurs abundantly in the Kurils as well as in Sakhalin (Table 2).

**2. *Arcterica nana*** (Maxim.) Makino in Bot. Mag. Tokyo **20**: 85 (1906); *Andromeda nana* Maxim. in Bull. Acad. Sci. St.-Pét. **18**: 47 (1873); *Pieris nana* (Maxim.) Makino in Bot. Mag. Tokyo **8**: (213) (1894), **18**: 18 (1904).

Japanese name: Komeba-tsugazakura.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1976) p. 704.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 52A.

This species is evergreen dwarf shrubs with stems decumbent and somewhat ascending apically to 10 cm high, growing in stony places of alpine tundras. It is confined to Japan and the Kurils, but extends to Kamchatka (Khokhryakov and Mazurenko 1991; Yamazaki 1993).

*Arcterica nana* is absent from Sakhalin (Table 1; also see Smirnov 2002), which is indicated by its extreme negative S-K index (-1.00). On the other hand, it occurs in the southern to northern Kurils, especially more frequently in the middle Kurils (Table 1). This general distribution pattern in Sakhalin and the Kurils has been supported by Horikawa (1976), Yamazaki (1981, 1993) and Khokhryakov and Mazurenko (1991).

Note: Kron et al. (1999) treated this species as *Pieris nana*, but *P. nana* is always sister to the other *Pieris* species in several phylogenetic analyses based on morphology, *rbcL*, and *matK* sequences (Kron et al. 1999). I adopt a distinct genus *Arcterica* segregated from *Pieris* in this paper.

**3. *Arctostaphylos uva-ursi*** (L.) Spreng. in Syst. Veg. **2**: 287 (1825); *Arbutus uva-ursi* L., Sp. Pl.: 395 (1753).

Japanese name: Kuma-kokemomo.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 83, the third from the upper right.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 52V.

N. Hemisphere: Hultén (1968) p. 729, the upper (for *A. uva-ursi* var. *uva-ursi*) and the lower (for *A. uva-ursi* var. *adenotricha*); Hultén and Fries (1986) Map 1454.

This species is evergreen and matted shrubs with decumbent stems to 1.5 m long, growing especially in dry sandy places. It has a widespread circumpolar distribution in the Northern Hemisphere with a gap in the Bering area including the Kurils, Kamchatka and main islands of the Aleutians (Hultén and Fries 1986). This means the continental habit of this species.

*Arctostaphylos uva-ursi* is found rarely in northern Sakhalin, but has not been recorded from the entire Kuril Islands (Tables 1 and 2; S-K index= +1.00). It has not been recorded from the southern and middle parts of Sakhalin (Khokhryakov and Mazurenko 1991; Smirnov 2002). The populations found in northern Sakhalin may be supplied mainly from those of eastern Siberia.

**4. *Arctous alpina* (L.)** Nied. in Engl., Bot. Jahrb. **12**: 180 (1890); *Arbutus alpinus* L., Sp. Pl.: 395 (1753); *Arctostaphylos alpina* (L.) Spreng. in Syst. Veg. **2**: 287 (1825); *Arctous japonica* Nakai in Bot. Mag. Tokyo **35**: 134 (1921); *Arctous alpina* (L.) Nied. var. *japonica* (Nakai) Takeda in Bull. Biogeog. Jap. **4**: 288 (1934).

Japanese name: Urashima-tsutsuji.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 83, the lower right.

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1976) p. 705.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 52G (for *A. alpina*) and Fig. 53B (for *A. japonica*).

N. Hemisphere: Hultén (1968) p. 730, the upper (as *Arctostaphylos alpina*); Hultén & Fries (1986) Map 1455 (as *Arctostaphylos alpina*).

This species is deciduous dwarf shrubs with stems decumbent and ascending apically to 10 cm high, growing in stony places. It has a circumpolar arctic-montane distribution of the Northern Hemisphere (Hultén and Fries 1986).

*Arctous alpina* occurs in southern to northern Sakhalin, with comparatively lower abundance in the northern part (Table 1). It is distributed in the entire Kuril Islands, especially with high abundance in the middle Kurils. This species occurs more or less abundantly (S+K= 116) in Sakhalin and the Kurils, and the S-K index (-0.31) means more or less similar abundance between Sakhalin and the Kurils.

Note: Most plants of Sakhalin and the Kurils have been sometimes regarded as *A. japonica* Nakai (= *A. alpina* var. *japonica*), characterized by wider and larger leaves than var. *alpina*. But I treat it as the widespread species *A. alpina* in the present study. The specific epithet "*alpinus*" in most Japanese references is incorrect.

**5. *Bryanthus gmelinii* D. Don** in Edinb. New Philos. J. **17**: 160 (1834).

Japanese name: Chishima-tsugazakura.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 265.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 44B.

This species is evergreen dwarf and matted shrubs with slender stems decumbent to 20 cm long, growing in sunny and stony places. It is native to Japan (N. Honshu and Hokkaido), the Kurils and Kamchatka (Khokhryakov and Mazurenko 1991; Yamazaki 1993). The geographical distribution pattern of this species is more or less similar to that of *Arctica nana*.

*Bryanthus gmelinii* is absent from Sakhalin but it occurs in the southern to northern Kuril Islands (S-K index= -1.00), especially with high abundance in the middle Kurils (Table 1). The distribution pattern in these regions has been generally supported by Horikawa (1972), Yamazaki (1981, 1993), Khokhryakov and Mazurenko (1991) and Smirnov (2002). This distribution and abundance pattern in Sakhalin and the Kurils; i.e., a geographical gap in Sakhalin and abundance in the middle Kurils, is the same in *Arctica nana*.

**6. *Cassiope ericoides* (Pall.) D. Don** in Edinb. New Philos. J. **17**: 158 (1834); *Andromeda ericoides* Pall., Fl. Ross. **1**: 56 (1788); *Cassiope redowskii* G. Don, sensu Miyabe and Tatewaki in Trans. Sapporo Nat. Hist. Soc. **14**(2): 77 (1935); *Cassiope redowskii* G. Don, sensu Sugawara in Plants of Saghalien: 255 (1937).

Japanese name: Karafuto-iwahige.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 84, the upper left.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 50B.

This species is evergreen shrubs with stems decumbent and ascending apically to 30 cm high, growing in stony places and lichen tundras. It occurs from the eastern Siberia to Kamchatka (Khokhryakov and Mazurenko 1991).

*Cassiope ericoides* is rarely found in Sakhalin but not in the Kurils (Tables 1 and 2; S+K= 6, S-K index= +1.00). Within Sakhalin, the present study shows only localities from the middle part, but the localities from the northern part has been also recorded by Khokhryakov and Mazurenko (1991) and Smirnov (2002).

Note: Specimens from the middle part of Sakhalin shows more or less shorter hairs at the leaf margin than those of typical *C. ericoides* from eastern Siberia.

**7. *Cassiope lycopodioides* (Pall.) D. Don** in Edinb. New Philos. J. **17**: 158 (1834); *Andromeda lycopodioides* Pall., Fl. Ross. **1**: 55 (1788).

Japanese name: Iwahige.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 84, the second from the upper left.

Table 2. A comparison of S-K index and S+K of the Ericaceae between Sakhalin and the Kurils (KYO, MAK, SAPS, SAPT, TI and TNS). Taxa are listed in order of S-K index and other characteristics of the species are listed for comparison.

Taxa (the number in text)	S-K index	S+K	Fruits	Leaves	Habit	Distr.
<i>Cassiope ericoides</i> (6)	+1.00	6	C	E	A-D	E
<i>Arctostaphylos uva-ursi</i> (3)	+1.00	7	B	E	D	C(PG)
<i>Rhododendron adamsii</i> (18)	+1.00	8	C	E	A	E
<i>Therorhodion redowskianum</i> (24)	+1.00	8	C	D	A-D	E
<i>Rhododendron lapponicum</i> (21)	+1.00	23	C	E	A	C(SG)
<i>Chamaedaphne calyculata</i> (8)	+1.00	84	C	E	A	C(A/PG)
<i>Phyllodoce caerulea</i> (17)	+0.67	30	C	E	A-D	C(SG)
<i>Vaccinium smallii</i> (29)	+0.61	109	B	D	A	J
<i>Vaccinium ovalifolium</i> (26)	+0.56	124	B	D	A	P
<i>Vaccinium microcarpum</i> (25)	+0.49	51	B	E	D	C
<i>Ledum palustre</i> s. lat. (12)	+0.49	307	C	E	A	C(A/PG)
<i>Vaccinium oxycoccus</i> (27)	+0.06	134	B	E	D	C(PG)
<i>Vaccinium praestans</i> (28)	0.00	112	B	D	A-D	(E)-P(W)
<i>Vaccinium vitis-idaea</i> (31)	-0.01	307	B	E	A-D	C
<i>Vaccinium uliginosum</i> (30)	-0.09	209	B	D	A	C
<i>Andromeda polifolia</i> (1)	-0.17	116	C	E	A	C
<i>Menziesia pentandra</i> (15)	-0.30	23	C	D	A	J
<i>Arctous alpina</i> (4)	-0.31	116	B	D	A-D	C
<i>Rhododendron aureum</i> (19)	-0.44	144	C	E	A	E-P(W)
<i>Therorhodion camtschaticum</i> (23)	-0.60	166	C	D	A-D	P
<i>Loiseleuria procumbens</i> (14)	-0.60	96	C	E	D	C(SG)
<i>Cassiope lycopodioides</i> (7)	-0.81	109	C	E	D	P
<i>Leucothoe grayana</i> (13)	-0.85	26	C	D	A	J
<i>Gaultheria miqueliana</i> (10)	-0.93	29	B	E	A-D	J-P(W)
<i>Phyllodoce aleutica</i> (16)	-1.00	81	C	E	A-D	P
<i>Bryanthus gmelinii</i> (5)	-1.00	38	C	E	D	P(W)
<i>Arctericia nana</i> (2)	-1.00	38	C	E	D	P(W)
<i>Harrimanella stelleriana</i> (11)	-1.00	11	C	E	D	P
<i>Cladothamnus bracteatus</i> (9)	-1.00	4	C	D	A	J
<i>Rhododendron brachycarpum</i> (20)	-1.00	2	C	E	A	J
<i>Rhododendron tschonoskii</i> (22)	-1.00	1	C	(D)	A	J

Fruits: B– berry or berrylike; C– capsules.

Leaves: D– deciduous; E– evergreen.

Habit: A– small shrubs with ascending stems; D– dwarf shrubs with decumbent stems.

Distribution pattern (Distr.): C– circumpolar; C(AG)– circumpolar with a North Atlantic gap; C(PG)– circumpolar with a North Pacific gap; C(SG)– circumpolar with a gap of Siberia; E– Northeast Eurasia (eastern Siberia to the Okhotsk Sea region); J– Japan and its adjoining regions; P– the North Pacific region (from the Okhotsk Sea region to Alaska); P(W)– the North Pacific region, but not extending to Alaska.

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 266.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 51B.

N. Hemisphere: Hultén (1968) p. 726, the lower.

This is an alpine tundra species of evergreen matted dwarf shrubs with much branched stems decumbent to 20 cm long, growing on rocks or in crevices of mountain slopes. It is native to Japan, Sakhalin, Okhotsk, the Kurils, Kamchatka, the Aleutians, Alaska and Canada (Hultén 1968; Yamazaki 1993).

*Cassiope lycopodioides* is found in the southern part of Sakhalin but not in middle and northern Sakhalin

(Table 1). It occurs more or less abundantly in the entire Kuril Islands from south to north, especially with high abundance in the middle Kurils. High negative S-K index (-0.81) means that the distribution is biased in favor of the Kurils.

**8. *Chamaedaphne calyculata* (L.) Moench, Methodus: 457 (1794); *Andromeda calyculata* L., Sp. Pl.: 394 (1753).**

Japanese name: Yachi-tsutsuji, Horomui-tsutsuji.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 84, the third from the upper left; Takahashi (2004b) Fig. 2.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991)

Fig. 51G.

N. Hemisphere: Hultén (1968) p.727, the lower; Hultén and Fries (1986) Map 1457.

This species is evergreen small shrubs with stems decumbent and ascending apically to 1 m high, growing in wet meadows at lowlands. It has a broad circumpolar distribution in the cooler regions of the Northern Hemisphere, with a wide distribution gap in the North Atlantic area and the absence in the islands in the North Pacific area (Hultén 1968; Hultén and Fries 1986). This geographical distribution pattern of *Chamaedaphne calyculata* suggests a continental habit of this species.

This species is found abundantly in Sakhalin but not found in the entire Kurils (Tables 1 and 2; S+K= 84, S-K index +1.00). This geographical distribution pattern has been also supported by Yamazaki (1989, 1993) and Khokhryakov and Mazurenko (1991). The lacking of the species in Sakhalin in Hultén and Fries (1986: Map. 1457) should be an error.

**9. *Cladothamnus bracteatus*** (Maxim.) T. Yamaz. in J. Jap. Bot. **63**: 163 (1988); *Tripetaleia bracteata* Maxim. in Bull. Acad. Sci. St.-Pét. **16**: 407 (1871); *Botryostege bracteata* (Maxim.) Stapf in Kew Bull. 1934: 194 (1934).

Japanese name: Miyama-hotsutsuji.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 287 (as *Tripetaleia bracteata*).

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 44A (as *Botryostege bracteata*).

This species is deciduous small shrubs up to 60 cm high, growing in mountain to alpine scrubs. It is confined to Japan (C. Honshu to Hokkaido), but extends to the southern and middle Kurils.

In the present study, *Cladothamnus bracteatus* is not found in Sakhalin, and its lacking has been confirmed by the former studies (Khokhryakov and Mazurenko 1991; Smirnov 2002). It occurs in the southern and middle Kurils; Iturup and Urup, thus the easternmost population of *C. bracteatus* is found in Urup (Table 1 and Appendix). The presence of this species in the Kurils have not been described by Yamazaki (1989, 1993).

**10. *Gaultheria miqueliana*** Takeda in Bot. Mag. Tokyo **32**: 195 (1918); *Gaultheria pyroloides* Hook.f. et Thoms. ex Miq. in Ann. Mus. Bot. Lugd.-Bat. **1**: 30 (1863), p. p.

Japanese name: Shiratamanoki.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 84, the lower left.

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 269.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 53A.

N. Hemisphere: Hultén (1968) p. 782, the lower.

This species is evergreen shrubs with stems ascending to 30 cm high, growing in dry and often volcanic stony places. It is distributed in Japan, northern Sakhalin, the southern to middle Kurils, southern Kamchatka and central Aleutians. Berry-like fruits with

white fleshy parts could explain this somewhat disjunct distribution pattern from the long distance seed dispersal by birds.

*Gaultheria miqueliana* occurs rarely in the northern part of Sakhalin and occasionally in the southern and middle Kurils, but not in the northern Kurils (Tables 1 and 2; S+K= 29, S-K index= -0.93). This geographical distribution pattern in Sakhalin and the Kurils has been generally supported by Khokhryakov and Mazurenko (1991).

**11. *Harrimanella stelleriana*** (Pall.) Coville in Proc. Washing. Acad. Sci. **3**: 574 (1901); *Andromeda stelleriana* Pall., Fl. Ross. **1**: 58 (1788); *Cassiope stelleriana* (Pall.) DC., Prodr. **7**: 611 (1839).

Japanese name: Jimukade.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 270.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 44V.

N. Hemisphere: Hultén (1968) p. 726, the upper (as *Cassiope stelleriana*).

This species is evergreen dwarf creeping shrubs with much branched slender stems decumbent to 30 cm long, growing in stony places of alpine tundras. It is distributed in Japan (central Honshu and Hokkaido), the Kurils, Kamchatka, the Aleutians, Alaska and Canada (Hultén 1968; Yamazaki 1993). The geographical distribution pattern of this species is the same as that of *Cassiope lycopodioides*.

*Harrimanella stelleriana* is not found in Sakhalin, but comparatively rarely occurs in the Kurils (Tables 1 and 2; S+K= 11, S-K index= -1.00). In the southern Kurils it rarely occurs (Table 1). This general distribution pattern in these regions has been supported by Horikawa (1972), Yamazaki (1981, 1993) and Khokhryakov and Mazurenko (1991).

**12. *Ledum palustre*** L., Sp. Pl.: 391 (1753), sensu lato

Japanese name: Iso-tsutsuji s. lat.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 84, the upper right to p. 85, the second from the upper left (as *L. decumbens*, *L. hypoleucum*, *L. maximum*, *L. palustre*, *L. palustriforme* and *L. subulatum*).

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 271 (for *L. palustre* var. *diversipilosum*); Horikawa (1976) p. 707 (for *L. palustre* var. *decumbens*).

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 42-43 (as the above mentioned species by Smirnov (2002))

N. Hemisphere: Hultén (1968) p. 717, the lower (for *L. palustre* subsp. *decumbens* and subsp. *palustre*) to p. 718, the upper (for *L. palustre* subsp. *groenlandicum*); Hultén and Fries (1986) Map. 1451 (as *L. palustre* complex)

The species s. lat. is low suberect or somewhat decumbent shrubs 30–70 cm high, growing in wet mires or sometimes alpine stony places. It has a circumpolar distribution in the cooler regions of the Northern Hemisphere with a North Atlantic gap and the absence

in the main islands of the Aleutians in the N. Pacific area (Hultén and Fries 1986). This shows a similar distribution pattern as that of *Chamaedaphne calyculata* (Table 2).

*Ledum palustre* s. lat. is found very abundantly in the entire Sakhalin and moderately in the Kurils (Tables 1 and 2; S+K= 307, S-K index= +0.49), but with the lacking in the middle Kurils (Table 1). Thus, its distribution pattern is regarded as the bilateral in the Kuril Archipelago. It is one of the most abundant species of the Ericaceae in Sakhalin and the Kurils.

Note: *Ledum palustre* complex is taxonomically confusing. Russian taxonomists generally recognize six "species" in these regions (Khokhryakov and Mazurenko 1991; Smirnov 2002; Barkalov and Taran 2004), but in this study I follow Hultén (1968) and Hultén and Fries (1986) who recognized as the complex composed of several subspecies.

**13. *Leucothoe grayana*** Maxim. in Bull. Acad. Sci. St.-Pét. **18**: 46 (1872); *Eubotryoides grayana* (Maxim.) H.Hara in J. Jap. Bot. **11**: 621 (1935).

Japanese name: Hanahirinoki.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1976) p. 708.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 52B (as *Eubotryoides grayana*).

This is a cool-temperate species of deciduous shrubs with the height of 1.5 m, growing generally in stony and rocky places of deciduous forests or scrubs. It is confined to Japan (Honshu and Hokkaido), but extends to southern Sakhalin and the southern Kurils.

*Leucothoe grayana* very rarely occurs in southern Sakhalin, and is found moderately in the southern Kurils; Shikotan, Kunashir and Iturup (Table 1 and Appendix). The presence of this species in southern Sakhalin have not been noticed in the most references (Horikawa 1976; Yamazaki 1989, 1993; Smirnov 2002; Barkalov and Taran 2004), although Sugawara (1937) recorded the species from southern Sakhalin. The author verified one old specimen from Mt. Omanbetsu of southeastern Sakhalin (see Appendix). This should be an endangered plant species in Sakhalin. Horikawa (1976) and Yamazaki (1989, 1993) did not notice the presence of this species in the southern Kurils also.

**14. *Loiseleuria procumbens*** (L.) Desv. in J. Bot. **1**: 35 (1814); *Azalea procumbens* L., Sp. Pl.: 151 (1753).

Japanese name: Minezuô.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 85, the third from the upper left.

Japan and its neighbors incl. Hokkaido and the Kurils: Horikawa (1972) p. 272.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 49A.

N. Hemisphere: Hultén (1968) p. 720, the lower; Hultén and Fries (1986) Map. 1452.

This arctic-alpine species is evergreen dwarf and matted shrubs with stems much branched and decumbent to 10 cm long, growing in sunny and stony places. It has a circumpolar distribution in the Northern Hemisphere, with a wide gap in Siberia (Hultén and Fries 1986).

*Loiseleuria procumbens* occurs in both Sakhalin and the Kurils, but more abundantly in the Kurils, especially in the middle and northern Kurils (Tables 1 and 2; SK index= -0.60).

**15. *Menziesia pentandra*** Maxim. in Bull. Acad. Sci. St.-Pét. **11**: 431 (1867).

Japanese name: Koyôroku-tsutsuji.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 85, the lower left.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 49B.

This is a cool-temperate species of deciduous shrubs up to 2 m high, growing on rocks and at the edges of deciduous forests. It is endemic to Japan (Kyushu to Hokkaido) and its neighboring regions; the southern parts of Sakhalin and the Kurils.

*Menziesia pentandra* is found only in southern Sakhalin and the southern Kurils; Shikotan, Kunashir and Iturup (Table 1, see Appendix). This general distribution pattern in these regions has been supported by Khokhryakov and Mazurenko (1993). The S-K index (-0.30) means that the occurrence of *M. pentandra* does not show a distinct difference of abundance between Sakhalin and the Kurils.

**16. *Phyllodoce aleutica*** (Spreng.) A.Heller in Muhlenbergia **1**: 1 (1900).

Japanese name: Aono-tsegazakura.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 274.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 50A.

N. Hemisphere: Hultén (1968) p. 723, the lower (for *P. aleutica* subsp. *aleutica*) and p. 724, the upper (for *P. aleutica* subsp. *glanduliflora*).

This is a subalpine to alpine species of low evergreen shrubs with stems ascending to 30 cm high, growing in moderately moist stony places, especially around the snow-beds. It is native to the North Pacific area; Japan, the Kurils, Kamchatka, the Aleutians, Alaska and Canada (Hultén 1968; Yamazaki 1993). This distribution pattern is the same in *Cassiope lycopodioides* and *Harrimanella stelleriana* (Table 2).

*Phyllodoce aleutica* is not found in Sakhalin, but comparatively abundantly found in the southern to northern Kurils (Tables 1 and 2; S+K= 81, SK index= -1.00). The records from Sakhalin by Hultén (1968) and Yamazaki (1981, 1993) have not been exactly ascertained by recent Russian references (Khokhryakov and Mazurenko 1991; Smirnov 2002; Barkalov and Taran 2004). It should occur very rarely in Sakhalin, if ever.

**17. *Phyllodoce caerulea*** (L.) Bab., Man. Brit. Bot.: 194 (1843).

Japanese name: Ezono-tsugazakura.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 85, the third from the upper right.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 49V.

N. Hemisphere: Hultén (1968) p. 723, the upper (as "*P. caerulea*"); Hultén and Fries (1986) Map. 1453.

This is an arctic and alpine species of low evergreen shrubs with stems ascending to 30 cm high, growing in moderately moist stony places. The habitat of this species doesn't seem to be substantially different from that of *Phyllodoce aleutica*. It has a circumpolar distribution of the Northern Hemisphere with some gaps including Siberian region (Hultén and Fries 1986).

*Phyllodoce caerulea* occurs more abundantly in Sakhalin than in the Kurils (Tables 1 and 2; S-K index = +0.67). This abundance pattern is different from that of closely related *P. aleutica*. Within Sakhalin, it has not been recorded from the southern part. It occurs rarely in the southern and northern Kurils with a gap in the middle Kurils, thus its distribution pattern is recognized as the bilateral one in the Kurils (Table 1).

Note: Hybrid swarms are easily formed where the ranges of the two *Phyllodoce* species overlap (see Toyokuni 1988; p. 260-261), thus it is often difficult to determine the herbarium specimens of *Phyllodoce* exactly. Presumed hybrids between *Phyllodoce aleutica* and *P. caerulea* were found from Mt. Chacha of Kunashir, the southern Kurils (see Appendix).

**18. *Rhododendron adamsii*** Rehder et Wilson, Monogr. Azalea: 190 (1921).

Japanese name: Karafuto-miyamatsutsuji.

[Representative distribution maps]

Sakhalin: Yamazaki (1996) Map 2; Smirnov (2002) p. 85, the lower right.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 46A.

This species is evergreen low shrubs up to 1 m high, growing in rocky places of alpine tundras. It is distributed in eastern Siberia, Aldan, Kolyma, Okhotsk and Sakhalin, but does not extend to Japan. A closely related species to it is regarded as *R. anthopogon* D. Don of the Himalayas (Khokhryakov and Mazurenko 1991).

*Rhododendron adamsii* is more or less rarely found in middle and northern Sakhalin, and it has not been recorded from the Kurils (Tables 1 and 2; S+K= 8, S-K index = +1.00).

**19. *Rhododendron aureum*** Georgi, Bemer. Reise Russ. Reiche 1: 214 (1775).

Japanese name: Kibana-shakunage.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 86.

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 277, Yamazaki (1996) Map 26 (S. Kurils).

Okhotsk Sea region: Khokhryakov and Mazurenko (1991)

Fig. 45V.

This species is evergreen shrubs up to 1 m high, growing in alpine scrubs. It is native to eastern Siberia, northern Korea, Japan, Sakhalin, the Kurils, Kamchatka and the Aleutians.

*Rhododendron aureum* is found in both Sakhalin and the Kurils, especially abundantly in the middle Kurils (Tables 1 and 2; S+K= 144). S-K index (-0.44) indicates a distribution bias more or less in favor of the Kurils (Table 2).

**20. *Rhododendron brachycarpum*** D. Don ex G. Don, Gen. Hist. Pl. 3: 843 (1834).

Japanese name: Hakusan-shakunage.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).

Japan and its neighbors incl. S. Kurils: Yamazaki (1996) Map 25.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 44G.

This species is evergreen shrubs up to 3 m high, growing in mountain and subalpine forests. It is confined to Japan (Shikoku to Hokkaido), but extends to Korea and the southern Kurils (Yamazaki 1996).

*Rhododendron brachycarpum* is not found in Sakhalin and rarely found in the southern Kurils; Kunashir and Iturup (Tables 1 and 2; S+K= 2, S-K index = -1.00). The eastern limit of its distribution is located in Iturup. The distribution pattern in these regions has been generally supported by Khokhryakov and Mazurenko (1991) and Yamazaki (1993).

**21. *Rhododendron lapponicum*** (L.) Wahlenb., Fl. Lapp.: 104 (1812); *Azalea lapponica* L., Sp. Pl.: 151 (1753); *Rhododendron lapponicum* (L.) Wahlenb. var. *parvifolium* (Adams) Herder in Act. Hort. Petrop. 1: 343 (1872); *Rhododendron lapponicum* (L.) Wahlenb. subsp. *parvifolium* (Adams) Yamazaki, Rev. Gen. Rhododendron Jap.: 18 (1996).

Japanese name: Sakai-tsutsuji.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 85, the third from the upper left (as *R. parvifolium*).

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 283; Yamazaki (1996) Map 2 (as *R. lapponicum* subsp. *parvifolium*).

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 46B (for *R. parvifolium*) and Fig. 46V (for *R. lapponicum*).

N. Hemisphere: Hultén (1968) p. 718, the lower (for *R. lapponicum*); Hultén and Fries (1986) Map. 1450 (for *R. lapponicum*).

This species is much branched evergreen shrubs up to 1 m high, growing in marshes of lowland. It has a circumpolar distribution of the Northern Hemisphere with a wide gap in Northeastern Europe and Western to Central Siberia (Hultén and Fries 1986).

*Rhododendron lapponicum* is found in middle and northern Sakhalin, especially with high abundance in middle Sakhalin, but not in southern Sakhalin and the entire Kurils (Tables 1 and 2; S+K= 23, S-K index =



+1.00). This general distribution pattern in these regions has been supported by Horikawa (1972), Yamazaki (1989, 1993) and Khokhryakov and Mazurenko (1991). This species extends to Japan with rare occurrences in eastern Hokkaido; Ochiishi.

**22. *Rhododendron tschonoskii* Maxim.** in Bull. Acad. Sci. St.-Pét. **15**: 230 (1870).

Japanese name: Kome-tsutsuji.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).

Japan and its neighbors incl. S. Kurils: Hara and Kanai (1959) Map 175; Yamazaki (1996) Map 11.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 48B.

This is a temperate species of much branched semi-deciduous shrubs up to 3 m high, growing on rocky mountain slopes. It is confined to southern Korea and Japan, but extends to the southern Kurils (Yamazaki 1996).

*Rhododendron tschonoskii* is not found in Sakhalin, but very rarely found only in the southern Kurils; Kunashir (Tables 1 and 2; S+K= 1, S-K index= -1.00). The eastern limit of its distribution is located in Kunashir. The distribution pattern in these regions has been generally supported by Hara and Kanai (1959), Yamazaki (1989, 1993) and Khokhryakov and Mazurenko (1991).

**23. *Therorhodium camtschaticum* (Pall.) Small** in North Amer. Fl. **29**: 45 (1914); *Rhododendron camtschaticum* Pall., Fl. Ross. **1**: 48 (1784).

Japanese name: Ezo-tsutsuji.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 86, the second from the upper left (as *R. camtschaticum*)

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 279.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 48G (as *R. camtschaticum*).

N. Hemisphere: Hultén (1968) p. 719, the upper and lower (as *R. camtschaticum* subsp. *camtschaticum* and *R. camtschaticum* subsp. *glandulosum*).

This species is small deciduous shrubs decumbent and ascending apically to 40 cm high, growing in wet and stony alpine meadows. It is native to the Okhotsk Sea region including Japan (N. Honshu and Hokkaido), but extends eastward to the Aleutians and Alaska.

*Therorhodium camtschaticum* occurs abundantly in both Sakhalin and the Kurils (S+K= 166), but is absent in the northern part of Sakhalin (Table 1). It is found very abundantly in the entire Kurils (Table 1), and its S-K index (-0.60) indicates a distribution bias in favor of the Kurils (Table 2).

Note: The independent genus *Therorhodium* separated from *Rhododendron* was supported by the phylogenetic analysis using the *matK* data (Kron 1997).

**24. *Therorhodium redowskianum* (Maxim.) Hutch.** in Bull. Misc. Inform. Kew 1921: 204 (1921); *Rhododendron redowskianum* Maxim. in Mém. Prés.

Acad. Sci. Pétersb. Div. Sav. **9**: 189 (1859).

Japanese name: Kumoma-tsutsuji.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 85, the lower left (as *Rhododendron redowskianum*).

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 48V (as *Rhododendron redowskianum*).

This is a species of deciduous shrubs up to 20 cm high, growing in stony places of alpine tundras. It is native to eastern Siberia, Kolyma-Okhotsk, Aldan, Ussuri, and Sakhalin, but does not extend to Japan. This geographical distribution pattern is more or less similar to that of *Rhododendron adamsii* (Table 2).

*Therorhodium redowskianum* is found only in the middle part of Sakhalin, and not found in south and north Sakhalin, and also not found in the entire Kurils (Tables 1 and 2; S+K= 8, S-K index= +1.00).

**25. *Vaccinium microcarpum* (Turcz. ex Rupr.) Schmalh.,** Tr. S.-Pet. Ob. Est. **2**: 149 (1871); *Oxycoccus microcarpus* Turcz. ex Rupr. in Beitr. Pfl. Russ. Reich. **4**: 56 (1845).

Japanese name: Hime-tsuru-kokemomo.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 85 the upper right (as *Oxycoccus microcarpus*).

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 57B (as *Oxycoccus microcarpus*).

N. Hemisphere: Hultén (1968) p. 735, the lower (as *Oxycoccus microcarpus*); Hultén and Fries (1986) Map 1459.

This is a boreal species of evergreen dwarf shrubs with slender stems creeping up to 50 cm long, growing in boggy places. It has a wide circumpolar distribution of the Northern Hemisphere (Hultén and Fries 1986).

*Vaccinium microcarpum* occurs in Sakhalin and the Kurils (S+K= 51), but the S-K index (+0.49) means a distributional bias more or less toward Sakhalin (Tables 1 and 2).

**26. *Vaccinium ovalifolium* Sm.** in Rees, Cycl. **36**: no. 1 (1817); *Vaccinium axillare* Nakai in Bot. Mag. Tokyo **35**: 135 (1921).

Japanese name: Kurousugo.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 86, the upper right (as *Vaccinium axillare*)

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 55B (as *Vaccinium axillare*).

N. Hemisphere: Hultén (1968) p. 733, the lower.

This species is deciduous erect shrubs up to 1 m high, growing at the edges of deciduous forests and scrubs of subalpine to alpine zones. It is distributed in the northern regions of the North Pacific area; Japan (C. Honshu to Hokkaido), Sakhalin, the Kurils, Kamchatka, the Aleutians, Alaska and western N. America.

*Vaccinium ovalifolium* occurs abundantly in Sakhalin and the Kurils (S+K= 124), but especially commonly in southern and middle Sakhalin (Table 1). The S-K index (+0.56) indicates that this species occurs somewhat abundantly in Sakhalin than in the Kurils

(Table 2). In both Sakhalin and the Kurils the geographical distribution is biased in favor of south.

Note: Yamazaki (1987) recognized *V. ovalifolium* var. *sachalinense* for plants of N. Hokkaido and Sakhalin.

**27. *Vaccinium oxycoccus* L., Sp. Pl.: 351 (1753); *Oxycoccus palustris* Pers., Syn. Pl. 1: 419 (1805).**

Japanese name: Tsuru-kokemomo.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 85, the second from the upper right (as *Oxycoccus palustris*).

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 57A (as *Oxycoccus palustris*).

N. Hemisphere: Hultén (1968) p. 736, the upper (as *Oxycoccus palustris*); Hultén and Fries (1986) Map 1458.

This species is evergreen dwarf shrubs with slender stems creeping to 50 cm long. The species is closely related to *V. microcarpum*. It has a wide circumpolar distribution of the Northern Hemisphere, with a distribution gap in Alaska and main islands of the Aleutians.

*Vaccinium oxycoccus* occurs abundantly in both Sakhalin and the Kurils (Table 1; S+K= 134), and S-K index (+0.06) means that this species occurs abundantly in the Kurils as well as in Sakhalin (Table 2).

**28. *Vaccinium praestans* Lamb. in Trans. Linn. Soc. Bot. 10: 264 (1811).**

Japanese name: Iwa-tsutsuji.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 86, the second from the upper right.

Japan and its neighbors incl. Sakhalin and the Kurils: Horikawa (1972) p. 291.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 55A.

This species is deciduous dwarf shrubs with stems ascending apically to 10 cm high. It is distributed in the Okhotsk Sea region; Japan (C. Honshu to Hokkaido), Amur, Ussuri, Sakhalin, the Kurils, and Kamchatka.

*Vaccinium praestans* occurs more or less abundantly in Sakhalin and the Kurils (Table 1; S+K= 112), but more rarely or is absent in the northern parts of the both regions. The S-K index (0.00) means that the occurrence of this species shows a similarity in abundance between Sakhalin and the Kurils (Table 2).

**29. *Vaccinium smallii* A.Gray in Mem. Amer. Acad. Arts Sci. (Boston), new ser. 6: 398 (1859), in note; *Vaccinium hirtum* auct. non Thunb.**

Japanese name: Ōba-sunoki.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 86, the third from the upper right.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 54A (as *Vaccinium hirtum*).

This is a temperate species of deciduous shrubs up to 1 m high, growing at the edges of deciduous forests in lowlands to subalpine zones. It is confined to Japan (Kyushu to Hokkaido), but extends to Sakhalin and the

southern Kurils.

*Vaccinium smallii* is found more or less abundantly in Sakhalin and the Kurils (Table 1; S+K= 109), but more abundantly in Sakhalin (Table 2; S-K index= +0.61). The distribution is confined to the southern and middle parts of Sakhalin and the southern Kurils; Kunashir and Iturup.

**30. *Vaccinium uliginosum* L., Sp. Pl.: 350 (1753); *Vaccinium uliginosum* L. var. *alpinum* Bigel., Fl. Boston. ed. 2: 153 (1824).**

Japanese name: Kuromamenoki.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 86, the lower right.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 54B.

N. Hemisphere: Hultén (1968) p. 734, the lower (for *V. uliginosum* subsp. *alpinum* and subsp. *uliginosum*) and p. 735, the upper (for *V. uliginosum* subsp. *microphyllum*); Hultén and Fries (1986) Map. 1461.

This species is deciduous erect shrubs up to 1 m high, growing in stony and boggy places. It has a wide circumpolar distribution of the Northern Hemisphere (Hultén and Fries 1986).

*Vaccinium uliginosum* occurs very abundantly in the Kurils as well as in Sakhalin (Tables 1 and 2; S+K= 209, S-K index= -0.09).

**31. *Vaccinium vitis-idaea* L., Sp. Pl.: 351 (1753); *Rhodococcum vitis-idaea* (L.) Avror. in Fl. Murm. Obl. 4: 314 (1959).**

Japanese name: Kokemomo.

[Representative distribution maps]

Sakhalin: Smirnov (2002) p. 87, the upper left.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 56A (as *Rhodococcum vitis-idaea*).

N. Hemisphere: Hultén (1968) p. 731 (for *V. vitis-idaea* subsp. *minus* and subsp. *vitis-idaea*); Hultén and Fries (1986) Map 1460.

This species is evergreen shrubs with stems decumbent and ascending apically to 20 cm high, growing in sunny and stony places to on somewhat dark forest floors. It has a wide circumpolar distribution of the Northern Hemisphere (Hultén and Fries 1986).

*Vaccinium vitis-idaea* occurs very abundantly in the Kurils as well as in Sakhalin (Tables 1 and 2; S+K= 307, S-K index= -0.01).

**Comments on some dubious species**

The herbarium specimen of *Elliottia paniculata* (Sieb. et Zucc.) Benth. et Hook.f. (= *Tripetaleia paniculata* Sieb. et Zucc.) collected from Mt. Handa, Sakhalin by S. Sugawara (Sept. 30, 1923; No. 17831) is deposited in SAPT. But considering the distribution gap of this species in N. Hokkaido (Hara and Kanai 1958; Horikawa 1976) and the lack of this species in his floristic list (Sugawara 1937), the collection data of this herbarium specimen is very doubtful. Also, this species has not been recorded from Sakhalin by recent references (Khokhryakov and Mazurenko 1991; Smirnov 2002; Barkalov and Taran 2004). The author does not adopt

this specimen in the present study.

*Vaccinium hirtum* Thunb. had been recorded abundantly from middle and southern Sakhalin and the southern Kurils by Khokhryakov and Mazurenko (1991), but *V. hirtum* sensu auct. was regarded as *V. smallii* A. Gray by Smirnov (2002) and Barkalov and Taran (2004).

*Vaccinium japonicum* Miq. had been recorded from Sakhalin by Yamazaki (1989, 1993), but the presence of this species in Sakhalin was not supported by recent Russian references (Khokhryakov and Mazurenko 1991; Smirnov 2002; Barkalov and Taran 2004). It is not ascertained by the herbarium specimens examined in the present study.

*Vaccinium yatabei* Makino has been recorded from southern Sakhalin and the southern Kurils; Iturup (Khokhryakov and Mazurenko 1991; Smirnov 2002; Barkalov and Taran 2004), but this species is known only from central and northern Honshu, and not known from Hokkaido (Yamazaki 1989, 1993). Thus, the presence of this species in Sakhalin and the Kurils is doubtful. *Vaccinium yatabei* sensu Russian authors may be regarded as *V. hirtum* Thunb., but this species has not been sufficiently ascertained from Sakhalin and the Kurils until now (cf. Yamazaki 1993). The distribution of *V. hirtum* Thunb. in Sakhalin and the Kurils needs further clarification.

#### **Distribution patterns between Sakhalin and the Kurils**

A wide range of the S-K indices (–1.00 to +1.00) in the Ericaceae is different from that (+0.05 to +1.00) in gymnosperms (Takahashi 2004). The noteworthy difference in the S-K indices between the two taxonomic groups may be explained from the fact that coniferous forests are more predominant in Sakhalin and arctic-alpine “heath” tundras are found more prominently in the Kurils; especially from the middle to northern Kurils. *Ledum palustre* s. lat. (S+K= 307), *Vaccinium vitis-idaea* (S+K= 307) and *Vaccinium uliginosum* (S+K= 209) represent the three most abundant species of the Ericaceae in these regions. All these three species have the circumpolar distribution pattern. The species with more or less low S+K values have a distributional bias toward either Sakhalin or the Kurils (Table 2).

The extreme high positive S-K index (+1.00) which means the presence in Sakhalin but the absence in the Kurils, is found in the following six species; *Arctostaphylos uva-ursi*, *Cassiope ericoides*, *Chamaedaphne calyculata*, *Rhododendron adamsii*, *Rhododendron lapponicum* and *Therorhodium redowskianum*. All these species are characterized by their circumpolar or Northeast Eurasian distribution patterns (Table 2). These species followed or are following the Sakhalin route to (or from) Hokkaido; especially it is clear in *Chamaedaphne calyculata* with more or less high S+K value (see also Takahashi 2004b). Among the six species, the following four species; *Arctostaphylos uva-ursi*, *Cassiope ericoides*, *Rhododendron adamsii* and *Therorhodium redowskianum*, are characterized by rare occurrences in the northern and/

or middle parts of Sakhalin, and do not extend to Hokkaido. Furthermore, *Phyllodoce caerulea* (S-K index= +0.67), *Vaccinium smallii* (S-K index= +0.61), *V. ovalifolium* (S-K index= +0.56), *V. microcarpum* (S-K index= +0.49) and *Ledum palustre* s. lat. (S-K index= +0.49), also show a distributional bias more or less in favor of Sakhalin (Table 2).

The extreme high negative S-K index (–1.00) which means the presence in the Kurils but the absence in Sakhalin, is found in the following seven species; *Arctericia nana*, *Bryanthus gmelinii*, *Cladothamnus bracteatus*, *Harrimanella stelleriana*, *Phyllodoce aleutica*, *Rhododendron brachycarpum* and *Rhododendron tschonoskii*. All these species are characterized by their distribution patterns confined to Japan and its neighbors, or the North Pacific region (Table 2). Among the seven species, the following three species; *Cladothamnus bracteatus*, *Rhododendron brachycarpum* and *Rhododendron tschonoskii*, are especially characterized by rare occurrences only in the southern Kurils, sometimes to the middle Kurils (for *Cladothamnus*), and occur more or less commonly in the cool-temperate zone in Japan. The eastern geographical limits of these three species are located in the Kuril Archipelago. The other four species; *Arctericia nana*, *Bryanthus gmelinii*, *Harrimanella stelleriana* and *Phyllodoce aleutica*, are characterized by more or less high S+K values and the North Pacific distribution, thus these species followed or are following the Kuril route to (or from) Hokkaido. Furthermore, *Gaultheria miqueliana* (S-K index= –0.93), *Leucothoe grayana* (S-K index= –0.85), *Cassiope lycopodioides* (S-K index= –0.81), *Loiseleuria procumbens* (S-K index= –0.60) and *Therorhodium camtschaticum* (S-K index= –0.60) show a distribution bias more or less in favor of the Kurils. Especially *Arctericia nana*, *Bryanthus gmelinii*, *Cassiope lycopodioides*, *Harrimanella stelleriana* and *Loiseleuria procumbens* constitute the arctic-alpine “heath” tundras in the Kurils.

Several pairs of plant species which have the similar ecological niche and belong to the same genus, should be noticed in the regions of Sakhalin and the Kurils. The clearly differentiated distribution patterns are found in the following pairs of species; *Phyllodoce aleutica* (S-K index= –1.00) versus *P. caerulea* (S-K index= +0.67), *Cassiope lycopodioides* (S-K index= –0.81) versus *C. ericoides* (S-K index= +1.00), and *Therorhodium camtschaticum* (S-K index= –0.60) versus *T. redowskianum* (S-K index= +1.00), and more or less differentiated patterns in the pair; *Vaccinium oxycoccus* (S-K index= +0.06) versus *V. microcarpum* (S-K index= +0.49).

All the species with the extreme S-K index value (+1.00 or –1.00) are characterized by having the capsules (Table 2), except for *Arctostaphylos uva-ursi*. At present the author can not find a reasonable explanation on this correlation. The further distributional studies on the other plant groups are necessary.

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## Appendix

A list of the herbarium specimens of the Ericaceae collected from Sakhalin and the Kurils. All specimens examined were deposited in the following Japanese herbaria; KYO, MAK, SAPS, SAPT, TI and TNS. Within each region (Sakhalin or the Kurils) the specimens are listed in order of locality (from north to south). Both Sakhalin and the Kuril Archipelago is divided into three geographic parts; the northern, middle and the southern (see Figs. 1 & 2). Within Sakhalin, the figure between angle brackets indicates the grid on a map (Fig. 1). Four quarters of each grid are recognized further when we can locate the collection site. Within the Kurils, the figure between angle brackets equivalents to the island (Fig. 2). Within each quarter of the grid in Sakhalin or each island in the Kurils, the specimens are listed in order of collection date. Specimens without accurate locality are listed last in each corresponding region or part.

Collector name “K. Miyake” found in TNS is correctly described as T. Miyake in this list. Collector S. Sugawara is described as “Sugahara” in some herbaria, and similarly K. Yendo as “K. Endo”, S. Komatsu as “Komatu” in some herbaria.

### ERICACEAE

#### 1. *Andromeda polifolia* L. [Hime-shakunage] <SAKHALIN>

NORTH. Pomeri–Moskalivo, Takada-shokai-deitanchi <06-lower r.>, Y. Kudo & B. Ishida 7333, Aug. 31, 1923 (SAPS); N of Moskal'vo, around Lake Bol'shoje <06-lower r.>, V. Y. Barkalov 10643, Aug. 13, 2001 (SAPS); Northern end of the Gulf of Pomr', Muzjma <07-upper l.>, T. Fukuda 1900, Aug. 10, 2001 (SAPS); SW of the Gulf of Pomr, ca 2 km NW from Moskal'jv <09-lower r.>, T. Fukuda 2022, Aug. 13, 2001 (SAPS); Gulf of Odoptu, Lake Pomor <11-upper l.>, T. Fukuda 1471, Aug. 3, 2001 (SAPS); East of Gulf of Piltun, Vstrechnaya <11-upper l.>, T. Fukuda 1521, 1533, Aug. 4, 2001 (SAPS); South of Gulf of Piltun, near the Lake Pilitu <15-lower r.>, T. Fukuda 2253, Aug. 18, 2001 (SAPS); Seacoast of Chaio <19-lower l.> Y. Kusano, May 6, 1921 (SAPS); Nyiwo, tundra, prope litus <23-lower l.>, Y. Kudo & M. Tatewaki 6532, Aug. 13, 1922 (SAPS); Nyiwo, Ins. Mobio, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6548, Aug. 14, 1922 (SAPS); Nyiwo, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6585, Aug. 15, 1922 (SAPS).

MIDDLE. Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS); Shisuka-shicho, Chirie-gun, Akaigawa River <39-lower r.>, M. Tatewaki & Y. Takahashi 23109, Jun. 25, 1936 (SAPS); Shisuka, Nimenjo–Yamahana <44-lower l.>, B. Yoshimura & M. Hara 49, Jul. 11, 1937 (TNS); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 22719, Jun. 21, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 22776, Jun. 23, 1936 (SAPS); Swamp between Poronaysk and Leonidovo <48-upper l.>, N. Fujii 01341, Aug. 13, 2002 (MAK 346251); Shikka <48-upper r.>, K. Miyabe & T. Miyagi, Jul. 23, 1906 (SAPS); Duwatacko <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Tobani <48-upper r.>, T. Miyake, Aug. 20, 1906 (SAPS); Shisuka <48-upper r.>, I.

Namikawa, Aug. 12, 1914 (SAPS); Shisuka <48-upper r.>, S. Sugawara, Jun. 7, 1928 (TI- 2 sheets); Shisuka, Experiment Forest of Kyoto University <48-upper r.>, T. Chono, Jul. 28, 1928 (TNS); Shisuka, Experiment Forest of Kyoto University <48-upper r.>, S. Okamoto, Jul. 28, 1928 (KYO); Shisuka <48-upper r.>, S. Sugawara 17381, Jul., 1928 (SAPT); Shisuka <48-upper r.>, S. Sugawara 17382, Jun., 1929 (SAPT); Shisuka <48-upper r.> H. Ohtani & Y. Imai, Jul. 20, 1930 (SAPS); Amiba <48-upper r.> G. Koidzumi, Aug. 18, 1930 (KYO); Shisuka, tundra <48-upper r.>, H. Hara, Aug. 2, 1931 (TI); Horonai River, tundra at downstream <48-upper r.>, H. Hara, Aug. 2, 1931 (TI- 2 sheets); Shisuka, Horonai-honryu, near Amiba <48-upper r.>, R. Imaseki, Jul. 17, 1941 (TNS 87228); Poronaysk, in the city <48-upper r.>, H. Takahashi 30562, Aug. 13, 2002 (SAPS); Lak. Taraika <49-upper l.>, T. Miyake, Aug. 14, 1906.08.14 (SAPS); Shisuka-shicho, Taraika–Nimenjo <49-upper r.>, B. Yoshimura & M. Hara, Jul. 10, 1937 (SAPS- 2 sheets); Shisuka-shicho, near Taraika <49-upper r.>, M. Honda & Y. Kimura, Aug. 16, 1940 (TI- 2 sheets); Shisuka-shicho, Nishinokoro <50-upper r.>, Y. Hoshino et al., Aug. 17, 1933 (SAPS); Kitashiretoko [Peninsula?] <51- to 55->, S. Sugawara 17380, Jul. 25, 1935 (SAPT); Kitashiretoko Peninsula, Naifuto <51-lower l.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); Lak. Solenuiya <51-lower r.>, K. Miyabe & T. Miyagi, Jul. 26, 1906 (SAPS); Kitashiretoko Peninsula, Funakoshi <51-lower r.>, Y. Hoshino et al., Jul. 23, 1933 (SAPS); Kitashiretoko Peninsula, Kitashiretoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 19, 1933 (SAPS); Shisuka, Kitashiretoko-misaki <55-lower r.>, S. Sugawara 27096, Jul. 25, 1935 (SAPS).

SOUTH. Shisuka-cho, Otasu <56-upper r.>, Y. Hoshino et al., Jul. 8, 1933 (SAPS); Maguntan <57-lower l.>, S. Saito, Aug. 5, 1929 (TI); Motodomari-shicho, Mt. Tosso-zan <57-lower l.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI); Odasamu <59-lower l.>, S. Otagiri, Jul. 1, 1930 (KYO); Fukakusa (Kurokawa) <62-lower l.>, S. Sugawara, Aug. 10, 1922 (SAPS).

[No Locality]. Komatu, 1909 (TI- 2 sheets).

#### <THE KURILS>

NORTH. SHUMSHU <02>. [no locality], S. Gunji, 1898 (SAPS); near Bettobu, S. Yokoyama, Sep. 22, 1893 (SAPS- 2 sheets); [no locality], T. Ishikawa, Jun. 29, 1894 (SAPS); [no locality], T. Ishikawa, Jul. 29, 1894 (SAPS); Kataoka, Bettobu, K. Endo, Aug. 24, 1903 (SAPS); [no locality], [no collector's name], Sep., 1917 (MAK 74956); Bettobi-numa–Bettobi-gyojyo, T. Ohashi, Aug. 13, 1932 (KYO); Bettobi, J. Ohwi & R. Yoshii 18, Jul. 25, 1934 (KYO); S of Pochtareva Cape, Y. Kuwahara 151, Aug. 8, 1997 (SAPS); S of Pochtareva Cape, H. Takahashi 23404, Aug. 8, 1997 (SAPS); Babushkina Bay, H. Takahashi 23517, Aug. 10, 1997 (SAPS). PARAMUSHIR <03>. Murakami-wan, Kitahara, Jul., 1916 (TI); Tomarizaki, Y. Kudo 5738, Aug. 7, 1920 (SAPS); Chitosewan, Y. Kudo 4852, Jun. 26, 1920 (SAPS); Shiribachi, Y. Kudo 4904, Jun. 27, 1920 (SAPS); Murakami-wan, Y. Kudo 4981, Jul. 4, 1920 (SAPS); Murakami-wan, Y. Kudo 4991, Jul. 6, 1920 (SAPS); Tomarizaki, Y. Kudo 5774, Aug. 6, 1920 (SAPS); Murakami-wan, M. Tatewaki 17242, May 29, 1930 (SAPS); Upstream of Ohtani River and foot of Mt. Hakuen., K. Kojima 1443, Jul. 31, 1932 (TNS); Suribachi Bay, J. Ohwi & R. Yoshii 5408, Jul. 22, 1934 (KYO); Kashiwahara Bay, J. Ohwi & R. Yoshii 5959, Aug. 2, 1934 (KYO); Vasil'yeva Bay, N of Lake Pernatoye, Y. Kuwahara, Aug. 3, 1996 (SAPS); Vasil'yeva Bay,

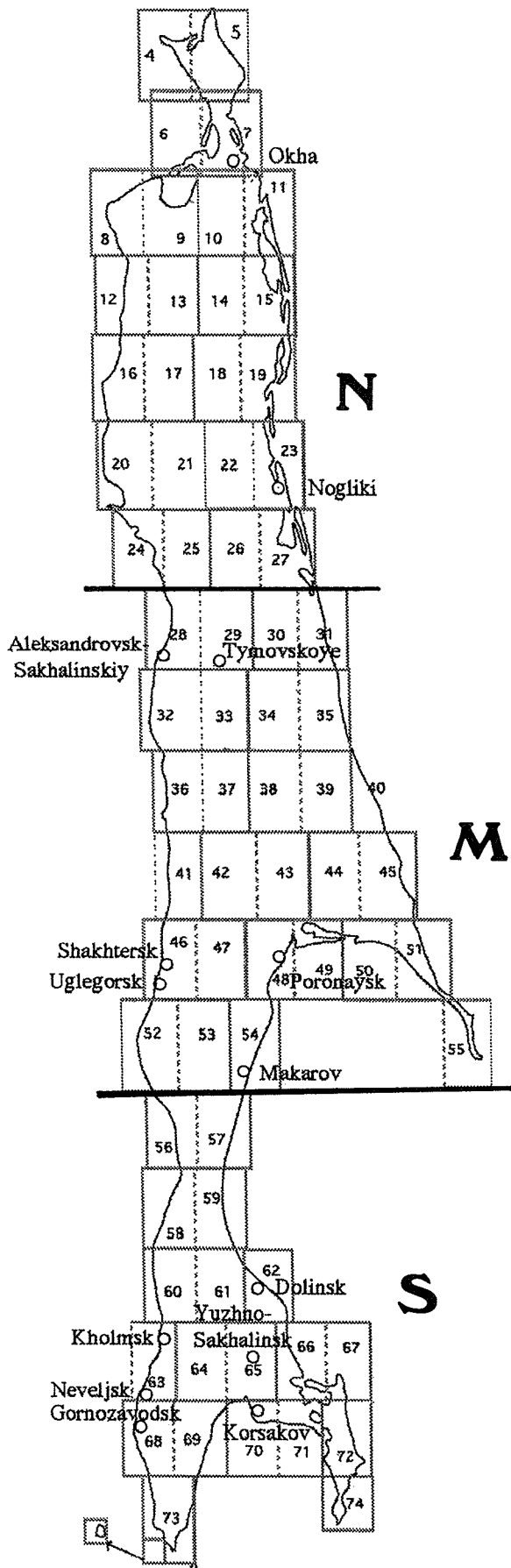


Figure 1. A map showing the division into the southern (S), middle (M) and northern (N) parts. The grid numbers are equivalent to those in a list of Appendix and the map "Atlas of Sakhalin Region part I Sakhalin (1994)".

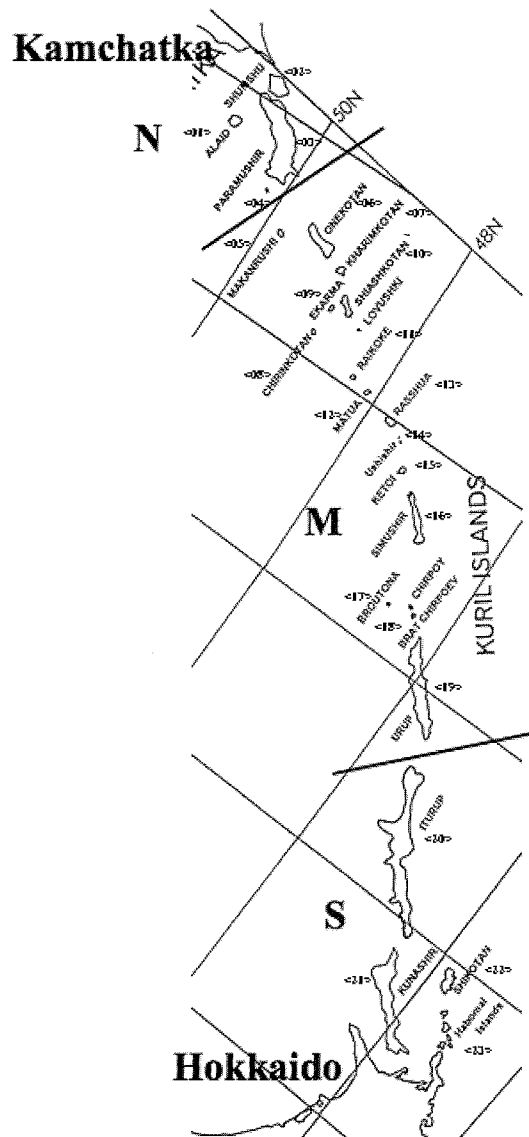


Figure 2. A map of the Kuril Islands showing the division into the southern (S), middle (M) and northern (N) parts. The island numbers are equivalent to those in a list of Appendix.

around Lake Pernatoye, Y. Kuwahara, Aug. 3, 1996 (SAPS); Vasil'yeva Bay., H. Takahashi 21022, Aug. 3, 1996 (SAPS); Utiosnaya Bay, V. Y. Barkalov 97040, Jul. 13, 1997 (SAPS); Vasil'yeva Bay, H. Takahashi 28048, Jul. 25, 2000 (SAPS). [Island uncertain; Shumshu or Paramushir], K. Fujita, 1944-45 (TNS 219293).

MIDDLE. SHIASHKOTAN <10>. Zakatnaya Bay, H. Takahashi 21775, Aug. 12, 1996 (SAPS). RASSHUA <13>. Onuma, M. Tatewaki & K. Takahashi 15165, Aug. 5, 1929 (SAPS); Yoriki-hama, H. Takahashi 19256, Aug. 13, 1995 (SAPS). KETOI <15>. Kodakigawa, M. Tatewaki & K. Takahashi 15288, Aug. 15, 1929 (SAPS); Lake Ketoi, M. Tatewaki & K. Takahashi 15349, Aug. 17, 1929 (SAPS); Isozaki, M. Tatewaki & K. Takahashi 15577, Aug. 24, 1929

(SAPS). SIMUSHIR <16>. Broton Bay, Cap. Taketomi, Aug. 1926 (SAPS); Broton Bay, M. Tatewaki & Y. Tokunaga 11668, Aug. 14, 1928 (SAPS); Yamagoshizaki, M. Tatewaki & Y. Tokunaga 11773, Aug. 16, 1928 (SAPS); Wan-oku, M. Tatewaki 12059, Aug. 25, 1928 (SAPS). URUP <19>. [no locality], S. Fujimura, 1891 (SAPS); Yoshinohama, K. Jimbo, Jun. 18, 1891 (SAPS); Yoshinohama, K. Uchida, Jun. 18, 1891 (SAPS); Ahunruimori, K. Jimbo, Jun. 25, 1891 (SAPS); Afunruimoi, K. Uchida, Jun. 25, 1891 (SAPS); Kobune, M. Tatewaki 9806, Aug. 26, 1927 (SAPS); Daibahama, M. Tatewaki 9906, Sep. 1, 1927 (SAPS); Van-Der-Lind Cape, M. Ohara, Aug. 26, 1995 (SAPS); Van-Der-Lind Cape, H. Takahashi 20056, Aug. 26, 1995 (SAPS); Barhatny Bay, H. Takahashi 20109, Aug. 28, 1995 (SAPS).

SOUTH. ITURUP <20>. Moyoro Volcano, T. Ishikawa, Sep. 5, 1890 (SAPS); Mt. Atoiya, T. Kawakami 188, Aug. 12, 1898 (SAPS); Toshiruri, T. Kawakami 396, Sep., 1898 (SAPS); Shibetoro–Moyoro, G. Aizawa, Jul. 5, 1900 (SAPS); Shibetoro–Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Mt. Atoiya, K. Kondo 2238, Jul. 21, 1927 (TI- 2 sheets); Oyachi, S. Saito, Aug. 11, 1928 (TI- 2 sheets); Toshimoe–Rubetsu, S. Saito 6024, Sep. 3, 1928 (TI); Moyoro–Shibetoro, B. Yoshimura & H. Yokoyama, Aug. 5, 1938 (SAPS); Tannemoe, Chishima-chosasyo, Aug. 30, [no year; prob. 1939] (SAPS); Shana vill., near wetland of Yanketou, T. Azuma et al. 3320, Jun. 24, 2002 (SAPT). KUNASHIR <21>. Seseki, M. Tatewaki 3011, Jul. 20, 1923 (SAPS, SAPT); Furukamapp, M. Tatewaki 3493, Jul. 26, 1923 (SAPS); Furukamappu, Oyachi, J. Ohwi 3397, Aug. 12, 1923 (TNS 219293); Furukamappu, J. Ohwi, Aug. 20, 1931 (KYO); [no locality], [no collector's name], 1935 (KYO); Chibukaribetsu–Zaimokuiwa, K. Ito, Jun. 16, 1939 (SAPS); Chibukaribetsu–Tomari, K. Ito, Jun. 16, 1939 (SAPS); Yuzhno-Kuril'skiy, Y. Marusik, Sep. 2, 1995 (SAPS). SHIKOTAN <22>. Kiritoshi–Debari, J. Ohwi, Aug. 7, 1931 (KYO).

## 2. *Arctericia nana* (Maxim.) Makino [Komebatsugazakura] <THE KURILS>

NORTH. SHUMSHU <02>. [no locality], K. Yendo, Aug., 1903 (TI); S of Pochtareva Cape, H. Takahashi 23367b, Aug. 8, 1997 (SAPS). PARAMUSHIR <03>. Mt. Sannoheyama, J. Ohwi & R. Yoshii 6119, Aug. 9, 1934 (KYO).

MIDDLE. MAKANRUSHI <05>. [no locality], M. Tatewaki 11219, Aug. 9, 1928 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 11060, Aug. 8, 1928 (SAPS); Nemo Bay, H. Takahashi 21247, Aug. 4, 1996 (SAPS). KHARIMKOTAN <07>. [no locality], M. Tatewaki 17296, Jun. 4, 1930 (SAPS); Lazurnoye Pond, H. Takahashi 28171, Jul. 28, 2000 (SAPS). EKARMA <09>. [no locality], M. Tatewaki 11378, Aug. 11, 1928 (SAPS); Cape Shpilovoy, H. Takahashi 21678, Aug. 10, 1996 (SAPS). SHIASHKOTAN <10>. Otomewan, M. Tatewaki 17339, Aug. 6, 1930 (SAPS). MATUA <12>. Mt. Fuyo, M. Tatewaki & Y. Tokunaga 12218, Sep. 5, 1928 (SAPS). RASSHUA <13>. Sonraku-wan, M. Tatewaki & K. Takahashi 15022, Aug. 4, 1929 (SAPS); Side of Mt. Chotozan, M. Tatewaki & K. Takahashi 15105, Aug. 5, 1929 (SAPS); Top of Mt. Chotozan, M. Tatewaki & K. Takahashi 15317, Aug. 10, 1929 (SAPS); Yoriki-hama, H. Takahashi 19191, Aug. 12, 1995 (SAPS); Yoriki-hama, H. Takahashi 19213, Aug. 13, 1995 (SAPS); Yoriki-hama, H. Takahashi 19222, Aug. 13, 1995

(SAPS). KETOI <15>. Kodakigawa, M. Tatewaki & K. Takahashi 15319, Aug. 15, 1929 (SAPS); Stochnyy River, H. Takahashi 19605, Aug. 19, 1995 (SAPS). SIMUSHIR <16>. Broton, Uratomine, M. Tatewaki & Y. Tokunaga 11759, Aug. 15, 1928 (SAPS); Nakadomari, near Nakayama, M. Tatewaki & Y. Tokunaga 11901, Aug. 17, 1928 (SAPS); Lake Midori, M. Tatewaki & Y. Tokunaga 11961, Aug. 18, 1928 (SAPS); Near Simushir, M. Tatewaki & Y. Tokunaga 11865, Sep. 13, 1928 (SAPS); Nakatomari Bay, H. Takahashi 19773, Aug. 22, 1995 (SAPS); Nakatomari Bay, H. Takahashi 19783, Aug. 22, 1995 (SAPS). URUP <19>. Tokotan, M. Tatewaki 10085, Sep. 7, 1927 (SAPS).

SOUTH. ITURUP <20>. Mts. Peretarabetsu, T. Ishikawa, Aug., 1890 (SAPS); Mts. Peretarabetsu, K. Jimbo, Jun. 1, 1891 (SAPS); Mt. Moyoro, T. Kawakami 187, Aug. 12, 1898 (SAPS); Shana – Sashiusu, S. Saito, Aug. 20, 1928 (TI- 2 sheets); Mt. Sashiusu, S. Saito 6118, Aug. 22, 1928 (TI- 2 sheets); Mt. Hitokappu-yama, R. Yoshii, Aug. 13, 1933 (KYO); Minami-Chiripp, B. Yoshimura & H. Yokoyama, Jul. 24, 1938 (SAPS); Mt. Moyoro, B. Yoshimura & H. Yokoyama, Aug. 4, 1938 (SAPS). KUNASHIR <21>. [no locality], S. Murata, 1935 (KYO); Mt. Chacha, K. Ito, Aug., 1939 (SAPS). SHIKOTAN <22>. Umanose, A. Kimura, Aug. 15, 1933 (KYO).

## 3. *Arctostaphylos uva-ursi* (L.) Spreng. [Kumakokemomo] <SAKHALIN>

NORTH. Luguri–Okha <7-lower l.>, Y. Kudo & B. Ishida 7225, Aug. 31, 1923 (SAPS); Oha <7-lower r.>, Okada, Sep. 2, 1923 (TI); 15km S of Okha <10-upper r.>, H. Takahashi 31168, Jul. 28, 2003 (SAPS); Chaio-kaigan <19-lower l.>, Y. Kusano, 1921 (SAPS); Nogliki–Okha, 5km S of Val <19-lower l.>, H. Takahashi 31116, Jul. 27, 2003 (SAPS); Nogliki–Okha, 5km S of Val <19-lower l.>, H. Takahashi 31129, Jul. 27, 2003 (SAPS). Northern part of N. Sakhalin <?>, M. Arakawa, Aug., 1923 (TNS 5139589).

## 4. *Arctous alpina* (L.) Nied. [Urashima-tsutsuji, Kumakokemomo] <SAKHALIN>

NORTH. SE from the Cape of Maria, around the Lake Monchigar <04-upper r.>, T. Fukuda 1704, Aug. 6, 2001 (SAPS); Around Pilewo, mountain <04-lower r.>, Y. Kudo & B. Ishida 7045, Aug. 24, 1923 (SAPS); Pilituk, dry peat <07-upper l.>, Y. Kudo & B. Ishida 7145, Aug. 28, 1923 (SAPS); Uruta, on the hill, alpine meadows <07-lower r.>, Y. Kudo & B. Ishida 7281, Sep. 1, 1923 (SAPS); East of the Gulf of Piltun, Vstrechnaya Bogs <11-upper l.>, T. Fukuda 1541, Aug. 4, 2001 (SAPS); Chaio-kaigan <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS); Nyiwo, in arenosis litoralibus <23-lower l.>, Y. Kudo & M. Tatewaki 6490, Aug. 12, 1922 (SAPS).

MIDDLE. Shisuka-shicho, Mt. Sekkai-yama (60, 61-rinpan) <39-lower l.>, B. Yoshimura & M. Hara (89), Jul. 15, 1937 (SAPS, TNS 219227); Shisuka-shicho, Chirie-gun, Naruko <45-upper r.>, M. Tatewaki & Y. Takahashi 22858, Jun. 26, 1936 (SAPS); Shikka Distr., Naruko <45-upper r.>, B. Yoshimura, Aug. 8, 1936 (SAPS); Mt. Shisuka-dake <47-upper l.>, S. Sugawara 17392, Jul., 1931 (SAPT); Shisuka-shicho, Motomari <51-upper l.>, Y. Hoshino et al., Aug. 3, 1933 (SAPS); Lak. Solenuiya <51-lower r.>, K. Miyabe & T. Miyagi, Jul. 26,

1906 (SAPS); Chirie, back of settlement <51-lower r.>, J. Ohwi, Aug. 1, 1932 (KYO); Kitashiretoko Peninsula, Funakoshi <51-lower r.>, Y. Hoshino et al., Jul. 23, 1933 (SAPS); Shisuka, Nushike <51-lower r.>, S. Sugawara 26994, Jul. 24, 1935 (SAPS); W. Coast, Mt. Ushoro <52-upper r.>, T. Miyake, Aug. 31, 1907 (TNS 397515); Kitashiretoko Peninsula, Enton <55-upper l.>, Y. Hoshino et al., Jul. 21, 1933 (SAPS); Kitashiretoko Peninsula, Enman-Rosoku-iwa <55-upper r.>, Y. Hoshino et al., Jul. 21, 1933 (SAPS); Kitashiretoko Peninsula, Harato-zaki <55-lower r.>, Y. Hoshino et al., Jul. 19, 1933 (SAPS).

SOUTH. E. Coast, Mt. Nupuripo <57-lower l.>, T. Miyake, Aug. 13, 1907 (SAPS, TNS 380588); Mt. Tosso <57-lower l.>, S. Sugawara 17391, Jul., 1925 (SAPT); Mt. Tosso <57-lower l.>, G. Yamada, Aug. 4, 1926 (KYO); Mt. Tosso <57-lower l.>, N. Hiratsuka, Jul. 20, 1927 (TNS 513986); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka et al., Jul. 23, 1927 (SAPS); Mt. Nupuripo <57-lower l.>, S. Saito, Aug. 3, 1929 (TI- 2 sheets); Upper part of Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TI); 80 Km N of Dolinsk, Tsapko to N peak of Mt. Vladimirovka <57-lower l.>, H. Takahashi 29575, Aug. 2, 2001 (SAPS); Kashipo, Kitanodake <57-upper r.>, A. Abumiya et al., Aug. 13, 1932 (SAPS); Kashipo, Horonaipodake <57-upper r.>, A. Abumiya et al., Aug. 15, 1932 (SAPS); E. Coast, Shiraraka <59-upper l.>, T. Miyake, Sep. 20, 1907 (SAPS, TNS 380589); Summit of Mt. Susuya <65-upper r.>, K. Numajiri, Aug. 6, 1925 (TNS); Mt. Susuya, 8-gome <65-upper r.>, H. Hara, Aug. 13, 1928 (TI).

#### <THE KURILS>

NORTH. SHUMSHU <02>. [no locality], S. Seki, 1895 (SAPS); On the hill, K. Endo, Jul. 20, 1903 (SAPS); [no locality], K. Endo, Aug., 1903 (TNS 24123); Kodomari-Numajiri, Y. Okada, Aug. 17, 1931 (TNS 306780); Hyakuikagahara, Y. Okada, Aug. 18, 1931 (TNS); [no locality], T. Ohashi, Aug., 1932 (KYO); Koseki-gawa-Shiroiwa, T. Ohashi, Aug. 28, 1932 (KYO); Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5648, Jul. 28, 1934 (KYO); S of Pochtareva Cape, H. Takahashi 23374, Aug. 8, 1997 (SAPS). PARAMUSHIR <03>. Shiribachi, Y. Kudo 4905, Jun. 27, 1920 (SAPS); Murakamiwan, Y. Kudo 5014, Jul. 7, 1920 (SAPS); Nagaiwasaki, Y. Kudo 5133, Jul. 11, 1920 (SAPS); Yotsuiwahama, Y. Kudo 5177, Jul. 12, 1920 (SAPS); Shirakawa, Y. Kudo 5604, Jul. 30, 1920 (SAPS); Tomarizaki, Y. Kudo 5781, Aug. 8, 1920 (SAPS); Arakawa, Y. Okada, Aug. 10, 1931 (TNS 302685); Suribachi-wan, J. Ohwi & R. Yoshii 5354, Jul. 22, 1934 (KYO); Vasil'yeva Bay, side of Lake Pernatoye, H. Takahashi 21037, Aug. 3, 1996 (SAPS).

MIDDLE. MAKANRUSHI <05>. [no locality], M. Tatewaki 11220, Aug. 9, 1928 (SAPS); Zakha Bay, H. Takahashi 24034, Aug. 18, 1997 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 17285, Jun. 3, 1920 (SAPS); Nemo, M. Tatewaki 11035, Aug. 8, 1928 (SAPS); Nemo, M. Tatewaki 11145, Aug. 9, 1928 (SAPS); Minamiura, M. Tatewaki 17316, Jun. 6, 1930 (SAPS); Nemo Bay, slope, H. Takahashi 21218, Aug. 4, 1996 (SAPS); Nemo Bay, terrace, H. Takahashi 21224, Aug. 4, 1996 (SAPS); Nemo Bay, tundra, O. Kolesnikova, Jul. 27, 2000 (SAPS). KHARIMKOTAN <07>. Mishima, M. Tatewaki 17209, May 28, 1930 (SAPS); [no locality], M. Tatewaki 17305, Jun. 4, 1930 (SAPS); Lazurnoye Pond, H. Takahashi 28143, Jul. 28, 2000 (SAPS). SHIASHKOTAN <10>. Otome-wan, M. Tatewaki 17349, Jun. 6, 1930 (SAPS); Zakatnaya Bay, H. Takahashi 21830, Aug. 12, 1996 (SAPS). MATUA <12>.

Dvoynaya Bay-Aynu Bay, H. Takahashi 22071, Aug. 15, 1996 (SAPS). RASSHUA <13>. Mikasa, M. Tatewaki & Y. Tokunaga 12427, Aug. 6, 1928 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14899, Aug. 3, 1929 (SAPS); Sonrakuwan, M. Tatewaki & K. Takahashi 15024, Aug. 4, 1929 (SAPS); Top of Mt. Chotozan, M. Tatewaki & K. Takahashi 15315, Aug. 10, 1929 (SAPS); Yoriki-hama, H. Takahashi 19192, Aug. 12, 1995 (SAPS); Yoriki-hama, H. Takahashi 19164, Aug. 12, 1995 (SAPS). USHISHIR-RYPONKICHA <14a>. [no locality], M. Tatewaki & Y. Tokunaga 12561, Aug. 11, 1928 (SAPS); [no locality], M. Tatewaki & Y. Tokunaga 12544, Aug. 11, 1928 (SAPS); On the terrace, H. Takahashi 22958, Aug. 2, 1997 (SAPS). KETOI <15>. [no locality], M. Tatewaki & Y. Tokunaga 11507, Sep. 1, 1928 (SAPS); Minami, M. Tatewaki & K. Takahashi 15177, Aug. 14, 1929 (SAPS); Minami-ura, M. Tatewaki & K. Takahashi 15464, Aug. 20, 1929 (SAPS); Isozaki, M. Tatewaki & K. Takahashi 15557, Aug. 24, 1929 (SAPS); Ishikuzurehamadai, M. Tatewaki & K. Takahashi 15752, Sep. 4, 1929 (SAPS); Stochnyy River, H. Takahashi 19565, Aug. 19, 1995 (SAPS). SIMUSHIR <16>. Broughton Bay, I. Kodama, Jun., 1898 (SAPS); Broton Bay, M. Tatewaki & Y. Tokunaga 11749, Aug. 15, 1928 (SAPS); Yamagoshizaki, M. Tatewaki & Y. Tokunaga 11784, Aug. 16, 1928 (SAPS); Broughton Bay, M. Tatewaki 17405, Jun. 9, 1930 (SAPS); Malaya Inlet, H. Takahashi 19537, Aug. 18, 1995 (SAPS). CHIRPOI <18a>. Peschanaya Bay, H. Takahashi 19858, Aug. 23, 1995 (SAPS); Peschanaya Bay, H. Takahashi 19869, Aug. 23, 1995 (SAPS). URUP <19>. Anama-Yoshinohama, K. Uchida, Jun. 17, 1891 (SAPS); Kobune, M. Tatewaki 9816, Aug. 26, 1927 (SAPS); Tokotan, M. Tatewaki 9669, Aug. 29, 1927 (SAPS); Tokotan River, M. Tatewaki 10092, Sep. 13, 1927 (SAPS); Natalii Bay, H. Takahashi 18730, Aug. 7, 1995 (SAPS); Natalii Bay, H. Takahashi 18749, Aug. 7, 1995 (SAPS).

SOUTH. ITURUP <20>. [no locality], K. Yamagata, Oct., 1898 (SAPS); Porosu-Sokiya, B. Yoshimura & H. Yokoyama, Jul. 30, 1938 (SAPS). SHIKOTAN <22>. Mt. Shakotan-yama, [no collector's name; prob. H. Takeda], Jul. 17, 1909 (SAPS); Mt. Shakotan, S. Saito, Aug. 30, 1925 (TI); Mt. Okkaibetsu, S. Saito, Sep. 5, 1925 (TI); Nodoro-Inemoshiri, S. Saito 1582, Sep. 6, 1925 (TI); [no locality], K. Kondo 7823, Aug. 11, 1927 (TI); [no locality], K. Kondo 7834, Aug. 11, 1927 (TI- 2 sheets); Mt. Shakotan, K. Kondo 5977, Aug. 6, 1929 (TI); Chiboi, K. Kondo, Aug. 10, 1929 (TI- 2 sheets); Anama, K. Kondo (6190), Aug. 28, 1929 (TI- 2 sheets, TNS); Horobetsu-Okkaibetsu, K. Kondo, Aug. 31, 1929 (TI); Mt. Okkaibetsu, Horobetsu-Nodoro, S. Saito 317, Sep. 5, 1929 (TI); Matakotan, J. Ohwi, Jul. 19, 1931 (KYO); [no locality], K. Numajiri, [no date] (TNS 131013).

#### 5. *Bryanthus gmelinii* D. Don [Chishima-tsugazakura] <THE KURILS>

NORTH. SHUMSHU <02>. Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5610, Jul. 28, 1934 (KYO); Kodomari-Numajiri, Y. Okada, Aug. 17, 1937 (TNS); S of Pochtareva Cape, H. Takahashi 23369, Aug. 8, 1997 (SAPS). PARAMUSHIR <03>. Suribachi, Y. Emoto, Aug. 12, 1917[9?] (TI); Yotsuiwahama, Y. Kudo 5178, Jul. 12, 1920 (SAPS); Yotsuiwahama, Y. Kudo 5305, Jul. 14, 1920 (SAPS); Arakawa, Y. Okada, Aug. 11, 1931 (TNS); Mt. Yake-dake, K. Kojima 1446, Aug. 5-7, 1932 (TNS); Murayama-wan, J. Ohwi 6021, Jul. 30, 1934 (TNS); Raisha, J.



Ohwi & R. Yoshii 6021, Aug. 6, 1934 (KYO); Kakumabetsu, Mt. Sannohe-yama, J. Ohwi (& R. Yoshii) 6122, Aug. 9, 1934 (KYO, TNS). [Island uncertain; Shumshu or Paramushir], T. Ohashi, 1932 (KYO).

MIDDLE. MAKANRUSHI <05>. [no locality], M. Tatewaki 11218, Aug. 9, 1928 (SAPS); [no locality], M. Tatewaki 11381, Aug. 11, 1928 (SAPS); Zakat Bay, H. Takahashi 24040, Aug. 18, 1997 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 11024, Aug. 8, 1928 (SAPS); Nemo, M. Tatewaki 11138, Aug. 9, 1928 (SAPS); Nemo, M. Tatewaki 11147, Aug. 9, 1928 (SAPS); M. Tatewaki, Jun. 3, 1930 (TNS); Nemo Bay, H. Takahashi 21227, Aug. 4, 1996 (SAPS). KHARIMKOTAN <07>. Nishiura, M. Tatewaki 17289, Jun. 3, 1930 (SAPS); Higashiura, M. Tatewaki 17297, Jun. 4, 1930 (SAPS); S of Lazurnoye Pond, H. Takahashi 28144, Jul. 28, 2000 (SAPS). SHIASHKOTAN <10>. Zakatnaya Bay, H. Takahashi 28241, Jul. 29, 2000 (SAPS). RASSHUA <13>. Side of Mt. Choto-zan, M. Tatewaki & K. Takahashi 15141, Aug. 5, 1929 (SAPS); Sonraku-wan, M. Tatewaki & K. Takahashi 15288, Aug. 9, 1929 (SAPS); Yoriki-hama, H. Takahashi 19236, Aug. 13, 1995 (SAPS). KETOI <15>. Kodakigawa, M. Tatewaki & K. Takahashi 15253, Aug. 15, 1929 (SAPS); Kodakigawa, M. Tatewaki & K. Takahashi 15293, Aug. 15, 1929 (SAPS); Isozaki, M. Tatewaki & K. Takahashi 15571, Aug. 24, 1929 (SAPS); Ishikuzurehamadai, M. Tatewaki & K. Takahashi 15752, Sep. 4, 1929 (SAPS). SIMUSHIR <16>. Yamagoshizaki, M. Tatewaki & Y. Tokunaga 11770, Aug. 16, 1928 (SAPS); Nakadomari, M. Tatewaki & Y. Tokunaga 11898, Aug. 17, 1928 (SAPS).

SOUTH. ITURUP <20>. Mt. Atoiya-yama, T. Kawakami, Aug. 11, 1898 (SAPS- 2 sheets); Mt. Sashiusu, S. Saito 4006, Aug. 22, 1928 (TI- 2 sheets); Shibetoro-Moyoro, B. Yoshimura & H. Yokoyama, Aug. 2, 1938 (SAPS); Mt. Moyoro, B. Yoshimura & H. Yokoyama, Aug. 4, 1938 (SAPS). KUNASHIR <21>. Mt. Rausu, B. Sawazaki 3723, Aug. 5, 1923 (SAPS).

## 6. *Cassiope ericoides* (Pall.) D. Don [Karafuto-iwahige] <SAKHALIN>

MIDDLE. Upstream of Hoe River, Experiment Forest of Kyushu Univ. <42-lower l.>, [no collector's name], 1930 (SAPS); Upstream of Hoe River <42-lower l.>, S. Sugawara 17420, Jul., 1932 (SAPT); Upstream of Hoe River <42-lower l.>, S. Sugawara 17421 & 17422, Aug., 1932 (SAPT- 2 sheets); Mt. Shisuka-yama <47-upper l.>, R. Kohno, Jul., 1933 (SAPS); Upstream of Shisuka River, divide <47-upper l.>, S. Sugawara 17427, Jul., 1933 (SAPT); Upstream of Shisuka River, divide <47-upper l.>, S. Sugawara 17424-17426, Aug., 1933 (SAPT- 3 sheets).

## 7. *Cassiope lycopodioides* (Pall.) D. Don [Iwahige] <SAKHALIN>

SOUTH. E. Coast, Mt. Nupuripo <57-lower l.>, T. Miyake, Aug. 13, 1907 (SAPS, TNS); Mt. Tosso <57-lower l.>, S. Sugawara 17412, Jul. 12, 1925 (SAPT); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka (N. Hiratsuka et al.), Jul. 23, 1927 (SAPS, TNS); Mt. Nupuripo <57-lower l.>, S. Saito, Aug. 3, 1929 (TI); Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TI- 2 sheets); Mt. Tosso <57-lower l.>, J. Ohwi, Jul. 22, 1932 (KYO); Mt. Tosso <57-lower l.>, S. Sugawara 17411,

Jul. 18, 1935 (SAPT); Mt. Kashipo-yama <57-upper r.>, J. Ohwi, Jul. 23, 1932 (KYO); Kashipo, Nakanodake <57-upper r.>, H. Abumiya et al., Aug. 1, 1932 (SAPS); Mt. Susuya <65-upper r.>, S. Sugawara 17413 & 17414, Jul. 12, 1928 (SAPT- 2 sheets).

## <THE KURILS>

NORTH. ATLASOVA <01>. Kitaura, alt. 600m, S. Ito & G. Komori, Jul. 23, 1926 (SAPS); [no locality], Y. Okada, Jul. 14, 1931 (TNS). SHUMSHU <02>. (Kataokawan), K. Yendo, Jul. 13, 1903 (SAPS, TI); [no locality], K. Endo, Aug., 1903 (TNS); Kataoka-wan, M. Tatewaki 17257, May 30, 1930 (SAPS); Hyakuike-gahara, Y. Okada, Aug. 18, 1931 (TNS); Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5619, Jul. 28, 1934 (KYO); Kataoka, J. Ohwi & R. Yoshii 247, Aug. 18, 1934 (KYO). PARAMUSHIR <03>. Musashi-wan, M. Aizawa, Jun. 22, 1900 (SAPS); Kuzira-wan, T. Matsubara, Jul. 24, 1917 (SAPS); Shikatanoma, Y. Kudo 5086, Jul. 11, 1920 (SAPS); Hirata-zaki, Y. Kudo 5390, Jul. 21, 1920 (SAPS); [no locality], K. Numajiri, Aug., 1926 (TNS); Chikura-dake, Y. Okada, Jul. 30, 1931 (TNS); Kuzira-hama, H. Koidzumi, Jul. 25, 1932 (TNS); [no locality], T. Ohashi, Aug., 1932 (KYO); Suribachi(-wan), J. Ohwi (& R. Yoshii) 5390, Jul. 22, 1934 (KYO, SAPS).

MIDDLE. MAKANRUSHI <05>. [no locality], M. Tatewaki 11223, Aug. 9, 1928 (SAPS); Zakat Bay, H. Takahashi 24000, Aug. 18, 1997 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 11042, Aug. 8, 1928 (SAPS); Minamiura, M. Tatewaki 17321, Jun. 6, 1930 (SAPS); Nemo Bay, Y. Kuwahara, Aug. 4, 1996 (SAPS); Nemo Bay, M. Yabe, Aug. 4, 1996 (SAPS); Nemo Bay, H. Takahashi 21205, Aug. 4, 1996 (SAPS); Mussel Bay-Kol'tsevoye, H. Takahashi 21404, Aug. 7, 1996 (SAPS). KHARIMKOTAN <07>. Nishiura, M. Tatewaki 17215, May 28, 1930 (SAPS). EKARMA <09>. [no locality], M. Tatewaki 11376, Aug. 11, 1928 (SAPS); Cape Shpilevoy, H. Takahashi 21671, Aug. 10, 1996 (SAPS). SHIASHKOTAN <10>. Otomewan, M. Tatewaki 17340, Jun. 6, 1930 (SAPS); Zakatnaya Bay, H. Takahashi 21829, Aug. 12, 1996 (SAPS). RAIKOKE <11>. E side of island, H. Takahashi 21900, Aug. 13, 1996 (SAPS); E side of island, H. Takahashi 21909, Aug. 13, 1996 (SAPS). MATUA <12>. Yamatowan-Ainuwan, M. Tatewaki 12153, Aug. 7, 1928 (SAPS); Mt. Fuyo, M. Tatewaki & Y. Tokunaga 12216, Aug. 7, 1928 (SAPS). RASSHUA <13>. Kitakado, M. Tatewaki & Y. Tokunaga 12465, Aug. 6, 1928 (SAPS); Mikasa, M. Tatewaki & Y. Tokunaga 12341, Aug. 6, 1928 (SAPS); [no locality], N. Hitomi 12482, Aug. 9, 1928 (SAPS); Sonrakuwan, M. Tatewaki & K. Takahashi 14857, Aug. 2, 1929 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14897, Aug. 3, 1929 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14906, Aug. 3, 1929 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14913, Aug. 3, 1929 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14957, Aug. 3, 1929 (SAPS); Minamikado, M. Tatewaki & K. Takahashi 14994, Aug. 4, 1929 (SAPS); Mt. Chotozan, M. Tatewaki & K. Takahashi 15313, Aug. 10, 1929 (SAPS); Yoriki-hama, H. Takahashi 19060, Aug. 12, 1995 (SAPS). USHISHIR-RYPONKICHA <14a>. [no locality], M. Tatewaki & Y. Tokunaga 12540, Aug. 11, 1928 (SAPS); [no locality], M. Tatewaki & K. Takahashi 15926, Sep. 14, 1929 (SAPS). USHISHIR-YANKICHA <14b>. In heath, M. Tatewaki & K. Takahashi, Jul. 30, 1929 (SAPS); Kraternaya Bay, H. Takahashi 19346, Aug. 14, 1995 (SAPS); Mountain ridge, H. Takahashi 22905,

Aug. 1, 1997 (SAPS). KETOI <15>. [no locality], S. Nishida, May 5, 1928 (SAPS); [no locality], M. Tatewaki & Y. Tokunaga 11486, Sep. 1, 1928 (SAPS); Minami, M. Tatewaki & K. Takahashi 15178, Aug. 14, 1929 (SAPS); Lake Ketoi, M. Tatewaki & K. Takahashi 15337, Aug. 17, 1929 (SAPS); Ashizaki, sea-cliff, M. Tatewaki & K. Takahashi 15409, Aug. 18, 1929 (SAPS); Ashizaki, heath, M. Tatewaki & K. Takahashi 15430, Aug. 18, 1929 (SAPS); Shimizugawa, M. Tatewaki & K. Takahashi 15643, Aug. 30, 1929 (SAPS); Stochnyy River, meadow on marine terrace, H. Takahashi 19604, Aug. 19, 1995 (SAPS); Stochnyy River, meadow slope facing stream, H. Takahashi 19606, Aug. 19, 1995 (SAPS). SIMUSHIR <16>. Brotonzaki, M. Tatewaki & Y. Tokunaga 11699, Aug. 14, 1928 (SAPS); Nakayama, Nakadomari, M. Tatewaki & Y. Tokunaga 11905, Aug. 17, 1928 (SAPS); Simushir, M. Tatewaki & Y. Tokunaga 11866, Sep. 13, 1928 (SAPS); Simushir River, M. Tatewaki 17443, Jun. 9, 1930 (SAPS); Kitoboynaya Bay, H. Takahashi 18938, Aug. 10, 1995 (SAPS); Malaya Inlet, H. Takahashi 19529, Aug. 18, 1995 (SAPS). CHIRPOI <18a>. [no locality], I. Kodama, Jun., 1893 (SAPS); [as Three Brothers; prob. CHIRPOI], [no locality], T. Kitahara, Aug. 20, 1895 (SAPS); Peschanaya Bay, H. Takahashi 19847, Aug. 23, 1995 (SAPS); W of Peschanaya Bay, H. Takahashi 19897, Aug. 23, 1995 (SAPS). BRAT CHIRPOEV <18b>. [no locality], Tarao [no collector's name in MAK], Jun. 18, 1892 (SAPS, MAK 74968); Samotuga Cape, H. Takahashi 24133, Aug. 20, 1997 (SAPS); Uglovaya Bay, H. Takahashi 28506, Aug. 4, 2000 (SAPS). URUP <19>. Anama–Yoshinohama, K. Uchida, Jun. 17, 1891 (SAPS- 2 sheets); Yoshinohama, K. Jimbo, Jun. 18, 1891 (SAPS- 2 sheets); [no locality], K. Miura, Jul. 8-9, 1906 (SAPS- 2 sheets); Tokotan, M. Tatewaki 9997, Sep. 3, 1927 (SAPS); Onsenzaki, M. Tatewaki 10074, Sep. 9, 1927 (SAPS); Natalii Bay, H. Takahashi 18726, Aug. 7, 1995 (SAPS); Natalii Bay, H. Takahashi 18745, Aug. 7, 1995 (SAPS); Ukromnaya Bay, H. Takahashi 22176, Aug. 20, 1996 (SAPS).

SOUTH. ITRUP <20>. Peretarabetsu Volc., T. Ishikawa, Aug., 1890 (SAPS, TI); Perekarabets Mt., K. Jimbo, Jun. 1, 1891 (SAPS, TI); Mt. Moyoro, K. Fukuzawa, Aug. 27, 1893 (SAPS- 2 sheets); Moyoro, T. Kawakami 97, Aug. 12, 1898 (SAPS); Mt. Chirippu, T. Kawakami 97, Aug. 19, 1898 (SAPS); Rawakozima, T. Kawakami 94, Aug. 27, 1898 (SAPS); Moyoro, Chishima-chosasyo, Sep. 15, [no year; prob. 1939] (SAPS); Toro, K. Miura, Jul. 24, 1906 (SAPS- 2 sheets); Porosu–Sokiya, Ken. Miyabe & G. Tanaka, Jul. 26, 1910 (SAPS); Toshimoe, Mt. Sashiusu, S. Saito 6117 & 6119, Aug. 22, 1928 (TI- 3 sheets); Minami-Chirippu, B. Yoshimura & H. Yokoyama, Jul. 24, 1938 (SAPS); Mt. Atosa-yama, B. Yoshimura, Aug. 14, 1939 (SAPS). KUNASHIR <21>. Mt. Chacha, T. Ishikawa, Jul. 21, 1894 (SAPS- 2 sheets); Mt. Chacha, M. Nagai & M. Shimamura, Jul. 26, 1929 (SAPS- 5 sheets); Mt. Iwo-zan, Y. Matsumura, Jul. 20, 1930 (KYO); Mt. Chacha, K. Ito, Aug., 1939 (SAPS); [no locality], [no collector's name], [no date] (KYO). SHIKOTAN <22>. [no locality], K. Numajiri, Aug., 1928 (TNS).

[Island Uncertain]. S. Koriba & R. Yoshii, [no date] (KYO).

**8. Chamaedaphne calyculata** (L.) Moench [Yachitsutsuji]  
<SAKHALIN>

NORTH. Pomeri–Moskarivo, Takada-shokai, on the peat <06-lower r.>, Y. Kudo & B. Ishida 7334, Aug. 31, 1923 (SAPS); Luguri–Okha <07-lower l.>, Y. Kudo & B. Ishida 7228, Aug. 31, 1923 (SAPS); Along the Baikal Bay <09-upper l.>, Y. Kudo & B. Ishida 7436, Sep. 5, 1923 (SAPS); 15km S of Okha <10-upper r.>, H. Takahashi 31182, Jul. 28, 2003 (SAPS); East coast, E of the Gulf of Piltun, Vstrechnaya <11-upper l.>, T. Fukuda 1502, 1535 & 1556, Aug. 4, 2001 (SAPS- 3 sheets); Seacoast of Chaio <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS); Nyiwo, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6464, Aug. 12, 1922 (SAPS); Nyiwo, Ins. Mobio, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6549, Aug. 14, 1922 (SAPS); Parukata, tundra <26-upper r.>, Y. Kudo & M. Tatewaki 6427, Aug. 10, 1922 (SAPS); Palkata <26-upper r.>, Okada, Aug. 26, 1923 (TI).

MIDDLE. Adatuim <29-upper l.>, Okada, Aug. 23, 1923 (TI); Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS); Higashiyama <38-lower l.>, T. Miyake, Aug. 28, 1906 (SAPS); 80km N of Poronaysk, Mirnyy–Pervomayskoye <38-lower l.>, H. Takahashi 30470 & 30477, Aug. 10, 2002 (SAPS- 2 sheets); Shisuka-shicho, Chirie-gun, Mirukunai <40-lower r.>, M. Tatewaki & Y. Takahashi 22499, Jun. 15, 1936 (SAPS); Vicinity of R. Wuruna <43->, T. Miyake, Aug. 22, 1906 (SAPS); Shisuka-shicho, Shibunkoro <45-lower r.>, Y. Hoshino et al., Aug. 4, 1933 (SAPS); [illegible] River, tundra <48-?>, R. Imaseki, Jul. 16, 1941 (TNS- 2 sheet); Poronaysk–Leonidovo <48-upper l.>, H. Takahashi 30531, Aug. 13, 2002 (SAPS); Nairo, Ueshiba <48-lower l.>, K. Washimi, Jun. 10, 1931 (KYO); Nairo <48-lower l.>, S. Sugawara 17431, Jul. 1, 1933 (SAPT); Experiment Forest of Kyoto Univ. <48-lower l.?>, [collector name illegible; Y. Kobayashi?], Jul. 21, 1928 (TNS); Shikka <48-upper r.>, K. Miyabe & T. Miyagi, Jul. 23, 1906 (SAPS); Telpenia Bay, Tarankotan <48-upper r.>, T. Miyake, Aug. 13, 1906 (SAPS); Ramotteiuri <48-upper r.>, T. Miyake, Aug. 15, 1906 (SAPS); Duwatakkō <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Donida <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Pamaito Detu <48-upper r.>, T. Miyake, Aug. 19, 1906 (SAPS); Shisuka <48-upper r.>, I. Namikawa, Aug. 12, 1914 (SAPS); Siska <48-upper r.>, T. Sawada, Aug. 14, 1923 (TI- 3 sheets); Shisuka, Experiment Forest of Kyoto Univ. <48-upper r.>, S. Okamoto, Jul. 28, 1928 (TNS); Shisuka <48-upper r.>, H. Ohtani & Y. Imai, Jul. 20, 1930 (SAPS); Shisuka <48-upper r.>, G. Koidzumi, Aug. 17, 1930 (KYO); Amiba <48-upper r.>, G. Koidzumi, Aug. 18, 1930 (KYO); Downstream of Horonai River, tundra <48-upper r.>, H. Hara, Aug. 2, 1931 (TI); Shisuka <48-upper r.>, H. Tobita, Jul. 23, 1935 (KYO); Shisuka, Horonai River, near Amiba <48-upper r.>, R. Imaseki, Jul. 17, 1941 (TNS- 2 sheets); Shiska <48-upper r.>, S. Kitamura, Jul. 29, 1942 (KYO); Tobani <48-upper r.?>, T. Miyake, Aug. 20, 1906 (SAPS); Shisuka-shicho, near Taraika <49-upper r.>, M. Honda & Y. Kimura, Aug. 16, 1940 (TI- 3 sheets); Shisuka-shicho, Nishinokoro <50-upper r.>, Y. Hoshino et al., Aug. 17, 1933 (SAPS); Kitashiretoko Peninsula, Noto <51-lower l.>, Y. Hoshino et al., Jul. 12, 1933 (SAPS); Kitashiretoko Peninsula, Naifuto <51-lower l.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); E. Coast, Ponkotan <54->, T. Miyake, Sep. 13, 1906 (SAPS); Kitashiretoko Peninsula, Kitashiretokomisaki <55-lower r.>, Y. Hoshino et al., Jul. 19, 1933 (SAPS).

SOUTH. E. Coast, Nupuripo <57-lower l.>, T. Miyake, Sep. 18, 1906 (SAPS); Maguntan <57-lower l.>, S. Saito 985,

Aug. 5, 1929 (TI); E. Coast, Manue <59-upper l.>, T. Miyake, Sep. 22, 1906 (SAPS); E. Coast, Manue <59-upper l.>, T. Miyake, Aug. 20[?], 1907[?] (SAPS); Odasamu <59-lower l.>, T. Wada, Sep., 1942 (TI); Aihama <61-upper r.>, S. Sugawara 17432, Aug., 1931 (SAPT); Dobuki <62-upper l.>, G. Nakahara, Jun. 24, 1906 (TNS); Sakaehama <62-upper l.>, S. Komatsu, Aug. 2, 1913 (TI); Sakaehama <62-upper l.>, S. Sugawara 17429, Aug. 10, 1923 (SAPT); By Lake Hakucho <62-upper l.>, S. Sugawara 17430, Jun. 30, 1932 (SAPT); 8 Km N of Dolinsk, Nayba River <62-upper l.>, H. Takahashi 29113, Jul. 23, 2001 (SAPS); Galkinovlaskoe <62-lower l.>, T. Miyake, Jul. 11, 1906 (SAPS); Fukakusa, Kurokawa Mire <62-lower l.>, S. Sugawara, May 1, 1925 (SAPS); Kurokawa <62-lower l.>, S. Sugawara, Jun. 10, 1927 (TI); Kurokawa Mire <62-lower l.>, H. Hara, Jul. 31, 1931 (TI- 2 sheets); 6km W of Sokol town, Mal Takoy River <62-lower l.>, H. Takahashi 29191, Jul. 20, 2001 (SAPS); Kosato <64-lower r.>, [no collector's name], Aug. 22, 1913 (TI); Rutaka <64-lower r.>, [no collector's name], Aug. 22, 1913 (TI); Vladimirohuka <65-upper l.>, K. Miyabe & T. Miyagi, Aug. 22, 1906 (SAPS); Toyokita-mura, Konuma <65-upper l.>, H. Sase, Aug. 21, 1937 (SAPS); Mitsuriohuka <65-lower l.>, G. Nakahara, Jun. 23, 1906 (TI- 2 sheets); Mituriohuka <65-lower l.>, G. Nakahara, Jun. 24, 1906 (KYO); Solowiyohuka <65-lower l.>, T. Miyake, Jun. 28, 1906 (SAPS); Mitsuriohuka <65-lower l.>, K. Miyabe & T. Miyagi, Aug. 22, 1906 (SAPS); Vspenskoe <65-lower l.>, T. Miyake, Sep. 30, 1906 (SAPS); Soriofka <65-lower l.>, U. Faurie, Jul., 1908 (KYO); Mitsuriofka <65-lower l.>, U. Faurie, Jul. 4, 1908 (KYO); Mitsuriohuka <65-lower l.>, K. Fujii, Sep. 12, 1910 (TI); Susuya moor, Ozeretskoye <65-lower l.>, S. Noshiro et al. 9707056, Jul. 5, 1997 (TI); Kamikiminai <65-lower r.>, H. Sase, Aug. 21, 1938 (TNS 91657); Okhotskoe, Sedykh Lake <66-lower l.>, S. Tsuji et al. 603, Aug. 14, 1996 (TI); Mt. Oyakochi <67-lower l.>, T. Miyake, Jun. 25, 1908 (SAPS); Uryu <69-upper r.>, [no collector's name], Aug. 21, 1913 (TI- 2 sheets); Arakuri <71-upper r.>, S. Sugawara 17428, Jun. 19, 1935 (SAPT); Tobuchi-mura, Pont mire <71-upper r.>, H. Sase, Aug. 11, 1936 (SAPS).

[No/illegible Locality]. On the peat, U. Faurie. Oct., 1907 (KYO); Komatu, 1909 (TI); S. Otagiri, May 27, 1930 (KYO); tundra, [no collector's name], 1932 (MAK 101329).

### 9. *Cladothamnus bracteatus* (Maxim.) Yamazaki [Miyama-hotsutsuji]

<THE KURILS>

MIDDLE. URUP <19>. Chernoburka Bay, M. Nakatani, Aug. 9, 2000 (SAPS). SOUTH. ITURUP <20>. Mt. Atoiya-yama, T. Kawakami 286, Aug. 11, 1898 (SAPS); Oyachi, S. Saito 6134, Aug. 11, 1928 (TI- 2 sheets); Moyoro, B. Yoshimura & H. Yokoyama, Aug. 3, 1938 (SAPS).

### 10. *Gaultheria miqueliana* Takeda [Shiratamanoki]

<SAKHALIN>

NORTH. Near Pilewo, forest <04-lower r.>, Y. Kudo & B. Ishida 7119, Aug. 25, 1923 (SAPS).

<THE KURILS>

MIDDLE. SHIASHKOTAN <10>. Zakatnaya Bay, H. Takahashi 21812, Aug. 12, 1996 (SAPS- 2 sheets). MATUA <12>. Dvoynaya Bay-Aynu Bay, H. Takahashi 22061, Aug. 15, 1996 (SAPS). RASSHUA <13>. Yoriki-hama, H. Takahashi

19216, Aug. 13, 1995 (SAPS). KETOI <15>. Kodakigawa, M. Tatewaki & K. Takahashi 15318, Aug. 15, 1929 (SAPS); Lake Ketoi, M. Tatewaki & K. Takahashi 15332, Aug. 17, 1929 (SAPS); Shimizugawa, M. Tatewaki & K. Takahashi 15642, Aug. 30, 1929 (SAPS). SIMUSHIR <16>. Simushir, M. Tatewaki & Y. Tokunaga 11864, Sep. 13, 1928 (SAPS). CHIRPOI <18a>. Peschanaya Bay, H. Takahashi 28554, Aug. 5, 2000 (SAPS). URUP <19>. Anama-Yoshinohama, K. Uchida, Jun. 17, 1891 (SAPS); Kobune, M. Tatewaki 9792, Aug. 26, 1927 (SAPS); Onsenzaki, M. Tatewaki 10059, Sep. 9, 1927 (SAPS); Tetyayeva Bay, H. Takahashi 22262, Aug. 21, 1996 (SAPS- 2 sheets); Tetyaeva Bay, H. Takahashi 28632, Aug. 8, 2000 (SAPS); Chernoburka Bay, M. Nakatani, Aug. 9, 2000 (SAPS).

SOUTH. ITURUP <20>. Moyoro Volcano, T. Ishikawa, Sep. 5, 1890 (SAPS); Peretarabets Mt., K. Jimbo, Jun. 1, 1891 (SAPS); Mt. Atoiya, T. Kawakami 289, Aug. 11, 1898 (SAPS); Mt. Chirippu, T. Kawakami 288, Aug. 19, 1898 (SAPS); Moyoro, Chishima-chosasyo, Sep. 18, [no year; prob. 1939] (SAPS); [no locality], A. Abe, Jul. 25-Aug. 5, 1924 (TNS); Mt. Atoiya, K. Kondo 2189, Jul. 21, 1927 (TI- 2 sheets); Oyachi, S. Saito (6163), Aug. 11, 1928 (TNS, TI- 2 sheets); Shibetoro-Moyoro, B. Yoshimura & H. Yokoyama, Aug. 2, 1938 (SAPS); Mt. Atosa, B. Yoshimura, Aug. 14, 1939 (SAPS). KUNASHIR <21>. Mt. Chacha, T. Ishikawa, Jul. 21, 1894 (SAPS- 2 sheets); Mt. Chacha, M. Nagai & M. Shirahama, Jul. 26, 1929 (SAPS- 2 sheets); Mt. Chacha-nupuri, Y. Okada, Aug. 3, 1929 (TNS 386965); [no locality], [no collector's name], 1935 (KYO).

### 11. *Harrimanella stelleriana* (Pall.) Coville [Jimukade] <THE KURILS>

NORTH. SHUMSHU <02>. Mt. Tenzin-yama, J. Ohwi (& R. Yoshii) 5620, Jul. 28, 1934 (TNS, KYO). PARAMUSHIR <03>. Hiratazaki, Y. Kudo 5391, Jul. 21, 1920 (SAPS); Mt. Murakami-dake, K. Kojima 1451, Jul. 26, 1932 (TNS); Kashiwabara-wan, J. Ohwi & R. Yoshii 5973, Aug. 2, 1934 (KYO); Volcano Ebeko, V. Y. Barkalov 97039 [9739 incorrect], Jul. 14, 1997 (SAPS- 2 sheets); NW of Severo-Kurilsk, H. Takahashi 23170, Aug. 5, 1997 (SAPS).

MIDDLE. RASSHUA <13>. Sonrakuwan, M. Tatewaki & K. Takahashi 15266, Aug. 8, 1929 (SAPS); Chotozan, M. Tatewaki & K. Takahashi 15329, Aug. 10, 1929 (SAPS). KETOI <15>. Kodakigawa, M. Tatewaki & K. Takahashi 15317, Aug. 15, 1929 (SAPS); Lake Ketoi, M. Tatewaki & K. Takahashi 15335, Aug. 17, 1929 (SAPS).

SOUTH. ITURUP <20>. Minami-Chirippu, B. Yoshimura & H. Yokoyama, Jul. 24, 1938 (SAPS).

### 12. *Ledum palustre* L. sensu lato [Iso-tsutsuji sensu lato] <SAKHALIN>

NORTH. Ado <04-upper l.>, Y. Kudo & B. Ishida 7514, Sep. 7, 1923 (SAPS); Mouth of River Tum' of the Gulf of Nadezhda <04-lower l.>, T. Fukuda 1872, Aug. 9, 2001 (SAPS); SE of the Cape of Maria, Lake Monchigar <04-upper r.>, T. Fukuda 1689, Aug. 6, 2001 (SAPS); Near Pilewo, Larix forests <04-lower r.>, Y. Kudo & B. Ishida 7097, Aug. 25, 1923 (SAPS- 2 sheets); Pomeri-Moskarivo, Takada-shokai, on the peat <06-lower r.>, Y. Kudo & B. Ishida 7335 & 7336, Aug. 31, 1923 (SAPS- 2 sheets); N of Moakal'vo, around Lake Bol'shoeye <06-lower r.>, V. Y. Barkalov 10647, Aug. 13, 2001 (SAPS); Pirituk,

dry peak <07-upper l.>, Y. Kudo & B. Ishida 7146, Aug. 28, 1923 (SAPS); Oha <7-lower r.>, Okada, Sep. 5, 1923 (TI); 15km S of Okha <10-upper r.>, H. Takahashi 31176, Jul. 28, 2003 (SAPS); East coast, east of the Gulf of Piltun, Vstrechnay <11-upper l.>, T. Fukuda 1575, Aug. 4, 2001 (SAPS); Lake Pilitu <15-lower l.>, T. Fukuda 2252, Aug. 18, 2001 (SAPS); East Coast, Nuto-Chaiwo <19-upper l.>, T. Ishikawa, Jul. 6, 1912 (SAPS- 2 sheets); Seacoast of Chaio <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS); Nyiwo, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6465, Aug. 12, 1922 (SAPS); Nyiwo, in aremosis litoralibus <23-lower l.>, Y. Kudo & M. Tatewaki no number, 6511, 6512 & 6511', Aug. 13, 1922 (SAPS- 4 sheets); Nyiwo Ins. Mobio, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6550, Aug. 14, 1922 (SAPS); Pupuni, in humidis <26-lower l.>, Y. Kudo & M. Tatewaki 1367, Aug. 8, 1922 (SAPS- 2 sheets); Parukata <26-upper r.>, Y. Kudo & M. Tatewaki, Aug. 10, 1922 (SAPS); Parukata, tundra <26-upper r.>, Y. Kudo & M. Tatewaki 6428 & 6429, Aug. 10, 1922 (SAPS-2 sheets); Parukata, in sylvis <26-upper r.>, Y. Kudo & M. Tatewaki 6451, Aug. 10, 1922 (SAPS); Palkata <26-upper r.>, Okada, Aug. 26, 1923 (TI).

MIDDLE. Adatuim <29-upper l.>, Okada, Aug. 23, 1923 (TI); Luekoff <33-upper r.>, Y. Kudo & M. Tatewaki 6300, Aug. 4, 1922 (SAPS); Nabilskiy Mts., Mt. Changa <34-upper r.>, N. Fujii 01152, Aug. 7, 2002 (MAK 343111); 40km E of Palevo, Mt. Changa <34-upper r.>, H. Takahashi 30330, Aug. 7, 2002 (SAPS); NW of Pogranichnoye, S banks of the Langeri River <35-lower r.>, N. Fujii 01297, Aug. 11, 2002 (MAK 346152); West of Pilewo <36-lower l.>, K. Jimbo, Aug. 13, 1907 (TNS 53548); Hinan-ekisha-Aobaeki <36-lower l.>, Y. Kudo & M. Tatewaki, Jul. 30, 1922 (SAPS); Anbetsu, in the forest < 36-lower l.>, T. Ishiyama, Jul. 16, 1927 (SAPS); Anbetsu, Ooiwa-toge <36-lower l.>, Y. Tokunaga & K. Kawai, Sep. 2, 1929 (SAPS); Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS- 3 sheets); Poronai-mura <37-lower r.>, T. Miyake, Aug. 29, 1906 (SAPS); Handa <37-lower r.>, S. Sugawara 17572, Aug. 10, 1931 (SAPT); Vicinity of R. Jobboroit <37-lower r. to 43>, T. Miyake, Aug. 30, 1906 (SAPS); Higashiyama <38-lower l.>, T. Miyake, Aug. 28, 1906 (SAPS- 2 sheets); Hayabusayama <38-lower l.>, T. Miyake, Aug. 28, 1906 (SAPS); 80km N of Poronaysk, Mirnyy-Pervomayskoye <38-lower l.>, H. Takahashi 30475, 30476, 30478, 30482 & 30484, Aug. 10, 2002 (SAPS- 5 sheets); 20km NE of Smirnykh, banks of the Poronay RAA Mirnyy <38-lower l.>, N. Fujii 01280, Aug. 10, 2002 (MAK 346153); Shisuka-shicho, Mt. Sekkai-yama (60, 61-rinpan) <39-lower l.>, B. Yoshimura & M. Hara, Jul. 15, 1937 (SAPS); Shisuka-shicho, Chirie-gun, Akaigawa <39-lower r.>, M. Tatewaki & Y. Takahashi 23110, Jun. 25, 1936 (SAPS); Shisuka-shicho, Asase <40-lower l.>, Y. Hoshino et al., Aug. 11, 1933 (SAPS- 2 sheets); Shisuka, Ennai-kokkyo <40-lower l.>, S. Sugawara no number & 17514, Aug. 5, 1935 (SAPS, SAPT); Shisuka-shicho, Chirie-gun, Mirukunai <40-lower r.>, M. Tatewaki & Y. Takahashi 22500, Jun. 15, 1936 (SAPS); Upstream of Hoe River, tundra <42-lower l.>, [no collector's name], Aug. 13, 1929 (KYO); Keton <42-upper r.>, S. Sugawara 17597 & 17599, Aug. 8, 1931 (SAPT- 2 sheet); Hoe-mura, Mt. Mimizuku-yama <42-lower r.>, [no collector's name], Aug. 10, 1929 (KYO); Hoe <42-lower r.>, S. Sugawara 17598 & 17522, Aug. 10, 1931 (SAPT- 2 sheets); Mt. Shotoi-dake <42-lower r.?>, S. Sugawara

17593, Aug. 24, 1931 (SAPT); Horoto <42-lower r.>, S. Sugawara 17595-2 & 17600, Aug. 25, 1931 (SAPT- 2 sheets); Mt. Horoto-dake <42-lower r.>, S. Sugawara 17594, Aug. 25, 1931 (SAPT); Mt. Horoto-dake <42-lower r.>, S. Sugawara, Aug. 5, 1932 (KYO); Hoe <42-lower r.>, S. Sugawara, Aug. 6, 1932 (KYO); Mt. Horoto-yama <42-lower r.>, Z. Tashiro, Sep. 3, 1939 (KYO); Vicinity of R. Wuruna <43->, T. Miyake, Aug. 22, 1906 (SAPS); Horonai, tundra <43 to 44, 48 to 49>, S. Sugawara 17556, 17532, 17533 & 17234, Aug. 12, 1927 (SAPT- 4 sheets); Borodo <43-lower l.>, T. Miyake, Sep. 1, 1909 (SAPS); Shisuka-shicho, Nimenjo-Yamahana <44-lower l.>, B. Yoshimura & M. Hara Jul. 11, 1937 (SAPS); Shisuka-shicho, Chirie-gun, Naruko-Nirayama <45-upper r.?>, M. Tatewaki & Y. Takahashi 22881, Jun. 26, 1936 (SAPS); Shikka Distr., R. Atsunai <45-upper r.>, Y. Hoshino & S. Sugiyama (Y. Hoshino et al.), Aug. 12, 1933 (SAPS- 6 sheets); Shisuka-shicho, Naruko River <45-upper r.>, Y. Hoshino et al., Aug. 13, 1933.08.13 (SAPS); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 22720, Jun. 21, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 23006, Jun. 29, 1936 (SAPS); Esutoru, on tundra <46-lower l.>, S. Otagiri, Jul. 8, 1931 (SAPS); Mt. Shisuka-dake <47-upper l.>, S. Sugawara 17574, Jul. 10, 1934 (SAPT); Mt. Shisuka-dake <47-upper l.>, S. Sugawara 17561, 17585, 17586 & 17591, Jul. 16, 1934 (SAPT- 4 sheets); Kamishisuka <48-upper l.>, S. Sugawara 17575, 17578 & 17579, Jul. 4, 1934 (SAPT- 3 sheets); Poronayski-Leonidovo, moor <48-upper l.>, H. Takahashi 30534, 30545, Aug. 13, 2002 (SAPS- 2 sheets); E. Coast, Ehorokofunai <48-lower l.>, T. Miyake, Aug. 11, 1906 (SAPS- 2 sheets); E. Coast, Nayoro <48-lower l.>, T. Miyake, Sep. 6, 1906 (SAPS); Naikawa (near Nairo) <48-lower l.>, S. Sugawara no number, 17570, 17571 & 17573, Jun. 20, 1928 (SAPS, SAPT- 3 sheets); Kusunokiyama, Experiment Forest of Kyoto Univ. <48-lower l.>, Y. Kobayashi, Jul. 25, 1928 (TNS); Nairo <48-lower l.>, S. Sugawara 17529, 17530, 17562, 17564 & 17565, Aug. 6, 1931 (SAPT- 5 sheets); Shikka <48-upper r.>, K. Miyabe & T. Miyagi, Jul. 23, 1906 (SAPS, TNS); Telpenia Bay, Shikka <48-upper r.>, T. Miyake Aug. 12, 1906 (SAPS); Duwatakkko <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Satsukari, near Shisuka <48-upper r.>, I. Namikawa, Aug. 8, 1914 (SAPS); Satsukari, near Shisuka <48-upper r.>, I. Namikawa, Aug. 11, 1914 (SAPS- 2 sheets); Shisuka <48-upper r.>, S. Komatsu, Aug. 10, 1914 (TI); Siska <48-upper r.>, T. Sawada, Aug. 14, 1923 (TI); Shisuka <48-upper r.>, S. Sugawara, Jun. 20, 1927 (SAPS); Shisuka <48-upper r.>, S. Sugawara 17576 & 17577, Jun., 1928 (SAPT- 2 sheets); Shisuka, Experiment Forest of Kyoto Univ. <48-upper r.>, T. Chono, Jul. 28, 1928 (TNS); Shisuka <48-upper r.>, S. Sugawara 17539, Jul. 2, 1929 (SAPT); Shisuka <48-upper r.>, H. Ohtani & Y. Imai, Jul. 19, 1930 (SAPS- 2 sheets); Shisuka <48-upper r.>, G. Koidzumi, Aug. 19, 1930 (KYO); Shisuka, tundra <48-upper r.>, H. Hara, Aug. 2, 1931 (TI); Near Shisuka <48-upper r.>, B. Yoshimura & M. Hara, Jul. 9, 1937 (SAPS- 2 sheets); Shisuka-cho, Otasuno-mori <48-upper r.>, R. Imaseki, Jul. 16, 1941 (TNS); Shisuka, Horonai-gawa, near Amiba <48-upper r.>, R. Imaseki, Jul. 17, 1941 (TNS); Shiska <48-upper r.>, S. Kitamura, Jul. 29, 1942 (KYO); Amiba <48-upper r.>, G. Koidzumi, Aug. 18, 1930 (KYO); Downstream of Horonai River, tundra <48-upper r.>, H. Hara, Aug. 2, 1931 (TI); Telpenia

Bay, Taraika <49-upper l.>, T. Miyake, Aug. 13, 1906 (SAPS); Arakuri <49-upper l.>, S. Sugawara 17550 & 17551, Jun. 19, 1935 (SAPT- 2 sheets); Shisuka-shicho, Nishitaraiika wetland <49-upper l.>, M. Kawashima, Jul. 7, 1935 (SAPS); Shisukagun, by Lake Taraika <49-upper l.>, B. Yoshimura & M. Hara 22, Jul. 10, 1937 (TNS); Taraika <49-upper r.>, T. Miyake, Aug. 14, 1906 (SAPS); Taraika <49-upper r.>, S. Sugawara 17559, Aug. 9, 1927 (SAPT); Shisuka-shicho, Taraika-Nimenjo <49-upper r.>, B. Yoshimura & M. Hara no number & 21, Jul. 10, 1937 (SAPS- 4 sheets, TNS); Rukutama <49-upper r.>, S. Sugawara 17557 & 17558, Jul. 7, 1938 (SAPT- 2 sheets); Shisuka-shicho, near Taraika <49-upper r.>, M. Honda & Y. Kimura, Aug. 16, 1940 (TI- 2 sheets); Jimutaki <50-upper r.>, K. Miyabe & T. Miyagi, Jul. 24, 1906 (SAPS); Shikka Distr., Nokoro <50-upper r.>, Y. Hoshino & S. Sugiyama, Aug. 17, 1933 (SAPS); Shisuka-shicho, Nishinokoro <50-upper r.>, Y. Hoshino et al., Aug. 17, 1933 (SAPS- 2 sheets); Shisuka-shicho, Nokoro <50-upper r.>, S. Sugawara 29638 & 17596, Jul. 31, 1935 (SAPS, SAPT); Shisuka-shicho, Nokoro <50-upper r.>, M. Kawashima, Aug. 12, 1935 (SAPS); Shisuka, Nokoro <50-upper r.>, S. Sugawara, Aug. 14, 1935 (SAPS); Kitashiretoko [Peninsula?] <51 to 55>, S. Sugawara 17553, Jul. 25, 1935 (SAPT); Shisuka-shicho, Noto <51-lower l.>, Y. Hoshino et al., Jul. 12, 1933 (SAPS- 3 sheets); Shikka Distr., Noto <51-lower l.>, Y. Hoshino et al., Jul. 27, 1933 (SAPS- 2 sheets); Kitashiretoko Peninsula, Naihuto <51-lower l.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); Shisuka, Kitashiretoko, Mt. Kasyokuyama <51-lower l.>, S. Sugawara 17540, 17552, 26669, 26674 & 26679, Jul. 22, 1935 (SAPS- 3 sheets, SAPT- 2 sheets); Lake Solenuiya <51-lower r.>, K. Miyake & T. Miyagi, Jul. 26, 1906 (SAPS- 2 sheets); Kitashiretoko Peninsula, Nushike <51-lower r.>, Y. Hoshino et al., Jul. 21, 1933 (SAPS); Shikka Distr., Funakoshi <51-lower r.>, Y. Hoshino & S. Sugiyama, Jul. 24, 1933 (SAPS- 2 sheets); Shikka Distr., Funakoshi <51-lower r.>, Y. Hoshino et al., Jul. 25, 1933 (SAPS); Shisuka, Nushike <51-lower r.>, S. Sugawara 26996 & 26997, Jul. 24, 1935 (SAPS- 2 sheets); Kitashiretoko Peninsula, Mt. Hokke-yama <51-lower r.>, S. Sugawara 17540-2, Jul. 27, 1935 (SAPT); Naikotoru <52-upper l.>, T. Miyake, Aug. 29, 1907 (TNS); Mt. Isara-yama <52-lower l.>, S. Sugawara 17589, Jul. 17, 1933 (SAPT); Mt. Kotan-dake <52-lower l.>, S. Sugawara 17595, Jul. 19, 1933 (SAPT); Mt. Isara-yama <52-lower l.>, S. Sugawara 17555, 17590 & 17592, Aug. 17, 1933 (SAPT- 3 sheets); W. Coast, Mt. Ushoro <52-upper r.>, T. Miyake, Aug. 30, 1907 (SAPS); Mt. Kamabuse-yama <52-lower r.>, S. Sugawara 17554, 17585 & 17587, Aug. 7, 1934 (SAPT- 3 sheets); W.Coast, Mt. Ushoro <52-upper r.>, T. Miyake, Aug. 31, 1907 (SAPS); E. Coast, Ponkotan <54->, T. Miyake, Sep. 13, 1906 (SAPS); E. Coast, Kotankeshi <54-upper r.>, T. Miyake, Sep. 12, 1906 (SAPS); Kitashiretoko Peninsula, Yoman-Rosoku-iwa <55-upper r.>, Y. Hoshino et al., Jul. 21, 1933 (SAPS); Kitashiretoko Peninsula, Harato-misaki-Futatsuiwa <55-lower r.>, Y. Hoshino et al., Jul. 19, 1933 (SAPS); Kitashiretoko Peninsula, Futatsu-iwa <55-lower r.>, Y. Hoshino, Jul. 20, 1933 (SAPS); Kitashiretoko Peninsula, Kitashiretoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 20, 1933 (SAPS- 2 sheets); Shisuka-shicho, Kitashiretoko-misaki <55-lower r.>, S. Sugawara 27130 & 27131, Jul. 25, 1935 (SAPS- 2 sheets).

SOUTH. Shikka Distr., Otasu <56-upper r.>, Y. Hoshino et al., Jul. 8, 1933 (SAPS); E. Coast, Mt. Nupuripo <57-lower l.>, T. Miyake, Aug. 13, 1907 (SAPS); Maguntan <57-lower l.>, S. Sugawara 17535 & 17536, Jul. 20, 1920 (SAPT- 2 sheets); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka et al., Jul. 20, 1927 (SAPS); Mt. Tosso <57-lower l.>, N. Hiratsuka et al. 20 & 21, Jul. 23, 1927 (TI- 2 sheets, SAPS); Maguntan <57-lower l.>, S. Sugawara 17568, 17569 & 17549, Jul. 10, 1928 (SAPT- 3 sheets); Mt. Tosso-zan <57-lower l.>, S. Sugawara 17563, Jun. 13, 1929 (SAPT); Mt. Nupuripo <57-lower l.>, S. Saito no number & 358, Aug. 3, 1929 (TI- 4 sheets); Maguntan <57-lower l.>, S. Sugawara, Jul. 2, 1930 (SAPS); Maguntan <57-lower l.>, S. Sugawara 17512, Jun. 5, 1931 (SAPT); Mt. Tossozan <57-lower l.>, H. Hara, Aug. 5, 1931 (TI- 2 sheets); Mt. Tosso-zan <57-lower l.>, S. Sugawara 17560, Sep. 20, 1931 (SAPT); Mt. Tosso-zan <57-lower l.>, [no collector's name], 1932 (MAK 81405); Hoyori-mura, Maguntan <57-lower l.>, H. Sase, Aug. 13, 1936 (SAPS); Maguntan <57-lower l.>, S. Sugawara 17517, Aug. 21, 1936 (SAPT); Maguntan, near Deikazan <57-lower l.>, G. Koidzumi, Aug. 9, 1940 (KYO); Mt. Tosso-zan <57-lower l.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI- 3 sheets); Pugacheva (Maguntan), dry meadow <57-lower l.>, H. Takahashi & A. Taran 27869, Jul. 17, 2000 (SAPS); Tsapko to N peak of Mt. Vladimirovka <57-lower l.>, H. Takahashi 29581, Aug. 2, 2001 (SAPS); Tsapko to N peak of Mt. Vladimirovka <57-lower l.>, H. Takahashi 29648, Aug. 2, 2001 (SAPS); 80km N of Dolinsk, Mt. Zhdanko <57-lower l.>, H. Takahashi 30155, Aug. 2, 2002 (SAPS); 80km N of Dolinsk, Mt. Zhdanko <57-lower l.>, N. Fujii 01091, Aug. 2, 2002 (MAK 340820); Mt. Kashipo <57-upper r.>, N. Hiratsuka, Aug. 7, 1928 (SAPS); Mt. Kashipo-dake <57-upper r.>, S. Sugawara 17584, Aug. 27, 1929 (SAPT); Kashipo, Kashipo-dake <57-upper r.>, H. Abumiya et al., Jul. 22, 1932 (SAPS); Kashipo, Nakanodake <57-upper r.>, H. Abumiya et al., Jul. 27, 1932 (SAPS); Kashipo, Shokuminchi <57-upper r.>, H. Abumiya et al., Aug. 8, 1932 (SAPS); Kashipo <57-upper r.>, M. Sato, Jul. 30, 1933 (TI); W. Coast, Kusunnai <58-upper r.>, T. Miyake, Jul. 7, 1906 (SAPS, TNS); Kusunnai <58-upper r.>, K. Miyabe & T. Miyagi, Aug. 9, 1906 (SAPS); E. Coast, Kusunnai <58-upper r.>, T. Miyake, Sep. 21, 1906 (SAPS); Kushunnai <58-upper r.>, S. Sugawara 17515 & 17520, Jun. 20, 1934 (SAPT- 2 sheets); Kushunnai <58-upper r.>, S. Sugawara 17521, Jun. 20, 1935 (SAPT); E. Coast, Shiraraka <59-upper l.>, T. Miyake, Sep. 20, 1907 (SAPS, TNS); Manui <59-upper l.>, S. Komatsu, Aug. 3, 1913 (TI); Manui <59-upper l.>, S. Sugawara 17519, Jun. 21, 1934 (SAPT); Odasamu <59-lower l.>, S. Otagiri, Jul. 1, 1930 (KYO); Aihama-mura, Experiment Forest of Tokyo Univ. <61-upper r.>, R. Imaseki, Jul. 12, 1941 (TNS); Dubki <62-upper l.>, K. Miyabe & T. Miyagi, Jul. 22, 1906 (SAPS); Naibuchi <62-upper l.>, T. Miyake, Sep. 26, 1906 (TNS); Sakaehama <62-upper l.>, G. Koidzumi, Aug. 13, 1930 (KYO); Sakaehama <62-upper l.>, S. Sugawara 17531, Jul. 6, 1931 (SAPT); Sakaehama <62-upper l.>, Herb. Dr. T. Ito, [no date], (TNS- 3 sheets); 8 Km N of Dolinsk, Nayba River <62-upper l.>, H. Takahashi 29315, Jul. 23, 2001 (SAPS- 2 sheets); Bogs of Sokol <62-lower l.>, T. Fukuda 1108, Jul. 20, 2001 (SAPS); 6km W of Sokol town, Mal Takoy River <62-lower l.>, H. Takahashi 29178, Jul. 20, 2001 (SAPS); W. Coast, Teiya <63-upper r.>, T. Miyake, Jul. 4, 1906 (SAPS); Rutaka <64-lower r.>, S. Sugawara 17566, Aug. 4, 1928 (SAPT); Vladimirohuka <65-upper l.>, K. Miyabe & T. Miyagi, Aug. 22, 1906 (SAPS); Toloetsukoe <65-upper

l.>, T. Miyake, Sep. 29, 1906 (SAPS, TNS); Dalni <65-upper l.>, T. Miyake, Sep. 29, 1906 (SAPS); Konuma <65-upper l.>, S. Sugawara 17513, Jul. 4, 1921 (SAPT); Konuma <65-upper l.>, G. Koidzumi, Aug. 11, 1930 (KYO); Konuma <65-upper l.>, H. Sasa, Jul. 22, 1937 (TNS); Susuya <65-upper l.>, S. Sugawara 17511, Jul. 10, 1928 (SAPT); Suzuya <65-upper l.>, [no collector's name], 1932 (MAK 101398); Tamagawa <65-upper l.>, S. Sugawara 17509 & 17518, Jul. 4, 1935 (SAPT- 2 sheets); Kitatoyohara <65-upper l.>, S. Sugawara 17516, Sep. 8, 1940 (SAPT); Toyohara <65-upper l.>, S. Otagiri, Jul. 2, 1931 (SAPS- 9 sheets); Toyohara <65-upper l.>, S. Otagiri, Jul. 23, 1931 (SAPS- 3 sheets); Toyohara <65-upper l.>, S. Kitamura, Aug. 7, 1940 (KYO); Toyohara <65-upper l.>, S. Kitamura, Jul. 10, 1942 (KYO); Juzhno-Sachalinskaja (Sussunajskaja) <65-upper l.>, K. Stepanova & I. Parschina, Jun. 15, 1952 (TNS); Juzhno-Sachalinskaja (Sussunajskaja) <65-upper l.>, L. Motorina, Jun. 26, 1952 (TNS); Aniva distr., near Novo-Alexandrovskaia <65-upper l.>, G. Proskuriakova & G. Porobinovskaia, Sep. 7, 1973 (SAPT, TI 1323360); Torechapaachi <65-lower l.>, G. Nakahara, Jun. 24, 1906 (TNS); Mitsurihuka <65-lower l.>, K. Miyake & T. Miyagi, Aug. 22, 1906 (SAPS); Mitsuryofka <65-lower l.>, U. Faurie, Jul., 1908 (KYO); Kaizuka <65-lower l.>, S. Sugawara 17510, Jun. 7, 1930 (SAPT); Kaizuka <65-lower l.>, S. Sugawara 17523 & 17524, Sep. 10, 1930 (SAPT- 2 sheets); Mt. Susuya <65-upper r.>, T. Miyake, Jul. 31, 1907 (SAPS); Chekhovskiy Pass-Mt. Chekhova <65-upper r.>, H. Takahashi 29288 & 29291, Jul. 22, 2001 (SAPS- 2 sheets); Peak Chekhov <65-upper r.>, T. Fukuda 1180, Jul. 22, 2001 (SAPS); S of Okhotskoye <66-lower l.>, H. Takahashi 27893, Jul. 19, 2000 (SAPS); S of Okhotskoye <66-lower l.>, H. Takahashi 27926, Jul. 19, 2000 (SAPS); NE of Lake Tunaycha, NE of Lake Khvalisekoye <66-lower r.>, T. Fukuda 1376, Jul. 29, 2001 (SAPS- 2 sheets); N side of Tunaycha Lake <66-lower r.>, H. Takahashi 29514, Jul. 29, 2001 (SAPS- 3 sheets); Uryu <69-upper r.>, S. Sugawara 17537 & 17538, Jul. 3, 1935 (SAPT- 2 sheets); Near Korsakof <70-upper r.>, S. Takeo, Sep., 1905 (SAPS- 2 sheets); Korsakof <70-upper r.>, T. Minami & Kanno, Nov., 1905 (SAPS- 2 sheets); Aniwa Bay, Korssakoff <70-upper r.>, T. Miyake, Jun. 19, 1906 (SAPS); Korssakoff <70-upper r.>, K. Miyabe & T. Miyagi, Jul. 12, 1906 (SAPS); Aniwa Bay, Ootomari <70-upper r.>, T. Miyake, Jul. 10, 1907 (SAPS); Ohtomari <70-upper r.>, K. Numajiri, Jun., 1924 (TNS); Ohtomari <70-upper r.>, S. Sugawara 17567, Jun. 5, 1929 (SAPT); Nagahama <71-upper r.>, S. Sugawara, Jul. 20, 1929 (SAPS); Nannichi-gawa River <71-upper r.>, S. Sugawara 17546 & 17548, Jun. 20, 1935 (SAPT- 2 sheets); Arakuri <71-upper r.>, S. Sugawara 17547, Jun. 20, 1935 (SAPT); Nagahama-gun, Tobuchi-mura, near Ponto <71-upper r.>, H. Sase, Jul. 24, 1936 (SAPS); Nagahama-gun, Tobuchi-mura, Ponto mire <71-upper r.>, H. Sase, Aug. 15, 1937 (SAPS- 2 sheets); 8km SE of Ozerskiy, Arakul River <71-upper r.>, H. Takahashi 30623, Aug. 15, 2002 (SAPS); 45km E of Korsakov, 2km E of Beregovoy <72-upper l.>, H. Takahashi 30660 & 30665, Aug. 16, 2002 (SAPS- 2 sheets); Mt. Shiretoko Juzozan <74-upper l.>, T. Miyake, Jul. 11, 1908 (SAPS).

[Locality Uncertain]. Komatu, 1909 (TI- 6 sheets); Western coast, [no collector's name], Aug., 1922 [?] (MAK 75171); Ochiishi [?], S. Sugawara 17541, Jul. 10, 1935 (SAPT); Z. Tashiro, Aug.-Sep., 1939 (KYO); T. Iishiba, [no date] (TI).

## <THE KURILS>

NORTH. SHUMSHU <02>. Tenzin-yama, J. Ohwi (& R. Yoshii) 5652, Jul. 28, 1934 (SAPS, KYO). PARAMUSHIR <03>. [no locality], S. Yokoyama, 1908 (SAPS- 2 sheets) ; [no locality], Y. Yasuhara, Aug., 1923 (KYO); Raisha, J. Ohwi & R. Yoshii 5994, Aug. 6, 1934 (KYO); Vasil'yeva Bay, H. Takahashi 28065, Jul. 25, 2000 (SAPS).

MIDDLE. CHIRPOI <18>. Peschanaya Bay, H. Takahashi 19894, Aug. 23, 1995 (SAPS- 2 sheets); Peschanaya Bay, H. Takahashi 28539, 28556 & 28561, Aug. 5, 2000 (SAPS- 3 sheets). URUP <19>. Anama-Yoshinohama, highland, K. Uchida, Jun. 17, 1891 (SAPS, TI); Afunruimoi, K. Uchida, Jun. 25, 1891 (SAPS); Yoshinohama, K. Jimbo, Jun. 18, 1891 (SAPS- 2 sheets); Anama, K. Jimbo, Jun. 18, 1891 (SAPS); Onsenzaki, K. Jimbo, Jul., 1891 (SAPS, TI); Iyema, I. Kodama, May, 1893 (SAPS); Kobune, *Betula* forests. M. Tatewaki 9834, Aug. 26, 1927 (SAPS); Kobune, bog, M. Tatewaki 9820, Aug. 26, 1927 (SAPS); Kobune, M. Tatewaki 9842, Aug. 26, 1927 (SAPS); Daiba-hama, M. Tatewaki 9894, Sep. 1, 1927 (SAPS); Onsenzaki, M. Tatewaki, Sep. 7, 1927 (SAPS); Tokotan, M. Tatewaki 10099, Sep. 13, 1927 (SAPS); NE of Van-Der-Lind, M. Ohara, Aug. 26, 1995 (SAPS); NE of Van-Der-Lind, H. Takahashi 20062, Aug. 26, 1995 (SAPS); Barhatnyy Bay, H. Takahashi 20091, Aug. 28, 1995 (SAPS); Ukromnaya Bay, H. Takahashi 22200, Aug. 20, 1996 (SAPS- 2 sheets); Tetyaeva Bay, H. Takahashi 22266, Aug. 21, 1996 (SAPS- 2 sheets); Tetyaeva Bay, H. Takahashi 28618, Aug. 8, 2000 (SAPS).

SOUTH. ITURUP <20>. Moyoro Volcano, T. Ishikawa, Sep. 5, 1890 (SAPS); Moyoro-yama, S. Yokoyama, Jul. 27, 1893 (SAPS); Mt. Moyoro, K. Fukuzawa, Aug. 27, 1893 (SAPS- 3 sheets); Mt. Moyoro, T. Kawakami 99, Aug. 12, 1898 (SAPS); Teinei, T. Kawakami no number & 289, Aug. 28, 1898 (SAPS); Moyoro, Mt. Iwo, M. Aizawa, Jul. 4, 1900 (SAPS); Bettobu-Shamanbe, K. Miura, Jul. 13-14, 1906 (SAPS); Shibetoro, K. Miura, Jul. 21, 1906 (SAPS); Moyoro Coast, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Shibetoro-Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Shana-Bettobi, K. Kondo 1957, Jul. 13, 1927 (TI- 2 sheets); Mt. Atoiya, K. Kondo, Jul. 21, 1927 (TI- 3 sheets); Oyachi, S. Saito, Aug. 11, 1928 (TI); Bettobi-Shana, S. Saito, Aug. 18, 1928 (TI- 2 sheets); Shana-Sashiusu, S. Saito, Aug. 20, 1928 (TI); Shibetoro-Moyoro, B. Yoshimura & H. Yokoyama, Aug. 2, 1938 (SAPS); Mt. Moyoro, B. Yoshimura & H. Yokoyama, Aug. 4, 1938 (SAPS); Tannemoe, Chishima-chosasyo, Aug. 30, [no year; prob. 1939] (SAPS); Shana vill., near wetland of Yanketou, T. Azuma et al. 3301, Jun. 24, 2002 (SAPT). KUNASHIR <21>. Atosanobori, D. Hashimoto, Jul. 15, 1890 (SAPS- 2 sheets); Rausu Sulphar, K. Jimbo, Aug. 16, 1890 (SAPS); Shumanobori, S. Yokoyama, Jun. 12, 1891 (SAPS); Ichibishinai, C. Endo, Jul. 27, 1894 (SAPS); Mt. Tomari, Y. Tanaka, Sep. 11, 1895 (SAPS); Znbekotan, H. Tanaka, [no date; 1895?] (SAPS); Furukamapp, M. Tatewaki 3407, Jul. 26, 1923 (SAPS); Mt. Rausu, M. Tatewaki 3690, Jul. 23, 1923 (SAPS); Mt. Rausu, M. Tatewaki 3265, Jul. 23, 1923 (SAPS- 2 sheets, SAPT); Furukamapp, J. Ohwi, Sep. 3, 1923 (TNS); Tomari, H. Ohtani, Aug. 9, 1929 (SAPS); Furukamapp-Nikishiro, Y. Matsumura, Jul. 20, 1930 (KYO); [no locality], [no collector's name], 1935 (KYO); Mt. Chacha, K. Ito, Aug., 1939 (SAPS); Mt. Rausu, K. Ito, Sep. 22, 1939 (SAPS). SHIKOTAN <22>. Shakotan, T. Kawakami 511, Aug. 1, 1898 (SAPS); Shakotan,

K. Miura, Jul. 26, 1906 (SAPS); (Around) Shakotan, [no collector's name] (H. Takeda), Jul. 16, 1909 (SAPS- 2 sheets); Anama, Arai, Sep. 24, 1909 (TNS); [no locality], A. Abe, Jul. 17, 1924 (TNS); Mt. Shakotan, S. Saito, Aug. 30, 1924 (TI); Mt. Shakotan, S. Saito 3301, Sep., 1925 (TI); Shakotan, S. Saito 2324, Sep. 2, 1925 (TI); Shakotan–Horobetsu, S. Saito, Sep. 4, 1925 (TI); [no locality], A. Abe, Aug. 11, 1927 (TI); [no locality], K. Kondo, Aug. 11, 1927 (TI); [no locality], K. Kondo no number & 7835, Aug. 11, 1927 (TI- 2 sheets); Chiboi, K. Kondo, Aug. 10, 1929 (TI- 2 sheets); Horobetsu–Okkaibetsu, K. Kondo, Aug. 31, 1929 (TI); Kekkyowan, K. Kondo, Sep. 5, 1929 (TI); Shakotan, S. T. Ono 46, Jun. 29, 1930 (TI); Shakotan, J. Ohwi, Jul. 22, 1931 (KYO); Toiro, M. Tatewaki 20572, Jun. 20, 1934 (SAPS); Odatomi, M. Tatewaki 20573, Jun. 20, 1934 (SAPS); Shikotan–Matsuhara, D. Akaishi 20884, Jun. 29, 1934 (SAPS).

### 13. *Leucothoe grayana* Maxim. [Hanahirinoki] <SAKHALIN>

SOUTH. Mt. Omanbetsu <72-lower l.>, T. Miyake, Jul. 15, 1908 (SAPS); Memanbetsu [error for Omanbetsu?] <72-lower l.?>, S. Sugawara 17466, Sep., 1931 (SAPT).

#### <THE KURILS>

SOUTH. ITURUP <20>. Shana–Sashiusu, S. Saito, Aug. 20-22, 1928 (TI- 2 sheets). KUNASHIR <21>. Ichibishinai-shindo, H. Yokoyama, Jun. 6, 1891 (SAPS); Furukamapp, C. Endo, Sep. 16, 1894 (SAPS); Mt. Tomari, Y. Tanaka, Sep. 11, 1895 (SAPS); Furukamapp, M. Tatewaki 3324, Jul. 25, 1923 (SAPS, SAPT); Mt. Rausu, H. Ishikawa, Aug. 1, 1923 (SAPS); Atoiya, M. Nagai & M. Shimamura, Aug. 3, 1929 (SAPS); Furukamapp, Y. Matsumura, Jul. 20, 1930 (KYO); Mt. Tomari, M. Tatewaki no number & 25512, Aug. 20, 1936 (SAPS- 2 sheets). SHIKOTAN <22>. Shakotan, K. Miyabe, Jul. 27, 1884 (SAPS); Shakotan, K. Miura, Jul. 26, 1906 (SAPS); Around Shakotan, [no collector's name; prob. H. Takeda], Jul. 16, 1909 (SAPS); Shakotan, G. Tanaka & Ken. Miyabe, Aug. 4, 1910 (SAPS); Mt. Shakotan, S. Saito 1864, Aug. 30, 1925 (TI); Mt. Shakotan, S. Saito 1917 & 1918, Aug. 30, 1925 (TI- 3 sheets); Shakotan–Horobetsu, S. Saito, Sep. 4, 1925 (TI); Horobetsu, S. Saito 1397, Sep. 5, 1925 (TI); [no locality], K. Kondo 7836, Aug. 11, 1927 (TI- 3 sheets); Mt. Shakotan, K. Kondo, Aug. 6, 1929 (TI- 2 sheets); Anama, K. Kondo, Aug. 28, 1929 (TI); Horobetsu–Okkaibetsu, K. Kondo, Aug. 31, 1929 (TI); Mt. Tomari, K. Kondo, Sep. 5, 1929 (TI); Matakotan, J. Ohwi, Jul. 19, 1931 (KYO); Kagenoma, J. Ohwi 543, Aug. 4, 1931 (TNS).

### 14. *Loiseleuria procumbens* (L.) Desv. [Minezuô] <SAKHALIN>

NORTH. SE from the Cape of Maria, Lake Monchigar <04-upper r.>, T. Fukuda 1688, Aug. 6, 2001 (SAPS); 15km S of Okha <10-upper r.>, H. Takahashi 31188, Jul. 28, 2003 (SAPS); Seacoast of Chaio <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS); Nyiwo, in arenosis litoralibus <23-lower l.>, Y. Kudo & M. Tatewaki 6513, Aug. 13, 1922 (SAPS); Nyiwo, Ins Mobio, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6551, Aug. 14, 1922 (SAPS).

MIDDLE. Hantuza <37-lower r.>, Ezawa, Jul., 1923 (TI); Upstream of Hoe River <42-lower l.>, S. Sugawara 17612, Aug. 15, 1931 (SAPT); Mt. Horoto-yama <42-lower r.>, S. Sugahara 12, Jul. 1, 1934 (KYO); Shisuka <48-upper r.>, S.

Sugawara 17615, Jul. 20, 1929 (SAPT); Siska <48-upper r.>, Nagamatsu, Jul. 15, 1930 (KYO); Shisuka, Rukutama <49-upper r.>, S. Sugawara no number & 17613, Aug. 16, 1935 (SAPS, SAPT); Chirie, behind the settlement <51-lower r.>, J. Ohwi, Aug. 1, 1932 (KYO); Mt. Kotan-yama <52-lower l.>, S. Sugawara 17614, Aug., 1934 (SAPT); W. Coast, Mt. Ushoro <52-upper r.>, T. Miyake, Aug. 31, 1907 (SAPS, TNS); Kitashiretoko Peninsula, Rosoku-iwa <55-upper l.>, Y. Hoshino et al., Jul. 22, 1933 (SAPS); Kitashiretoko Peninsula, Kitashiretoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 19, 1933 (SAPS); Kitashiretoko-misaki <55-lower r.>, S. Sugawara 17616, Jul. 26, 1935 (SAPT). Shisuka-shicho, Toyo[?]koro, tundra <?>, M. Kawashima, Jun. 3, 1935 (SAPS).

SOUTH. Lower place of Mt. Ochiho <65-upper r.>, S. Sugawara 17624-17626, Aug. 2, 1934 (SAPT- 3 sheets).

#### <THE KURILS>

NORTH. SHUMSHU <02>. [no locality], T. Ishikawa, Jun. 29, 1894 (SAPS- 2 sheets); [no locality], K. Endo, Jul. 3, 1903 (SAPS, TI); Daizingu, K. Endo, Jul. 20, 1903 (SAPS); Koseki-gawa–Shiroiwa, T. Ohashi, Aug. 28, 1932 (KYO- 2 sheets); Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5651, Jul. 28, 1934 (KYO); Pochtareva Cape, H. Takahashi 23367, Aug. 8, 1997 (SAPS). PARAPUSHIR <03>. Musashi-wan, M. Aizawa, Jun. 22, 1900 (SAPS); Miyakawa-zaki, T. Matsubara, Aug. 7, 1917 (SAPS); Shiribachi, Y. Kudo 4906, Jun. 27, 1920 (SAPS); Nagaiwasaki, Y. Kudo 5134, Jul. 11, 1920 (SAPS); Nishikawa–Atenkeshi, Y. Kudo 5233, Jul. 13, 1920 (SAPS); Yotsuiwahana, Y. Kudo 5306, Jul. 14, 1920 (SAPS); Shirakawa, Y. Kudo 5605, Jul. 30, 1920 (SAPS); Tomarizaki, Y. Kudo 5782, Aug. 8, 1920 (SAPS); Urafuto-yama, Y. Kudo 5810, Aug. 8, 1920 (SAPS); Mt. Chai, Kamogawa, Jul. 27, 1930 (SAPS- 2 sheets); Chikura-dake, Y. Okada, Jul. 30, 1931 (TNS); Arakawa, Y. Okada, Aug. 10, 1931 (TNS); Mt. Murakami-dake, K. Kojima 1448, Jul. 26, 1932 (TNS); [no locality], T. Ohashi, Aug., 1932 (KYO); Mt. Yake-dake, Kojima, Aug. 5-7, 1932 (TNS); Murakami-wan, T. Ohashi, Aug. 11, 1932 (KYO- 2 sheets); Arakawa, J. Ohwi & R. Yoshii 151, Jul. 18, 1934 (KYO); Suribachi-wan, J. Ohwi & R. Yoshii 5381, Jul. 22, 1934 (KYO); Kashiwabara-wan, J. Ohwi (& R. Yoshii) 5967, Aug. 2, 1934 (KYO, SAPS, TI, TNS); Utesnyy River, H. Takahashi 20744, Aug. 1, 1996 (SAPS); Volcano Ebeko, V. Y. Barkalov 97044, Jul. 14, 1997 (SAPS); NW of Severo-Kurilsk, Y. Kuwahara 123, Aug. 5, 1997 (SAPS); NW of Severo-Kurilsk, H. Takahashi 23162, Aug. 5, 1997 (SAPS). [Island Uncertain; Shumshu or Paramushir], K. Fujita, 1944-45 (TNS).

MIDDLE. MAKANRUSHI <05>. M. Tatewaki 11217, Aug. 9, 1928 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 11117, Aug. 8, 1928 (SAPS); [no locality], M. Tatewaki, Jun. 3, 1930 (TNS); Minamiura, M. Tatewaki 17318, Jun. 6, 1930 (SAPS); Nemo Bay, H. Takahashi 21237, Aug. 4, 1996 (SAPS); Mussel Bay–Kol'tsevoye Lake, H. Takahashi 21403, Aug. 7, 1996 (SAPS). KHARIMKOTAN <07>. Nishiura, M. Tatewaki 17214, May 28, 1930 (SAPS); [no locality], M. Tatewaki 17292, Jun. 4, 1930 (SAPS). SHIASHKOTAN <10>. Otomewan, M. Tatewaki 17342, Jun. 6, 1930 (SAPS). MATUA <12>. Ainuwan, M. Tatewaki & Y. Tokunaga 12262, Sep. 6, 1928 (SAPS). RASSHUA <13>. Kotomari, M. Tatewaki & K. Takahashi 15070, Aug. 4, 1929 (SAPS); Sonraku-wan, M. Tatewaki & K. Takahashi 15021, Aug. 4, 1929 (SAPS); Minamikado, M. Tatewaki & K. Takahashi 14993, Aug. 4, 1929 (SAPS); Mt.

Choto, M. Tatewaki & K. Takahashi 15107, Aug. 5, 1929 (SAPS); Sonraku-wan, M. Tatewaki & K. Takahashi 15289, Aug. 9, 1929 (SAPS); Choto-zan, M. Tatewaki & K. Takahashi 15339, Aug. 10, 1929 (SAPS); Yoriki-hama, H. Takahashi 19227 & 19231, Aug. 13, 1995 (SAPS- 2 sheets). USHISHIR-RYPONKICHA <14a>. [no locality], M. Tatewaki & K. Takahashi 15929, Sep. 14, 1929 (SAPS); SW side-central part, H. Takahashi 22971, Aug. 2, 1997 (SAPS). KETOI <15>. [no locality], M. Tatewaki & Y. Tokunaga 11477, Sep. 1, 1928 (SAPS); Minami, M. Tatewaki & K. Takahashi 15191, Aug. 14, 1929 (SAPS); Lake Ketoi, M. Tatewaki & K. Takahashi 15354, Aug. 17, 1929 (SAPS); Isozaki, M. Tatewaki & K. Takahashi 15556, Aug. 24, 1929 (SAPS); Nishiura, M. Tatewaki & K. Takahashi 15740, Sep. 4, 1929 (SAPS). SIMUSHIR <16>. Broton Bay, M. Tatewaki & Y. Tokunaga 11757, Aug. 15, 1928 (SAPS); Yamagoshizaki, M. Tatewaki & Y. Tokunaga 11775, Aug. 16, 1928 (SAPS); Nakadomari, Nakayama, M. Tatewaki 11897, Aug. 17, 1928 (SAPS). URUP <19>. Suribachi-yama Volc., K. Jimbo, Jun. 16, 1891 (SAPS); Yoshinohama, K. Jimbo, Jun. 18, 1891 (SAPS); Terrace of Yoshinohama, K. Jimbo, Jun. 18, 1891 (TI).

SOUTH. ITURUP <20>. Peretarabetsu Volc., T. Ishikawa, Aug., 1890 (SAPS); Peretarabets Mt., K. Jimbo, Jun. 1, 1891 (SAPS, TI); Mt. Atoiya, T. Kawakami 195, Aug. 13, 1898 (SAPS); Mt. Moyoro, G. Tanaka & Ken. Miyabe, Jul. 17, 1910 (SAPS); Shibetoro-Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Mt. Atoiya, K. Kondo 2237, Jul. 21, 1927 (TI- 3 sheets); Oyachi, S. Saito, Aug. 11, 1928 (TI- 2 sheets); Shana-Sashiusu, S. Saito, Aug. 20-22, 1928 (TI); Mt. Hitokappu-yama, M. Koriba & R. Yoshii, Aug. 14, 1933 (KYO); Shibetoro-Moyoro, B. Yoshimura & H. Yokoyama, Aug. 2, 1938 (SAPS); Mt. Moyoro, B. Yoshimura & H. Yokoyama, Aug. 4, 1938 (SAPS); Mt. Moyoro, Chishima-chosasyo, Sep. 15, 1939 (SAPS); Oyachi, Chishima-chosasyo, Sep. 15, [no year; prob. 1939] (SAPS). KUNASHIR <21>. Mt. Chacha, M. Nagai & M. Shimamura, Jul. 26, 1929 (SAPS- 2 sheets); Mt. Chacha, Y. Okada, Jul. 30, 1929 (TI); [no locality], [no collector's name], 1935 (KYO); Mt. Chacha, K. Ito, Aug., 1939 (SAPS).

### 15. *Menziesia pentandra* Maxim. [Koyōraku-tsutsuji] <SAKHALIN>

SOUTH. Mt. Oyakochi <67-lower l.>, T. Miyake, Jun. 26, 1908 (SAPS); E. Coast, Kamuikeshi <67-lower l.>, T. Miyake, Jun. 29, 1908 (SAPS); Nakashiretoke, Airo <67-lower l.>, S. Sugawara 17635, Jun. 19, 1935 (SAPT); Mt. Ninushi <72-upper l.?,>, T. Miyake, Jul. 2, 1908 (SAPS); E. Coast, Cheppopo <72-lower r.>, T. Miyake, Jul. 8, 1908 (SAPS); Mt. Shiretoke, Juzo-zan <74-upper l.>, T. Miyake, Jul. 2, 1908 (SAPS); Nakashiretoke, Mt. Jyuzo-zan <74-upper l.>, S. Sugawara 17631 & 17632, Sep. 20, 1931 (SAPT- 2 sheets); Nakashiretoke, Mt. Sankaku-yama <74-upper l.>, S. Sugawara 17633 & 17634, Jun. 20, 1935 (SAPT- 2 sheets).

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SOUTH. ITURUP <20>. Peretarabets Mt., K. Jimbo, Jun. 1, 1891 (SAPS); Mt. Atoiya, T. Kawakami 200, Aug. 11, 1898 (SAPS); Mt. Atosa, T. Kawakami 290, Sep. 5, 1898 (SAPS); Oyachi, S. Saito, Aug. 11, 1928 (TI- 4 sheets); Shana-Sashiusu, S. Saito, Aug. 20-22, 1928 (TI- 2 sheets); Shibetoro-Moyoro, B. Yoshimura & H. Yokoyama, Aug. 2, 1938 (SAPS); Shana-Rubetsu, B. Yoshimura, Jul. 31, 1939 (SAPS);

Shibetoro-Moyoro, Chishima-chosasho, Sep. 15, [no year; prob. 1939] (SAPS); Shibetoro vill., from mouth to middle of Shibetoro River, T. Azuma et al. 3077, Jun. 14, 2002 (SAPT). KUNASHIR <21>. Ichibishinai, C. Endo, Jul. 27, 1894 (SAPS); Seseki, M. Tatewaki 3004, Jul. 20, 1923 (SAPS); Mt. Rausu, M. Tatewaki 3267, Jul. 29, 1923 (SAPS, SAPT); Near River Onnebetsu, K. Kondo, Jul. 26, 1929 (TI- 2 sheets); Furukamapp-Nikishiro, Y. Matsumura, Jul. 21, 1930 (KYO- 2 sheets). SHIKOTAN <22>. [no locality], S. Ono (S. Sugawara Herb. 17636), Jul., 1928 (SAPT); Notoro-Shakotan, J. Ohwi (853), Aug. 12, 1931 (KYO, SAPS).

### 16. *Phyllodoce aleutica* (Spreng.) A. Heller [Aonotsugazakura] <THE KURILS>

NORTH. ATLASOVA <01>. Kitaura, S. Ito & G. Komori, Jul. 23, 1926 (SAPS); Minamiura, J. Ohwi & R. Yoshii 5842, Jul. 31, 1934 (KYO). SHUMSHU <02>. [no locality], S. Seki, 1895 (SAPS); [no locality], K. Yendo, Jul. 20, 1903 (TI); On the hill, K. Endo, Aug. 18, 1903 (SAPS); Kataokawan, M. Tatewaki 17256, May 30, 1930 (SAPS); Bettobi, J. Ohwi & R. Yoshii 30, Jul. 25, 1934 (KYO); Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5641, Jul. 28, 1934 (KYO); S of Pochtareva Cape, H. Takahashi 23303, Aug. 8, 1997 (SAPS); Baikovo, H. Takahashi 27961, Jul. 24, 2000 (SAPS). PARAMUSHIR <03>. T. Yamazaki, Aug., 1926 (SAPS); Ottomai (Otmái), [no collector's name] (Tarao), Aug. 15, 1892 (MAK 81518, SAPS); Miyakawazaki, T. Sugihara, Aug. 7, 1917 (SAPS); Murakami-wan, Y. Kudo 4946, Jul. 3, 1920 (SAPS); Kashiwabara-wan, Y. Kudo 5060, Jul. 9, 1920 (SAPS); Magarikawa, Y. Kudo 5261, Jul. 13, 1920 (SAPS); Hiratazaki, Y. Kudo 5389, Jul. 21, 1920 (SAPS); Kashiwabara-wan, Y. Kudo 5516, Jul. 26, 1920 (SAPS); Urafuto-yama, Y. Kudo 5821, Aug. 8, 1920 (SAPS); [no locality], Y. Yasuhara, Aug., 1923 (KYO); Murakami-wan, M. Tatewaki 17244, May 29, 1930 (SAPS); Mt. Kanmuri-dake, K. Kojima, Jul. 25, 1932 (TNS); Mt. Hakuen-san, K. Kojima, Jul. 31, 1932 (TNS); [no locality], T. Ohashi, Aug., 1932 (KYO); Suribachi(-wan), J. Ohwi (& R. Yoshii) 5378, Jul. 22, 1934 (KYO, SAPS); Kashiwabara-wan, J. Ohwi & R. Yoshii 5986, Aug. 2, 1934 (KYO); Usteny River, near sandy beach, H. Takahashi 20720, Aug. 1, 1996 (SAPS); Usteny River, meadows near sandy beach, H. Takahashi 20745, 20754 & 20758, Aug. 1, 1996 (SAPS- 3 sheets); Usteny River, H. Takahashi 20857, Aug. 1, 1996 (SAPS); S of Savushkina Cape, H. Takahashi 23054, Aug. 4, 1997 (SAPS); Mt. Ebeko, Y. Kuwahara 122, Aug. 5, 1997 (SAPS); Mt. Ebeko, H. Takahashi 23183, Aug. 5, 1997 (SAPS); Utesnaya Bay, H. Takahashi 23626, Aug. 11, 1997 (SAPS). [Island Uncertain; Shumshu or Paramushir], Kataoka Bay, K. Fujita, 1944-45 (TNS).

MIDDLE. MAKANRUSHI <05>. Zakat Bay, H. Takahashi 24059, Aug. 18, 1997 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 11057, Aug. 8, 1928 (SAPS); Nemo, M. Tatewaki 11155, Aug. 9, 1928 (SAPS); Minamiura, M. Tatewaki 17324, Jun. 6, 1930 (SAPS); Nemo Bay, Y. Kuwahara, Aug. 4, 1996 (SAPS); Nemo Bay, H. Takahashi 21213, Aug. 4, 1996 (SAPS); Mussel Bay-Kol'tsevoye Lake, H. Takahashi 21398, Aug. 7, 1996 (SAPS). KHARIMKOTAN <07>. M. Tatewaki 17299, Jun. 4, 1930 (SAPS); Severgina Bay, H. Takahashi 21530, Aug. 8, 1996 (SAPS). SHIASHKOTAN <10>. Zakatnaya Bay, H. Takahashi 21807, Aug. 12, 1996 (SAPS);



Zakatnaya Bay, H. Takahashi 21783, Aug. 12, 1996 (SAPS); Zakatnaya Bay, H. Takahashi 28260, Jul. 29, 2000 (SAPS). MATUA <12>. Dvoynaya Bay–Aynu Bay, H. Takahashi 22062, Aug. 15, 1996 (SAPS); Dvoynaya Bay–Aynu Bay, H. Takahashi 22083, Aug. 15, 1996 (SAPS). RASSHUA <13>. Mt. Chotozan, NW side, M. Tatewaki & K. Takahashi 15124, Aug. 5, 1929 (SAPS); Mt. Chotozan, S side, M. Tatewaki & K. Takahashi 15143, Aug. 5, 1929 (SAPS); Sonrakuwan, M. Tatewaki & K. Takahashi 15264, Aug. 8, 1929 (SAPS); Yoriki-hama–Lakes Beloye, H. Takahashi 19204, 19208 & 19212, Aug. 13, 1995 (SAPS- 3 sheets). KETOI <15>. Minamiura, M. Tatewaki & K. Takahashi 15794, Jul. 28, 1929 (SAPS); Kodakigawa, M. Tatewaki & K. Takahashi 15259, Aug. 15, 1929 (SAPS); Kodakigawa, M. Tatewaki & K. Takahashi 15303, Aug. 15, 1929 (SAPS); Lake Ketoi, M. Tatewaki & K. Takahashi 15344, Aug. 17, 1929 (SAPS); Shimizugawa, M. Tatewaki & K. Takahashi 15653, Aug. 30, 1929 (SAPS). SIMUSHIR <16>. Lake Midori, M. Tatewaki & Y. Tokunaga 11972, Aug. 18, 1928 (SAPS); Broton Bay, Wan-oku, M. Tatewaki & Y. Tokunaga 12011, Aug. 22, 1928 (SAPS); Simushir, M. Tatewaki & Y. Tokunaga 11863, Sep. 13, 1928 (SAPS); Simushir River, M. Tatewaki 17444, Jun. 9, 1930 (SAPS); Nakatomari Bay, H. Takahashi 19715, Aug. 22, 1995 (SAPS). CHIRPOI <18a>. [no locality], T. Valentina, Aug. 23, 1995 (SAPS); Peschanaya Bay, H. Takahashi 28553, Aug. 5, 2000 (SAPS).

SOUTH. ITURUP <20>. Moyoro Volc., T. Ishikawa, Sep. 5, 1890 (SAPS); Moyoro-yama, S. Yokoyama, Jul. 27, 1893 (SAPS- 2 sheets); Moyoro Volc., K. Fukuzawa, Aug. 27, 1893 (SAPS); Mt. Atoiya, T. Kawakami 191, Aug. 12, 1898 (SAPS); Mt. Moyoro, T. Kawakami 198, Aug. 12, 1898 (SAPS); Mt. Moyoro Iwo, M. Aizawa, Jul. 4, 1900 (SAPS); Shibetoro–Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Oyachi, S. Saito, Aug. 11, 1928 (TI- 3 sheets); Mt. Sashiusu, S. Saito, Aug. 22, 1928 (TI); Minamichirippu, B. Yoshimura & H. Yokoyama, Jul. 24, 1938 (SAPS); Moyoro-yama, B. Yoshimura & H. Yokoyama, Aug. 4, 1938 (SAPS); Moyoro–Shibetoro, B. Yoshimura & H. Yokoyama, Aug. 5, 1938 (SAPS); Mt. Atoiya, B. Yoshimura, Aug. 14, 1939 (SAPS); Mt. Moyoro, Chishima-chosasyo, Sep. 10, [no year: prob. 1939] (SAPS). KUNASHIR <21>. [no locality], [no collector's name], 1935 (KYO); Chacha, T. Ishikawa, Jul. 21, 1894 (SAPS) [Hybrid? between *P. aleutica* and *P. caerulea*]; Chacha, M. Nagai & M. Shimamura, Jul. 26, 1929 (SAPS- 2 sheets) [Hybrid? between *P. aleutica* and *P. caerulea*, but the flower shape is more similar to that of *P. aleutica*].

### 17. *Phylodoce caerulea* (L.) Bab. [Ezono-tsugazakura] <SAKHALIN>

NORTH. S of Peninsula of Schmidt <05-upper l.>, T. Fukuda 2275, Aug. 16, 2001 (SAPS); Luguri–Okha <07-lower l.>, Y. Kudo & B. Ishida 7230, Aug. 31, 1923 (SAPS); Oha <07-lower r.>, Okada, Sep. 5, 1923 (TI- 2 sheets); 15km S of Okha <10-upper r.>, H. Takahashi 31170, Jul. 28, 2003 (SAPS); 30km S of Okha <10-lower r.>, H. Takahashi 31156, Jul. 27, 2003 (SAPS); Gulf of Odoptu <11-upper l.>, V. Y. Barkalov 1490, Aug. 3, 2001 (SAPS); E of Gulf of Piltun, Vstrechnaya <11-upper l.>, T. Fukuda 1543, Aug. 4, 2001 (SAPS); East Coast, at 52°45' n.l., Nuto–Chaiwo <19-upper l.>, T. Ishikawa, Jul. 6, 1912 (SAPS- 2 sheets); Seacoast of Chaio <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS).

MIDDLE. 40km E of Palevo, Mt. Changa <34-upper r.>, H. Takahashi 30300, Aug. 7, 2002 (SAPS); Hantuza <37-lower r.>, Ezawa, Jul., 1923 (TI); Upstream of Hoe River <42-lower l.>, S. Sugawara 17685, Aug., 1933 (SAPT); Hoye, Forest of Kyushu Univ., Mt. Mumei-dake <42-lower r.>, Ban, Sep. 13, 1929 (KYO) [determined as *P. aleutica* by Toyokuni]; Shisuka-shicho, Mt. Shirochi-yama <45-upper l.>, S. Sugawara 29274, 29273, Aug. 7, 1935 (SAPS- 2 sheets); E. Coast, forests of Funadomari <45-upper r.>, M. Kawashima, Jul. 16, 1935 (SAPS); Shikka Distr., Mt. Kawashima <45-upper r.>, S. Sugawara no number, 17686 & 17687, Aug. 3, 1935 (SAPS, SAPT- 2 sheets); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 22721, Jun. 21, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 22777, Jun. 23, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Naruko–Nirayama <45-upper r.>, M. Tatewaki & Y. Takahashi 22882, Jun. 26, 1936 (SAPS); Shikka Distr., Naruko (Nirayama) <45-upper r.>, B. Yoshimura, Aug. 8, 1936 (SAPS); Mt. Shisuka-dake <47-upper l.>, K. Washimi, Jul. 23, 1931 (KYO); Upstream of Shisuka River, divide <47-upper l.>, S. Sugawara 17678-17680, Aug., 1933 (SAPT- 3 sheet); Mt. Shisuka-dake <47-upper l.>, S. Sugawara 17682-17684, Jul. 16, 1934 (SAPT- 3 sheets); Mt. Miharashi-yama <48-lower l.>, [no collector's name], [no date] (KYO); Mt. Isara-yama <52-lower l.>, S. Sugawara 17681, Aug. 17, 1933 (SAPT).

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NORTH. PARAMUSHIR <03>. Mt. Chai, Kamogawa, Jul. 27, 1930 (SAPS); Murakami-wan, K. Kojima 1453, Jul. 26, 1932 (TNS).

SOUTH. KUNASHIR <21>. Chacha, M. Nagai & M. Shimamura, Jul. 26, 1929 (SAPS- 3 sheets) [Hybrid? between *P. aleutica* and *P. caerulea*, but the flower shape is more similar to that of *P. caerulea*]; Mt. Chacha-nupuri, Y. Okada, Aug. 3, 1929 (TI, TNS 386956); Mt. Chacha-nupuri, M. Koriba & R. Yoshii, Jul. 23, 1933 (KYO).

### 18. *Rhododendron adamsii* Rehder [Karafuto-miyamatsutsuji] <SAKHALIN>

NORTH. S of Peninsula of Schmidt <05-lower r.>, T. Fukuda 2203, Aug. 16, 2001 (SAPS); Schmidt Peninsula, Cape Longri <05-lower r.>, V. Y. Barkalov 10875, Aug. 16, 2001 (SAPS).

MIDDLE. Shisuka-shicho, Mt. Sekkai-yama (60, 61-rinpan), <39-lower l.>, B. Yoshimura & M. Hara (104), Jul. 15, 1937 (SAPS- 3 sheets, TI); Around the border from Ikeda, Mt. Okada-yama <39-lower l.>, S. Sugawara, Jul. 11, 1938 (KYO); Mt. Asase-yama <44-upper r.>, S. Sugawara 17720-17722, Aug. 6, 1935 (SAPT- 3 sheets); Mt. Asase-yama <44-upper r.>, S. Sugawara 17718, Aug. 7, 1935 (SAPT); Shisuka, Chirie-gun, Mt. Shirochi-yama <45-upper l.>, S. Sugawara no number, 17723 & 29440, Aug. 7, 1935 (KYO, SAPS, SAPT); Shikka Distr., Naruko, Mt. Chonosuke <45-upper r.>, B. Yoshimura, Aug. 10, 1936 (SAPS).

### 19. *Rhododendron aureum* Georgi [Kibana-shakunage] <SAKHALIN>

NORTH. Near Pilewo, mountain <04-lower r.>, Y. Kudo & B. Ishida 7046, Aug. 24, 1923 (SAPS); SW from the Cape

Elizavety, mouth of River Nala <05-upper l.>, T. Fukuda 1835, Aug. 8, 2001 (SAPS).

MIDDLE. 40km E of Palevo, Mt. Changa <34-upper r.>, H. Takahashi 30323, Aug. 7, 2002 (SAPS); Nabilskiy Mts., Mt. Changa <34-upper r.>, N. Fujii 01153, Aug. 7, 2002 (MAK 343112); Pilevo <36-lower l.>, K. Jimbo, Aug. 13, 1907 (TNS); Shisuka-shicho, Mt. Sekkai-yama (60, 61-rinpan) <39-lower l.>, B. Yoshimura & M. Hara Jul. 15, 1937 (SAPS); Mt. Mimizuku-yama <42-lower r.>, H. Tobita, Jul. 26, 1925 (KYO, TI); Mt. Horoto-yama <42-lower r.>, S. Sugawara 17728, Aug. 25, 1931 (SAPT); Mt. Shisuka-dake <47-upper l.>, K. Washimi, Jul. 23, 1931 (KYO); Mt. Shisuka-dake <47-upper l.>, S. Sugawara 17725, Jul. 23, 1931 (SAPT); Kitashiretoko Peninsula, Naifuto <51-lower l.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); Kitashiretoko, Chirie <51-lower r.>, S. Sugawara 17729, Jun. 5, 1929 (SAPT); W. Coast, Mt. Ushoro <52-upper r.>, T. Miyake, Aug. 30, 1907 (SAPS, TNS).

SOUTH. E. Coast, Mt. Nupuripo <57-lower l.>, T. Miyake, Aug. 13, 1907 (SAPS, TNS); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka et al., Jul. 23, 1927 (SAPS); Mt. Nupuripo <57-lower l.>, S. Saito, Aug. 3, 1929 (TI); Upper part of Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TI); Motodomari-shicho, Mt. Tosso <57-lower l.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI); Tsapko to N peak of Mt. Vladimirovka <57-lower l.>, H. Takahashi 29574, Aug. 2, 2001 (SAPS); Mt. Kashipo <57-upper r.>, S. Hiratsuka, Aug. 7, 1928 (SAPS); Kashipo, Nishiyama <57-upper r.>, H. Abumiya & G. Takee, Aug. 4, 1932 (SAPS); Mt. Susuya <65-upper r.>, T. Miyake, Jul. 31, 1907 (SAPS); Mt. Ochopoka <65-upper r.>, T. Miyake, Jun. 13, 1908 (SAPS); Summit of Mt. Susuya <65-upper r.>, K. Numajiri, Aug. 6, 1925 (TNS); Mt. Susuya <65-upper r.>, S. Sugawara 17731, Aug. 20, 1927 (SAPT); Summit of Mt. Susuya <65-upper r.>, H. Hara, Aug. 13, 1928 (TI); Mt. Suzuya <65-upper r.>, S. Saito, Jul. 26, 1929 (TI); Mt. Susuya <65-upper r.>, S. Suganami, Aug. 16, 1931 (KYO); Mt. Ochiho-dake <65-upper r.>, S. Sugawara 17730, Jul. 20, 1933 (SAPT); Toyohara-gun, Mt. Susuya, H. Sase, Sep. 18, 1937 (SAPS); Chekhovskiy Pass–Mt. Chekhova <65-upper r.>, H. Takahashi 29281 & 29285, Jul. 22, 2001 (SAPS); Peak Chekhov, at the peak-like rocky place <65-upper r.>, T. Fukuda 1178 & 1183, Jul. 22, 2001 (SAPS); Nakashiretoko, Mt. Sankaku-yama <67-lower l.>, S. Sugawara 17726, Jun. 20, 1935 (SAPT); Todomoshiri, Mt. Dainan <73-lower l.>, T. Miyake, Jul. 26, 1906 (SAPS, TNS); Kaiba Isl. <73-lower l.>, S. Komat, Aug. 12, 1915 (TI- 2 sheets); Kaiba Isl. <73-lower l.>, S. Sugawara, Jun. 7, 1928 (TI); Kaiba Isl. <73-lower l.>, S. Sugawara 17727, Jun. 5, 1929 (SAPT); Todomoshiri, Mt. Dainan" <73-lower l.>, Kimoto et al., Jul. 28, 1931 (SAPS); Mt. Shiretoko (Juzozan) <74-upper l.>, T. Miyake, Jul. 22, 1908 (SAPS, TNS).

[No Locality]. T. Iishiba, [no date] (TI).

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NORTH. ATLASOVA <01>. [no locality], S. Ito & G. Komori, Aug., 1926 (SAPS). SHUMSHU <02>. [no locality], S. Seki, 1895 (SAPS); Bettobu, S. Yokoyama, Sep. 22, 1893 (SAPS); [no locality], T. Ishikawa, Jun. 29, 1894 (SAPS); [no locality], K. Endo, Apr. [?], 1903 (TNS); [no locality], K. Endo, Jun. 29, 1903 (SAPS); [no locality], K. Yendo, Jul. 2, 1903 (TI); Kataoka-wan, M. Tatewaki 17254, May 30, 1930 (SAPS); Hyakuike-gahama, Y. Okada, Aug. 18, 1931 (TNS); Bettobi, J. Ohwi & R. Yoshii 26, Jul. 25, 1934 (KYO); Kataoka, J. Ohwi

& R. Yoshii 69, Aug. 18, 1934 (KYO); S of Pochtareva Cape, H. Takahashi 23299, Aug. 8, 1997 (SAPS); SW of Baikovo, H. Takahashi 28004, Jul. 24, 2000 (SAPS). PARAMUSHIR <03>. Musashi-wan, M. Aizawa, Jun. 22, 1900 (SAPS); Chitose-wan, Y. Kudo 4853, Jun. 26, 1920 (SAPS); Murakami-wan, Y. Kudo 4957, Jul. 4, 1920 (SAPS); Magarikawa, Y. Kudo 5262, Jul. 13, 1920 (SAPS); Hiratazaki, Y. Kudo 5387, Jul. 21, 1920 (SAPS); Murakami-wan, Y. Kudo 5542, Jul. 27, 1920 (SAPS); Shirakawa, Y. Kudo 5609, Jul. 30, 1920 (SAPS); Urafuto-yama, Y. Kudo 5811, Aug. 8, 1920 (SAPS); Murakami-wan, M. Tatewaki 17245, May 29, 1930 (SAPS); Yamato-wan, M. Tatewaki 17355, Jun. 7, 1930 (SAPS); Mt. Murakami-dake, K. Kojima, Jul. 26, 1932 (TNS); [no locality], T. Ohashi, Aug., 1932 (KYO); Murakami-wan, J. Ohwi & R. Yoshii 5764, Jul. 30, 1934 (KYO); Vasil'yeva Bay, Y. Kuwahara, Aug. 3, 1996 (SAPS); E of Vasil'yeva Bay, H. Takahashi 21046, Aug. 3, 1996 (SAPS); NE of Mt. Ebeko, H. Takahashi 23151, Aug. 5, 1997 (SAPS); NE of Mt. Ebeko, H. Takahashi 23136, Aug. 5, 1997 (SAPS).

MIDDLE. MAKANRUSHI <05>. In heath, M. Tatewaki 11215, Aug. 9, 1928 (SAPS); [no locality], M. Tatewaki 11377, Aug. 11, 1928 (SAPS); Zakat Bay, H. Takahashi 24027, Aug. 18, 1997 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 11114, Aug. 8, 1928 (SAPS); Nemo Bay, H. Takahashi 21236, Aug. 4, 1996 (SAPS); Mussel Bay–Kol'tsevoye Lake, H. Takahashi 21396, Aug. 7, 1996 (SAPS). KHARIMKOTAN <07>. Nishiura, M. Tatewaki 17206, May 28, 1930 (SAPS); Severgina Bay, H. Takahashi 21571, Aug. 8, 1996 (SAPS); S of Lazurnoye Pond, H. Takahashi 28147, Jul. 28, 2000 (SAPS). SHIASHKOTAN <10>. [no locality], T. Ishikawa, Jun. 23, 1894 (SAPS); Otome-wan, M. Tatewaki 17335, Jun. 6, 1930 (SAPS); Zakatnaya Bay, H. Takahashi 21834, Aug. 12, 1996 (SAPS). MATUA <12>. Hokuto-misaki, M. Tatewaki & Y. Tokunaga 12223, Sep. 5, 1928 (SAPS); Dvoynaya Bay–Aynu Bay, H. Takahashi 22086, Aug. 15, 1996 (SAPS); Dvoynaya Bay–Aynu Bay, H. Takahashi 22063, Aug. 15, 1996 (SAPS). RASSHUA <13>. Kitakado, M. Tatewaki & Y. Tokunaga 12448, Aug. 6, 1928 (SAPS); Mikasa, M. Tatewaki & Y. Tokunaga 12353, Aug. 6, 1928 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14974, Aug. 3, 1929 (SAPS- 2 sheets); Mt. Choto-zan, M. Tatewaki & K. Takahashi 15318, Aug. 10, 1929 (SAPS); Yorikihama, H. Takahashi 19029, Aug. 12, 1995 (SAPS); S of Yorikihama, H. Takahashi 19156, Aug. 12, 1995 (SAPS). USHISHIR-RYPONKICHA <14a>. [no locality], M. Tatewaki & Y. Tokunaga 12542, Aug. 11, 1928 (SAPS); In heath, M. Tatewaki & K. Takahashi 15910, Sep. 14, 1929 (SAPS); SW side to central part, H. Takahashi 22961, Aug. 2, 1997 (SAPS). KETOI <15>. [no locality], M. Tatewaki & Y. Tokunaga 11492, Sep. 1, 1928 (SAPS); Minami, M. Tatewaki & K. Takahashi 15188, Aug. 14, 1929 (SAPS); Kodakigawa, stream, M. Tatewaki & K. Takahashi 15260, Aug. 15, 1929 (SAPS); Kodakigawa, bog, M. Tatewaki & K. Takahashi 15307, Aug. 15, 1929 (SAPS); Lake Ketoi, M. Tatewaki & K. Takahashi 15324, Aug. 17, 1929 (SAPS); Stochnyy River, H. Takahashi 19593 & 19601, Aug. 19, 1995 (SAPS- 2 sheets). SIMUSHIR <16>. Broton Bay, M. Tatewaki & Y. Tokunaga 11660, Aug. 14, 1928 (SAPS); Broughton-Bay, M. Tatewaki 17406, Jun. 9, 1930 (SAPS); Malaya Inlet, H. Takahashi 19520, Aug. 18, 1995 (SAPS); Nakatomari Bay, H. Takahashi 19717, Aug. 22, 1995 (SAPS). CHIRPOI <18a>. [no locality], Kodama, Jun., 1893 (SAPS);

[As Three Brothers], [no locality], T. Kitahara, Aug. 20, 1895 (SAPS); Peschanaya Bay, H. Takahashi 19859, Aug. 23, 1995 (SAPS). BRAT CHIRPOEV <18b>. [no locality], Tarao, Jun. 18, 1892 (SAPS); Uglovaya Bay, H. Takahashi 28487, Aug. 4, 2000 (SAPS). URUP <19>. Suribachi-yama Volcano, K. Jimbo, Jun. 16, 1891 (SAPS); Anama-Yoshinohama, K. Uchida, Jun. 17, 1891 (SAPS- 2 sheets); Anama, terrace, K. Jimbo, Jun. 18, 1891 (SAPS); [no locality], K. Miura, Jul. 8-9, 1906 (SAPS); Kobune, M. Tatewaki 9791, Aug. 26, 1927 (SAPS); Tokotan, M. Tatewaki 9671, Aug. 29, 1927 (SAPS); Daibahama, M. Tatewaki 9921, Sep. 1, 1927 (SAPS); Onsenzaki, M. Tatewaki 10063, Sep. 9, 1927 (SAPS); 15km N of Van-Der-Lind Cape, M. Ohara, Aug. 26, 1995 (SAPS); Barhatnyy Bay, H. Takahashi 20089, Aug. 28, 1995 (SAPS, TUS); Tetyayeva Bay, H. Takahashi 22247, Aug. 21, 1996 (SAPS).

SOUTH. ITURUP <20>. Moyoro Volcano, T. Ishikawa, Sep. 5, 1890 (SAPS); Peretarabets Mt., K. Jimbo, Jun. 1, 1891 (SAPS); Moyoroyama, S. Yokoyama, Jul. 27, 1893 (SAPS- 2 sheets); Mt. Atoiya, T. Kawakami, Aug. 11, 1898 (SAPS); Rakko-jima, T. Kawakami 283, Aug. 27, 1898 (SAPS); Moyoro, G. Tanaka & Ken. Miyabe, Jul. 17, 1910 (SAPS); Shibetoro-Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Oyachi, S. Saito no number & 6125, Aug. 11, 1928 (TI, TNS); Mt. Hitokappu-yama, M. Koriba & R. Yoshii, Aug. 14, 1933 (KYO); Minamichirippu, B. Yoshimura & H. Yokoyama, Jul. 24, 1938 (SAPS). KUNASHIR <21>. Furukamapp, M. Tatewaki 3373, Jul. 26, 1923 (SAPS); Mt. Rausu, H. Ishikawa 3694, Aug. 1, 1923 (SAPS); Mt. Rausu, K. Ito, Sep. 22, 1939 (SAPS); Mt. Moyoro, Chishimachosasyo, [no year; prob. 1939] (SAPS). SHIKOTAN <22>. Mt. Okkaibetsu, S. Saito 1467, Sep. 5, 1925 (TI); K. Kondo 7837, Aug. 11, 1927 (TI); Mt. Shakotan, K. Kondo, Aug. 6, 1929 (TI- 2 sheets); Chiboi, K. Kondo, Aug. 10, 1929 (TI); Horobetsu-Okkaibetsu, K. Kondo, Aug. 31, 1929 (TI); Chiboi-Umanose, K. Kondo, Sep. 7, 1929 (TI); Umanose, J. Ohwi, Jul. 31, 1931 (KYO); Shakotan, S. T. Ono, Jun. 1, 1932 (TI); Shakotan, S. T. Ono, Jun. 3, 1934 (TNS); [no locality], Ono, Jul., 1938 (SAPT).

## 20. *Rhododendron brachycarpum* D. Don ex G. Don [Hakusan-shakunage] <THE KURILS>

SOUTH. ITURUP <20>. Peretarabets Sulphur Mt., K. Jimbo, Jun. 1, 1891 (SAPS). KUNASHIR <21>. Tohutsu-mura, Furukamapp, C. Endo, Sep. 17, 1894 (SAPS).

## 21. *Rhododendron lapponicum* (L.) Wahlenb. [Sakai-tsutsuji] <SAKHALIN>

NORTH. East Coast, at 52°45' n.l., Nuto-Chaiwo <19-upper l.>, T. Ishikawa, Jul. 6, 1912 (SAPS); Seacoast of Chaiwo <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS).

MIDDLE. Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS, TNS 380672); Poronai-mura <37-lower r.>, T. Miyake, Aug. 29, 1906 (SAPS); Mirnyy-Pervomayskoye <38-lower l.>, H. Takahashi 30469, Aug. 10, 2002 (SAPS); 20km NE of Smirnykh, banks of the Poronay RAA Mirnyy <38-lower l.>, N. Fujii 01284, Aug. 10, 2002 (MAK 346154); Tobani <43->, T. Miyake, Aug. 20, 1906 (SAPS); Shisuka-

shicho, Atsunai River <45-upper r.>, Y. Hoshino et al., Jul. 12, 1933 (SAPS); Nairo <48-lower l.>, S. Sugawara 17788, Jun. 1, 1936 (SAPT); Duwatakko <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Near Shisuka, R. Shottoi <48-upper r.>, I. Namikawa, Aug. 18, 1914 (SAPS); Shisuka <48-upper r.>, S. Sugawara 17780 & 17781, Jun., 1928 (SAPT- 2 sheets); Shisuka <48-upper r.>, S. Sugawara 37, Jun. 8, 1928 (TI); Shisuka <48-upper r.>, S. Sugawara no number & 17784, Jun. 15, 1928 (SAPT, TI); Siska <48-upper r.>, S. Sugahara, Jul. 15, 1928 (KYO); Siska, tundra, Amiba <48-upper r.>, G. Koidzumi, Aug. 18, 1930 (KYO); Downstream of Shisuka River, tundra <48-upper r.>, H. Hara, Aug. 3, 1931 (TI- 2 sheets); Shisuka-shicho, Taraika-Nimenjo <49-upper r.>, B. Yoshimura & M. Hara, Jul. 10, 1907 (SAPS); Rukutama <49-upper r.>, S. Sugawara 17783, 17785 & 17786, Jun. 5, 1939 (SAPT- 3 sheets); Tohkishi <50-upper l.>, S. Sugawara 17782, Aug., 1927 (SAPT); Shisuka-shicho, Nishinokoro <50-upper r.>, Y. Hoshino et al., Aug. 16, 1933 (SAPS). Shisuka-shicho, Toyo[?]koro, tundra <?>, M. Kawahsima, Jun. 3, 1935 (SAPS). [No/uncertain Locality]. S. Komatsu, 1909 (TI- 4 sheets).

## 22. *Rhododendron tschonoskii* Maxim. [Kome-tsutsuji] <THE KURILS>

SOUTH. KUNASHIR <21>. Mt. Tomari, M. Tatewaki 25501, Aug. 20, 1936 (SAPS- 2 sheets).

## 23. *Therorhodium camtschaticum* (Pall.) Small [Ezo-tsutsuji] <SAKHALIN>

MIDDLE. Pilevo <36-lower l.>, K. Jimbo, Aug. 13, 1907 (TNS); Mt. Horoto-yama <42-lower r.>, S. Sugawara 17823, Aug. 25, 1931 (SAPT); E. Coast, upstream of Naruko River <45-upper l.?, M. Kawashima 16, Jul. 21, 1935 (SAPS); Mt. Shisuka-dake <47-upper l.>, K. Washimi, Jul. 23, 1931 (KYO); Upstream of Shisuka River <47-upper l.>, S. Sugawara 17824 & 17826, Jul. 16, 1933 (SAPT- 2 sheets); Nairo-sawa, divide <47-lower r.?, S. Sugawara 17829, Jul. 10, 1933 (SAPT); Shisuka-shicho, Motomari <51-upper l.>, Y. Hoshino et al., Aug. 3, 1933 (SAPS); Mt. Isara-yama <52-lower l.>, S. Sugawara 17822, Aug. 17, 1933 (SAPT); Mt. Shiritori <54-lower l.>, K. Fujita, Aug. 5, 1928 (SAPS).

SOUTH. E. Coast, Mt. Nupuripo <57-lower l.>, T. Miyake, Aug. 13, 1907 (SAPS, TNS); Mt. Tosso <57-lower l.>, G. Yamada, Aug. 4, 1926 (KYO); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka et al., Jul. 20, 1927 (SAPS); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka et al., Jul. 23, 1927 (SAPS); Mt. Tosso <57-lower l.>, N. Hiratsuka, Aug. 7, 1928 (SAPS); Mt. Nupuripo <57-lower l.>, S. Saito, Aug. 3, 1929 (TI- 2 sheets); Summit of Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TI- 2 sheets); Mt. Tosso <57-lower l.>, J. Ohwi, Jul. 22, 1932 (KYO); Mt. Tosso <57-lower l.>, T. Tsuyama, Jul. 24, 1932 (TI); Mt. Tosso <57-lower l.>, S. Sugawara 17825, Jul. 18, 1935 (SAPT); Motodomari-shicho, Mt. Tosso <57-lower l.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI); Tsapko to N peak of Mt. Vladimirovka <57-lower l.>, H. Takahashi 29564, Aug. 2, 2001 (SAPS); Mt. Kashipo <57-upper r.>, S. Sugawara 17827, Aug. 27, 1929 (SAPT); Kashipo, Kashipo-dake <57-upper r.>, H. Abumiya et al., Jul. 22, 1932 (SAPS); Kashipo, Nishiyama <57-upper r.>, H. Abumiya et al., Jul. 31, 1932 (SAPS); E. Coast, Mt. Chikaporonai <59-upper l.>, T. Miyake,

Aug. 12, 1907 (SAPS, TNS); Tikhaya village, mouth of Tikhaya River <59-upper l.>, T. Fukuda 2499, Aug. 28, 2001 (SAPS); Mt. Susuya <65-upper r.>, T. Miyake, Jul. 31, 1907 (SAPS); Summit of Mt. Susuya <65-upper r.>, K. Numajiri, Aug. 6, 1925 (TNS); Mt. Susuya <65-upper r.>, S. Sugawara 17828, Jul. 10, 1927 (SAPT); Summit of Mt. Susuya <65-upper r.>, H. Hara, Aug. 3, 1928 (TI); Chekhovskiy Pass–Mt. Chekhova <65-upper r.>, H. Takahashi 29287, Jul. 22, 2001.07.22 (SAPS); Peak Chekhov, the peak-like rocky place <65-upper r.>, T. Fukuda 1176, Jul. 22, 2001 (SAPS- 2 sheets); Isl. Kaibato, Mt. Dainan <73-lower l.>, Kimoto et al., Jul. 26, 1931 (SAPS).

#### <THE KURILS>

NORTH. ATLASOVA <01>. Kitaura, S. Ito & G. Komori, Jul. 23, 1926 (SAPS); Chinowatashi–Minamiura, Y. Okada, Jul. 23, 1931 (TNS). SHUMSHU <02>. [no locality], S. Seki, 1895 (SAPS); [no locality], S. Gunji, 1897 (SAPS); [no locality], S. Gunji, 1898 (SAPS); [no locality], K. Endo, Aug. (17), 1903 (TI, TNS); Saisyu-gahara, K. Endo, Aug. 17, 1903 (SAPS); Shiomi-gawa, J. Ohwi & R. Yoshii 5711, Jul. 29, 1934 (KYO); Kataoka, J. Ohwi & R. Yoshii 5677, Aug. 18, 1934 (KYO); S of Pochtareva Cape, H. Takahashi 23283, Aug. 8, 1997 (SAPS); Baikovo, H. Takahashi 27975, Jul. 24, 2000 (SAPS); Baikovo, M. Nakatani, Jul. 24, 2000 (SAPS). PARAMUSHIR <03>. Ottomai, [no collector's name], Aug. 15, 1892 (MAK 101481); Ottomai (Otomai), C. Tarao, Aug. 25, 1892 (MAK 101482, SAPS, TI); Kuzira-wan, T. Matsubara, Jul. 24, 1917 (SAPS); Shikatanoma, Y. Kudo 5087, Jul. 11, 1920 (SAPS); Yotsuiwahana, Y. Kudo 5179, Jul. 12, 1920 (SAPS); Arakawa, Y. Kudo 5361, Jul. 15, 1920 (SAPS); Hiraizaki, Y. Kudo 5388, Jul. 21, 1920 (SAPS); Kashiwabara-wan, Y. Kudo 5517, Jul. 26, 1920 (SAPS); Shirakawa, Y. Kudo 5608, Jul. 30, 1920 (SAPS); Ruesan, Y. Kudo 5673, Aug. 5, 1920 (SAPS); Ruesan, Y. Kudo 5851, Aug. 11, 1920 (SAPS); Kakumabetsu, [no collector's name], Jul. 26, 1931 (SAPS); Mt. Chikura-dake, Y. Okada, Jul. 30, 1931 (TNS); Mt. Kanmuri-dake, K. Kojima, Jul. 25, 1932 (TNS); Kuzira-hama, H. Koidzumi, Jul. 31, 1932 (TNS); [no locality], T. Ohashi, Aug., 1932 (KYO); Arakawa, J. Ohwi & R. Yoshii '96, Jul. 10, 1934 (KYO); Suribachi-wan, J. Ohwi & R. Yoshii 5376, Jul. 22, 1934 (KYO); Suribachi, J. Ohwi & R. Yoshii 5539, Jul. 23, 1934 (KYO); Kashiwabara-wan, J. Ohwi & R. Yoshii 5957, Aug. 2, 1934 (KYO); Utesnyy River, H. Takahashi 20864, Aug. 1, 1996 (SAPS); NE of Mt. Ebeko, H. Takahashi 23160 & 23176, Aug. 5, 1997 (SAPS- 2 sheets). [Island Uncertain; Shumshu or Paramushir], K. Fujita, 1944-45 (TNS);

MIDDLE. MAKANRUSHI <05>. In heatsh, M. Tatewaki 11216, Aug. 9, 1928 (SAPS); [no locality], M. Tatewaki 11382, Aug. 11, 1928 (SAPS); Zakat Bay, H. Takahashi 24043 & 24063, Aug. 18, 1997 (SAPS- 2 sheets). ONEKOTAN <06>. Nemo, M. Tatewaki 11072, Aug. 8, 1928 (SAPS); Nemo, M. Tatewaki 11193, Aug. 9, 1928 (SAPS); Nemo Bay, M. Yabe, Aug. 4, 1996 (SAPS); Nemo Bay, H. Takahashi 21186, Aug. 4, 1996 (SAPS); N of Angibi Cape, H. Takahashi 21335, Aug. 5, 1996 (SAPS); Nemo Bay, H. Takahashi 28106, Jul. 27, 2000 (SAPS). KHARIMKOTAN <07>. Severgina Bay, H. Takahashi 21518, Aug. 8, 1996 (SAPS). EKARMA <09>. E of Cape Shpilevoy, H. Takahashi 21679, Aug. 10, 1996 (SAPS). SHIASHKOTAN <10>. Zakatnaya Bay, H. Takahashi 21764, Aug. 11, 1996 (SAPS, TUS); Zakatnaya Bay, M. Nakatani, Jul. 29, 2000 (SAPS- white

fls.). RAIKOKE <11>. E side of island, H. Takahashi 21910, Aug. 13, 1996 (SAPS). MATUA <12>. Nakadomari, M. Tatewaki & Y. Tokunaga 12139, Aug. 7, 1928 (SAPS); Mt. Fuyo, M. Tatewaki & Y. Tokunaga 12217, Sep. 5, 1928 (SAPS); Dvoynaya Bay, H. Takahashi 22011, Aug. 14, 1996 (SAPS); Dvoynaya Bay–Orlova Cape, M. Nakatani, Jul. 31, 2000 (SAPS). RASSHUA <13>. [no locality], Kodama, Jul., 1893 (SAPS); Mikasa, M. Tatewaki & Y. Tokunaga 12384, Aug. 6, 1928 (SAPS); Minamikado, M. Tatewaki & K. Takahashi 14992, Aug. 4, 1929 (SAPS); Sonrakuwan, M. Tatewaki & K. Takahashi 14858, Aug. 2, 1929 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14905, Aug. 3, 1929 (SAPS); Mt. Choto-zan, M. Tatewaki & K. Takahashi 15137, Aug. 5, 1929 (SAPS); Mt. Choto-zan, M. Tatewaki & K. Takahashi 15312, Aug. 10, 1929 (SAPS); Yoriki-hama, H. Takahashi 19033 & 19047, Aug. 12, 1995 (SAPS, TUS); S of Yoriki-hama, H. Takahashi 19146, Aug. 12, 1995 (SAPS). USHISHIR-YANKICHA <14b>. M. Tatewaki & K. Takahashi 15817, Jul. 30, 1929 (SAPS); Mountain ridge, H. Takahashi 22891 & 22908, Aug. 1, 1997 (SAPS- 2 sheets). KETOI <15>. Lake Ketoi, M. Tatewaki & K. Takahashi 15347, Aug. 17, 1929 (SAPS); Ishikuzurehama, M. Tatewaki & K. Takahashi 15360, Aug. 17, 1929 (SAPS); Stochnyy River, H. Takahashi 19634, Aug. 19, 1995 (SAPS, TUS). SIMUSHIR <16>. Brotonzaki, M. Tatewaki & Y. Tokunaga 11700, Aug. 14, 1928 (SAPS); Nakadomari, M. Tatewaki & Y. Tokunaga 11896, Aug. 17, 1928 (SAPS); Simushir, M. Tatewaki & Y. Tokunaga 11867, Sep. 13, 1928 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 15984, Jul. 25, 1929 (SAPS); Nakadomari Bay, H. Takahashi 19732, Aug. 22, 1995 (SAPS, TUS). CHIRPOI <18a>. Peschanaya Bay, H. Takahashi 19846, Aug. 23, 1995 (SAPS). BRAT CHIRPOEV <18b>. Uglovaya Bay, H. Takahashi 28498, Aug. 4, 2000 (SAPS). URUP <19>. [no locality], K. Miura, Jul. 8-9, 1906 (SAPS); Near Tokotan, M. Tatewaki 9613, Aug. 29, 1927 (SAPS); W of Tokotan, M. Tatewaki 9981, Sep. 3, 1927 (SAPS); [no locality], K. Watanabe, Jun.-Jul., 1944 (TI); Otkrytyy Bay, H. Takahashi 18560 & 18568, Aug. 5, 1995 (SAPS- 2 sheets); Ukromnaya Bay, H. Takahashi 22178, Aug. 20, 1996 (SAPS); Chernoburka Bay, M. Nakatani, Aug. 9, 2000 (SAPS).

SOUTH. ITURUP <20>. Moi[?]keshi Bay, T. Ishikawa, Aug. 18, 1890 (SAPS); Mt. Moyoro-yama, K. Fukuzawa, Aug. 27, 1893 (SAPS); Mt. Moyoro-yama, T. Kawakami 186 & 187, Aug. 12, 1898 (SAPS- 2 sheets); Mt. Chirippu-yama, T. Kawakami 285, Aug. 19, 1898 (SAPS); Moyoro, Mt. Iwo-zan, M. Aizawa, Jul. 4, 1900 (SAPS); Shibetoro–Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Porosu–Sokiya, G. Tanaka & Ken. Miyabe, Jul. 21, 1910 (SAPS); Shamanbe, K. Kondo, Jul. 14-15, 1927 (TI- 2 sheets); Porosu–Sokiya, K. Kondo, Jul. 18, 1927 (TI- 2 sheets); Porosu–Sokiya, S. Saito, Aug. 7, 1928 (TI); Oyachi, S. Saito 6128, Aug. 11, 1928 (TI- 3 sheets); Mt. Hitokappu-yama, M. Koriba & R. Yoshii, Aug. 14, 1933 (KYO); Minamichrippu, B. Yoshimura & H. Yokoyama, Jul. 24, 1938 (SAPS); Mt. Moyoro-yama, B. Yoshimura & H. Yokoyama, Aug. 4, 1938 (SAPS); Mt. Atosa-yama, B. Yoshimura, Aug. 14, 1939 (SAPS); Moyoro, Chishimachosasyo, Sep. 15, [no year; prob. 1939] (SAPS- 2 sheets). KUNASHIR <21>. Seseki, U. Faurie 5107, Aug. 11, 1889 (SAPS); Furukamapp, M. Tatewaki 3247 & 3347, Jul. 25, 1923 (SAPS, SAPT); Nikishiro, M. Tatewaki 3574, Jul. 29, 1923

(SAPS); Mt. Rausu, H. Ishikawa 3695, Aug. 1, 1923 (SAPS); Mt. Chacha-nupuri, M. Koriba & R. Yoshii, Aug. 24, 1933 (KYO); [no locality], [no collector's name], 1935 (KYO); Mt. Tomari, M. Tatewaki 25496, Aug. 20, 1936 (SAPS); Mt. Chacha, K. Ito, Aug., 1939 (SAPS). SHIKOTAN <22>. [no locality], K. Miyabe, Jul. 2, 1884 (TI); Shakotan, K. Miyabe, Jul. 27, 1884 (SAPS); Shakotan, T. Kawakami 510, Aug. 1, 1898 (SAPS); Shakotan, K. Miura, Jul. 26, 1906 (SAPS); Anama, Arai, Jul. 6, 1909 (TNS); Around Shakotan, [no collector's name; prob. H. Takeda], Jul. 16, 1909 (SAPS); Anama, H. Takeda, Jul. 20, 1909 (SAPS); Anama, [no collector's name; prob. H. Takeda], Jul. 24, 1909 (SAPS); Anama, M. Arai, Jul. 6, 1910 (SAPS); Anama, G. Tanaka & Ken. Miyabe, Aug. 14, 1910 (SAPS); Anama, M. Arai, Sep. 14, 1910 (SAPS); Mt. Shakotan, S. Saito 3300, Aug. 30, 1925 (TI); Shakotan, S. Saito, Sep. 2, 1925 (TI); Horobetsu, S. Saito 1437, Sep. 4, 1925 (TI); [no locality], K. Kondo 7827 & 7838, Aug. 11, 1927 (TI- 3 sheets); Shakotan, M. Tatewaki 9502, Aug. 23, 1927 (SAPS); Shakotan, K. Kondo, Aug. 4, 1929 (TI); Mt. Shakotan, K. Kondo, Aug. 6, 1929 (TI); Chiboi, K. Kondo, Aug. 10, 1929 (TI- 2 sheets, TNS); Anama, K. Kondo, Aug. 28, 1929 (TI- 2 sheets); Mt. Tomari, K. Kondo, Sep. 5, 1929 (TI); Chiboi-Umanose, K. Kondo, Sep. 7, 1929 (TI); Shakotan, S. T. Ono, Jul. 5, 1930 (SAPT, TI); Matakotan, J. Ohwi, Jul. 19, 1931 (KYO); Shakotanzaki, J. Ohwi no number & 263, Jul. 27, 1931 (KYO, SAPS); Shakotan-zaki, J. Ohwi, Sep. 3, 1931 (KYO); Shakotan-yama, M. Tatewaki 20795, Jun. 29, 1934 (SAPS); [no locality], [no collector's name], 1937 (TNS); [no locality], S. T. Ono, Jun., 1938 (SAPS).

**24. Therorhodium redowskianum (Maxim.) Hutch.**  
[Kumoma-tsutsuji]  
<SAKHALIN>

MIDDLE. 40km E of Palevo, Mt. Changa, alt. 1120-1511m <34-upper r.>, H. Takahashi 30335, Aug. 7, 2002 (SAPS); 40km E of Palevo, Mt. Changa, alt. 1400-1510m <34-upper r.>, H. Takahashi 30351, Aug. 7, 2002 (SAPS); Nabil'skiy Mts., Changinskiy Pass <34-upper r.>, V. Y. Barkalov 2440 (SAPS); Shisuka-shicho, Mt. Sekkai-yama (60-61-rinpan) <39-lower l.>, B. Yoshimura & M. Hara no number & 103, Jul. 15, 1937 (SAPS- 3 sheets, TNS); Mt. Okada-yama <39-lower l.>, S. Sugahara, Jul. 11, 1938 (KYO); Mt. Okada-yama <39-lower l.>, S. Sugawara 17793-17797, Aug. 10, 1938 (SAPT- 5 sheets); E. Coast, Shikka Distr., the upper Naruko <45-upper l.?,>, M. Kawashima, Jul. 21, 1935 (SAPS- 2 sheets); Shikka Distr., the upper Naruko <45-upper l.?,>, B. Yoshimura, Aug. 14, 1936 (SAPS).

**25. Vaccinium microcarpum (Turcz. ex Rupr.) Schmalh.**  
[Hime-tsurukokemomo]  
<SAKHALIN>

NORTH. Pomere-Moskariwo, Takada-shoka, on the peat <06-lower r.>, Y. Kudo & B. Ishida 7338, Aug. 31, 1923 (SAPS); East Coast, at 52°45' n.l., Nuto-Chaiwo <19-upper l.>, T. Ishikawa, Jul. 6, 1912 (SAPS); Nyiwo, Ins. Mobio, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6552, Aug. 14, 1922 (SAPS); Parukata, tundra <26-upper r.>, Y. Kudo & M. Tatewaki 6431, Aug. 10, 1922 (SAPS).

MIDDLE. Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS); Shisuka-shicho, Sibunkoro <45-lower r.>, Y.

Hoshino et al., Jul. 6, 1933 (SAPS); Nairo <48-lower l.>, S. Sugawara 17658, Aug. 6, 1930 (SAPT); Shikka <48-upper r.>, K. Miyabe & T. Miyagi, Jul. 23, 1906 (SAPS); Duwatacko <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS, TNS); Tobani <48-upper r.?,>, T. Miyake, Aug. 20, 1906 (SAPS, TNS 380698); Siska <48-upper r.>, T. Sawada, Aug. 14, 1923 (TI); Shisuka <48-upper r.>, S. Sugawara 17660, Jun., 1925 (SAPT); Shisuka, Experiment Forest of Kyoto Univ. <48-upper r.>, T. Chono, Jul. 28, 1928 (TNS); Shisuka <48-upper r.>, H. Otani & Y. Imai, Jul. 20, 1930 (SAPS); Amiba < 48-upper r.>, G. Koidzumi, Aug. 18, 1930 (KYO); Downstream of Horanai River, tundra <48-upper r.>, H. Hara, Aug. 2, 1931 (TI); Shisuka-cho, Otasu <48-upper r.>, Y. Hoshino et al., Jul. 8, 1933 (SAPS); Taraika <49-upper l.>, T. Miyake, Aug. 14, 1906 (SAPS); Shisuka-shicho, near Taraika <49-upper r.>, M. Honda & Y. Kimura, Aug. 16, 1904 (TI- 3 sheets, mingled with *V. oxycoccus*); Shisuka-shicho, Taraika-Nimenjo <49-upper r.>, B. Yoshimura & M. Hara, Jul. 10, 1937 (SAPS); Shisuka-shicho, Nishinokoro <50-upper r.>, Y. Hoshino et al., Aug. 17, 1933 (SAPS); Shisuka-shicho, Nokoro <50-upper r.>, M. Kawasima, Jul. 7, 1935 (SAPS); Kitashiretoko Peninsula, Noto <51-lower l.>, Y. Hoshino et al., Jul. 27, 1933 (SAPS); Kitashiretoko Peninsula, Kitashiretoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 20, 1933 (SAPS).

SOUTH. Y. Hoshino, S. Okada & S. Sugiyama, Jul. 20, 1933 (SAPS); Maguntan <57-lower l.>, S. Saito 995, Aug. 5, 1929 (TI- 2 sheets); Hoyori-mura, Maguntan <57-lower l.>, H. Sase, Aug. 13, 1936 (SAPS); Odasamu <59-lower l.>, S. Otagiri, Jul. 1, 1930 (KYO, mingled with *V. oxycoccus*); Toyohara-shicho, (Kurokawa) Fukakusa <61-lower r.>, S. Sugawara, Sep. 10, 1925 (SAPS); Kurokawa <62-lower l.>, S. Sugawara 17659, Jul. 15, 1926 (SAPT); Kurokawa mire <62-lower l.>, H. Hara, Jul. 31, 1931 (TI); Enoura <65-lower l.>, S. Sugawara 17657, Jul. 18, 1929 (SAPT); Korsakovsky Distr., Susuya moor, Ozeretskoye <65-lower l.>, S. Noshiro, Y. Iokawa & M. Suzuki 970705-18, Jul. 5, 1997 (TI); 10km E of Korsakov, N of Prigordnoye, E side of Mereya River <70-upper r.>, H. Takahashi 29425, Jul. 28, 2001 (SAPS); Aniwa Bay, Chipisani <71-upper l.>, T. Miyake, Jul. 19, 1908 (SAPS, TNS); Nagahama-gun, Tobuchi-mura <71-upper r.>, H. Sasa, Sep. 13, 1936 (SAPS); Notoro-Kiridoshi <73-lower r.>, K. Kondo, Sep. 3, 1929 (TI).

[No Locality]. T. Miyake, [no date] (TNS).

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NORTH. SHUMSHU <02>. Numajiri [?], Y. Okada, Aug. 18, 1931 (TNS); Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5640, Jul. 28, 1934 (KYO). PARAMUSHIR <03>. Suribachi, J. Ohwi & R. Yoshii 5429, Jul. 22, 1934 (KYO, SAPS).

MIDDLE. KETOI <15>. Isozaki, M. Tatewaki & K. Takahashi 15576, Aug. 24, 1929 (SAPS). SIMUSHIR <16>. Yamagoshizaki, M. Tatewaki & Y. Tokunaga 11818, Aug. 16, 1928 (SAPS). URUP <19>. Kobune, M. Tatewaki 9824, Aug. 26, 1927 (SAPS); 15km NE of Van-Der-Lind, M. Ohara, Aug. 26, 1995 (SAPS).

SOUTH. KUNASHIR <21>. Furukamappu, J. Ohwi, Aug. 12, 1923 (TNS). SHIKOTAN <22>. Kiritoshi-Debari, J. Ohwi, Aug. 7, 1931 (KYO); Shakotan, Kiridoushi, S. Ono, Aug. 15, 1931 (SAPS); Shikotan-matsuhara, M. Tatewaki 20843, Jun. 22, 1934 (SAPS); Shakotan, Inemoshiri, S. T. Ono 48, Jun. 22, 1934 (TI); Shikotan-matsuhara, D. Akaiishi 20885,

Jun. 29, 1934 (SAPS).

**26. *Vaccinium ovalifolium* Sm. [Kuro-usugo]  
<SAKHALIN>**

**NORTH.** Near Pilewo, mountain <04-lower r.>, Y. Kudo & B. Ishida 7047, Aug. 24, 1923 (SAPS); Oha <7-lower r.>, Okada, Sep. 3, 1923 (TI- 2 sheets); Pupuni, in sylvis <26-lower l.>, Y. Kudo & M. Tatewaki 6358, Aug. 8, 1922 (SAPS).

**MIDDLE.** Alexandrovski <28-lower l.>, S. Takeo, Aug., 1905 (SAPS); Adatuim <29-upper l.>, Okada, Aug. 23, 1923 (TI); 35-40km E of Kirovskoye, N of Chamginskyi Pass <34-upper r.>, N. Fujii 01227, Aug. 8, 2002 (MAK 346156, SAPS); 40km E of Palevo, N of Changinskiy Pass <34-upper r.>, H. Takahashi 30373, Aug. 8, 2002 (SAPS); NW of Pogranichnoye, S bank of the Langeri River <35-lower r.>, N. Fujii 01296, Aug. 11, 2002 (MAK 346155); Hinan-ekisha-Aobaeki <36-lower l.>, Y. Kudo & M. Tatewaki 6175, Jul. 30, 1922 (SAPS); Anbetsu <36-lower l.>, K. Kawai & Y. Tokunaga, Sep. 2, 1929 (SAPS); Anbetsu, Ooiwa-toge <36-lower l.>, Y. Tokunaga & K. Kawai, Sep. 2, 1929 (SAPS); Aobaeki-Kamionoru <36-upper r.>, Y. Kudo & M. Tatewaki 6203, Jul. 31, 1922 (SAPS); Eastern boundary, Asase <40-lower l.>, Y. Hoshino et al., Aug. 11, 1933 (SAPS); Asase <40-lower l.>, S. Sugawara 17872, Aug. 4, 1935 (SAPT); Ennai <40-lower l.>, S. Sugawara 17870 & 17871, Aug. 5, 1935 (SAPT- 2 sheets); Shisuka-shicho, Chirie-gun, Ennai <40-lower l.>, M. Tatewaki & Y. Takahashi 22457, Jun. 13, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Ennai <40-lower l.>, M. Tatewaki & Y. Takahashi 22474, Jun. 14, 1936 (SAPS); Shisuka, Ennai, border <40-lower l.>, S. Sugawara 28691, Aug. 5, 1938 (SAPS); Shisuka, Saren <40-lower r.>, S. Sugawara 28652 & 28653, Aug. 4, 1935 (SAPS); Hoe <42-lower r.>, S. Sugawara 17867-17869, Aug. 10, 1931 (SAPT- 3 sheets); Shisuka-gun, Hoe <42-lower r.>, S. Sugawara, Aug. 6, 1932 (KYO); Shisuka-shicho, Chirie-gun, Chirikoro <45-upper r.>, M. Tatewaki & Y. Takahashi 22669, Jun. 20, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 22722, Jun. 21, 1936 (SAPS); Kitashiretoko Peninsula, Shibunkoro <45-lower r.>, Y. Hoshino et al., Aug. 4, 1933 (SAPS); Nayoshi-gun, Kitaozawa <46-upper l.>, M. Henmi, Jun. 1, 1943 (MAK 80900, TNS); Nayoshi-gun, Kitaozawa, mountain <46-upper l.>, M. Henmi, Jul. 21, 1945 (MAK 80899); E. Coast, Nayoro <48-lower l.>, T. Miyake, Sep. 6, 1906 (TNS); Nayoro <48-lower l.>, I. Namikawa, Aug. 13, 1914 (SAPS); Tomarikishi <48-lower l.>, G. Koidzumi, Aug. 23, 1930 (KYO- 2 sheets); Tomarikishi <48-lower l.>, S. Ban, [no date] (KYO); Jimutaki <50-upper r.>, K. Miyabe & T. Miyagi, Jul. 24, 1906 (SAPS); Shisuka, Nokoro <50-upper r.>, S. Sugawara 30103, Aug. 13, 1935 (SAPS); Nokoro <50-upper r.>, S. Sugawara 17878, Aug. 16, 1935 (SAPT); Shisuka, Nokoro divide <51-upper l.ÅH>, S. Sugawara 29641, Jul. 31, 1935 (SAPS); Kitashiretoko Peninsula, Noto <51-lower l.>, Y. Hoshino et al., Jul. 12, 1933 (SAPS); Mt. Isara-yama <52-lower l.>, S. Sugawara 17875, Aug. 17, 1933 (SAPT); Minaminiitoi <54-upper r.?,>, H. Hara, Aug. 4, 1931 (TI); Kitashiretoko Peninsula, Kitashiretoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 20, 1933 (SAPS).

**SOUTH.** Mt. Tosso <57-lower l.>, S. Sugawara 17963, Aug. 3, 1925 (SAPT); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka et al., Jul. 23, 1927 (SAPS); Mt. Tosso <57-lower

l.>, S. Sugawara 17987, Jun. 8, 1929 (SAPT); Maguntan <57-lower l.>, S. Sugawara 17986, Jun. 20, 1929 (SAPT); Maguntan <57-lower l.>, S. Sugawara, Jul. 8, 1930 (SAPS); Side of Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TI- 2 sheets); Mt. Tosso <57-lower l.>, S. Sugawara 17877, Jul. 18, 1935 (SAPT); Motodomari-shicho, Mt. Tosso <57-lower l.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI); 80km N of Dolinsk, Mt. Zidanko <57-lower l.>, N. Fujii 01094, Aug. 2, 2002 (MAK 340821); Mt. Kashipo <57-upper r.>, S. Sugawara 17876, Aug. 27, 1929 (SAPT); Kashipo, Nishiyama <57-upper r.>, H. Abumiya et al., Jul. 31, 1932 (SAPS); Shokuminchi at Kashipo <57-upper r.>, H. Abumiya & G. Takee, Aug. 8, 1932 (SAPS); Tomarioru <58-lower l.>, [no collector's name], Aug. 7, 1913 (TI- 3 sheets); Tomarioru <58-lower l.>, [no collector's name], Aug. 8, 1913 (TI); Manui <59-upper l.>, S. Komatsu 1370, Aug. 4, 1913 (TI); Higashishiraura <59-upper l.>, [no collector's name], Aug. 5, 1913 (TI); Manui-sando <59-upper l.>, [no collector's name], Aug. 6, 1913 (TI); Kitaitada <59-lower r.>, [no collector's name], Aug., 1913 (TI); W. Coast, Notasan <60-upper l.>, T. Miyake, Jun. 28, 1907 (SAPS); Mt. Kabuto-yama <61-lower l.>, S. Sugawara 17879, Jun. 6, 1935 (SAPT); Aihama <61-upper r.>, K. Kimura, Jul. 22, 1932 (KYO- 2 sheets); Toyohara-shicho, Aikawa, Experiment Forest of Tokyo Univ. <61-upper r.>, M. Honda & Y. Kimura, Aug. 11, 1940 (TI- 2 sheets); Fukakusa <61-lower r.>, S. Sugawara 17873, Sep. 2, 1922 (SAPT); Fukakusa <61-lower r.>, S. Sugawara 17882, Jul. 25, 1926 (SAPT); In viciniis opp. Dolinsk <62-lower l.>, A. Gizha et al., Jun. 22, 1953 (TNS); 30km N of Yuzhno-Sakhalinsk, Sokol <62-lower l.>, H. Takahashi 30035, Jul. 30, 2002 (SAPS); Around the mouth of Bakhura River <62-lower r.>, H. Takahashi 29134 & 29136, Jul. 19, 2001 (SAPS, 29134-TI); 20km SE of Dolinsk, Shuya River and Bakhura River <62-lower r.>, K. Inoue 8, Jul. 31, 2002 (SAPS); Honto, Mt. Inaho <63-lower l.?,>, U. Kimoto et al., Aug. 18, 1931 (SAPS); Maoka <63-upper r.>, S. Sugawara 17874, Sep., 1938 (SAPT); Shimizu <64-upper l.>, T. Miyake, Jun. 30, 1906 (SAPS); Oomagari <64-upper r.>, T. Miyake, Jun. 30, 1906 (SAPS); Sekiguchi-toge <64-upper r.>, T. Miyake, Jun. 30, 1906 (SAPS); Ohsawa <65-upper l.>, [no collector's name], Aug. 1, 1913 (TI); Konuma <65-upper l.>, G. Koidzumi, Aug. 11, 1930 (KYO); Toyohara-gun, Toyokita-mura, Konuma <65-upper l.>, H. Sase, Aug. 15, 1937 (SAPS); Aniva Distr., prope Novo-Alexandrovsk <65-upper l.>, G. Proskuriakova & G. Porubinovskaia, Sep. 8, 1973 (MAK 209139, SAPT, TI); Peak Chekov (alt. 1045 m) <65-upper l.>, T. Fukuda 1148 & 1173, Jul. 22, 2001 (SAPS); Vspenskoe <65-lower l.>, T. Miyake, Sep. 30, 1906 (SAPS); Mt. Susuya <65-upper r.>, T. Miyake, Jul. 27, 1907 (SAPS, TNS); Mt. Susuya <65-upper r.>, T. Miyake, Jul. 31, 1907 (SAPS); Mt. Ochopoka <65-upper r.>, T. Miyake, Jun. 13, 1908 (SAPS); Sussuja <65-upper r.>, S. Sugahara, Aug., 1928 (KYO); Side of Mt. Susuya <65-upper r.>, H. Hara, Aug. 13, 1928 (TI); Mt. Susuya (Suzuya) <65-upper r.>, S. Saito, Jul. 26, 1929 (TI- 2 sheets); Mt. Ochiho-yama <65-upper r.>, S. Sugawara, Aug. 3, 1929 (TI); Mt. Susuya <65-upper r.>, S. Sugawara 17881, Sep. 14, 1930 (SAPT); Mt. Ochiho-dake <65-upper r.>, S. Sugawara 17880, Aug. 25, 1931 (SAPT); Toyohara, upstream of Ohsawa <65-upper r.>, S. Kitamura, Jul. 11, 1942 (KYO); E. Coast, Omuto <66-lower l.>, T. Miyake, Jun. 10, 1908 (SAPS); Okhotskoe, Sedykh Lake <66-lower l.>, S. Noshiro et al. 970706-26, Jul. 6, 1997 (TI); Mt. Oyakochi <67-lower l.>,

T. Miyake, Jun. 25, 1908 (SAPS); Korssakoff <70-upper r.>, K. Miyabe & T. Miyagi, Aug. 4, 1906 (SAPS); Aniwa Bay, Ootomari <70-upper r.>, T. Miyake, May 26, 1907 (SAPS); Otomari <70-upper r.>, H. Hara, Jul. 28, 1936 (TI); Shibisani <71-upper l.>, G. Nakahara, Aug., 1906 (TNS); Tokushi <73-upper l.>, S. Sugawara 17965, Jun., 1929 (SAPT); Mt. Shiretoko Juzozan <74-upper l.>, T. Miyake, Jul. 11, 1908 (SAPS).

[No Locality]. S. Sakhalin, S. Komatsu 1383, Aug., 1913 (TI).

#### <THE KURILS>

NORTH. PARAMUSHIR <03>. [no locality], Yokoyama, 1908 (SAPS); Suribachi-wan, J. Ohwi & R. Yoshii 5347, Jul. 22, 1934 (KYO).

MIDDLE. URUP <19>. Tokotan, M. Tatewaki 10122, Sep. 8, 1927 (SAPS); Kobune, M. Tatewaki 17193, May 18, 1930 (SAPS); Barhatnyy Bay, N. Tsurusaki, Aug. 28, 1995 (SAPS); Negodnaya Bay, N. Tsurusaki, Aug. 29, 1995 (SAPS); Negodnaya Bay, H. Takahashi 20147, Aug. 29, 1995 (SAPS); Ukromnaya Bay, H. Takahashi 22192, Aug. 20, 1996 (SAPS); Tetyayeva Bay, H. Takahashi 28634, Aug. 8, 2000 (SAPS).

SOUTH. ITURUP <20>. Rubetsu, S. Yokoyama, Aug. 23, 1893 (SAPS); Toshiruri, K. Fukuzawa, Sep. 2, 1893 (SAPS-2 sheets); Mt. Moyoro-yama, T. Kawakami 196, Aug. 12, 1898 (SAPS); Shibetoro, K. Miura, Jul. 19, 1906 (SAPS); Shana-Bettobi, K. Kondo, Jul. 13, 1927 (TI); Shamanbe, K. Kondo 1912, Jul. 14-15, 1927 (TI-2 sheets); Mt. Atoiya, K. Kondo, Jul. 21, 1927 (TI); Sokiya-Shibetoru, S. Saito 3878, Aug. 8, 1928 (MAK 331507, TI-total? 3 sheets); Oyachi, S. Saito, Aug. 11, 1928 (TI-2 sheets); Shibetoro-Moyoro, B. Yoshimura & H. Yokoyama, Aug. 2, 1938 (SAPS); Mt. Moyoro-yama, B. Yoshimura & H. Yokoyama, Aug. 4, 1938 (SAPS); Rubetsu vill., from mouth of Naibo River to Lake Naibo, T. Azuma et al. 3208, Jun. 18, 2002 (SAPT); Shana vill., near wetland of Yanketou, T. Azuma et al. 3291, Jun. 24, 2002 (SAPT). KUNASHIR <21>. [no locality], [no collector's name], 1935 (KYO); Mt. Iwo-zan, Y. Matsumura, Jul. 24, 1930 (KYO-2 sheets). SHIKOTAN <22>. Mt. Shakotan, S. Saito, Aug. 30, 1925 (TI); Shakotan, K. Kondo, Aug. 4, 1929 (TI); Masuba-Notoro, K. Kondo, Sep. 3, 1929 (TI).

#### 27. *Vaccinium oxycoccus* L. [Tsuru-kokemomo] <SAKHALIN>

NORTH. Near Pilew, lakeside <04-lower r.>, Y. Kudo & B. Ishida 7127, Aug. 25, 1923 (SAPS); Pomeri-Moskariwo, Takada-shokai, on the peat <06-lower r.>, Y. Kudo & B. Ishida 7339, Aug. 31, 1923 (SAPS); SW of the Gulf of Pomr', ca 2 Km NW from Moskaljvo <06-lower r.>, T. Fukuda 2028, Aug. 13, 2001 (SAPS); N end of the Gulf of Pomr'. Village Muzjma <07-upper l.>, T. Fukuda 1898, Aug. 10, 2001 (SAPS); Oha <07-lower r.>, Okada, Sep. 3, 1923 (TI); Wisk, near winter house <09-upper l.>, Y. Kudo & B. Ishida 7393, Sep. 2, 1923 (SAPS); Okha Region, Ekhabi Bay <11-upper l.>, V. Y. Barkalov 10061, Aug. 3, 2001 (SAPS); E of Gulf of Piltun, Vstrechnaya <11-upper l.>, T. Fukuda 1568, Aug. 4, 2001 (SAPS); Seacoast of Chaio <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS); Nyiwo, tundra prope litus <23-lower l.>, Y. Kudo & M. Tatewaki 6533, Aug. 13, 1922 (SAPS); Parukata, tundra <26-upper r.>, Y. Kudo & M. Tatewaki 6430, Aug. 10, 1922 (SAPS).

MIDDLE. Ako, tundra <28-lower l.>, Y. Kudo & M.

Tatewaki 6099, Jul. 26, 1922 (SAPS); Hantusa <37-lower r.>, Okada, Aug. 30, 1923 (TI); Shisuka-shicho, Chirie-gun, Chirikoro <45-upper r.>, M. Tatewaki & Y. Takahashi 22923, Jun. 28, 1936 (SAPS); Shisuka-shicho, Shibunkoro <45-lower r.>, Y. Hoshino et al., Aug. 4, 1933 (SAPS); E. Coast, Ehorokofunai <48-lower l.>, T. Miyake, Aug. 11, 1906 (SAPS); E. Coast, Nayoro <48-lower l.>, T. Miyake, Sep. 6, 1906 (SAPS); Nairo <48-lower l.>, S. Sugawara 17663, Jul., 1934 (SAPT); Nairo, Ueshiba <48-lower l.>, K. Washimi, Jun. 10, 1937 (KYO); Ramotteiuri <48-upper r.>, T. Miyake, Aug. 15, 1906 (SAPS); Duwatacco <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Shikka <48-upper r.>, I. Namikawa, Sep. 8, 1914 (SAPS); E. Coast, Shikka <48-upper r.>, Y. Hada, Jul. 15, 1929 (SAPS); Shisuka <48-upper r.>, H. Ohtani & Y. Imai, Jul. 20, 1930 [29?] (SAPS); Amiba <48-upper r.>, G. Koidzumi, Aug. 18, 1930 (KYO); Downstream of Horonai River, tundra <48-upper r.>, H. Hara, Aug. 2, 1931 (TI); Shisuka <48-upper r.>, B. Yoshimura & M. Hara 3, Jul. 9, 1937 (TNS); Taraika <49-upper r.>, S. Sugawara 17661, Aug. 10, 1927 (SAPT); Shisuka-shicho, near Taraika <49-upper r.>, M. Honda & Y. Kimura, Aug. 16, 1940 (TI-2 sheets); Shisuka-shicho, Nishinokoro <50-upper r.>, Y. Hoshino et al., Aug. 17, 1933 (SAPS); Lak. Solenuiya <51-lower r.>, K. Miyabe & T. Miyagi, Jul. 26, 1906 (SAPS); Kitashiretoko Peninsula, Funakoshi <51-lower r.>, Y. Hoshino et al., Jul. 24, 1933 (SAPS); Kitashiretoko Peninsula, Kitashiretoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 19, 1933 (SAPS).

SOUTH. Maguntan <57-lower l.>, S. Saito 994, Aug. 5, 1929 (TI); Motodomari-shicho, Mt. Tosso <57-lower l.>, M. Honda & Y. Kimura Aug. 12, 1940 (TI); W. Coast, Kusunnai <58-upper r.>, T. Miyake, Jul. 7, 1906 (SAPS); E. Coast, Shiraraka <59-upper l.>, T. Miyake, Jul. 9, 1906 (SAPS); Odasamu <59-lower l.>, S. Otagiri, Jul. 1, 1930 (KYO, mingled with *V. microcarpum*); Odasamu <59-lower l.>, K. Sato, Jul., 1941 (TI); W. Coast, Tokotan <60-lower l.>, T. Miyake, Jun. 22, 1907 (SAPS); Fukakusa <61-lower r.>, S. Sugawara 17669 & 17670, Aug. 10, 1921 (SAPT, f. *oblongicarpus*); Fukakusa <61-lower r.>, S. Sugawara 17662, Aug. 19, 1921 (SAPT); Toyohara, Fukakusa <61-lower r.>, S. Sugawara, Sep. 11, 1925 (SAPS); Dobki <62-upper l.>, G. Nakahara, Jun. 24, 1906 (TI); Dubki <62-upper l.>, K. Miyabe & T. Miyagi, Jul. 22, 1906 (SAPS); E. Coast, Dubki <62-upper l.>, T. Miyake, Sep. 26, 1906 (SAPS); Sakaehama <62-upper l.>, [no collector's name] (S. Komatsu) 1378, Aug. 2, 1913 (TI-2 sheets); Sakaihama <62-upper l.>, S. Saito 395, Jul. 29, 1929 (TI-2 sheets); Sakaehama <62-upper l.>, G. Koidzumi, Aug., 1930 (KYO); Near the mouth of r. Naiba, Lake Lebyazhie <62-upper l.>, T. Fukuda 1224, Jul. 23, 2001 (SAPS); Kurokawa <62-lower l.>, S. Sugawara 17664, Aug. 19, 1922 (SAPT); Kurokawa <62-lower l.>, S. Sugawara, Jul. 3, 1927 (TI); Kurokawa mire <62-lower l.>, H. Hara, Jul. 31, 1931 (TI); 6km W of Sokol town, environs surrounding Mal Takoy River <62-lower l.>, H. Takahashi 29184, Jul. 20, 2001 (SAPS); W. Coast, Uentomari <63-upper r.>, T. Miyake, Jun. 22, 1907 (SAPS); Soriofka <65-lower l.>, U. Faurie, Sep. 2, 1908 (KYO); Kaizuka <65-lower l.>, K. Numajiri, Jul., 1924 (TNS); Kaizuka, peatland <65-lower l.>, H. Hara, Aug. 17, 1928 (TI); Kaizuka <65-lower l.>, S. Sugawara, Aug. 30, 1940 (TI); Okhotskoe, Sedykh Lake <66-lower l.>, S. Tsuji et al. 803010, Aug. 3, 1996 (TI); Okhotskoe, Sedykh Lake <66-lower l.>, S. Noshiro et al. 970706-53, Jul.

6, 1997 (TI); Near Korsakov, mire <70-upper r.>, H. Ueda, Oct. 14, 1905 (SAPS); 10km E of Korsakov, N of Prigordnoye <70-upper r.>, H. Takahashi 29424, Jul. 28, 2001 (SAPS); Aniwa Bay, Chipisani <71-upper l.>, T. Miyake, Jul. 17, 1908 (SAPS); Aniwa Bay, Chipisani <71-upper l.>, T. Miyake, Jul. 20, 1908 (SAPS); Aniwa Bay, Arakuri <71-upper r.>, T. Miyake, Jul. 18, 1908 (SAPS); Nagahama-gun, Tobuchi-mura <71-upper r.>, H. Sase, Sep. 8, 1935 (SAPS); Arakul River, Ozerskiy-Beregoboy <71-upper r.>, N. Fujii 01404, Aug. 15, 2002 (MAK 346252, SAPS); Nagahama-gun, Tobuchi-mura, Tobuchi-sawa <72-upper l.>, H. Sase, Jun. 24, 1933 (SAPS).

[No locality]. Komatu, 1909 (TI- 4 sheets); Komatsu, [no date] (TI- 2 sheets).

#### <THE KURILS>

NORTH. SHUMSHU <02>. Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5601, Jul. 28, 1934 (KYO); S of Pochtareva Cape, H. Takahashi 23405, Aug. 8, 1997 (SAPS); S of Pochtareva Cape, Y. Kuwahara 150, Aug. 8, 1997 (SAPS). PARAMUSHIR <03>. Murakamiwan, Y. Kudo 4982, Jul. 4, 1920 (SAPS); Murakamiwan, Y. Kudo 4992, Jul. 6, 1920 (SAPS); Murakamiwan, Y. Kudo 5456, Jul. 23, 1920 (SAPS); Ruesan, Y. Kudo 5674, Aug. 5, 1920 (SAPS); Tomarizaki, Y. Kudo 5739, Aug. 7, 1920 (SAPS); Murakamiwan, M. Tatewaki 17243, May 29, 1930 (SAPS); Arakawa, J. Ohwi & R. Yoshii 208, Jul. 10, 1934 (KYO); Murakami-wan, J. Ohwi & R. Yoshii 5914, Aug. 1, 1934 (KYO); Raisha, J. Ohwi & R. Yoshii 5998, Aug. 6, 1934 (KYO); Vasil'yeva Bay, Y. Kuwahara, Aug. 3, 1996 (SAPS); Severo-Kurilsk, Utiosnaya Bay, V. Y. Barkalov 97068, Jul. 13, 1997 (SAPS); S of Savushkina Cape, Y. Kuwahara 116, Aug. 4, 1997 (SAPS).

MIDDLE. SHIASHKOTAN <10>. Zakatnaya Bay, H. Takahashi 21776, Aug. 12, 1996 (SAPS); Zakatnaya Bay, H. Takahashi 28255, Jul. 29, 2000 (SAPS). RASSHUA <13>. Onuma, M. Tatewaki & K. Takahashi 15166, Aug. 5, 1929 (SAPS); Mt. Chotozan, M. Tatewaki & K. Takahashi 15126, Aug. 5, 1929 (SAPS); Yoriki-hama, H. Takahashi 19257 & 19267, Aug. 13, 1995 (SAPS- 2 sheets). KETOI <15>. Kodakigawa, M. Tatewaki & K. Takahashi 15274, Aug. 15, 1929 (SAPS); Isozaki, M. Tatewaki & K. Takahashi 15578, Aug. 24, 1929 (SAPS). SIMUSHIR <16>. Yamagoshizaki, M. Tatewaki & Y. Tokunaga 11808, Aug. 16, 1928 (SAPS); Wanoku, M. Tatewaki (& Y. Tokunaga) 12057 & 12058, Aug. 25, 1928 (SAPS- 2 sheets); Broughton Bay, M. Tatewaki & K. Takahashi 16006, Jul. 26, 1929 (SAPS). URUP <19>. Yoroigawa, M. Tatewaki 9960, Sep. 6, 1927 (SAPS); NE of Van-Der Lind, H. Takahashi 20038, Aug. 26, 1995 (SAPS); NE of Van-Der Lind, H. Takahashi 20064, Aug. 26, 1995 (SAPS); Barhatny Bay, H. Takahashi 20115, Aug. 28, 1995 (SAPS); Barhatny Bay, H. Takahashi 20127, Aug. 28, 1995 (SAPS).

SOUTH. ITURUP <20>. Mt. Atoiya, T. Kawakami 193, Aug. 11, 1898 (SAPS); Shibetoru, K. Miura, Jul., 1906 (SAPS); Bettoufu, K. Miura, Jul. 16, 1906 (SAPS); Shibetoro, K. Miura, Jul. 19, 1906 (SAPS); Shibetoro-Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Shana-ko, K. Kondo, Jul. 11, 1927 (TI- 2 sheets); Mt. Atoiya, K. Kondo, Jul. 21, 1927 (TI- 2 sheets); Oyachi, S. Saito 3855, Aug. 11, 1928 (MAK 331508, TI- 3 sheets); Bettobi, S. Saito, Aug. 17, 1928 (TI- 2 sheets); Moyoro-Shibetoro, B. Yoshimura & H. Yokoyama, Aug. 5, 1938 (SAPS); Tannemoe, Chishima-chosasyo, Aug. 30, [no year; prob. 1939] (SAPS); Rubetsu vill., from mouth of Naibo

River to Iriribushi, T. Azuma et al. 3279, Jun. 19, 2002 (SAPT); Shana vill., near wetland of Yanketou, T. Azuma et al. 3304, Jun. 24, 2002 (SAPT). KUNASHIR <21>. Furukamappu, C. Endo, Sep. 17, 1894 (SAPS); Seseki, M. Tatewaki 3013, Jul. 20, 1923 (SAPS, SAPT); Furukamappu, M. Tatewaki 3402, Jul. 26, 1923 (SAPS); Furukamappu, J. Ohwi, Aug. 12, 1923 (TNS); Furukamappu-Nikishiro, Y. Matsumura, Jul. 21, 1930 (KYO); [no locality], [no collector's name], 1935 (KYO); Tomari, M. Tatewaki 25370, Aug. 17, 1936 (SAPS); Zenbekotan, M. Tatewaki 25684, Aug. 22, 1936 (SAPS); Furukamappu mire, S of Furukamappunuma-pond, H. Fujita et al. 03-0019, Jul. 13, 2003 (SAPT). SHIKOTAN <22>. (Shakotan-Chipoi) [no locality], [no collector's name] (H. Takeda), Jul. 18, 1909 (SAPS, TNS 29727); Nodoro-Inemoshiri, S. Saito 1601, Sep. 6, 1925 (TI); Aburakowan, K. Kondo, Sep. 6, 1929 (TI); Poropet-Shakotan, J. Ohwi, Jul. 30, 1931 (KYO); Notoro, J. Ohwi 762, Aug. 9, 1931 (SAPS); Notoro Riv., J. Ohwi, Aug. 9, 1931 (KYO); Notoro, J. Ohwi, Aug. 11, 1931 (KYO); Toiro, M. Tatewaki 20571, Jun. 20, 1934 (SAPS); Shikotan-matsuhara, M. Tatewaki 20649, Jun. 22, 1934 (SAPS); Shikotan-matsuhara, D. Akaiishi 20886, Jun. 29, 1934 (SAPS); Syakotan, Kiritoshi, S. T. Ono, Jul. 10, 1934 (TI).

#### 28. *Vaccinium praestans* Lamb. [Iwa-tsutsuji]

##### <SAKHALIN>

NORTH. Near Pilevo, forests <04-lower r.>, Y. Kudo & B. Ishida 7120, Aug. 25, 1923 (SAPS); Pupuni, in sylvus <26-lower l.>, Y. Kudo & M. Tatewaki 6357, Aug. 8, 1922 (SAPS).

MIDDLE. Dui, mountain <28-lower l.>, H. Ueda, Sep. 1, 1905 (SAPS); Ako-tundra <28-lower l.>, Y. Kudo & M. Tatewaki 6098, Jul. 26, 1922 (SAPS); Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS); Kita Nayoshi <41-lower l.>, K. Kawai & M. Tokunaga, Aug. 28, 1929 (SAPS); Shisuka-shicho, Ikeda-Takada-jimusyo <44-upper r.>, B. Yoshimura & M. Hara, Jul. 13, 1937 (SAPS); Shisuka-gun, Ikeda <44-upper r.>, B. Yoshimura & M. Hara 74, Jul. 13, 1937 (TNS); Shisuka-shicho, Chirie-gun, Chirikoro <45-upper r.>, M. Tatewaki & Y. Takahashi 22922, Jun. 28, 1936 (SAPS); E. Coast, Nayoro <48-lower l.>, K. Miyabe & T. Miyagi, Jul. 28, 1906 (SAPS); E. Coast, Nayoro <48-lower l.>, T. Miyake, Sep. 6, 1906 (SAPS); Nayoro <48-lower l.>, I. Namikawa, Aug. 13, 1914 (SAPS); Kusunokisawa [Kusunokiyama?], Experiment Forest of Kyoto Univ. <48-lower l.>, Y. Kobayashi, Jul. 18, 1928 (TNS); Jimutaki <50-upper r.>, K. Miyabe & T. Miyagi, Jul. 24, 1906 (SAPS); Kitashiretoko Peninsula, Noto <51-lower l.>, Y. Hoshino et al., Jul. 12, 1933 (SAPS); Mt. Isara-yama <52-lower l.>, S. Sugawara 17902, Aug. 17, 1933 (SAPT).

SOUTH. Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TI); Motodomari-shicho, Mt. Tosso <57-lower l.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI); 80km N of Dolinsk, Mt. Zidanko <57-lower l.>, N. Fujii 01114, Aug. 2, 2002 (MAK 341826); Kashipo, Nakano-dake <57-upper r.>, H. Abumiya et al., Jul. 27, 1932 (SAPS); Kashipo, Kashipo-dake <57-upper r.>, H. Abumiya & G. Takee, Aug. 5, 1932 (SAPS); E. Coast, Manue <59-upper l.>, T. Miyake, Sep. 17, 1907 (SAPS); Manui <59-upper l.>, [no collector's name], Aug. 6, 1913 (TI); Manui <59-upper l.>, S. Komatsu, Aug. 4, 1914 (TI); Odasamu <59-lower l.>, [no collector's name], Aug. 4, 1913 (TI- 2 sheets); W. Coast, Tokotan <60-lower l.>, T. Miyake, Jun. 22, 1907 (SAPS); Aihama <61-upper r.>, K. Kimura, Jul. 22, 1932



(KYO); Aihama-mura, Experiment Forest of Tokyo Univ. <61-upper r.>, R. Imaseki, Jul. 13, 1941 (TNS); Fukakusa <61-lower r.>, S. Sugawara 17901, Jul. 11, 1922 (SAPT); Sakachama <62-upper l.>, (S. Komatsu) [no collector's name], Aug. 2, 1913 (TI- 3 sheets); Sakaihama <62-upper l.>, S. Saito 3672, Jul. 29, 1929 (TI- 2 sheets); In viciniis opp. Dolinsk <62-lower l.>, A. Czernjaeva, Jul. 14, 1953 (TNS); Chinehira <63-lower l.>, [no collector's name], Aug. 11, 1913 (TI); Vladimirohuka <65-upper l.>, K. Miyabe & T. Miyagi, Aug. 22, 1906 (SAPS); Prope urbis Novo-Alexandrovsk <65-upper l.>, E. Egorova et al., Aug. 9, 1973 (TI); Vspenskoe <65-lower l.>, T. Miyake, Sep. 30, 1906 (SAPS); Kaizuka <65-lower l.>, H. Hara, Aug. 17, 1928 (TI); Mt. Susuya <65-upper r.>, T. Miyake, Jul. 27, 1907 (SAPS); Yuzhno-Sakhalinsk, Mt. Moskovskaya, alt.540m <65-upper r.>, S. Noshiro et al. 970707-10, Jul. 7, 1997 (TI); Tonnaichya-sando <65-lower r.>, T. Miyake, Oct. 10, 1906 (SAPS); Tonnai <66-lower l.>, K. Numajiri, Aug. 15, 1925 (TNS); NE of Lake Tunaycha, NE of Lake Khvalisekoye <66-lower r.>, T. Fukuda 1372, Jul. 29, 2001 (SAPS); Ozerskiy, S of the Lake Mal. Chibisanskoye <71-upper l.>, T. Fukuda 1364, Jul. 28, 2001 (SAPS); Ozerskiy, Lake Mal. Chibisanskoye <71-upper l.>, H. Takahashi 29458, Jul. 28, 2001 (SAPS); Nagahama-gun, Tobuchi-mura, school forest <71-upper r.>, H. Sase, Jun. 29, 1935 (SAPS); Nagahama-gun, Tobuchi-mura, school forest <71-upper r.>, H. Sase, Sep. 14, 1935 (SAPS); Mt. Omanbetsu <72-lower l.>, T. Miyake, Jul. 15, 1908 (SAPS); Cape Notoro <73-lower l.>, K. Miyabe & T. Miyagi, Jul. 19, 1906 (SAPS); Todomoshiri, Dainan-wan <73-lower l.>, T. Miyake, Jul. 23, 1906 (SAPS); Kaiba Isl. <73-lower l.>, S. Komat, Aug. 12, 1915 (TI); Ins. Kaiba <73-lower l.>, S. Saito, Jul. 19, 1929 (TI- 2 sheets); Kaiba Isl. <73-lower l.>, S. Sugawara 17899, Sep., 1934 (SAPT); Mt. Shiretoko-Juzozan <74-upper l.>, T. Miyake, Jul. 11, 1908 (SAPS).

[No Locality]. G. Nakahara, 1906 (TI); Komatsu, 1909 (TI); [no collector's name], Aug. [?], 1935 (MAK 105542).

#### <THE KURILS>

MIDDLE. KETOI <15>. Minamiura, M. Tatewaki & K. Takahashi 15777, Jul. 28, 1929 (SAPS); Kodakigawa, M. Tatewaki & K. Takahashi 15262, Aug. 15, 1929 (SAPS). SIMUSHIR <16>. Nakadomari, M. Tatewaki & K. Takahashi 15997, Jul. 25, 1929 (SAPS); Malaya Bay, H. Takahashi 19545, Aug. 18, 1995 (SAPS). URUP <19>. Kobune, M. Tatewaki 9839, Aug. 26, 1927 (SAPS); Tokotan, M. Tatewaki 9646, Aug. 29, 1927 (SAPS); W from Tokotan, M. Tatewaki 9968, Sep. 3, 1927 (SAPS); Otkrytyy Bay, H. Takahashi 18550, Aug. 5, 1995 (SAPS); Ukromnaya Bay, H. Takahashi 22151, Aug. 20, 1996 (SAPS).

SOUTH. ITURUP <20>. Furebetsu, K. Miyabe, Jul. 28, 1884 (SAPS); Furebetsu, Y. Tanaka, Aug. 27, 1895 (SAPS); Shibetoro, T. Kawakami 161, Aug. 9, 1898 (SAPS); Naibo, T. Kawakami 282, Sep. 5, 1898 (SAPS); Shibetoro, K. Miura, Jul. 19, 1906 (SAPS); Shibetoro, K. Miura, Jul. 21, 1906 (SAPS- 2 sheets); Shimo-naibo, K. Miura, Jul. 23, 1906 (SAPS); Toro, K. Miura, Jul. 24, 1906 (SAPS); Shana, A. Abe, Aug., 1924 (TNS 514034); Sokiya-Shibetoru, K. Kondo, Jul. 19, 1927 (TI); Mt. Atoiya, K. Kondo, Jul. 21, 1927 (TI- 2 sheets); Bettobi-Porosu, S. Saito, Aug. 6, 1928 (TI); Porosu-Sokiya, S. Saito, Aug. 7, 1928 (TI); Oyachi, S. Saito, Aug. 11, 1928 (TI); Shana-Bettobi, B. Yoshimura, Aug. 13, 1937 (SAPS); Moyoro, Chishima-chosasyo, Sep. 16, [no year; prob. 1939] (SAPS).

KUNASHIR <21>. Chikkaribetsu, Shozunai, C. Endo, Aug. 5, 1894 (SAPS); Tomari-mura, S. Sasa, Jul. 9, 1908 (SAPS); Seseki, M. Tatewaki 3091, Jul. 20, 1923 (SAPS); Kaikaramui, M. Tatewaki 3205, Jul. 22, 1923 (SAPS); Mt. Rausu, M. Tatewaki 3688, Jul. 23, 1923 (SAPS); Near River Onnebetsu, K. Kondo, Jul. 26, 1929 (TI- 2 sheets); Furukamappu-Nikishiro, Y. Matsumura, Jul. 21, 1930 (KYO); Nikisyoro Lake, Y. Matsumura, Jul. 22, 1930 (KYO); Mt. Tomari, M. Tatewaki 25519, Aug. 20, 1936 (SAPS); [no locality], [no collector's name], 1935 (KYO); [no locality], Nagato, Aug., 1930 (TI). SHIKOTAN <22>. Shakotan, K. Miyabe, Jul. 27, 1884 (SAPS); Shakotan, K. Miura, Jul. 26, 1906 (SAPS); (Chipoi) [no locality], [no collector's name] (H. Takeda), Jul. 18, 1909 (SAPS, TNS); Shakotan, G. Tanaka & Ken. Miyabe, Aug. 9, 1910 (SAPS); Anama, G. Tanaka & Ken. Miyabe, Aug. 14, 1910 (SAPS); Anama, M. Arai, Aug. 15, 1910 (SAPS); Shakotan, Nodoro-Inemoshiri, S. Saito 1599, Sep. 6, 1925 (TI); Cape Shakotan, K. Kondo, Aug. 4, 1929 (TI); Mt. Shakotan, K. Kondo, Aug. 6, 1929 (TI); Anama, K. Kondo, Aug. 28, 1929 (TI); Mt. Tomari, K. Kondo, Sep. 5, 1929 (TI); Shakotan, S. T. Ono, Jun. 29, 1930 (SAPT); Matakotan, J. Ohwi, Jul. 19, 1931 (KYO); Kagenoma, J. Ohwi, Aug. 4, 1931 (KYO); Umanose, A. Kimura, Aug. 15, 1933 (SAPS); Shikotan-matsuhara, M. Tatewaki, Jun. 19, 1934 (SAPS); Shakotan-yama, M. Tatewaki 20794, Jun. 29, 1934 (SAPS); Shakotan, S. T. Ono, [no date] (SAPS); [no locality], K. Numajiri, [no date] (TNS).

[Island Uncertain]. G. Toba 588, Jun. 20, 1930 (TI).

#### 29. *Vaccinium smallii* A.Gray [Ôba-sunoki] <SAKHALIN>

MIDDLE. Adatuim <29-upper l.>, Okada, Aug. 23, 1923 (TI); 35-40km E of Kirovskoye, N of Chamginskii pass <34-upper r.>, N. Fujii 01220, Aug. 8, 2002 (MAK 346157, SAPS); W. Coast, Anbetsu <36-lower l.>, T. Ishiyama, Jul. 16, 1927 (SAPS); Anbetsu <36-lower l.>, S. Sugawara 17915, Aug. 13, 1933 (SAPT); Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS); Mt. Okada-yama <39-lower l.>, S. Sugawara 17909, Aug. 10, 1938 (SAPT); Eastern border, Asase <40-lower l.>, Y. Hoshino et al., Aug. 11, 1933 (SAPS); Saren <40-lower r.>, S. Sugawara 17916, Aug. 4, 1935 (SAPT); Shisuka-gun, Hoe-mura <42-lower r.>, [no collector's name], Aug. 20, 1929 (KYO); Mt. Horoto-yama <42-lower r.>, S. Sugawara 17906, Aug. 25, 1931 (SAPT); Vicinity of R. Wuruna <43-lower l.>, T. Miyake, Aug. 22, 1906 (SAPS); Shisuka-shicho, Yamahana-Ikeda <44-lower r.>, B. Yoshimura & M. Hara, Jul. 12, 1937 (SAPS); Mt. Kawashima-yama <45-upper r.>, S. Sugawara 17908, Aug. 3, 1935 (SAPT); Nayoshi-gun, Kitaozawa <46-upper l.>, M. Henmi, Jul. 12, 1945 (TNS); Kitaozawa <46-upper l.>, M. Henmi, Jul. 21, 1945 (TNS); E. Coast, Nayoro <48-lower l.>, T. Miyake, Sep. 6, 1906 (SAPS); Nayoro <48-lower l.>, I. Namikawa, Aug. 13, 1914 (SAPS); Kusunokiyama, Experiment Forest of Kyoto Univ. <48-lower l.>, T. Chono, Jul. 21, 1928 (TNS); Kusunokiyama, Experiment Forest of Kyoto Univ. <48-lower l.>, T. Koshima, Jul. 21, 1928 (TNS); Duwataikko <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Kitashiretoko Peninsula, Noto <51-lower l.>, Y. Hoshino et al., Jul. 27, 1933 (SAPS); Kitashiretoko, Mt. Kashoku-yama <51-lower l.>, S. Sugawara 17913, Jul. 22, 1935 (SAPT); W. Coast, Mt. Ushoro <52-upper r.>, T. Miyake, Aug. 31, 1907 (SAPS); E. Coast, Ponkotan <54->, T. Miyake, Sep. 13, 1906 (SAPS);

E. Coast, Shirutoru <54-lower l.>, T. Miyake, Sep. 13, 1909 (SAPS); Shirutoru <54-lower l.>, S. Sugawara 17907, Aug. 2, 1927 (SAPT); Minami-niitoi <54-upper r. ?>, H. Hara, Aug. 4, 1931 (TI); Kitashiretoko Peninsula, Kitashiretoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 20, 1933 (SAPS).

SOUTH. Mihama-mura, Lake Shosen [?] <56->, H. Hara, Jul. 30, 1936 (TI); E. Coast, Mt. Nupuripo <57-lower l.>, T. Miyake, Aug. 13, 1907 (SAPS); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka et al., Jul. 23, 1927 (SAPS); Mt. Nupuripo <57-lower l.>, S. Saito, Aug. 3, 1929 (TI); Upper part of Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TI); Side of Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TI); Mt. Tosso <57-lower l.>, J. Ohwi, Jul. 22, 1932 (KYO); Mt. Tosso <57-lower l.>, S. Sugawara 17911, Jul. 18, 1935 (SAPT); Motodomari-shicho, Mt. Tosso <57-lower l.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI); 80km N of Dolinsk, Mt. Zhdanko <57-lower l.>, H. Takahashi 30151, Aug. 2, 2002 (SAPS); Mt. Kashipo <57-upper r.>, S. Sugawara 17914, Aug. 27, 1929 (SAPT); Kashipo, Kashipo-dake <57-upper r.>, H. Abumiya et al., Jul. 22, 1932 (SAPS); Kashipo, Nishiyama <57-upper r.>, H. Abumiya & G. Takee, Aug. 4, 1932 (SAPS); Tomarioru <58-lower l.>, [no collector's name], Aug. 8, 1913 (TI); Kusunnai <58-upper r.>, K. Miyabe & T. Miyagi, Aug. 9, 1906 (SAPS); Ware <59-upper l.>, K. Miyabe & T. Miyagi, Jul. 29, 1906 (SAPS); E. Coast, Shiraraka <59-upper l.>, T. Miyake, Sep. 20, 1907 (SAPS); Manui <59-upper l.>, S. Komatsu, Aug. 3, 1913 (TI); Higashishiraura <59-upper l.>, [no collector's name], Aug. 5, 1913 (TI); Manui-Nayoro <59-upper l.>, S. Komatsu, Aug. 6, 1913 (TI); Shiraura <59-upper l.>, S. Sugawara 17964, Aug. 20, 1930 (SAPT); Kitaitada <59-lower r.>, [no collector's name], Aug. 4, 1913 (TI- 3 sheets); W. Coast, Notasan <60-upper l.>, T. Miyake, Jun. 29, 1907 (SAPS); W. Coast, Tokotan <60-lower l.>, T. Miyake, Jun. 22, 1907 (SAPS); Aikawa, Experiment Forest of Tokyo Univ. <61-upper r.>, S. Otagiri, Jul. 3, 1927 (TI); Experiment Forest of Tokyo Univ. <61-upper r.>, S. Otagiri, Aug. 7, 1928 (TI- 2 sheets); Aikawa, Experiment Forest of Tokyo Univ. <61-upper r.>, S. Otagiri, Sep. 10, 1928 (TI); Aihama-mura, Experiment Forest of Tokyo Univ. <61-upper r.>, R. Imaseki, Jul. 13, 1941 (TNS); Fukakusa (Kawakita) <61-lower r.>, S. Sugawara, May 20, 1922 (SAPS); Fukakusa <61-lower r.>, S. Sugawara, Jun., 1923 (TI); Dubki <62-upper l.>, K. Miyabe & T. Miyagi, Jul. 22, 1906 (SAPS); Sakaehama, seacoast <62-upper l.>, S. Otagiri, Jul. 5, 1928 (TI); Sakaihama <62-upper l.>, S. Saito 3674, Jul. 29, 1929 (TI- 2 sheets); Mt. Ochiai-yama <62-lower l.>, S. Sugawara 17910, Jul. 25, 1926 (SAPT); Kurokawa <62-lower l.>, H. Hara, Jul. 31, 1931 (TI); In viciniis opp. Dolinsk <62-lower l.>, A. Czernajeva, Jul. 11, 1953 (TNS); 20km E of Sokol town, mouth of Bakhura River <62-lower r.>, H. Takahashi 29137, Jul. 19, 2001 (SAPS); 20km SE of Dolinsk, Shuya River <62-lower r.>, H. Takahashi 30138, Jul. 31, 2002 (SAPS); Toyohara <65-upper l.>, H. Hara, Jul. 30, 1931 (TI); Prope Novo-Alexandrovsk <65-upper l.>, G. Proskuriakova & G. Porubinovskaia, Sep. 5, 1973 (SAPT, TI); Mituryohuka <65-lower l.>, G. Nakahara, Jun., 1906 (TI); Vspenskoe <65-lower l.>, T. Miyake, Sep. 30, 1906 (SAPS); Mt. Susuya <65-upper r.>, T. Miyake, Jul. 27, 1907 (SAPS); Mt. Susuya <65-upper r.>, S. Sugawara 17905, Sep. 14, 1930 (SAPT); Peak Chekhov, along the pass <65-upper r.>, T. Fukuda 1174, Jul. 22, 2001 (SAPS); Tonnaichya-Sando <65-lower r.>, T. Miyake, Oct. 9, 1906 (SAPS); Sedykh Lake <66-lower l.>,

S. Tsuji et al. 805004 & 805007, Aug. 5, 1996 (TI- 3 sheets); Okhotskoe, Boilj Peninsula-Sedykh Lake <66-lower l.>, S. Noshiro et al. 970706-61, Jul. 6, 1997 (TI); 30 Km SE of Yuzhno-Sakhalinsk, S of Okhotskoye <66-lower l.>, H. Takahashi 27894, Jul. 19, 2000 (SAPS); Aniwa Distr., Urym-Bachinskaya Rivers <69-upper r.>, S. Noshiro et al. 970703-36, Jul. 3, 1997 (TI); Mereya <70-upper r.>, K. Miyabe et al., Jul. 14, 1906 (SAPS); Korssakoff <70-upper r.>, K. Miyabe & T. Miyagi, Aug. 24, 1906 (SAPS); Near Otomari <70-upper r.>, H. Koidzumi Herbarium, Aug., 1925 (TNS); Chipisani <71-upper l.>, K. Miyabe et al., Jul. 15, 1906 (SAPS); Aniwa Bay, Chipisani <71-upper l.>, T. Miyake, Jul. 17, 1908 (SAPS); Aniwa Bay, Chipisani <71-upper l.>, T. Miyake, Jul. 19, 1908 (SAPS); Mt. Otairenko <71-upper l.>, T. Miyake, Jul. 22, 1908 (SAPS); Nagahama-gun, Tobuchi-mura, school forest <71-upper r.>, H. Sase, Jul. 8, 1934 (SAPS); Mt. Omanbetsu <72-lower l.>, T. Miyake, Jul. 15, 1908 (SAPS); Kaiba Isl. <73-lower l.>, S. Sugawara 17912, Jun. 25, 1933 (SAPT).

#### <THE KURILS>

SOUTH. ITURUP <20>. Furubetsu, K. Miyabe, Jul. 28, 1884 (SAPS); Arimoi Nobori, K. Miyabe, Jul. 29, 1884 (SAPS); Shibetoro, T. Kawakami 98, Aug. 9, 1898 (SAPS); Bettobu-Shamanbe, K. Miura, Jul. 13-14, 1906 (SAPS- 2 sheets); Shibetoro, K. Miura, Jul. 19, 1906 (SAPS); Shibetoro, K. Miura, Jul. 21, 1906 (SAPS- 2 sheets); Mt. Moyoro, G. Tanaka & Ken. Miyabe, Jul. 17, 1910 (SAPS); Shibetoro-Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Moyoro coast, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); [no locality], K. Kondo 9998, Jul. 14-15, 1927 (TI); Shamanbe, K. Kondo, Jul. 14-15, 1927 (TI); Mt. Atoiya, K. Kondo, Jul. 21, 1927 (TI); Sokiya-Shibetoru, S. Saito, Aug. 8, 1928 (TI); Oyachi, S. Saito 3596, Aug. 11, 1928 (TI- 3 sheets); Shana-Sashiusu, S. Saito, Aug. 20-22, 1928 (TI- 3 sheets); Shana vill., near wetland of Yanketou, T. Azuma et al. 3296, Jun. 24, 2002 (SAPT). KUNASHIR <21>. Tohtsu, Furukamappu, C. Endo, Sep. 17, 1894 (SAPS); Kaikaramui, M. Tatewaki 3245, Jul. 22, 1923 (SAPS); Mt. Rausu, M. Tatewaki 3278, Jul. 23, 1923 (SAPS); Furukamapp, M. Tatewaki 3400, Jul. 26, 1923 (SAPS- 2 sheets); [no locality], [no collector's name], 1935 (KYO).

### 30. *Vaccinium uliginosum* L. [Kuromamenoki]

#### <SAKHALIN>

NORTH. Near Pilewo, mountain <04-lower r.>, Y. Kudo & B. Ishida 4048, Aug. 24, 1923 (SAPS); Near Pilewo, *Larix* forests <04-lower r.>, Y. Kudo & B. Ishida 7099, Aug. 25, 1923 (SAPS); SW of the Gulf of Pomr', ca 2Km NW from Moskaljvo <06-lower r.>, T. Fukuda 2018, Aug. 13, 2001 (SAPS); Pirituk, dry peat <07-upper l.>, Y. Kudo & B. Ishida 7147, Aug. 28, 1923 (SAPS); N of the Gulf of Pomr', Village Muzjma <07-upper l.>, T. Fukuda 1943, Aug. 10, 2001 (SAPS); 15km S of Okha <10-upper r.>, H. Takahashi 31181, Jul. 28, 2003 (SAPS); E of Gulf of Piltun, Vstrechnaya <11-upper l.>, T. Fukuda 1518, Aug. 4, 2001 (SAPS); Chaio, seacoast <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS); Nyiwo, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6466, Aug. 12, 1922 (SAPS); Nyiwo in arenosis litoralibus <23-lower l.>, Y. Kudo & M. Tatewaki 6514, Aug. 13, 1922 (SAPS); Nyiwo Tundra prope litus <23-lower l.>, Y. Kudo & M. Tatewaki 6534, Aug. 13, 1922 (SAPS); Nyiwo, Ins. Mobio, tundra <23-lower l.>, Y. Kudo & M. Tatewaki 6553, Aug. 14, 1922 (SAPS); Wieg-Katanguri, tundra <23-lower l.>,

Y. Kudo & M. Tatewaki 6570, Aug. 15, 1922 (SAPS); Pupni, tundra <26-lower l.>, Y. Kudo & M. Tatewaki 6366, Aug. 8, 1922 (SAPS); Parukata, tundra <26-upper r.>, Y. Kudo & M. Tatewaki 6432, Aug. 10, 1922 (SAPS); Parukata, in sylvis <26-upper r.>, Y. Kudo & M. Tatewaki 6453, Aug. 10, 1922 (SAPS); Palkata <26-upper r.>, Okada, Aug. 26, 1923 (TI- 2 sheets).

MIDDLE. Adatuim <29-upper l.>, Okada, Aug. 23, 1923 (TI); Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS); Poronai-mura <37-lower r.>, T. Miyake, Aug. 29, 1906 (SAPS); Handa <37-lower r.>, S. Sugawara 17947, 17948, 17957 & 17958, Aug. 10, 1931 (SAPT- 4 sheets); 80km N of Poronaysk, Mirnyy–Pervomayskoye <38-lower l.>, H. Takahashi 30468, Aug. 10, 2002 (SAPS); 20km NE of Smirnykh, banks of the Poronay RAA Mirnyy <38-lower l.>, N. Fujii 01285, Aug. 10, 2002 (MAK 346158); Shisuka-shicho, Chirie-gun, Akaigawa River <39-lower r.>, M. Tatewaki & Y. Takahashi 23111, Jun. 26, 1936 (SAPS); Mitsuriofka, in turfosis <40-lower l.>, U. Faurie, Jul. 4, 1908 (SAPS); Keton, toward the border <42-upper r.>, J. Ohwi, Aug. 11, 1932 (KYO); Mt. Horoto-yama <42-lower r.>, Z. Tashiro, Sep. 3, 1939 (KYO); Mt. Kawashima-yama <45-upper r.>, S. Sugawara 17956, Aug. 3, 1935 (SAPT); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 22723, Jun. 21, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 23019, Jun. 29, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Naruko-Nirayama <45-upper r.>? M. Tatewaki & Y. Takahashi 22884, Jun. 26, 1936 (SAPS); Shikka Distr., Naruko (Nirayama) <45-upper r.>?, B. Yoshimura, Aug. 8, 1936 (SAPS- 2 sheets); Summit of Mt. Shisuka-dake <47-upper l.>, K. Washimi, Jul. 23, 1931 (KYO); Poronaysk–Leonidovo, moor <48-upper l.>, H. Takahashi 30533 & 30535, Aug. 13, 2002 (SAPS- 2 sheets); E. Coast, Ehorokofunai <48-lower l.>, T. Miyake, Aug. 11, 1906 (SAPS); E. Coast, Nayoro <48-lower l.>, T. Miyake, Sep. 6, 1906 (SAPS); Tomarikishi, Experiment Forest of Kyoto Univ. <48-lower l.>, T. Chono, Jul. 16, 1928 (TNS); Shikka <48-upper r.>, T. Miyake, Aug., 1906 (SAPS); Shikka <48-upper r.>, K. Miyabe & T. Miyagi, Jul. 23, 1906 (SAPS); Duwatakkō <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Donida <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS); Shisuka <48-upper r.>, I. Namikawa, Aug. 12, 1914 (SAPS- 2 sheets); Siska <48-upper r.>, T. Sawada, Aug. 14, 1923 (TI); Shikka, tundra <48-upper r.>, H. Otani & Y. Imai, Jul. 20, 1930 (SAPS); Shisuka <48-upper r.>, G. Koidzumi, Aug. 17, 1930 (KYO); Amiba <48-upper r.>, G. Koidzumi, Aug. 18, 1930 (KYO); Downstream of Horonai River, tundra <48-upper r.>, H. Hara, Aug. 2, 1931 (TI); Shisuka <48-upper r.>, H. Tobita, Jul. 23, 1935 (KYO); Shisuka <48-upper r.>, R. Imaseki, Jul. 17, 1941 (TNS- 2 sheets); Tobani <48-upper r.>?, T. Miyake, Aug. 20, 1906 (SAPS); Taraika <49-upper l.>, T. Miyake, Aug. 14, 1906 (SAPS); W side of Taraika River <49-upper l.>, H. Hara, Aug. 3, 1931 (TI); Taraika <49-upper r.>, S. Sugawara 17945, Aug. 10, 1927 (SAPT); Shisuka-shicho, Taraika–Nimenjo <49-upper r.>, (B. Yoshimura &) M. Hara no number & 38, Jul. 10, 1937 (SAPS- 2 sheets, TNS); Shisuka-shicho, near Taraika <49-upper r.>, M. Honda & Y. Kimura, Aug. 17, 1940 (TI); Jimutaki <50-upper r.>, K. Miyabe & T. Miyagi, Jul. 24, 1906 (SAPS); Shisuka-shicho, Nokoro <50-upper r.>, Y. Hoshino et al., Aug. 17, 1933 (SAPS); Shisuka-shicho, Motomari <51-upper l.>, Y. Hoshino et al., Aug. 3, 1933 (SAPS); Kitashiretoko Peninsula,

Noto <51-lower l.>, Y. Hoshino et al., Jul. 27, 1933 (SAPS); Kitashiretoko Peninsula, Naifuto <51-lower l.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); Lak. Solenuiya <51-lower r.>, K. Miyabe & T. Miyagi, Jul. 26, 1906 (SAPS); Kitashiretoko Peninsula, Funakoshi <51-lower r.>, Y. Hoshino et al., Jul. 23, 1933 (SAPS); E. Coast, Ponkotan <54->, T. Miyake, Sep. 13, 1906 (SAPS); Kitashiretoko Peninsula, Rosoku-iwa <55-upper l.>, Y. Hoshino et al., Jul. 22, 1933 (SAPS); Kitashiretoko Peninsula, Kitashiretoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 20, 1933 (SAPS).

SOUTH. Maguntan <57-lower l.>, S. Saito, Aug. 5, 1929 (TI); Mt. Tosso <57-lower l.>, M. Honda & Y. Kimura Aug. 12, 1940 (TI); Kusunnai <58-upper r.>, K. Miyabe & T. Miyagi, Aug. 9, 1906 (SAPS); E. Coast, Manue <59-upper l.>, T. Miyake, Sep. 22, 1906 (SAPS); Shirahama <61-upper r.>, T. Naito, Aug. 8, 1931 (MAK 48362); Fukakusa (Kurokawa) <61-lower r.>, S. Sugawara, Aug. 1, 1924 (SAPS); Dobuki <62-upper l.>, G. Nakahara, Jun. 24, 1906 (TNS); E. Coast, Naibuchi <62-upper l.>, T. Miyake, Sep. 26, 1906 (SAPS); Sakaehama <62-upper l.>, Y. Narita, Aug. 25, 1923 (TI- 2 sheets); Sakaihama <62-upper l.>, S. Saito (3673), Jul. 29, 1929 (TI- 2 sheets); Sakaehama <62-upper l.>, G. Koidzumi, Aug. 12, 1930 (KYO); Lake Shiratori, lakeside <62-upper l.>, S. Sugawara 17949 & 17950, Jun. 15, 1932 (SAPT- 2 sheets); 8 Km N of Dolinsk, Nayba River <62-upper l.>, H. Takahashi 29316, Jul. 23, 2001 (SAPS); Kurokawa <62-lower l.>, S. Sugawara 17943, Sep. 12, 1921 (SAPT); Tumi <62-lower l.>, Y. Kudo & B. Ishida 7472, Sep. 6, 1923 (SAPS); Kotani <62-lower l.>, S. Sugawara 17946, Sep. 1, 1930 (SAPT); Kurokawa mire <62-lower l.>, H. Hara, Jul. 31, 1931 (TI- 2 sheets); 6km W of Sokol town, Mal. Takoy River <62-lower l.>, H. Takahashi 29189, Jul. 20, 2001 (SAPS); Ryutoka River <64-lower r.>, G. Nakahara, Jul. 9, 1906 (TI); Vladimirohuka <65-upper l.>, K. Miyabe & T. Miyagi, Aug. 22, 1906 (SAPS); Nagahama-gun, Toyokita-mura, Konuma <65-upper l.>, H. Sase, Aug. 15, 1937 (SAPS); Mitsuriohuka <65-lower l.>, K. Miyabe & T. Miyagi, Aug. 22, 1906 (SAPS); Vspenskoe <65-lower l.>, T. Miyake, Sep. 30, 1906 (SAPS); Korsakovsky distr., Susuya moor, around old-Enoura stat. <65-lower l.>, S. Tsuji et al. 809009, Aug. 9, 1996 (TI); Mt. Susuya-dake <65-upper r.>, S. Sugawara 17944, Sep. 21, 1927 (SAPT); E. Coast, Aberasani <66-lower r.>, T. Miyake, Jun. 28, 1908 (SAPS); Aniwa Bay, Chipisani <71-upper l.>, T. Miyake, Jul. 19, 1908 (SAPS); Notoro–Kiridoshi <73-lower r.>, K. Kondo, Sep. 3, 1929 (TI).

[No Locality]. Komatu, 1909 (TI- 8 sheets); [no collector's name], 1932 (MAK 102694); Komatu, [no date] (TI- 3 sheets).

#### <THE KURILS>

NORTH. ATLASOVA <01>. Sekine-zaki, S. Ito & G. Komori, Jul. 11, 1926 (SAPS); Minamiura, H. Ito & G. Komori, Jul. 17, 1926 (SAPS). SHUMSHU <02>. [no locality], S. Seki, 1895 (SAPS); Bettobi, S. Yokoyama, Sep. 22, 1893 (SAPS); [no locality], T. Ishikawa, Jun. 29, 1894 (SAPS); [no locality], K. Yendo, Jul. 20, 1903 (TI); [no locality], [no collector's name], Sep., 1917 (MAK 102705); Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5647, Jul. 28, 1934 (KYO); S of Pochtareva Cape, H. Takahashi 23302, Aug. 8, 1997 (SAPS); S of Pochtareva Cape, Y. Kuwahara 149, Aug. 8, 1997 (SAPS); SW of Baikovo, H. Takahashi 28005, Jul. 24, 2000 (SAPS). PARAMUSHIR <03>. Ottomoi, S. Yokoyama, Sep., 1893 (SAPS); [no locality], T.

Sakurai, Aug., 1910 (SAPS); Murakami-wan, Y. Kudo 4948, Jul. 3, 1920 (SAPS); Yotsuiwahana, Y. Kudo 5180, Jul. 12, 1920 (SAPS); Yotsuiwahana, Y. Kudo 5307, Jul. 14, 1920 (SAPS); Hiratazaki, Y. Kudo 5386, Jul. 21, 1920 (SAPS); Shirakawa, Y. Kudo 5606, Jul. 30, 1920 (SAPS); Tomarizaki, Y. Kudo 5711, Aug. 7, 1920 (SAPS); Urafutoyama, Y. Kudo 5813, Aug. 8, 1920 (SAPS); [no locality], K. Numajiri, Aug., 1926 (KYO); Mt. Chikura-dake, Y. Okada, Jul. 30, 1931 (TNS); Arakawa, Y. Okada, Aug. 11, 1931 (TNS- 2 sheets); [no locality], T. Ohashi, Aug., 1932 (KYO); Arakawa, J. Ohwi & R. Yoshii 222, Jul. 10, 1934 (KYO); Suribachi, J. Ohwi 5347, Jul. 22, 1934 (SAPS); Suribachi, J. Ohwi & R. Yoshii 5538, Jul. 23, 1934 (KYO); Kashiwabara-wan, J. Ohwi & R. Yoshii 5946, Aug. 2, 1934 (KYO); E of Vasil'yeva Bay, H. Takahashi 20987 & 21026, Aug. 3, 1996 (SAPS); Volcano Ebeko, V. Y. Barkalov 97054, Jul. 14, 1997 (SAPS); NE of Mt. Ebeko, H. Takahashi 23177, Aug. 5, 1997 (SAPS).

MIDDLE. MAKANRUSHI <05>. In heaths, M. Tatewaki 11222, Aug. 9, 1928 (SAPS); Zakat Bay, H. Takahashi 24029, Aug. 18, 1997 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 11009, Aug. 8, 1928 (SAPS); Nemo, M. Tatewaki 11130, Aug. 9, 1928 (SAP); Nemo Bay, H. Takahashi 21221, Aug. 4, 1996 (SAPS); N of Lake Chernoye, H. Takahashi 21239, Aug. 4, 1996 (SAPS); N of Angibi Cape, H. Takahashi 21344, Aug. 5, 1996 (SAPS); Mussel Bay-Kol'tsevoye Lake, H. Takahashi 21397, Aug. 7, 1996 (SAPS). KHARIMKOTAN <07>. Severgina Bay, H. Takahashi 21531, Aug. 8, 1996 (SAPS). EKARMA <09>. [no locality], M. Tatewaki 11380, Aug. 11, 1928 (SAPS). SHIASHKOTAN <10>. Zakatnaya Bay, H. Takahashi 21838 & 21839, Aug. 12, 1996 (SAPS- 2 sheets); Zakatnaya Bay, H. Takahashi 21808 & 21809, Aug. 12, 1996 (SAPS- 2 sheets). MATUA <12>. Kitatoko-misaki, M. Tatewaki & Y. Tokunaga 12222, Sep. 5, 1928 (SAPS); Ainuwan, M. Tatewaki & Y. Tokunaga 12260, Sep. 6, 1928 (SAPS); Dvoynaya Bay-Aynu Bay, H. Takahashi 22066 & 22069, Aug. 15, 1996 (SAPS- 2 sheets). RASSHUA <13>. Mikasa, M. Tatewaki & Y. Tokunaga 12428, Aug. 6, 1928 (SAPS); Kitakado, M. Tatewaki & Y. Tokunaga 12431, Aug. 6, 1928 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14915, Aug. 3, 1929 (SAPS); Sonrakuwan, M. Tatewaki & K. Takahashi 15023, Aug. 4, 1929 (SAPS); Mt. Choto, M. Tatewaki & K. Takahashi 15106, Aug. 5, 1929 (SAPS); Onuma, M. Tatewaki & K. Takahashi 15167, Aug. 5, 1929 (SAPS); Mt. Choto-zan, M. Tatewaki & K. Takahashi 15315, Aug. 10, 1929 (SAPS); S of Yoriki-hama, H. Takahashi 19170, Aug. 12, 1995 (SAPS). USHISHIR-RYPONKICHA <14a>. [no locality], M. Tatewaki & Y. Tokunaga 12552, Aug. 11, 1928 (SAPS); [no locality], M. Tatewaki & K. Takahashi 15951, Sep. 14, 1929 (SAPS); SW side to central part, H. Takahashi 22962, Aug. 2, 1997 (SAPS). KETOI <15>. [no locality], M. Tatewaki & Y. Tokunaga 11484, Sep. 1, 1928 (SAPS); Minami, M. Tatewaki & K. Takahashi 15179, Aug. 14, 1929 (SAPS); Kodakigawa, M. Tatewaki & K. Takahashi 15308, Aug. 15, 1929 (SAPS); Lake Ketoi, M. Tatewaki & K. Takahashi 15345, Aug. 17, 1929 (SAPS); Ashizaki, M. Tatewaki & K. Takahashi 15440, Aug. 18, 1929 (SAPS); Shimizugawa, M. Tatewaki & K. Takahashi 15645, Aug. 30, 1929 (SAPS); Cape Storozheva, H. Takahashi 19429, Aug. 15, 1995 (SAPS); Stochnyy River, H. Takahashi 19563, Aug. 19, 1995 (SAPS). SIMUSHIR <16>. Broton Bay, M. Tatewaki & Y. Tokunaga 11560, Aug. 5, 1928 (SAPS);

Broton Bay, M. Tatewaki & Y. Tokunaga 11592, Aug. 13, 1928 (SAPS); Broton Bay, M. Tatewaki 11670, Aug. 14, 1928 (SAPS); Broton Bay, M. Tatewaki 11758, Aug. 15, 1928 (SAPS); Nakadomari, M. Tatewaki & Y. Tokunaga 11911, Aug. 17, 1928 (SAPS); Wan-oku, M. Tatewaki & Y. Tokunaga 12024, Aug. 22, 1928 (SAPS); Wan-oku, M. Tatewaki 12049, Aug. 25, 1928 (SAPS); Malaya Inlet, H. Takahashi 19478, Aug. 18, 1995 (SAPS); Nakatomari Bay, H. Takahashi 19782, Aug. 22, 1995 (SAPS). CHIRPOI <18a>. Peschanaya Bay, H. Takahashi 19865, Aug. 23, 1995 (SAPS). URUP <19>. Kobune, M. Tatewaki 9818, Aug. 26, 1927 (SAPS); Daibahama, M. Tatewaki 9903, Sep. 1, 1927 (SAPS); Tokotan, M. Tatewaki 10095, Sep. 13, 1927 (SAPS); Natalii Bay, H. Takahashi 18734, Aug. 7, 1995 (SAPS); 15km NE of Van-Der-Lind Cape, M. Ohara, Aug. 26, 1995 (SAPS); NE of Van-Der-Lind Cape, H. Takahashi 20016, Aug. 26, 1995 (SAPS).

SOUTH. ITURUP <20>. Mt. Atoiya-yama, T. Kawakami 180, Aug. 11, 1898 (SAPS); Rakko-zaki, T. Kawakami 281, Aug. 27, 1898 (SAPS); Teinei, T. Kawakami, Aug. 28, 1898 (SAPS); Shimonaiibo, K. Miura, Jul. 23, 1906 (SAPS); Toro, K. Miura, Jul. 24, 1906 (SAPS); Porosu-Sokiya, K. Kondo, Jul. 18, 1927 (TI); Oyachi, S. Saito, Aug. 11, 1928 (TI); Porosu, S. Saito, Aug. 14, 1928 (TI); Shana, B. Yoshimura, Aug. 14, 1937 (SAPS- 2 sheets); Moyoro-Shibetoro, B. Yoshimura & H. Yokoyama, Aug. 5, 1938 (SAPS); Oyachi, Chishima-chosasyo, Sep. 15, 1939 (SAPS- 2 sheets); Shibetoro-Moyoro, Chishima-chosasyo, Sep. 15, [no year; prob. 1939] (SAPS- 2 sheets). KUNASHIR <21>. Furukamapp, M. Tatewaki 3250, Jul. 25, 1923 (SAPS, SAPT). SHIKOTAN <22>. Shakotan, K. Miura, Jul. 26, 1906 (SAPS- 2 sheets); Around Shakotan, [no collector's name; prob. H. Takeda], Jul. 17, 1909 (SAPS); Anama, G. Tanaka & Ken. Miyabe, Aug. 4, 1910 (SAPS); Shakotan, G. Tanaka & Ken. Miyake, Aug. 4, 1910 (SAPS); Masuba, G. Tanaka & Ken. Miyabe, Aug. 14, 1910 (SAPS); Mt. Shakotan-yama, S. Saito 1837 & 1867, Aug. 30, 1925 (TI- 3 sheets); Shakotan-Horobetsu, S. Saito, Sep. 4, 1925 (TI); Shakotan, Nodoro-Inemoshiri, S. Saito 1597, Sep. 6, 1925 (TI); [no locality], K. Kondo 7829 & 7840, Aug. 11, 1927 (TI- 3 sheets); Shakotan, K. Kondo, Aug. 4, 1929 (TI); Mt. Shakotan, K. Kondo, Aug. 6, 1929 (TI); Chiboi, K. Kondo, Aug. 10, 1929 (TI); Anama, K. Kondo, Aug. 28, 1929 (TI- 2 sheets); Tomari, K. Kondo, Sep. 5, 1929 (TI); Chiboi-Umanose, K. Kondo, Sep. 7, 1929 (TI); Matakotan, J. Ohwi, Jul. 19, 1931 (KYO); Notoro, J. Ohwi, Aug. 11, 1931 (KYO); Shakotan, S. T. Ono, Jun. 10, 1932 (SAPS); Shikotanmatsuhara, M. Tatewaki 20644, Jun. 22, 1934 (SAPS); Mt. Notoro, M. Tatewaki 20740, Jun. 25, 1934 (SAPS).

### 31. *Vaccinium vitis-idaea* L. [Kokemomo] <SAKHALIN>

NORTH. Ado <04-upper l.>, Y. Kudo & B. Ishida 7514, Sep. 7, 1923 (SAPS); Mouth of River Tum' of the Gulf of Nadezhda <04-lower l.>, T. Fukuda 1839 & 1867, Aug. 9, 2001 (SAPS- 2 sheets); SE from Cape of Maria, around the Lake Monchigar <04-upper r.>, T. Fukuda 1703, Aug. 6, 2001 (SAPS- 2 sheets); Near Pilewo, *Larix* forests <04-lower r.>, Y. Kudo & B. Ishida 7100, Aug. 25, 1923 (SAPS); Pirituk, dry peat <07-upper l.>, Y. Kudo & B. Ishida 7148, Aug. 28, 1923 (SAPS); Uruta, alpine meadow on hill <07-lower r.>, Y. Kudo & B. Ishida 7284, Sep. 1, 1923 (SAPS); 15km S of Okha <10-upper r.>, H.

Takahashi 31167, Jul. 28, 2003 (SAPS); E. Coast, S of Gulf Piltun, near the Lake Pilitu <15-lower r.>, T. Fukuda 2251, Aug. 18, 2001 (SAPS); E. Coast, at 52°45' n.l., Nuto-Chaiwo <19-upper l.>, T. Ishikawa, Jul. 6, 1912 (SAPS); Chaio, seacoast <19-lower l.>, Y. Kusano, May 6, 1921 (SAPS); Nogliki-Okha, 5km S of Val <19-lower l.>, H. Takahashi 31122, Jul. 27, 2003 (SAPS); Nyiwo, in arenosis litalalibus <23-lower l.>, Y. Kudo & M. Tatewaki 6491, Aug. 12, 1922 (SAPS); Parukata, in sylvis <26-upper r.>, Y. Kudo & M. Tatewaki 6452, Aug. 10, 1922 (SAPS); Palkata <26-upper r.>, Okada, Aug. 26, 1923 (TI).

MIDDLE. Nabilskiy Mts., Mt. Changa <34-upper r.>, N. Fujii 01182, Aug. 7, 2002 (MAK 346160); NW of Pogranichnoye, S bank of the Langeri River <35-lower r.>, N. Fujii 01298, Aug. 11, 2002 (MAK 346140, SAPS); Pilevo <36-lower l.>, K. Jimbo, Aug. 13, 1907 (TNS); Hinan-ekisha-Aobaeki <36-lower l.>, Y. Kudo & M. Tatewaki 6176, Jul. 30, 1922 (SAPS); Anbetsu, mountain peaks <36-lower l.>, T. Ishiyama, Jul. 16, 1927 (SAPS); Anbetsu, Ooiwa-toge <36-lower l.>, Y. Tokunaga & K. Kawai, Sep. 2, 1929 (SAPS); Aobaeki-Kamionoru <36-upper r.>, Y. Kudo & M. Tatewaki 6204, Jul. 31, 1922 (SAPS); Hamdasa <37-lower r.>, T. Miyake, Aug. 27, 1906 (SAPS, TNS); Hantuza <37-lower r.>, Okada, Aug. 30, 1923 (TI); Higashiyama <38-lower l.>, T. Miyake, Aug. 28, 1906 (SAPS); 20km NE of Smirnykh, banks of the Poronay RAA Mirnyy <38-lower l.>, N. Fujii 01281, Aug. 10, 2002 (MAK 346159); E boundary, Asase <40-lower l.>, Y. Hoshino et al., Aug. 11, 1933 (SAPS); Shisuka-shicho, Chirie-gun, Ennai River, Kumagoe Pass <40-lower l.?>, M. Tatewaki & Y. Takahashi 22583, Jun. 17, 1936 (SAPS); Borodo <43-lower l.>, T. Miyake, Sep. 1, 1906 (SAPS); Shisuka-shicho, Chirie-gun, Mt. Kawashima-yama <45-upper r.>, M. Tatewaki & Y. Takahashi 23000, Jun. 29, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Atsunai <45-upper r.>, M. Tatewaki & Y. Takahashi 23037, Jun. 30, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Naruko-Nirayama <45-upper r.?>, M. Tatewaki & Y. Takahashi 22883, Jun. 26, 1936 (SAPS); Shisuka-shicho, Shibunkoro <45-lower r.>, Y. Hoshino et al., Aug. 6, 1933 (SAPS); Esutoru <46-lower l.>, M. Kawashima, Sep. 16, 1936 (TI- 2 sheets); Poronaysk-Leonidovo <48-upper l.>, H. Takahashi 30530 & 30539, Aug. 13, 2002 (SAPS); E. Coast, Shikka, Ehorokofunai <48-lower l.>, T. Miyake, Aug. 11, 1906 (SAPS); E. Coast, Nayoro <48-lower l.>, T. Miyake, Sep. 6, 1906 (SAPS, TNS); Nayoro <48-lower l.>, T. Miyake, Sep. 7, 1906 (TNS); Tomari [Tomarikishi?], Experiment Forest of Kyoto Univ. <48-lower l.?>, T. Chono, Jul. 20, 1928 (TNS); Shikka <48-upper r.>, K. Miyabe & T. Miyagi, Jul. 23, 1906 (SAPS); Telpenia Bay, Shikka <48-upper r.>, T. Miyake, Aug. 12, 1906 (SAPS); Ramotteiuri <48-upper r.>, T. Miyake, Aug. 15, 1906 (SAPS); Duwatakkō <48-upper r.>, T. Miyake, Aug. 16, 1906 (SAPS, TNS); Shisuka <48-upper r.>, I. Namikawa, Aug. 7, 1914 (SAPS); Shisuka <48-upper r.>, Otani & Imai, Jul. 19, 1930 (SAPS); Amiba <48-upper r.>, G. Koidzumi, Aug. 18, 1930 (KYO); Shisuka <48-upper r.>, B. Yoshimura & M. Hara 2, Jul. 10, 1937 (TNS); Shisuka <48-upper r.>, R. Imaseki, Jul. 16, 1941 (TNS); Tobani <48-upper r.?>, T. Miyake, Aug. 20, 1906 (SAPS); Shikka, Taraika <49-upper l.>, K. Miyabe & T. Miyagi, Jul. 27, 1906 (SAPS); Telpenia Bay, Taraika <49-upper l.>, T. Miyake, Aug. 13, 1906 (SAPS); Shisuka-shicho, near Taraika <49-upper r.>, M. Honda & Y. Kimura, Aug. 16, 1940 (TI); Jimutaki <50-upper r.>, K. Miyabe & T. Miyagi, Jul. 24,

1906 (SAPS); Shisuka-shicho, Nishinokoro <50-upper r.>, Y. Hoshino et al., Aug. 16, 1933 (SAPS); Kitashiretoko Peninsula, Noto <51-lower l.>, Y. Hoshino et al., Jul. 14, 1933 (SAPS); Lak. Solenuiya <51-lower r.>, K. Miyabe & T. Miyagi, Jul. 26, 1906 (SAPS); Kitashiretoko Peninsula, Mt. Hokke-yama <51-lower r.>, Y. Hoshino et al., Jul. 22, 1933 (SAPS); Usutomanai <52-upper l.>, K. Miyabe & T. Miyagi, Aug. 14, 1906 (SAPS); Near Ushiro <52-upper l.>, H. Hara, Aug. 3, 1936 (TI); W. Coast, Mt. Ushoro <52-upper r.>, T. Miyake, Aug. 31, 1907 (SAPS, TNS); E. Coast, Ponkotan <54->, T. Miyake, Sep. 13, 1906 (SAPS); E. Coast, Chyakamaushinai <54-lower l.>, T. Miyake, Sep. 19, 1906 (SAPS); Kitashiretoko Peninsula, Rosoku-iwa-Funakoshi <55-upper l.>, Y. Hoshino et al., Jul. 22, 1933 (SAPS); Kitashiretoko Peninsula, Kitashiretokomisaki <55-lower r.>, Y. Hoshino et al., Jul. 20, 1933 (SAPS).

SOUTH. Raichishi <56-upper l.>, H. Hara 3895, Aug. 3, 1936 (TI); E. Coast, Mt. Nupuripo <57-lower l.>, T. Miyake, Aug. 13, 1907 (SAPS, TNS); E. Coast, Mt. Tosso <57-lower l.>, N. Hiratsuka et al., Jul. 23, 1927 (SAPS); Mt. Tosso, upper part <57-lower l.>, H. Hara, Aug. 5, 1931 (TI); Motodomari-shicho, Mt. Tosso <57-lower l.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI- 3 sheets); Tsapko to N peak of Mt. Vladimirovka <57-lower l.>, H. Takahashi 29576, Aug. 2, 2001 (SAPS); Mt. Kashipo <57-upper r.>, S. Sugawara 17971, Aug. 27, 1929 (SAPT); Kashipo, Kashipo-dake <57-upper r.>, H. Abumiya et al., Jul. 22, 1932 (SAPS); W. Coast, Kusunnai <58-upper r.>, T. Miyake, Jul. 7, 1906 (SAPS); Kusunnai <58-upper r.>, K. Miyabe & T. Miyagi, Aug. 9, 1906 (SAPS); Kushinnai <58-upper r.>, S. Saito, Aug. 7, 1929 (TI- 2 sheets); Manui <59-upper l.>, S. Komatsu 1371, Aug. 4, 1913 (TI); Manui-sando <59-upper l.>, [no collector's name], Aug. 6, 1913 (TI- 2 sheets); Kitaitada <59-lower r.>, [no collector's name], Aug. 4, 1913 (TI- 2 sheets); Maoka-gun, Habomai <60-lower l.>, Mizukoshi, Aug. 5, 1926 (TNS); Fukakusa <61-lower r.>, S. Sugawara, Sep. 20, 1921 (SAPS); E. Coast, Dubki <62-upper l.>, T. Miyake, Jul. 10, 1906 (SAPS); Dubki <62-upper l.>, K. Miyabe & T. Miyagi, Jul. 22, 1906 (SAPS); Sakaehama <62-upper l.>, [no collector's name], Aug. 2, 1913 (TI); Sakaehama, Experiment Forest of Tokyo Univ. <62-upper l.>, S. Muramatsu, Jul. 8, 1923 (TI); Sakaehama <62-upper l.>, Y. Narita, Aug. 24, 1923 (TI); Sakaehama <62-upper l.>, Y. Narita 2868, Aug. 25, 1923 (TI); Lake Hakucho, lakeside <62-upper l.>, S. Sugawara 17973, Jul. 1, 1928 (SAPT); Sakaehama <62-upper l.>, G. Koidzumi, Aug. 13, 1930 (KYO); Sakaehama <62-upper l.>, H. Hara, Jul. 31, 1931 (TI); Sakaehama <62-upper l.>, S. Sugawara 17974, Jun. 15, 1933 (SAPT); Galkinovlaskoe <62-lower l.>, T. Miyake, Jul. 11, 1906 (SAPS, TNS); Kurokawa <62-lower l.>, S. Sugawara, Jul. 10, 1927 (TI); Kurokawa <62-lower l.>, H. Hara, Jul. 31, 1931 (TI); Kurokawa <62-lower l.>, S. Sugawara, Sep. 10, 1940 (TI); 20km SE of Dolinsk, Shuya River <62-lower r.>, H. Takahashi 30139, Jul. 31, 2002 (SAPS); Kosato <64-lower r.>, [no collector's name], Aug. 22, 1913 (TI); Susuya <65-upper l.>, G. Nakahara, Jul., 1906 (TI); Toyohara <65-upper l.>, G. Koidzumi, Aug. 7, 1930 (KYO); Homutohuka <65-lower l.>, T. Miyake, Jul. 13, 1906 (SAPS); Mitsuriohuka <65-lower l.>, T. Miyake, Jul. 13, 1906 (SAPS); Mitsuriohuka <65-lower l.>, K. Miyabe & T. Miyagi, Aug. 22, 1906 (SAPS); Mt. Susuya <65-upper r.>, T. Miyake, Jul. 27, 1907 (SAPS, TNS); Mt. Susuya, summit <65-upper r.>, H. Hara, Aug. 13, 1928 (TI); Mt. Susuya <65-upper r.>, M. Sato, Jul.

19, 1932 (TI); Mt. Susuya <65-upper r.>, S. Sugawara 17972, Jul. 9, 1936 (SAPT); Chekhovskiy Pass–Mt. Chekhova <65-upper r.>, H. Takahashi 29277 & 29280, Jul. 22, 2001 (SAPS); Peak Chekhov (alt. 1045 m), alpine meadow <65-upper r.>, T. Fukuda 1156, Jul. 22, 2001 (SAPS); Peak Chekhov, peak-like rocky place <65-upper r.>, T. Fukuda 1181, Jul. 22, 2001 (SAPS); Near the River Shima <66-upper l.>, T. Fukuda 2441, Aug. 27, 2001 (SAPS); Okhotskoe, Sedykh Lake <66-lower l.>, S. Tsuji et al. 806031, Aug. 6, 1996 (TI); Korsakovsky Distr., Puzin Pen., Krestonoshka <66-lower l.>, S. Tsuji et al. 807014, Aug. 7, 1996 (TI); 30 Km SE of Yuzhno-Sakhalinsk, S of Okhotskoye <66-lower l.>, H. Takahashi 27912, Jul. 19, 2000 (SAPS); Tonnaicha <66-lower r.>, I. Namikawa, Jul. 29, 1914 (SAPS); Airoppu <67-lower l.>, K. Miyabe & T. Miyagi, Jul. 31, 1906 (SAPS); Penins. Shiretoko, Mt. Oyakochi <67-lower l.>, T. Miyake, Jun. 25, 1908 (SAPS); Taran'nai <69-upper r.>, [no collector's name], Aug. 21, 1913 (TI); Aniva Distr., Urym-Bachinskaya Rivers <69-upper r.>, S. Noshiro et al. 970703-18, Jul. 3, 1997 (TI); Near Korsakov <70-upper r.>, S. Takeo, Sep., 1905 (SAPS); Otomari <70-upper r.>, K. Numajiri, Jul., 1924 (TNS); Near Korsakov, Larix forests <70-upper r.>, H. Ueda, Oct. 19, 1905 (SAPS); Korsakkoff <70-upper r.>, T. Miyake, Jun. 14, 1906 (TNS); Aniwa Bay, Korssakoff <70-upper r.>, T. Miyake, Jun. 19, 1906 (SAPS); Korssakoff <70-upper r.>, K. Miyabe & T. Miyagi, Jul. 12, 1906 (SAPS); Korssakoff <70-upper r.>, K. Miyabe & T. Miyagi, Aug. 4, 1906 (SAPS); Aniwa Bay, Ootomari <70-upper r.>, T. Miyake, Jul. 10, 1907 (SAPS); Aniwa Bay, Ootomari <70-upper r.>, T. Miyake, Jul. 14, 1907 (SAPS); Aniwa Bay, Ootomari <70-upper r.>, T. Miyake, Jul. 16, 1907 (SAPS, TNS); Korsakof <70-upper r.>, U. Faurie, Jun., 1908 (KYO); Korsakof <70-upper r.>, U. Faurie, Jul., 1908 (KYO); Korsakof <70-upper r.>, U. Faurie, Jul. 8, 1908 (KYO); Ohtomari <70-upper r.>, Y. Narita 276, Aug. 20, 1923 (TI); Ohtomari <70-upper r.>, K. Numajiri, May 14, 1925 (TNS); Ohtomari, forests <70-upper r.>, H. Hara, Aug. 12, 1928 (TI- 2 sheets); Ohtomari <70-upper r.>, S. Saito, Jul. 24, 1929 (TI- 2 sheets); Ohtomari-cho, Fujigaoka <70-upper r.>, H. Sase, May 29, 1932 (SAPS); Ohtomari <70-upper r.>, H. Hara, Jul. 28, 1936 (TI- 2 sheets); Aniwa Bay, Chipisani <71-upper l.>, T. Miyake, Jul. 20, 1908 (SAPS, TNS); Aniwa Bay, Mt. Otairenko <71-upper l.>, T. Miyake, Jul. 22, 1908 (SAPS); Ozerskiy, S of the Lake Mal. Chibisanskoye <71-upper l.>, T. Fukuda 1350, Jul. 28, 2001 (SAPS); Nagahama-gun, Tobuchi-mura, Nozuki <71-upper r.>, H. Sase, Sep. 15, 1935 (SAPS- 2 sheets); Mt. Omanbetsu <72-lower l.>, T. Miyake, Jul. 15, 1908 (SAPS); Tohkushi <73-upper l.>, S. Sugawara 17970, Jul., 1929 (SAPT); Todomoshiri, Mt. Dainan <73-lower l.>, T. Miyake, Jul. 26, 1906 (SAPS, TNS); Kaiba Isl. <73-lower l.>, S. Komat, Aug. 12, 1915 (TI); Todomoshiri, Mt. Dainan <73-lower l.>, Kimoto, Murayama & Takee, Jul. 26, 1931 (SAPS); Mt. Shiretoko-Juzozan <74-upper l.>, T. Miyake, Jul. 11, 1908 (SAPS, TNS).

[No Locality]. In silvis, U. Faurie, Oct., 1907 (KYO- 2 sheets); Komatu, 1909 (TI- 3 sheets); [no collector's name], Aug. 14, 1913 (TI); [no collector's name], Sep., 1932 (TI); Komatu, [no date] (TI- 2 sheets); T. Iishiba, [no date] (TI- 2 sheets).

#### <THE KURILS>

NORTH. ATLASOVA <01>. Minami-ura, Maruyama,

S. Ito & G. Komori, Jul. 4, 1926 (SAPS); Minami-ura, S. Ito & G. Komori, Jul. 17, 1926 (SAPS). SHUMSHU <02>. [no locality], S. Seki, 1895 (SAPS); [no locality], S. Gunji, 1898 (SAPS); Takaoka [?], K. Endo, Aug. 17, 1903 (SAPS); [no locality], [no collector's name], Sep., 1917 (MAK 102776); Kataokawan, M. Tatewaki 17255, May 30, 1930 (SAPS); Tenzin-iwa, Y. Okada, Aug. 16, 1931 (TNS); Mt. Tenzin-yama, J. Ohwi & R. Yoshii 5633, Jul. 28, 1934 (KYO); S of Pochtareva Cape, H. Takahashi 23317, Aug. 8, 1997 (SAPS). PARAMUSHIR <03>. Kashiwabara-wan, S. Yokoyama, Sep. 9, 1893 (SAPS); Musashi-wan, M. Aizawa, Jun. 22, 1900 (SAPS); Murakamiwan, Y. Kudo 4947, Jul. 3, 1920 (SAPS); Nagaiwasaki, Y. Kudo 5135, Jul. 11, 1920 (SAPS); Shirakawa, Y. Kudo 5607, Jul. 30, 1920 (SAPS); Tomarizaki, Y. Kudo 5741, Aug. 7, 1920 (SAPS); Urafuto-yama, Y. Kudo 5812, Aug. 8, 1920 (SAPS); Atenkeshi, M. Tatewaki 17283, Jun. 2, 1930 (SAPS); Mt. Chikura-dake, Y. Okada, Jul. 30, 1931 (TNS); Kuzira-hama, K. Kojima, Jul. 31, 1932 (TNS); [no locality], T. Ohashi, Aug., 1932 (KYO); Nasauchi-kaigan, K. Kojima, Aug. 11-13, 1932 (TNS); Suribachi, J. Ohwi 233, Jul. 8, 1934 (SAPS); Arakawa, J. Ohwi & R. Yoshii 206, Jul. 10, 1934 (KYO); Arakawa, J. Ohwi & R. Yoshii 233, Jul. 10, 1934 (KYO); Suribachi-wan, J. Ohwi & R. Yoshii 5445, Jul. 22, 1934 (KYO); E of Vasil'yeva Bay, H. Takahashi 20983, Aug. 3, 1996 (SAPS). [Island Uncertain; Shumshu or Paramushir], K. Fujita, [no date] (TNS).

MIDDLE. MAKANRUSHI <05>. In heaths, M. Tatewaki 11221, Aug. 9, 1928 (SAPS); Zakat Bay, H. Takahashi 24004, Aug. 18, 1997 (SAPS). ONEKOTAN <06>. Nemo, M. Tatewaki 11050, Aug. 8, 1928 (SAPS); Minamiura, M. Tatewaki 17317, Jun. 6, 1930 (SAPS); Nemo Bay, H. Takahashi 21244, Aug. 4, 1996 (SAPS). KHARIMKOTAN <07>. Nishiura, M. Tatewaki 17211, May 28, 1930 (SAPS); [no locality], M. Tatewaki 17301, Jun. 4, 1930 (SAPS); Severgina Bay, H. Takahashi 21532, Aug. 8, 1996 (SAPS). EKARMA <09>. [no locality], M. Tatewaki 11379, Aug. 11, 1928 (SAPS). SHIASHKOTAN <10>. [no locality], T. Ishikawa, Jun. 23, 1894 (SAPS); Otomewan, M. Tatewaki 17341, Jun. 6, 1930 (SAPS); Zakatnaya Bay, H. Takahashi 21804, Aug. 12, 1996 (SAPS). RAIKOKE <11>. E side of island, H. Takahashi 21904 & 21911, Aug. 13, 1996 (SAPS). MATUA <12>. [no locality], Kodama, Aug., 1893 (SAPS); AINUWAN, M. Tatewaki & Y. Tokunaga 12256, Sep. 6, 1928 (SAPS); Yamatowan, M. Tatewaki 12306, Sep. 10, 1928 (SAPS); Isl. Banjo, E. Taketomi, Jul. 10, 1936 (SAPS); Dvoynaya Bay, H. Takahashi 22012, Aug. 14, 1996 (SAPS). RASSHUA <13>. Kitakado, M. Tatewaki & Y. Tokunaga 12434, Aug. 6, 1928 (SAPS); Mikasa, M. Tatewaki & Y. Tokunaga 12399, Aug. 6, 1928 (SAPS); Nakadomari, M. Tatewaki & K. Takahashi 14898 & 14958, Aug. 3, 1929 (SAPS- 2 sheets); Nakadomari, in heath, M. Tatewaki & K. Takahashi 14904, Aug. 3, 1929 (SAPS); Near Nakadomari, M. Tatewaki & K. Takahashi 14914, Aug. 3, 1929 (SAPS); Sonrakuwan, M. Tatewaki & K. Takahashi 15009, Aug. 4, 1929 (SAPS); Onuma, M. Tatewaki & K. Takahashi 15168, Aug. 5, 1929 (SAPS); Sonrakuwan, M. Tatewaki & K. Takahashi 15265, Aug. 8, 1929 (SAPS); Mt. Chotozan, M. Tatewaki & K. Takahashi 15314, Aug. 10, 1929 (SAPS); S of Yoriki-hama, H. Takahashi 19155 & 19158, Aug. 12, 1995 (SAPS). USHISHIR-RYPONKICHA <14a>. [no locality], M. Tatewaki & Y. Tokunaga 12581, Aug.

11, 1928 (SAPS); [no locality], M. Tatewaki & K. Takahashi 15927, Sep. 4, 1929 (SAPS). USHISHIR-YANKICHA <14b>. In heath, M. Tatewaki & K. Takahashi 15813, Jul.30, 1929 (SAPS); Kraternaya Bay, H. Takahashi 19670, Aug. 20, 1995 (SAPS); Mountain ridge, H. Takahashi 22901, Aug. 1, 1997 (SAPS). KETOI <15>. [no locality], M. Tatewaki & Y. Tokunaga 11526, Sep. 1, 1928 (SAPS); Minami, M. Tatewaki & K. Takahashi 15189, Aug. 14, 1929 (SAPS); Minamidai, M. Tatewaki & K. Takahashi 15541, Aug. 22, 1929 (SAPS); Todozaki, M. Tatewaki & K. Takahashi 15741, Sep. 4, 1929 (SAPS); Stochnyy River, H. Takahashi 19569, Aug. 19, 1995 (SAPS). SIMUSHIR <16>. Broton-wan, Kodama, Jun., 1893 (SAPS); [no locality], Cap. Uzawa, Sep., 1927 (SAPS); Broton Bay, M. Tatewaki & Y. Tokunaga 11559, Aug. 5, 1928 (SAPS); Broton Bay, M. Tatewaki & Y. Tokunaga 11591, Aug. 13, 1928 (SAPS); Yamagoshizaki, M. Tatewaki & Y. Tokunaga 11788, Aug. 16, 1928 (SAPS); Broughton Bay, M. Tatewaki & K. Takahashi 16014, Jul. 26, 1929 (SAPS); Simushir, M. Tatewaki 11859, Sep. 13, 1929 (SAPS); Malaya Inlet, H. Takahashi 19470, Aug. 18, 1995 (SAPS); Nakatomari Bay, H. Takahashi 19738, Aug. 22, 1995 (SAPS). CHIRPOI <18a>. Peschanaya Bay, H. Takahashi 19866, Aug. 23, 1995 (SAPS). BRAT CHIRPOEV <18b>. Uglovaya Bay, H. Takahashi 28491, Aug. 4, 2000 (SAPS). URUP <19>. Suribachiyama, K. Jimbo, Jun. 16, 1891 (SAPS, TI); Anama-Yoshinohama, K. Uchida, Jun. 17, 1891 (SAPS); Yoshinohama, K. Uchida, Jun. 18, 1891 (SAPS- 2 sheets); Anama, K. Jimbo, Jun. 18, 1891 (SAPS); Tokotan, T. Ishikawa, Jul. 23, 1894 (SAPS); Boat Harbor, T. Kitahara, Aug. 30, 1895 (SAPS); [no locality], K. Miura, Jul. 8-9, 1906 (SAPS); Kobune, M. Tatewaki 9827, Aug. 26, 1927 (SAPS); Tokotan, M. Tatewaki 9692, Aug. 29, 1927 (SAPS); Onsen-zaki, M. Tatewaki 10061, Sep. 9, 1927 (SAPS); Kobune, M. Tatewaki 17194, May 18, 1930 (SAPS); Tokotan, M. Tatewaki 17461, Jun. 10, 1930 (SAPS); Otkrytyy Bay, H. Takahashi 18565, Aug. 5, 1995 (SAPS); Natalii Bay, H. Takahashi 18609, Aug. 6, 1995 (SAPS); Natalii Bay, H. Takahashi 18741, Aug. 7, 1995 (SAPS); 15km NE of Van-Der-Lind Cape, M. Ohara, Aug. 26, 1995 (SAPS); Barhatnyy Bay, H. Takahashi 20090, Aug. 28, 1995 (SAPS); Tetyayeva Bay, H. Takahashi 22246, Aug. 21, 1996 (SAPS).

SOUTH. ITURUP <20>. Furubetsu, K. Miyabe, Jul. 28, 1884 (SAPS); Rubetsu River, S. Yokoyama, Aug. 23, 1893 (SAPS); Mt. Moyoro-yama, K. Fukuzawa, Aug. 27, 1893 (SAPS- 2 sheets); Furebetsu, Y. Tanaka, Aug. 27, 1895 (SAPS); Mt. Moyoro-yama, T. Kawakami 199, Aug. 12, 1898 (SAPS); Shana, K. Miura, Jul. 11, 1906 (SAPS); Shana-Bettofu, K. Miura, Jul. 13, 1906 (SAPS); Bettobu-Shamanbetsu, K. Miura,

Jul. 13-14, 1906 (SAPS); Shibetoro, K. Miura, Jul. 19, 1906 (SAPS); Mt. Moyoro, G. Tanaka & Ken. Miyabe, Jul. 17, 1910 (SAPS); Shibetoro-Moyoro, G. Tanaka & Ken. Miyabe, Jul. 18, 1910 (SAPS); Bettobu, G. Tanaka & Ken. Miyabe, Jul. 23, 1910 (SAPS); Shana-ko, K. Kondo 2114, Jul. 11, 1927 (TI); Shana-Bettobi, K. Kondo no number & 1949, Jul. 13, 1927 (TI- 2 sheets); Shamanbe, K. Kondo, Jul. 14-15, 1927 (TI- 2 sheets); Mt. Atoiya, K. Kondo, Jul. 21, 1927.(TI); Sokiya-Shibetoru, S. Saito, Aug. 8, 1928 (TI); Shibetoru, S. Saito, Aug. 10, 1928 (TI); Oyachi, S. Saito, Aug. 11, 1928 (TI); Bettobi-Tanimusyoy, S. Saito (6144), Aug. 16, 1928 (TI, TNS); Bettobi-Tanimusyoy, S. Saito, Aug. 16-17, 1928 (TI); Bettobi, B. Yoshimura, Aug. 11, 1937 (SAPS); Mt. Atosa-yama, B. Yoshimura, Aug. 14, 1939 (SAPS); Shana, Chishima-chosasyo, Aug. 17, 1939 (SAPS); Furibetsu, Chishima-chosasyo, Aug. 25, [no year; prob. 1939] (SAPS); Shibetoro vill., near mouth of Hiraitogawa River, T. Azuma et al. 3043, Jun. 13, 2002 (SAPT). KUNASHIR <21>. Zenbekotan, H. Tanaka, 1895 (SAPS); [no locality], [no collector's name], 1935 (KYO- 2 sheets); Tomari-mura, T. Ishikawa, Jul. 9, 1894 (SAPS); Uennai, C. Endo, Jul. 17, 1894 (SAPS); Keramui-misaki, C. Endo, Sep. 29, 1894 (SAPS); Tobutsu, S. Sasa, Jul. 9, 1908 (SAPS); Furukamapp, M. Tatewaki 3393, Jul. 26, 1923 (SAPS); Nikishiro, M. Tatewaki 3541, Jul. 29, 1923 (SAPS); Mt. Rausu, H. Ishikawa 3696, Aug. 1, 1923 (SAPS); Furukamappu, J. Ohwi, Aug. 13, 1923 (TNS); [no locality], N. Watanabe, Sep. 2, 1923 (TNS); Atoiya, M. Nagai & M. Shimamura, Aug. 3, 1929 (SAPS); Tomari, H. Ohtani, Aug. 9, 1929 (SAPS); Furukamappu, Y. Matsumura, Jul. 20, 1930 (KYO); Mt. Tomari, M. Tatewaki 25526, Aug. 20, 1936 (SAPS); Chibukaribetsu-Zaimokuiwa, K. Ito, Jun. 16, 1939 (SAPS); Mt. Rausu, K. Ito, Sep. 22, 1939 (SAPS). SHIKOTAN <22>. Inemoshiri, S. Yokoyama, Aug. 2, 1890 (SAPS); Shakotan, T. Kawakami 512, Aug. 1, 1898 (SAPS); Shakotan, K. Miura, Jul. 26, 1906 (SAPS); Shakotan-Chipoi, [no collector's name; prob. H. Takeda], Jul. 18, 1909 (SAPS); Anama, Arai, Sep. 24, 1909 (TNS); Anama, G. Tanaka & Ken. Miyabe, Aug. 14, 1910 (SAPS); Anama, M. Arai, Aug. 15, 1910 (SAPS); [no locality], A. Abe, Jul. 16, 1924 (TNS); Shakotan, S. Ono, Aug. 8, 1925 (TNS); Shakotan, Nodoro-Inemoshiri, S. Saito 1602, Sep. 6, 1925 (TI); [no locality], K. Kondo 7841, Aug. 11, 1927 (TI); Shakotan, K. Kondo, Aug. 4, 1929 (TI); Mt. Shakotan, K. Kondo, Aug. 6, 1929 (TI- 2 sheets); Horobetsu-Okkaibetsu, K. Kondo, Aug. 31, 1929 (TI- 2 sheets); Chiboi-Umanose, K. Kondo, Sep. 7, 1929 (TI); Shakotan, S. T. Ono, Jun. 29, 1930 (SAPT, TI); Shakotan, J. Ohwi, Jul. 22, 1931 (KYO); Umanose, J. Ohwi, Jul. 31, 1931 (KYO).

## **A Floristic Study of the Vascular Plants of Kharimkotan, Kuril Islands**

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**Abstract** The flora of Kharimkotan, the middle Kuril Islands, had not been known prior to field work performed under the auspices of the International Kuril Island Project (IKIP) in 1996 and 2000. A first checklist of the vascular plants including the old specimens collected by Tatewaki in 1930, is provided here. The list represents 46 families, 121 genera, 182 species, and 4 subspecies for the island. Dominant families are; Asteraceae (17 spp.), Poaceae (17 spp.), Cyperaceae (17 spp.), Brassicaceae (10 spp.), Rosaceae (10 spp.) and Ericaceae (10 spp.). The outline of the vegetation of Kharimkotan is also given.

**Key words:** flora, Kharimkotan, Kuril Islands, vegetation

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### **Introduction**

The island of Kharimkotan (area 68 km<sup>2</sup>) lies between Onekotan and Shiashkotan (about 15 km southwest of the former and about 30 km northeast of the latter), in the northern part of the middle Kurils (Fig. 1; geographical delimitation follows Takahashi 1996). The island is somewhat elongate (8 × 12 km) in a north-south direction and is composed of a single volcano with a height of 1157 m above sea level (Gorshkov 1970). Several eruptions have been known during the historic period and a strong eruption took place in 1933 (Gorshkov 1970). Around 1933, huts of Japanese winter quarters were situated on the shore of Severgina Bay, where we landed in 1996. After 1945 at the end of World War II, Kharimkotan has been the uninhabited island for over half a century. Oceanic climate is predominant on the island.

The flora of the entire Kuril Island chain has been roughly clarified by Miyabe (1890), Vorobiev (1956), Tatewaki (1957), Vorobiev et al. (1974), and Barkalov (2000); however, the flora of each individual island has not been fully explored (Takahashi 1996). This paper presents the first list of the vascular plants for this island following our previous lists of Chirpoi (Takahashi et al. 1997), Chirinkotan (Takahashi et al. 1999), and Raikoke (Takahashi et al. 2002), and Kharimkotan's vegetation and phytogeographical significances are discussed briefly.

### **Materials and Methods**

Botanists from Japan, Russia and the USA landed on the northwestern part of the island on August 8, 1996 (49°10.51' N latitude, 154°27.59' E longitude; Severgina Bay) and July 28, 2000 (49°08.662' N latitude, 154°27.365' E longitude; 1.5 km SW of Severgina Bay). We collected plants independently, and later exchanged information to compile a plant list for the island. Herbarium specimens collected by Tatewaki in 1930 May and June, and preserved at SAPS are also cited here as far as possible. Tatewaki landed on both the northwestern and southeastern parts of the island, thus our total study sites cover most accessible places on the island. Except for these two parts, people can not land on the island due to its steep marine cliffs (Fig. 1).

The circumscription and order of families in the floristic list follows Melchior (1964) to make it easier to compare our list with earlier floristic works. We cited the important synonyms only in the plant list (see Appendix). The specimens are deposited in the following herbaria: SAPS, Herbarium, The Hokkaido University Museum, Sapporo; VLA, Herbarium, Institute of Biology and Soil Sciences, Russian Academy of Sciences, Far Eastern Branch, Vladivostok; WTU, Herbarium, Department of Botany, University of Washington, Seattle. For comparison of the plant list of Kharimkotan with those of the neighboring islands, and to clarify distribution



patterns in the Kurils, we used Hultén (1930, 1968), Tatewaki (1957), Egorova (1964), Chernyaeva (1976), Hultén and Fries (1986), and our recent investigations on the Kurils in 1995 to 2000.

## Results and Discussion

### 1) Vegetation

On the island several plant communities are recognized, we describe these communities following the recognition by Tatewaki (1957). Some interesting species from the phytogeographical point of view were also noticed.

#### 1-1) Forest communities

Forest-thickets of *Pinus pumila* poorly developed on the northern mountain slope, but we (VB) could climb and recognize that the thickets of *P. pumila* well developed on the south-western slope of Mt. Severgina. As *Pinus pumila* has not been reported from Kharimkotan until now (Takahashi 2003), the present study is the first report of *P. pumila* for this island. In the central and

northern Kurils, the thickets of *Pinus pumila* do not exist on Atlasova, Matua (Tatewaki 1957, Barkalov 2002), and Raikoke (Takahashi et al. 2002), all which have the volcanic mountains with recent eruptions. Probably the northern and south-eastern slopes of Mt. Severgina were effected by recent volcanic actions, and the succession of the vegetation has been stopped at the early stage.

Thus, pure community of *Alnus maximowiczii*, is well developed from marine terrace to mountain slopes on the north and south-eastern parts of the island. The thickets of *Alnus maximowiczii* are sometimes mixed with *Sorbus sambucifolia*. We could not find *Betula ermanii*, which is distributed from Kunashir to Rasshua but not from Matua to Shumshu (Tatewaki 1957) in the Kurils. The lacking of *Betula ermanii* may suggest that the forest vegetation of Kharimkotan is more similar to that of the northern Kurils. *Betula ermanii* appears again in Kamchatka (Nedoluzhuko and Skvortsov 1996).

#### 1-2) Coastal vegetation

The plant communities on the sandy beaches are not very well developed but composed of *Honkenya*

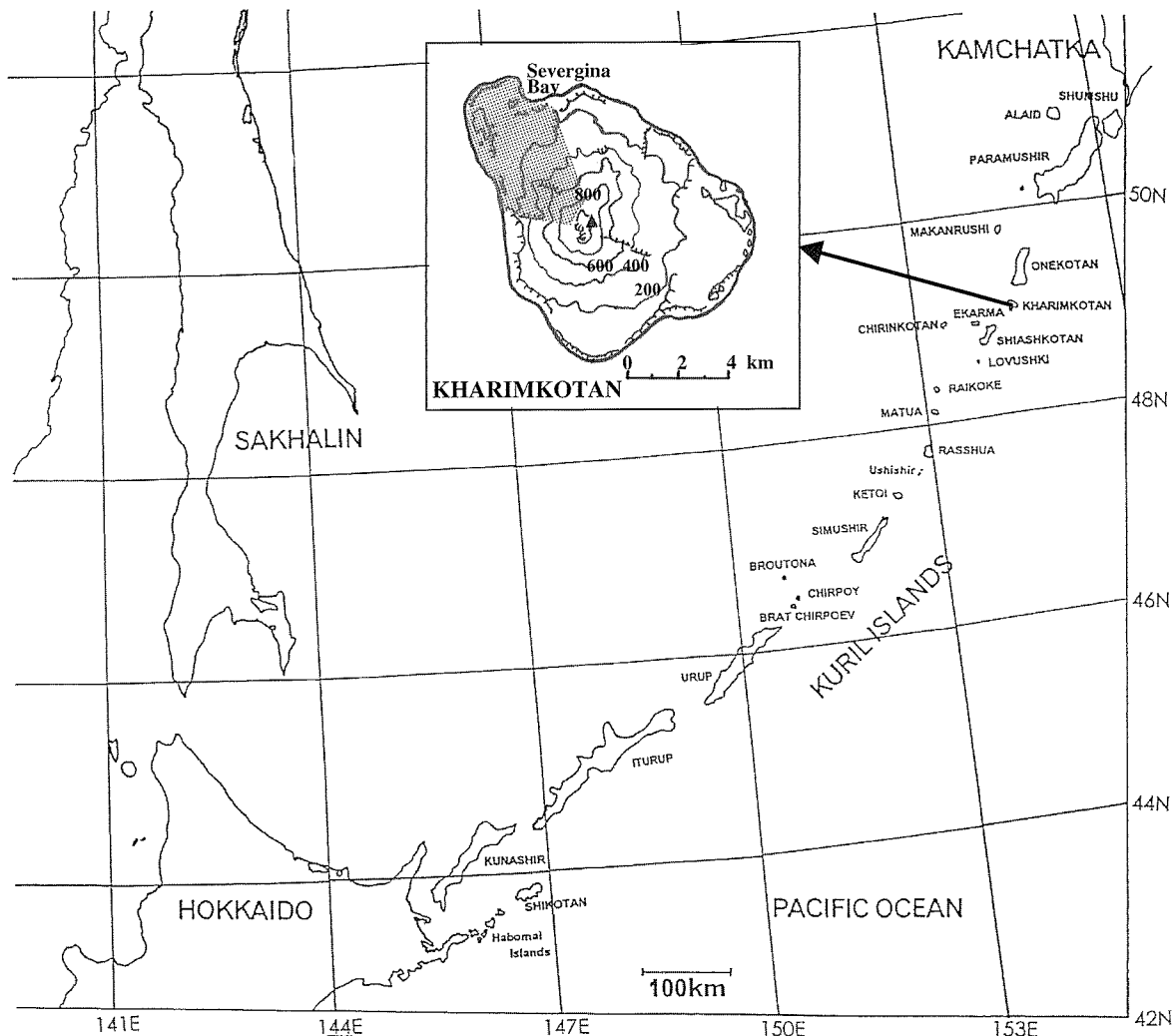
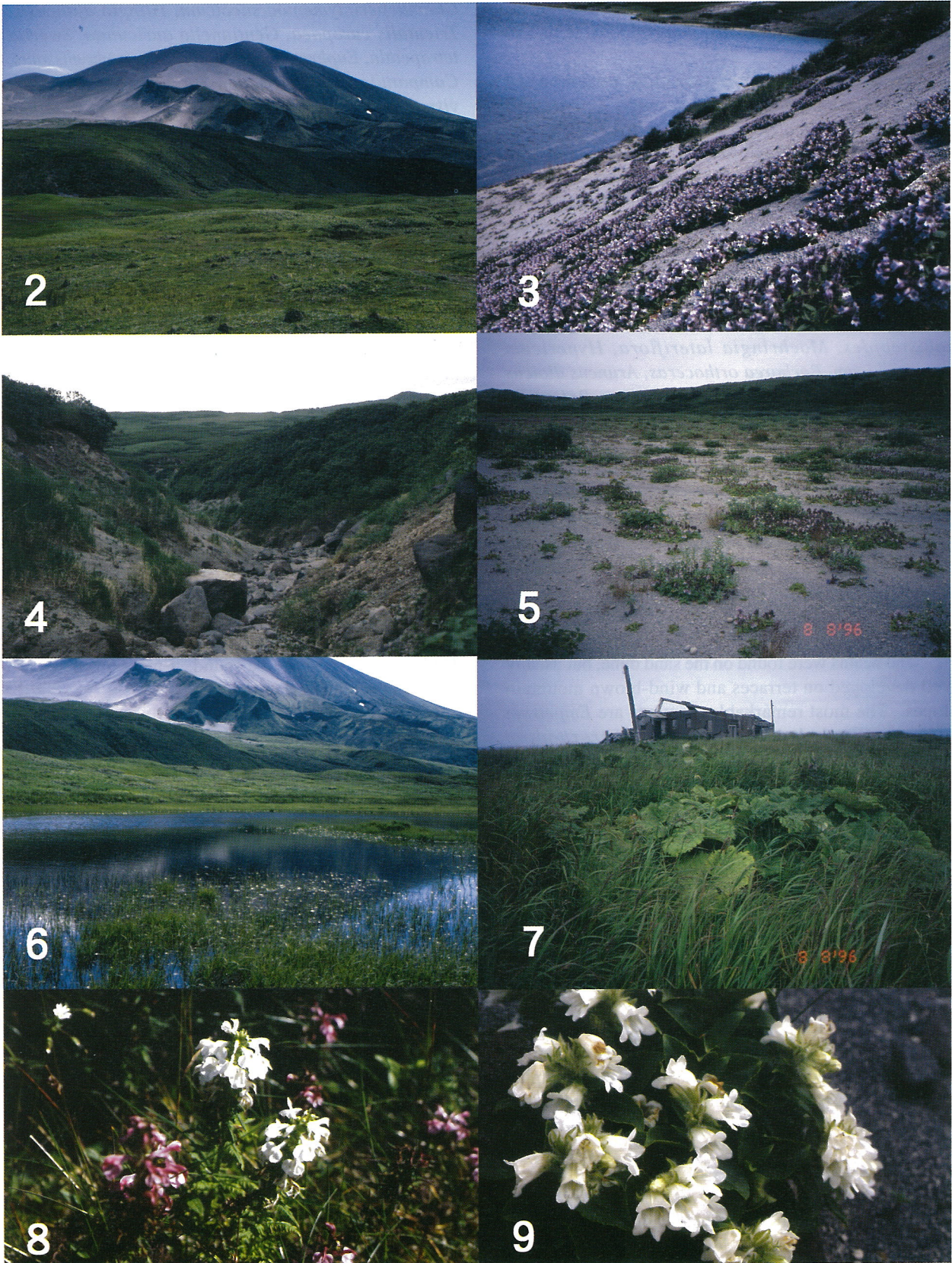


Figure 1. Map showing the explored area (shaded) on Kharimkotan Island in the Kuril Islands.



Figures 2 – 9. 2: Meadows on marine terrace and Mt. Severgina seen from the north; 3: *Pennellianthus frutescens* on volcanic ash (pumice) slope; 4: Dry creek in the *Alnus maximowiczii* thicket belt; 5: Patches of *Pennellianthus frutescens*, *Anaphalis margaritacea*, *Alnus maximowiczii*, etc. growing on volcanic ash in low river valleys; 6: Emergent plants in the lake on marine terrace; 7: *Petasites japonicus* subsp. *giganteus* around the ruins on the seacoast; 8: White flowered form of *Pedicularis chamissonis*; 9: White flowered form of *Pennellianthus frutescens*.

*oblongifolia*, *Lathyrus japonicus*, *Mertensia maritima* subsp. *asiatica*, *Leymus mollis*, *Poa macrocalyx*, and so on.

Boulder beaches to rocky sea cliffs are dominated by *Sagina maxima* var. *crassicaulis*, *Cochlearia officinalis*, *Saxifraga bracteata*, *Ligustichum scoticum*, *Arctanthemum arcticum*, *Senecio pseudoarnica*, and *Leymus mollis*. *Draba grandis*, a maritime species of north Pacific coastal regions (Takahashi et al. 2000), was once collected by Tatewaki on the rocky sea cliffs at the eastern side of Kharimkotan. But we could not find this species on the northwestern side of the island.

Coastal meadows on sand dunes are characterized by the presence of *Cerastium fischerianum*, *Cerastium holosteoides*, *Moehringia lateriflora*, *Hypericum kamtschaticum*, *Barbarea orthoceras*, *Aruncus dioicus* var. *kamtschaticus*, *Fragaria nipponica*, *Potentilla megalantha*, *Rubus arcticus*, *Geranium erianthum*, *Viola langsdorffii*, *Epilobium hornemannii*, *Pedicularis chamissonis*, *Lonicera caerulea*, *Achillea alpina* subsp. *kamtschatica*, *Picris hieracioides* subsp. *kamtschatica*, *Iris setosa*, *Luzula kjellmanniana*, *Calamagrostis langsdorffii*, *Carex gmelinii*, and so on. We could not find the salt-marshes on Kharimkotan, but *Potentilla anserina* was rarely found around a lake.

### 1-3) Heaths

The heaths were found on the sand dune, but usually well developed on terraces and wind-blown mountain slopes. The most remarkable elements are *Empetrum nigrum*, *Rhododendron aureum*, *Therorhodion kamtschaticum*, *Vaccinium uliginosum*, *V. vitis-idaea*, and so on. The following species; *Lycopodium selago*, *Chamaepericlymenum suecicum*, *Tilingia ajanensis*, *Gentianella auriculata*, *Maianthemum dilatatum*, *Deschampsia flexuosa*, *Orchis aristata*, are in company with them. Besides, *Salix nakamura* and *Alnus maximowiczii* occur scatteringly.

### 1-4) Grassy land

Grassy lands are found on terrace slopes, on terraces, and on slopes of the mountains (Fig. 2). Most widely distributed species is *Calamagrostis langsdorffii*, and *Festuca rubra* is locally abundant. A rich assortment of plants is found close to coastal meadows and subalpine meadows. Grassy land communities may develop into tall herbaceous meadows and wetter communities.

### 1-5) Herbaceous communities

Tatewaki (1957) recognized two types; the tall herbaceous meadow and the subalpine meadow. The tall herbaceous meadows are developed in the lowland, especially on rich wet soil, e.g., at the base of terrace. *Urtica platyphylla*, *Aconitum maximum*, *Artemisia unalaskensis*, *Cirsium kamtschaticum*, and *Senecio cannabifolius* are the main components.

The subalpine meadows are mainly developed on the marine terrace. The meadows are composed of *Bistorta vivipara*, *Moehringia lateriflora*, *Geum calthifolium* var. *nipponicum*, *Oxytropis retusa*,

*Chamaepericlymenum suecicum*, *Tilingia ajanensis*, *Trientalis europaea*, *Gentianella auriculata*, *Swertia tetrapetala*, *Euphrasia mollis*, *Pedicularis chamissonis*, *Campanula lasiocarpa*, *Saussurea riederi*, *Solidago virgaurea* subsp. *leiocarpa*, *Maianthemum dilatatum*, *Luzula kjellmanniana*, *Deschampsia flexuosa*, *Festuca rubra*, *Orchis aristata*, and so on.

### 1-6) Volcanic barrens

Since Kharimkotan is a volcanic island, higher mountain slopes and river valleys in low elevation are covered by volcanic ash and pumice (Figs. 3-5). *Oxyria digyna*, *Saxifraga merkii*, *Arctica nana*, *Pennellianthus frutescens* (Fig. 3), *Luzula arcuata* subsp. *unalaschkensis*, and *Carex stenantha* var. *taietsuensis* occur and form small patches on these habitats. *Salix nakamura* characteristically occur on the volcanic slope. *Honkenya oblongifolia*, a pioneer in the shorelines, and *Pennellianthus frutescens* occurs side by side on the volcanic ash in low river valleys (Fig. 5) which may be a result of the past pyroclastic flow.

### 1-7) Lakes and ponds

Some ponds and lakes are located only on the northwestern and southeastern parts of Kharimkotan (Fig. 1). But aquatic plants; submerged, floating-leaved, and free-floating plants; like as *Sparganium*, *Potamogeton*, *Utricularia*, could not be found. Emergent plants are noted in the next vegetation.

### 1-8) Swamps and bogs

The swamp vegetation is limited in area but found on lake margins (Fig. 6). The following emergent plants are found as the swamp vegetation; *Hippuris vulgaris* and *Eleocharis palustris*. The *Sphagnum* bogs are scatteringly found behind the sand dunes and around the lakes and ponds, the following plants are enumerated; *Selaginella selaginoides*, *Equisetum arvense*, *Rubus arcticus*, *Rubus chamaemorus*, *Viola hultenii*, *Juncus filiformis*, *Carex hakkodensis*, *Carex rariflora*, *Eriophorum angustifolium* subsp. *subarcticum*, and so on.

## 2) Flora

### 2-1) Floral composition

We list 46 families, 121 genera, 182 species, and four subspecies for the island. We added 19 species to the species number of the vascular plants in Kharimkotan reported by Pietsch et al. (2003). The vascular plant similarity between Kharimkotan and Matua shown by Pietsch et al. (2003) may be due to the similar island size and the similar past history and scale of volcanic activities. On average each family includes 2.6 genera and 4.0 species in the Kharimkotan flora. The average number of genera and species per family is larger than those from Chirinkotan (2 and 2.3, respectively) and Raikoke (2 and 2.5, respectively) in the previous studies (Takahashi et al. 1999, 2002). Thus the vascular flora of Kharimkotan is comparatively rich in the middle Kurils,

due to its comparatively large island size and various habitats.

The dominant families are; Asteraceae (17 spp.), Poaceae (17 spp.), Cyperaceae (17 spp.), Brassicaceae (10 spp.), Rosaceae (10 spp.) and Ericaceae (10 spp.). Three most dominant families; Asteraceae, Poaceae and Cyperaceae are commonly found in the temperate to subarctic regions in the Northern Hemisphere; i.e., Scandinavia, Yakutia, Alaska and Japan (Takahashi 1994). The floristic composition of Kharimkotan is not biased like those of Chirinkotan or Raikoke (Takahashi et al. 1999, 2002). The high position of the family Brassicaceae characterizes the more northern regions in the Northern Hemisphere (Takahashi 1994) and the high position of Ericaceae may indicate a floral connection with the Japanese alpine flora (cf., Volotovskiy et al. 1996). The following genera include more than two species; *Lycopodium* (6), *Stellaria* (3), *Arabis* (3), *Saxifraga* (3), *Viola* (5), *Epilobium* (3), *Taraxacum* (4), *Luzula* (5), *Agrostis* (3), *Calamagrostis* (3), *Deschampsia* (3, adding two infraspecific taxa), *Poa* (3), and *Carex* (16, adding one infraspecific taxon). Especially a high number of *Carex* species is a distinct character which may also indicate the rich and various habitats on Kharimkotan.

Since the small islands in the volcanically active Kuril archipelago are characterized by the rarity of true ferns (Takahashi et al. 2002), the presence of five species of the ferns including Ophioglossaceae (see Appendix) indicates that the island of Kharimkotan has the proper size and includes comparatively rich and many stable habitats.

## 2-2) Some noticeable species from a phyto-geographical viewpoint

*Ranunculus reptans* regarded as one of the species with a bilateral distribution pattern in the Kurils (Tatewaki 1947, 1957), was clarified as one of the continuously distributed species in the Kuril Archipelago (Hultén and Fries 1986). The present occurrence on Kharimkotan connects more closely the southern and northern populations of this species in the Kurils. Long distance seed dispersal by the sea birds for this species growing by the lake may be presumed like the case of *Ruppia occidentalis* in Atlasova, the northern Kurils (Takahashi and Kuwahara 1998).

The nucleotide sequences of non-coding regions of chloroplast DNA of *Primula cuneifolia* from Kharimkotan were analyzed by Fujii et al. (1999). The cpDNA haplotype in *P. cuneifolia* of Kharimkotan was designated as Type A together with those of Ushishir, Onkotan of the middle Kurils. Thus Type A unites the islands of the middle Kurils well, but curiously Type A is shared with Unalaska, the Aleutians. A common cpDNA haplotype found between far distant two regions can be explained by the long distance seed dispersal or ancient relicts left in the two regions. Further study is necessary in order to clarify the past migration history of the vascular plants in the northern Pacific Oceans including the Kuril Archipelago.

Several patches of *Petasites japonicus* subsp.

*giganteus* were found around the ruins on the seacoast (Fig. 7). This species has been used as one of the common wild vegetables in Japan, we (HT) expect that this was possibly introduced by Japanese residents before World War II. Presence of *Fragaria nipponica* producing edible berries on the coastal meadows might be explained in the similar reason, because the natural distribution of this species was not noticed in the middle and northern Kurils by Tatewaki (1957).

## Acknowledgements

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## Appendix

List of the vascular plants on Kharimkotan Island, the Kuril Islands. The names of authors of plant names follow Brummitt and Powell (1992) mainly, but “Worosch.” is adopted except for “Vorosch.”. Because he himself has used “Woroschilov” in Roman letters consistently, we obey Recommendation 46B.1 in Saint Louis Code (Greuter et al. 2000). In the species collected only by Tatewaki, the locality is noted in parenthesis under the Habitat. Recent and/or important taxonomic references and synonymy are cited in this list. Russian or Japanese names were not noted when appropriate names could not be traced. “Heaths” in the text is included in “tundra” or “subalpine meadow” in the Habitat of this list.

### LYCOPODIACEAE

1) **Lycopodium alpinum** L., Sp. Pl.: 1104 (1753); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 9 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 21 (2002) — *Diphasiastrum alpinum* (L.) Holub in Preslia **47**: 107 (1975); Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 48, fig. 8A (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 312 (1995).

Russian name: Plaun al’pijskij (for *Lycopodium alpinum*), Difasiastrum al’pijskij (for *Diphasiastrum alpinum*).

Japanese name: Chishima-hikage-no-kazura.

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Zhuravlev and Ilushko 400, Barkalov 20173, 20174 (VLA).

2) **Lycopodium annotinum** L., Sp. Pl.: 1103 (1753); Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 45, fig. 6A (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 313 (1995); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 9 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 37 (1997).

Russian name: Plaun godichnyj.

Japanese name: Sugi-kazura.

Habitat: (“Nishiura”, western inlet).

Specimen: Tatewaki 17212 (SAPS).

3) **Lycopodium clavatum** L., Sp. Pl.: 1101 (1753); Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 43, fig. 5A (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 313 (1995); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 8 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 22 (2002).

Russian name: Plaun bulavovidnyj.

Japanese name: Hikage-no-kazura.

Habitat: Meadows in low elevation and on marine terrace.

Specimens: Takahashi 21527 (SAPS); Zhuravlev and Ilushko 410, Barkalov 20167 (VLA); Gage 2068 (WTU).

4) **Lycopodium complanatum** L., Sp. Pl.: 1104 (1753); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 9 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 22 (2002) — *Diphasiastrum complanatum* (L.) Holub in Preslia **47**: 108 (1975); Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 47, fig. 7A (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 312 (1995).

Russian name: Plaun uploshchjonnyi (for *Lycopodium complanatum*), Difasiastrum uploshchjonnyi (for

*Diphasiastrum complanatum*).

Japanese name: Asuhi-kazura.

Habitat: Meadows around the lake.

Specimen: Takahashi 28160 (SAPS).

5) **Lycopodium obscurum** L., Sp. Pl.: 1102 (1753); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 8 (1995) — *L. juniperoideum* Sw., Syn. fil.: 178 (1806); Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 42, fig. 3A, tab. 1V (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 313 (1995).

Russian name: Plaun temnyj.

Japanese name: Man’nen-sugi.

Habitat: Subalpine meadows along seasonal streams on volcanic slopes.

Specimen: Barkalov 20180 (VLA).

6) **Lycopodium selago** L., Sp. Pl.: 1102 (1753); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 5 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 22 (2002) — *Huperzia selago* (L.) Bernh. ex Schrank et Mart. in Hort. Monac.: 3 (1829); Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 38, fig. 2B (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 275 (1995).

Russian name: Plaun-baranets obyknovennyj or Baranets obyknovennyj (for *Huperzia selago*).

Japanese name: Chishima-sugiran.

Habitat: On subalpine meadows.

Specimens: Tatewaki 17217, 17218 (SAPS); Zhuravlev and Ilushko 405, Barkalov 20181 (VLA).

### SELAGINELLACEAE

1) **Selaginella selaginoides** (L.) Link, Fil. Spec.: 158 (1841); Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 51, fig. 9B (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 486 (1995), the authors as “(L.) C.Mart.”; Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 12 (1995).

Russian name: Plaunnok plaunovidnyj.

Japanese name: Koke-sugiran.

Habitat: Coastal meadows and bog by the lake.

Specimens: Tatewaki 17216, 17288, 17294, Takahashi 21529 (SAPS); Barkalov 20119 (VLA).

### EQUISETACEAE

1) **Equisetum arvense** L., Sp. Pl.: 1061 (1753); Vorobiev in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 10, fig. 1A, tab. 1A & a (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 220 (1995); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 19 (1995).

Russian name: Khvoshch polevoj.

Japanese name: Sugina.

Habitat: *Sphagnum* bog in low elevation and stream side on volcanic slopes.

Specimens: Takahashi 21462, 21466 (SAPS); Zhuravlev and Ilushko 290, Barkalov 20245 (VLA); Semsrott 240 (WTU).

### OPHIOGLOSSACEAE

1) **Botrychium lunaria** (L.) Sw. in Schrader, J. Bot. **1800**(2): 110 (1801); Tzvelev in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 18, Fig. 1G (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 126 (1995); Kato in Iwatsuki et al., Fl. Jap. **1**: 25 (1995).

Russian name: Grozdovnik polulunnyj.

Japanese name: Hime-hanawarabi.

Habitat: Meadows in low elevation.  
Specimen: Zhuravlev and Ilushko 152 (VLA).

2) **Botrychium robustum** (Rupr. ex Milde) Underw. in Bull. Torrey Bot. Club **30**: 51 (1903); Tzvelev in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 20 (1991); Takahashi et al. in Acta Phytotax. Geobot. **53**: 22 (2002) — *B. multifidum* (S.G.Gmel.) Rupr. var. *robustum* (Rupr. ex Milde) C.Chr. in Kungl. Sv. Vet. Akad. Handl. **5**: 49 (1928); Kato in Iwatsuki et al., Fl. Jap. **1**: 27 (1995).

Russian name: Grozdovnik moshchnyj.

Japanese name: Ezo-fuyu-no-hanawarabi.

Habitat: Meadows on sand in low elevation.

Specimens: Takahashi 21558 (SAPS); Zhuravlev and Ilushko 150 (VLA).

#### DRYOPTERIDACEAE

1) **Dryopteris expansa** (C.Presl) Fras.-Jenk. et Jermy in Fern Gaz. **11**: 338 (1977); Tzvelev in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 53, Fig. 17A (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 217 (1995); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 156 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 22 (2002).

Russian name: Shchitovnik rasshirenyj.

Japanese name: Shirane-warabi.

Habitat: Coastal meadow slope.

Specimens: Tatewaki 17207, Takahashi 21478, Yabe s.n. (SAPS); Zhuravlev and Ilushko 276, 278, Barkalov 20254 (VLA); Gage 2066 (SAPS, WTU).

#### THELYPTERIDACEAE

1) **Thelypteris quelpaertensis** (H.Christ) Ching in Bull. Fan Mem. Inst. Biol. **6**: 328 (1936); Iwatsuki in Iwatsuki et al., Fl. Jap. **1**: 185 (1995) — *Oreopteris quelpaertensis* (H.Christ) Holub in Fol. Geobot. Phytotax. **4**(1): 48 (1969); Tzvelev in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: fig. 30A, tab. 9A (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 490 (1995).

Russian name: Gornopaporotnik chedzhudinskij (for *Oreopteris quelpaertensis*).

Japanese name: Ôba-shorima.

Habitat: Border of coastal streambed.

Specimen: Gage 2082 (SAPS, WTU).

#### WOODSIACEAE

1) **Athyrium filix-femina** (L.) Roth in Tent. Fl. Germ. **3**(1): 65 (1799), sensu lato.

Russian name: Kochedyzhnik zhenskij (in the broad sense).

Japanese name: Meshida (in the broad sense).

Habitat: Coastal meadows and thickets of alder on lower slopes.

Specimens: Takahashi 21533, 21534 (SAPS); Barkalov 20190 (VLA).

Note: The distinction between the related species of the *A. filix-femina* group needs further clarification.

#### PINACEAE

1) **Pinus pumila** (Pall.) Regel in Bull. Soc. Nat. Moscou **32**: 211, tab.1 (1859); Koropachinskij in Charkevich et al., Pl. Vasc.

Orient. Extr. Soviet. **4**: 15, fig. 5A (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 337 (1995); Yamazaki in Iwatsuki et al., Fl. Jap. **1**: 275 (1995).

Russian name: Sosna nizmaya.

Japanese name: Hai-matsu.

Habitat: On slopes.

Specimen: Barkalov 20205 (VLA).

#### SALICACEAE

1a) **Salix nakamura** Koidz. subsp. **kurilensis** (Koidz.) H. Ohashi in J. Jap. Bot. **75**: 12 (2000) — *S. kurilensis* Koidz. in Bot. Mag. Tokyo **32**: 62 (1918); Czerepanov, Vasc. Pl. Russ. Adj. Stat. 467 (1995); Nedoluzhko in Kharkevich et al., Pl. Vasc. Orient. Extr. Soviet. **7**: 199 (1995).

Russian name: Iva kuril'skaya.

Japanese name: Hidaka-mine-yanagi.

Habitat: Mountain tundra on volcanic slopes.

Specimen: Barkalov 20168 (VLA).

1b) **Salix nakamura** Koidz. in Bot. Mag. Tokyo **27**: 96 (1913); Czerepanov, Vasc. Pl. Russ. Adj. Stat. 467 (1995); Nedoluzhko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **7**: 199 (1995). subsp. **nakamura**; H. Ohashi in J. Jap. Bot. **75**: 11 (2000).

Russian name: Iva Nakamura.

Japanese name: Takane-iwa-yanagi, Ezo-takane-yanagi.

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Takahashi 28141, 28142 (SAPS); Zhuravlev and Ilushko 746a, 746, Barkalov 20118, 20206, 20207, 20221 (VLA).

#### BETULACEAE

1) **Alnus maximowiczii** Callier ex C.K.Schneid. in Ill. Handb. Laubholz. **1**: 122 (1904); Takahashi et al. in Acta Phytotax. Geobot. **48**: 37 (1997), the author name as "Callier"; Takahashi et al. in Acta Phytotax. Geobot. **53**: 23 (2002) — *Duschekia maximowiczii* (Callier ex C.K.Schneid.) Pouzar in Preslia **36**(4): 339 (1964); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 117 (1995); Nedoluzhko and Skvortsov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 27 (1996).

Russian name: Olkha Maksimovicha (for *Alnus maximowiczii*), Ol'khovnik Maksimovicha (for *Duschekia frutescens*).

Japanese name: Miyama-han'noki.

Habitat: On lower slopes and on marine terrace.

Specimens: Tatewaki 17208, Takahashi 21472, 21552, 28180 (SAPS); Zhuravlev and Ilushko 137, Barkalov 20285 (VLA); Gage 2065 (WTU).

#### URTICACEAE

1) **Urtica platyphylla** Wedd. in Arch. Mus. Hist. Nat. (Paris) **9**: 98 (1856); Geltman in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 106 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 494 (1995).

Russian name: Krapiva ploskolistnaya.

Japanese name: Ezo-irakusa.

Habitat: Coastal tall herb meadows.

Specimens: Takahashi 21453 (SAPS); Zhuravlev and Ilushko 819, Barkalov 20283 (VLA).

POLYGONACEAE

1) **Bistorta vivipara** (L.) Delarbre in Fl. Auvergne (Delarbre) ed. 2, 2: 516 (1800); Tzvelev in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 4: 62 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 405 (1995); Takahashi et al. in Acta Phytotax. Geobot. 48: 37 (1997), the author names as "(L.) S.F.Gray".

Russian name: Zmeevik zhivorodyashchij.

Japanese name: Mukagō-toranoo.

Habitat: Coastal meadows.

Specimens: Takahashi 28135, Yabe s.n. (SAPS); Barkalov 20215 (VLA).

2) **Oxyria digyna** (L.) Hill, Hort. Kew: 158 (1768); Tzvelev in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 4: 54 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 407 (1995); Takahashi et al. in J. Phytogeogr. Taxon. 47: 133 (1999); Takahashi et al. in Acta Phytotax. Geobot. 53: 23 (2002).

Russian name: Kislichnik dvukhstolbikovyj.

Japanese name: Jin'yō-suibā.

Habitat: By streams on volcanic slopes and pumice field.

Specimens: Takahashi 21542, 28167 (SAPS); Barkalov 20246 (VLA); Gage 2043, Semsrott 229 (WTU).

3) **Rumex acetosella** L., Sp. Pl.: 338 (1753), sensu lato.

Russian name: Shchhavelek pokrytoplodnyj (for *Acetosella angiocarpa*), Shchhavelek obyknovennyj (for *Acetosella vulgaris*).

Japanese name: Hime-suibā (in the broad sense).

Habitat: On seashore.

Specimens: Takahashi 21577 (SAPS); Zhuravlev and Ilushko 516 (VLA).

Note: Tzvelev (1989) recognized *Acetosella vulgaris* (Koch) Fourr. (= *Rumex acetosella* L., sensu stricto) and *A. angiocarpa* (Murb.) A.Löve in the Kuril Islands.

PORTULACACEAE

1) **Montia fontata** L., Sp. Pl.: 87 (1753); Probatova in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 2: 79 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 415 (1995).

Russian name: Montsiya klyuchevaya.

Japanese name: Numa-hakobe.

Habitat: By stream or wet slope in low elevation or seashore.

Specimens: Takahashi 21496, 21497, 28200 (SAPS); Zhuravlev and Ilushko 667, Barkalov 20242 (VLA).

CARYOPHYLLACEAE

1) **Cerastium fischerianum** Ser. in DC., Prodr. 1: 419 (1824); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 161 (1995); Pavlova in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 8: 88 (1996); Takahashi et al. in Acta Phytotax. Geobot. 48: 37 (1997).

Russian name: Yaskolka Fishera.

Japanese name: Ōbana-miminagusa.

Habitat: Meadows in low elevation.

Specimens: Takahashi 21501, 28162 (SAPS); Zhuravlev and Ilushko 209, Barkalov 20230, 20273 (VLA); Gage 2053 (WTU).

2) **Cerastium holosteoides** Fries, Nov. Fl. Suec. 4: 52 (1817); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 161 (1995); Pavlova in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 8: 87 (1996).

Russian name: Yaskolka dernistaya.

Japanese name: Miminagusa (in the broad sense).

Habitat: Meadows in low elevation.

Specimens: Takahashi 21492, 21513 (SAPS); Zhuravlev and Ilushko 212 (VLA); Gage 2069 (WTU).

3) **Honkenya oblongifolia** Torr. et Gray, Fl. North Amer. 1: 176 (1838); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 168 (1995), "*Honckenya*"; Pavlova in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 8: 52 (1996); Takahashi et al. in Acta Phytotax. Geobot. 53: 23 (2002) — *H. peplodes* (L.) Ehrh. var. *major* Hook.; Takahashi et al. in Acta Phytotax. Geobot. 48: 37 (1997).

Russian name: Gonkeniya prodolgovatolistnaya.

Japanese name: Hama-hakobe.

Habitat: On sandy beach.

Specimens: Takahashi 21441 (SAPS); Zhuravlev and Ilushko 216 (VLA); Gage 2011 (WTU).

4) **Moehringia lateriflora** (L.) Fenzl, Vers. Darstell. Alsin. tab. ad. 18, 38 (1833); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 171 (1995); Pavlova in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 8: 57 (1996); Takahashi et al. in Acta Phytotax. Geobot. 53: 23 (2002).

Russian name: Meringiya bokotsvetnaya.

Japanese name: Ōyama-husuma.

Habitat: Meadows on marine terrace and in low elevation.

Specimens: Takahashi 21445, 21559, 21567, 21568 (SAPS); Zhuravlev and Ilushko 221, Barkalov 20228 (VLA); Gage 2027 (WTU).

5) **Sagina maxima** A.Gray var. **crassicaulis** (S.Wats.) H.Hara in Rhodora 41: 391 (1939); Takahashi et al. in J. Phytogeogr. Taxon. 47: 133 (1999) — *S. crassicaulis* S.Wats.; Pavlova in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 8: 47 (1996) — *S. maxima* A.Gray; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 172 (1995).

Russian name: Mshanka tolstostebel'naya.

Japanese name: Ezo-hama-tsumekusa.

Habitat: On sandy and gravelly beaches.

Specimens: Takahashi 28196 (SAPS); Barkalov 20239 (VLA).

6) **Stellaria calycantha** (Ledeb.) Bong. in Mem. Acad. Sci. Petersb. Ser. 6. 2: 127 (1832); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 177 (1995); Pavlova in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 8: 72 (1996); Takahashi et al. in Acta Phytotax. Geobot. 53: 24 (2002).

Russian name: Zvevdchatka chashechkotsvetkovaya.

Japanese name: Kanchi-yachi-hakobe.

Habitat: Damp meadows on coastal slopes and by streams in low elevation.

Specimens: Takahashi 21458, 21499 (SAPS); Zhuravlev and Ilushko 233, Barkalov 20234 (VLA).

7) **Stellaria fenzlii** Regel in Bull. Soc. Nat. Moscou 35: 280 (1862); Pavlova in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. 8: 72 (1996); Takahashi et al. in Acta Phytotax. Geobot. 53: 24 (2002).

Russian name: Zvezdchatka Fentslya.

Japanese name: Shiraoi-hakobe.



Habitat: Meadows in low elevation and thickets of alder on slopes.

Specimens: Takahashi 21449 (SAPS); Zhuravlev and Ilushko 228, Barkalov 20145, 20282 (VLA).

8) **Stellaria ruscifolia** Pall. ex Schlttdl. in Mag. Ges. Nat. Freunde Berlin 7: 194 (1816); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 178 (1995); Pavlova in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 8: 83 (1996); Takahashi et al. in Acta Phytotax. Geobot. 48: 37 (1997); Takahashi et al. in J. Phytogeogr. Taxon. 47: 133 (1999); Takahashi et al. in Acta Phytotax. Geobot. 53: 24 (2002).

Russian name: Zvezdchatka iglitselistnaya.

Japanese name: Shikotan-hakobe.

Habitat: On rocks by upper of river.

Specimen: Barkalov 20200 (VLA).

#### RANUNCULACEAE

1) **Aconitum maximum** Pall. ex DC., Reg. Veg. Syst. Nat. 1: 380 (1817); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 422 (1995); Lufarov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 7: 61 (1995); Takahashi et al. in Acta Phytotax. Geobot. 48: 37 (1997).

Russian name: Borets bol'shoj.

Japanese name: Ôchishima-torikabuto.

Habitat: Coastal tall herbaceous meadows.

Specimens: Takahashi 21456 (SAPS); Zhuravlev and Ilushko 727 (VLA).

2) **Anemone narcissiflora** L. var. **villosissima** DC., Prodr. 1: 22 (1824) — *Anemonastrum villosissimum* (DC.) Holub; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 424 (1995); Starodubtsev in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 7: 74 (1995), the author names as "(DC) Starodub."

Russian name: VetreNIK mokhnateishyj (for *Anemonastrum villosissimum*).

Japanese name: Senka-sô, Chishima-ichige.

Habitat: On meadows by rocks on marine terrace slopes.

Specimen: Barkalov 20237 (VLA).

3) **Coptis trifolia** (L.) Salisb. in Trans. Linn. Soc. (London) 8: 305 (1807); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 427 (1995); Lufarov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 7: 32 (1995).

Russian name: Koptis trekhlistnyj.

Japanese name: Mitsuba-ôren.

Habitat: (No locality).

Specimen: Tatewaki 17304 (SAPS).

4) **Ranunculus reptans** L., Sp. Pl.: 554 (1753); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 434 (1995); Lufarov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 7: 105 (1995).

Russian name: Lyutik rasprostertyj.

Japanese name: Ito-kinpôge.

Habitat: Dried up lake.

Specimens: Kuwahara s.n., Takahashi 21574, 28156 (SAPS); Bogatov 20115 (VLA); Gage 2045 (WTU).

5) **Trollius riederianus** Fisch. et C.A.Mey. in Index Sem. Horti Bot. Petropol. 4: 48 (1837); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 436 (1995); Lufarov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 7: 19 (1995); Takahashi et al. in Acta Phytotax. Geobot. 48: 37 (1997).

Russian name: Kupalnitsa Ridera.

Japanese name: Chishimano-kinbaisô.

Habitat: Meadows at river-mouth.

Specimen: Takahashi 28194 (SAPS).

#### CLUSIACEAE

1) **Hypericum kamtschaticum** Ledeb. in Denkschr. Bot. Ges. Regensb. 3: 131 (1841); Probatova in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 2: 88 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 279 (1995).

Russian name: Zveroboi kamchatskij.

Japanese name: Hai-otogiri.

Habitat: Coastal meadows.

Specimens: Takahashi 21519 (SAPS); Zhuravlev and Ilushko 364; Barkalov 20269 (VLA); Gage 2062 (WTU).

#### DROSERACEAE

1) **Drosera rotundifolia** L., Sp. Pl.: 281 (1753); Charkevitz in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 7: 239 (1995); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 217 (1995).

Russian name: Rosyanka kruglolistnaya.

Japanese name: Môsen-goke.

Habitat: ("Nishiura", western inlet).

Specimen: Tatewaki 17291 (SAPS).

#### BRASSICACEAE

1) **Arabis lyrata** L. var. **kamtschatica** Fisch. ex DC., Syst. Nat. 2: 231 (1821); Takahashi et al. in Acta Phytotax. Geobot. 53: 24 (2002) — *Cardaminopsis lyrata* (L.) Hiitonen; Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 3: 101 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 133 (1995).

Russian name: Rezukha kamchatskaya (for *Arabis lyrata* var. *kamtschatica*), Serdechnikovidnik lirovidnyj (for *Cardaminopsis lyrata*).

Japanese name: Miyama-hatazao.

Habitat: On scree by rocks.

Specimens: Takahashi 21546 (SAPS); Barkalov 20194 (VLA).

2) **Arabis serrata** Franch. et Sav. var. **glauca** (H.Boissieu) Ohwi in Acta Phytotax. Geobot. 7: 33 (1938) — *A. glauca* H.Boissieu in Bull. Herb. Boiss. 7: 786 (1899); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 130 (1995).

Russian name: Rezukha sizaya.

Japanese name: Ezo-no-iwahatazao.

Habitat: Under tall grasses on stabilized scree by rocks.

Specimens: Barkalov 20197, 20256 (VLA).

3) **Arabis stelleri** DC., Syst. Nat. 2: 242 (1821); Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. 3: 99 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 130 (1995).

Russian name: Rezukha Stellera.

Japanese name: Hama-hatazao (in the broad sense).

Habitat: Stabilized sand dunes.

Specimen: Gage 2029 (WTU).

4) **Barbarea orthoceras** Ledeb. in Index Sem. Horti Dorp.: 2 (1824); Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 59 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 131 (1995).

Russian name: Surepka pryamaya.

Japanese name: Yama-garashi.

Habitat: Coastal meadows in low elevation.

Specimens: Takahashi 21447, Yabe s.n. in 2000 (SAPS); Zhuravlev and Ilushko 156, Barkalov 20208 (VLA); Gage 2030, 2044, Semsrott 238 (WTU).

5) **Cardamine regeliana** Miq. in Ann. Mus. Bot. Lugd-Bat. **2**: 73 (1865-66); Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 71 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 133 (1995); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 133 (1999) — *C. scutata* Thunb.

Russian name: Serdechnik Regelya.

Japanese name: Ōba-tanetsukebana.

Habitat: Along streams.

Specimens: Takahashi 21488, 28197 (SAPS); Barkalov 20243 (VLA).

6) **Cardamine umbellata** Greene in Pittonia **3**: 154 (1897); Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 70 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 133 (1995).

Russian name: Serdechnik zontichnyj.

Habitat: (No locality).

Specimen: Tatewaki 17300 (SAPS).

7) **Cochlearia officinalis** L., Sp. Pl.: 647 (1753); Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 48 (1988); Takahashi et al. in Acta Phytotax. Geobot. **48**: 37 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 133 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 24 (2002) — *C. oblongifolia* DC.; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 135 (1995).

Russian name: Lozhechnitsa aptechnaya.

Japanese name: Tomoshiri-sō.

Habitat: On seashore.

Specimens: Takahashi 21500 (SAPS); Zhuravlev and Ilushko 171, Barkalov 20248 (VLA); Gage 2057 (WTU).

8) **Draba borealis** DC., Reg. Veg. Syst. Nat. **2**: 342 (1821); Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 93 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 137 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 37 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 24 (2002).

Russian name: Krupka severnaya.

Japanese name: Ezo-inu-nazuna.

Habitat: On rocks by upper of river.

Specimen: Barkalov 20203 (VLA).

9) **Draba grandis** Langsd. in DC., Syst. Nat. **2**: 355 (1821); Berkutenko in Linzer Biol. Beitr. **27**(2): 1121 (1995); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 133 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 25 (2002) — *D. hyperborea* auct.,

non Desv.; Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 93 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 137.

Russian name: Krupka bol'shaya.

Japanese name: Ishino-nazuna.

Habitat: (Rocky cliffs at eastern side).

Specimen: Tatewaki 17308 (SAPS).

10) **Rorippa islandica** (Oeder) Borb's, Balaton Fl. **2**: 392 (1900) — *R. palustris* (L.) Besser, Enum. Pl. Volhyn.: 27 (1822); Berkutenko in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 62 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 148 (1995).

Russian name: Zherushnik bolotnyj.

Japanese name: Sukashitagobō.

Habitat: On shore of lake.

Specimen: Barkalov 20209 (VLA).

#### CRASSULACEAE

1) **Rhodiola rosea** L., Sp. Pl.: 1035 (1753), sensu lato; Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 133 (1999); Ohba in Iwatsuki et al., Fl. Jap. **2b**: 30 (2001) — *R. integrifolia* Raf. in Atl. J. **1**: 146 (1832); Bezdeleva in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **7**: 217 (1995); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 194 (1995).

Russian name: Rodiola rozovaya or Zolotoj koren' (for *R. rosea*), Rodiola tsel'nolistnaya (for *R. integrifolia*).

Japanese name: Iwa-benkei (in the broad sense).

Habitat: (No locality).

Specimen: Tatewaki 17310 (SAPS).

#### SAXIFRAGACEAE

1) **Chrysosplenium kamtschaticum** Fisch. ex Ser. in DC., Prodr. **4**: 48 (1830); Charkevitz in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **4**: 183 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 470 (1995); Wakabayashi in Iwatsuki et al., Fl. Jap. **2b**: 61 (2001).

Russian name: Seleznochnik kamchatskij.

Japanese name: Chishima-nekonomesō.

Habitat: Damp places by stream.

Specimens: Tatewaki 17205, 17312, Takahashi 21487 (SAPS); Zhuravlev and Ilushko 754, Barkalov 20281 (VLA).

2) **Parnassia palustris** L., Sp. Pl.: 273 (1753); Charkevitz in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **7**: 235 (1995); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 335 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997); Akiyama in Iwatsuki et al., Fl. Jap. **2b**: 38 (2001).

Russian name: Belozor bolotnyj.

Japanese name: Umehachi-sō.

Habitat: Subalpine meadows.

Specimen: Zhuravlev and Ilushko 500 (VLA).

3) **Saxifraga bracteata** D. Don in Trans. Linn. Soc. **13**(2): 367 (1822); Charkevitz in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **4**: 160 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 471 (1995); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 133 (1999); Wakabayashi in Iwatsuki et al., Fl. Jap. **2b**: 56 (2001); Takahashi et al. in Acta Phytotax. Geobot. **53**: 25 (2002).

Russian name: Kammelomka pritsvetnikovaya.

Japanese name: Kiyoshi-sô.

Habitat: On the beach and on wet rocks along streams on volcanic slopes.

Specimens: Tatewaki 17311, Takahashi 21544 (SAPS); Zhuravlev and Ilushko 766, Barkalov 20187 (VLA).

4) **Saxifraga merkii** Fisch. ex Sternb., Revis. Saxifr. Suppl. 1: 1 (1822); Charkevich in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 4: 149 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 472 (1995); Wakabayashi in Iwatsuki et al., Fl. Jap. 2b: 55 (2001), the author names as "Fisch. in Sternb."; Takahashi et al. in Acta Phytotax. Geobot. 53: 25 (2002).

Russian name: Kamnelomka Myerka.

Japanese name: Chishima-kumomagusa.

Habitat: On volcanic ash.

Specimens: Kuwahara s.n., Takahashi 21564, Yabe s.n. (SAPS); Zhuravlev and Ilushko 761, 762, Barkalov 20188 (VLA); Gage 2042, Semsrott 230 (WTU).

5) **Saxifraga nelsoniana** D.Don in Trans. Linn. Soc. 13: 355 (1821), sensu lato.

Russian name: Kamnelomka Nelsona (in the broad sense).

Japanese name: Chishima-iwabuki (in the broad sense).

Habitat: On wet rocks by streams.

Specimens: Takahashi 21489 (SAPS); Zhuravlev and Ilushko 757, 759, Barkalov 20202, 20279 (VLA).

Note: Charkevich (1989) recognized the separate three species; *Saxifraga insularis* (Hultén) Sipl., *S. nelsoniana* D.Don and *S. reniformis* Ohwi within the *S. nelsoniana* complex, in the Kurils. Intraspecific variation and the specific distinction of this complex needs further clarification.

## ROSACEAE

1) **Aruncus dioicus** (Walter) Fernald var. **kamtschaticus** (Maxim.) H.Hara in J. Jap. Bot. 30: 68 (1955); Ikeda in Iwatsuki et al., Fl. Jap. 2b: 101 (2001) — *A. dioicus* (Walter) Fernald; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 441 (1995); Yakubov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 8: 136 (1996).

Russian name: Volzhanka dvudomnaya (for *A. dioicus*).

Japanese name: Yamabuki-shôma.

Habitat: Coastal meadows.

Specimens: Takahashi 21475 (SAPS); Zhuravlev and Ilushko 679, Barkalov 20155 (VLA); Gage 2064 (WTU).

2) **Filipendula camtschatica** (Pall.) Maxim. in Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 248 (1879), "*kamtschatica*"; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 444 (1995); Shantser in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 8: 218 (1996); Ikeda in Iwatsuki et al., Fl. Jap. 2b: 187 (2001).

Russian name: Labaznik kamchatskij.

Japanese name: Oni-shimotsuke.

Habitat: Coastal sandy meadows.

Specimens: Takahashi 21512 (SAPS); Zhuravlev and Ilushko 683 (VLA).

Note: In many Japanese literature the spelling "*kamtschatica*" has been used for the specific epithet, but the original spelling by Pallas was "*camtschatica*" and later Maximowicz erroneously used "*kamtschatica*" (see synonymic list by Ikeda 2001).

3) **Fragaria nipponica** Makino in Bot. Mag. Tokyo 26: 282 (1912); Naruhashi in Iwatsuki et al., Fl. Jap. 2b: 189 (2001) — *F. yezoensis* H.Hara; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 445 (1995); Yakubov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 8: 164 (1996).

Russian name: Zemlyanika nipponskaya (for *F. nipponica*), Zemlyanika iezsskaya (for *F. yezoensis*).

Japanese name: Shirobana-no-hebi-ichigo, Ezo-kusa-ichigo.

Habitat: Coastal meadows (introduced?).

Specimens: Takahashi 21470, 21481 (SAPS); Zhuravlev and Ilushko 6835 (VLA); Gage 2058 (WTU).

4) **Geum calthifolium** Sm. var. **nipponicum** (F.Bolle) Ohwi, Fl. Jap.: 636 (1953); Takahashi et al. in Acta Phytotax. Geobot. 48: 38 (1997); Ikeda in Iwatsuki et al., Fl. Jap. 2b: 210 (2001) — *Parageum calthifolium* (Menz.) Nakai et H.Hara; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 446 (1995); Yakubov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 8: 212 (1996).

Russian name: Lzhegravilat kaluzhnetselistnyj.

Japanese name: Miyama-daikonsô.

Habitat: Coastal meadows and subalpine meadows on volcanic slopes.

Specimens: Takahashi 21579 (SAPS); Barkalov 20196, 20253 (VLA).

5) **Potentilla anserina** L., Sp. Pl.: 495 (1753); Naruhashi in Iwatsuki et al., Fl. Jap. 2b: 195 (2001) — *P. anserina* L. subsp. *egedii* (Wormsk.) Hiit.; Yakubov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 8: 205 (1996) in nota — *P. egedii* Wormsk. var. *grandis* (Torr. et Gray) H.Hara

Russian name: Lapchatka gusinaya (for *P. anserina*), Lapchatka Egeda (for *P. egedii*).

Japanese name: Ezo-tsuru-kinbai.

Habitat: Wet meadows around the lake.

Specimen: Takahashi 28159 (SAPS).

6) **Potentilla megalantha** Takeda in Bull. misc. Kew 6: 255 (1911); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 449 (1995); Takahashi et al. in Acta Phytotax. Geobot. 48: 38 (1997); Naruhashi in Iwatsuki et al., Fl. Jap. 2b: 199 (2001); Takahashi et al. in Acta Phytotax. Geobot. 53: 25 (2002) — *P. fragiformis* Willd. ex Schltld. subsp. *megalantha* (Takeda) Hultén; Yakubov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 8: 199 (1996) in nota.

Russian name: Lapchatka krupnotsvetkovaya (for *P. megalantha*), Lapchatka zemlyanikovidnaya (for *P. fragiformis*).

Japanese name: Chishima-kinbai.

Habitat: On seashore and coastal meadows.

Specimens: Takahashi 21514 (SAPS); Zhuravlev and Ilushko 690, 691 (VLA); Gage 2007 (WTU).

7) **Rubus arcticus** L., Sp. Pl.: 708 (1753); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 455 (1995); Yakubov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 8: 157 (1996).

Russian name: Rubus arkticheskij, Knyazhenika.

Japanese name: Chishima-ichigo.

Habitat: Coastal meadows.

Specimens: Takahashi 21528 (SAPS); Zhuravlev and Ilushko

704, Barkalov 20122 (VLA); Gage 2070 (WTU).

8) **Rubus chamaemorus** L., Sp. Pl.: 494 (1753); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 455 (1995); Yakubov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 156 (1996); Naruhashi in Iwatsuki et al., Fl. Jap. **2b**: 147 (2001).

Russian name: Rubus prizemistyj, Moroshka.

Japanese name: Horomui-ichigo (in the broad sense).

Habitat: Wet meadows around the lake.

Specimen: Takahashi 28161 (SAPS).

9) **Sanguisorba tenuifolia** Fisch. ex Link, Enum. Hort. Berol. Alt. **1**: 144 (1821); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 457 (1995); Yakubov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 228 (1996); Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997) — *S. tenuifolia* var. *grandiflora* Maxim.; Naruhashi in Fl. Jap. **2b**: 183 (2001).

Russian name: Krovokhlebkka tonkolistnaya.

Japanese name: Chishima-waremokô (for *S. tenuifolia* var. *grandiflora*), Nagabono-waremokô (in the broad sense).

Habitat: Coastal meadows.

Specimens: Takahashi 21535 (SAPS); Zhuravlev and Ilushko 716, 717, Barkalov 20124 (VLA).

10) **Sorbus sambucifolia** (Cham. et Schltld.) M. Roem., Fam. Nat. Synops. Fasc. **3**: 139 (1847); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 458 (1995); Nedoluzhko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 143 (1996); Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997); Iketani and Ohashi in Iwatsuki et al., Fl. Jap. **2b**: 114 (2001); Takahashi et al. in Acta Phytotax. Geobot. **53**: 25 (2002).

Russian name: Ryabina buzinolistnaya.

Japanese name: Takane-nanakamado.

Habitat: Shrubs on coastal meadows to subalpine thickets on volcanic slopes.

Specimens: Takahashi 21474, 21477 (SAPS); Zhuravlev and Ilushko 712, Barkalov 20175 (VLA); Semsrott 218 (WTU).

#### FABACEAE

1) **Hedysarum nonnae** Roskov in Kew Bull. **51**(2): 376 (1996); — *H. confertum* (N.S. Pavlova) N.S. Pavlova, non M. Bieb., nec Desf.; Pavlova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **4**: 288 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 246 (1995) — *H. hedysaroides* auct.

Russian name: Kopechnik Nonny.

Japanese name: Chishima-genge (in the broad sense).

Habitat: Meadows on marine terrace and in low elevation.

Specimens: Takahashi 28145, Yabe s.n. (SAPS); Barkalov 20125 (VLA).

2) **Lathyrus japonicus** Willd., Sp. Pl. **3**(2): 1092 (1802); Pavlova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **4**: 313 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 248 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997); Ohashi in Iwatsuki et al., Fl. Jap. **2b**: 231 (2001).

Russian name: China yaponskaya.

Japanese name: Hama-endô.

Habitat: On sandy beach and in dunes.

Specimens: Takahashi 21516, 28195 (SAPS); Zhuravlev and Ilushko 423 (VLA); Gage 2010 (WTU).

3) **Oxytropis retusa** Matsum. in Bot. Mag. Tokyo **15**: 116 (1901); Pavlova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **4**: 261 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 256 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997).

Russian name: Ostrodochnik pritulennyj.

Japanese name: Kodama-sô.

Habitat: Coastal meadows and subalpine meadows on volcanic slopes.

Specimens: Takahashi 28146, 28204 (SAPS); Barkalov 20218 (VLA).

Note: Pavlova (1989) recognized *Oxytropis retusa* Matsum. and *O. hidakamontana* Miyabe et Tatew. as two separate species, but Ohashi (2001) regarded them as a conspecific. This needs future clarification.

#### OXALIDACEAE

1) **Oxalis acetosella** L., Sp. Pl.: 433 (1753); Tzvelev in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 137 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 332 (1995); Amano in Iwatsuki et al., Fl. Jap. **2b**: 285 (2001).

Russian name: Kislitsa obyknovennaya.

Japanese name: Ko-miyama-katabami.

Habitat: Within mosses on lower slope and in *Pinus pumila* thickets.

Specimens: Takahashi 21495 (SAPS); Barkalov 20151 (VLA).

#### GERANIACEAE

1) **Geranium erianthum** DC., Prodr. **1**: 641 (1824); Tsyrenova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 141 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 272 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 133 (1999); Akiyama in Iwatsuki et al., Fl. Jap. **2b**: 288 (2001); Takahashi et al. in Acta Phytotax. Geobot. **53**: 25 (2002).

Russian name: Geran' volosistotsvetkovaya.

Japanese name: Chishima-hûro.

Habitat: On seashore to low slopes.

Specimens: Takahashi 21570 (SAPS); Zhuravlev and Ilushko 346, 354, Barkalov 20131 (VLA); Gage 2050 (WTU).

#### VIOLACEAE

1) **Viola biflora** L., Sp. Pl.: 936 (1753); Bezdeleva in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 127 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 496 (1995); Akiyama, Ohba and Tabuchi in Iwatsuki et al. Fl. Jap. **2c**: 188 (1999).

Russian name: Fialka dvukhtsvetkovaya.

Japanese name: Kibana-no-komanotsume.

Habitat: Meadows on the terrace.

Specimen: Takahashi 28178 (SAPS).

2) **Viola epipsiloides** Á.Löve et D.Löve in Bot. Not. **128**(4): 516 (1975); Bezdeleva in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 105 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 496 (1995) — *V. repens* Turcz. ex Trautv. et C.A. Mey., non Schwein.; Akiyama, Ohba and Tabuchi in Iwatsuki et al., Fl. Jap. **2c**: 165 (1999) — *V. epipsila* Ledeb. subsp. *repens* (Turcz.) W. Becker

Russian name: Fialka sverkhugolen'kaya.

Japanese name: Tanima-sumire.  
Habitat: Damp place on the mountain slope.  
Specimen: Takahashi 28174 (SAPS).

3) **Viola hultenii** W.Becker in Ark. Bot. **22A**(3): 4 (1928); Bezdeleva in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 106 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 496 (1995); Akiyama, Ohba and Tabuchi in Iwatsuki et al., Fl. Jap. **2c**: 164 (1999)—*V. blandiformis* Nakai var. *pilosa* H.Hara  
Russian name: Fialka Khultena.  
Japanese name: Chishima-usuba-sumire, Ke-usuba-sumire.  
Habitat: Coastal *Sphagnum* bogs.  
Specimens: Takahashi 21549, 28179 (SAPS).

4) **Viola langsdorfii** Fisch. ex Ging. in DC., Prodr. **1**: 296 (1824); Bezdeleva in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 122 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 497 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 26 (2002) [Japanese name “Ôba-tachitubo-sumire” was incorrect].  
Russian name: Fialka Langsdorfa.  
Japanese name: Takane-tachitsubo-sumire.  
Habitat: Coastal meadows to mountain slopes.  
Specimens: Takahashi 21536, 21551, 28173, 28199 (SAPS); Zhuravlev and Ilushko 821, Barkalov 20126, 20176 (VLA); Gage 2046 (WTU).

5) **Viola selkirkii** Pursh ex Goldie in Edinburgh Philos. J. **6**: 324 (1822); Bezdeleva in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 106 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 497 (1995); Akiyama, Ohba and Tabuchi in Iwatsuki et al., Fl. Jap. **2c**: 172 (1999).  
Russian name: Fialka Selkirka.  
Japanese name: Miyama-sumire.  
Habitat: In *Calamagrostis* meadows and under alder bushes on slope.  
Specimens: Tatewaki 17306, 17307, Takahashi 28185 (SAPS); Barkalov 20280 (VLA).

#### ONAGRACEAE

1) **Circaea alpina** L., Sp. Pl.: 9 (1753); Skvortsov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 204 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 319 (1995); Boufford in Iwatsuki et al., Fl. Jap. **2c**: 230 (1999).  
Russian name: Dbulepestnik al'pijskij.  
Japanese name: Miyama-tanitade.  
Habitat: Coastal meadows and under tall grasses in low elevation.  
Specimens: Takahashi 21448 (SAPS); Zhuravlev and Ilushko 466, Barkalov 20212 (VLA); Gage 2067, Semsrott 212 (WTU).

2) **Epilobium alpinum** L., Sp. Pl.: 348 (1753); Skvortsov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 195 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 319 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 26 (2002).  
Russian name: Kiprej al'pijskij.  
Habitat: Meadows near snow bed.  
Specimen: Zhuravlev and Ilushko 475 (VLA).

3) **Epilobium ciliatum** Raf. subsp. **glandulosum** (Lehm.) P.C.Hoch et P.H.Raven, Ann. Missouri Bot. Gard. **64** (1): 136

(1977) —*E. glandulosum* Lehm., Pugillus **2**: 14 (1830); Hooker, Fl. Bor.-Amer. **1**: 206 (1832); Skvortsov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 199 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 320 (1995) —*E. glandulosum* Lehm. var. *kurilense* (Nakai) H.Hara

Russian name: Kiprej zhelezistyj (for *E. glandulosum*).  
Japanese name: Ô-chishima-akabana (for *E. glandulosum* var. *kurilense*).  
Habitat: By streams.  
Specimen: Zhuravlev and Ilushko 471 (VLA).  
Note: The species delimitation and distribution of the three closely related species; *Epilobium ciliatum* Raf., *E. glandulosum* Lehm. and *E. maximowiczii* Hausskn. needs reexamination. Here we tentatively follow Lievens and Hoch (1999), but critical study on *Epilobium* of the Kurils should be done.

4) **Epilobium hornemannii** Rchb., Iconogr. Bot. Pl. Crit. **2**: 73, t. 180, f. 313 (1824); Skvortsov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 196 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 320 (1995); Lievens and Hoch in Iwatsuki et al., Fl. Jap. **2c**: 245 (1999).  
Russian name: Kiprej Hornemana.  
Japanese name: Miyama-akabana.  
Habitat: Coastal meadows and stream side on volcanic slopes.  
Specimens: Takahashi 21457, 21465, 21468, 28186, 28187, 28201, 28202 (SAPS); Zhuravlev and Ilushko 481, Barkalov 20192, 20236, 20247 (VLA); Gage 2080, Semsrott 239 (WTU).

#### HIPPURIDACEAE

1) **Hippuris vulgaris** L., Sp. Pl.: 4 (1753); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 274 (1995); Kozhevnikov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 267 (1996); Akiyama in Iwatsuki et al., Fl. Jap. **2c**: 251 (1999).  
Russian name: Khvostnik obyknovennyj.  
Japanese name: Suginamo.  
Habitat: Small lake.  
Specimens: Takahashi 28157 (SAPS); Bogatov 20114 (VLA).

#### CORNACEAE

1) **Chamaepericlymenum suecicum** (L.) Aschers. et Graebn., Fl. Nordostdeutsch. Flachl.: 539 (1899); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 191 (1995); Vishin in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 211 (1991); Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997); Noshiro in Iwatsuki et al., Fl. Jap. **2c**: 258 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 26 (2002).  
Russian name: Dyoren shvedskij.  
Japanese name: Ezo-gozen-tachibana.  
Habitat: Subalpine meadows on volcanic slopes.  
Specimens: Takahashi 21520, 21524 (SAPS); Zhuravlev and Ilushko 239, Barkalov 20163 (VLA); Gage 2052 (WTU).

#### APIACEAE

1) **Angelica gmelinii** (DC.) Pimenov, Novosti Syst. Vyssh. Rast.: 199 (1965); Pimenov in Charkevitz et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 250 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 9 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 26 (2002) —*Coelopleurum gmelinii* (DC.) Ledeb.; Takahashi

et al. in Acta Phytotax. Geobot. **48**: 38 (1997); Ohba in Iwatsuki et al., Fl. Jap. **2c**: 287 (1999); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 133 (1999).

Russian name: Dudnik Gmelina.

Japanese name: Ezo-no-shishiudo.

Habitat: On seashore to meadows on lower slopes.

Specimens: Takahashi 21473 (SAPS); Barkalov 20166 (VLA).

2) **Heracleum lanatum** Michx. in Fl. Bor.-Amer. **1**: 66 (1903); Pimenov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 269 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 17 (1995); Takahashi et al. in Acta Phytotax. Geobot. **54**: 27 (2002) — *H. dulce* Fisch.; Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997) — *H. sphondylium* L. subsp. *montanum* (Schleich. ex Gaudin) Briq.; Ohba in Iwatsuki et al., Fl. Jap. **2c**: 302 (1999).

Russian name: Borshchevik sherstistyy.

Japanese name: Ôhana-udo.

Habitat: On seashore.

Specimen: Takahashi 21521 (SAPS).

3) **Ligustichum scoticum** L., Sp. Pl.: 250 (1753); Pimenov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 239 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 19 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 27 (2002) — *L. hultenii* Fernald; Takahashi et al. in Acta Phytotax. Geobot. **48**: 38 (1997); Ohba in Iwatsuki et al., Fl. Jap. **2c**: 287 (1999); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 134 (1999).

Russian name: Ligustikum shotlandskij.

Japanese name: Maruba-tôki.

Habitat: On seashore.

Specimens: Takahashi 21503 (SAPS); Zhuravlev and Ilushko 131 (VLA); Gage 2008 (WTU).

4) **Tilingia ajanensis** Regel et Tiling in Nouv. Mém. Soc. Nat. Mosc. **11**: 97 (1858); Pimenov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 241 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 28 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997), the author name as “Regel”; Ohba in Iwatsuki et al., Fl. Jap. **2c**: 286 (1999), the author name as “Regel”.

Russian name: Tilingiya ayanskaya.

Japanese name: Shirane-ninjin.

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Takahashi 21541, 28148 (SAPS); Barkalov 20143, 20154, 20210, 20265 (VLA).

#### ERICACEAE

1) **Arctericia nana** (Maxim.) Makino in Bot. Mag. Tokyo **20**: 85 (1906); Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 144 (1991); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 52 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 221 (1995);

Russian name: Arkterika nizkaya.

Japanese name: Komeba-tsugazakura.

Habitat: On volcanic pumice and subalpine meadows.

Specimens: Tatewaki 17296, Takahashi 28171 (SAPS); Barkalov 20171 (VLA).

2) **Arctous alpina** (L.) Nied. var. **japonica** (Nakai) Takeda in Bull. Biogeogr. Jap. **4**: 288 (1934); Yamazaki in Iwatsuki et al.,

Fl. Jap. **3a**: 54 (1993), “*A. alpinus* var. *japonicus*”; Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997), “*A. alpinus* var. *japonicus* (Nakai) Ohwi” — *A. japonica* Nakai; Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 148 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 221 (1995).

Russian name: Arktous yaponskij.

Japanese name: Urashima-tsutsuji.

Habitat: Mountain tundra.

Specimens: Tatewaki 17209, 17305, Takahashi 28143 (SAPS); Barkalov 20177 (VLA).

3) **Bryanthus gmelinii** D. Don in Edinb. New Phil. J. **17**: 160 (1834); Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 127 (1991); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 8 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 221 (1995).

Russian name: Mokhotsvetnik Gmelina.

Japanese name: Chishima-tsugazakura.

Habitat: Mountain tundra.

Specimens: Tatewaki 17289, 17297, Takahashi 28144 (SAPS); Barkalov 20179 (VLA).

4) **Cassiope lycopodioides** (Pall.) D. Don in Edinb. New Phil. J. **17**: 158 (1834); Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 142 (1991); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 51 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 221 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 27 (2002).

Russian name: Kassiopeya plaunovidnaya.

Japanese name: Iwahige.

Habitat: Subalpine meadows on volcanic slopes to exposed uplands.

Specimens: Tatewaki 17215 (SAPS); Barkalov 20165 (VLA); Semsrott 215 (WTU).

5) **Loiseleuria procumbens** (L.) Desv. in J. Bot. Appl. (Paris) **3**, **1**: 35 (1814); Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 137 (1991); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 8 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 222 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 28 (2002).

Russian name: Lojzeleuria lezhachaya.

Japanese name: Mine-zuô.

Habitat: Mountain tundra.

Specimens: Tatewaki 17214, 17292 (SAPS); Barkalov 20170 (VLA).

6) **Phyllodoce aleutica** (Spreng.) A. Heller in Muehlenbergia **1**: 1 (1900); Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 140 (1991); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 9 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 222 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997).

Russian name: Fillodotse aleutskaya.

Japanese name: Aono-tsugazakura.

Habitat: Subalpine meadows.

Specimens: Tatewaki 17299, Takahashi 21530 (SAPS);

Barkalov 20178 (VLA).

7) **Rhododendron aureum** Georgi, Bemerk. Reise Russ. Reich. **1**: 214 (1775); Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 131 (1991); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 43 (1993); Czerepanov, Vasc. Russ. Adj. Stat.: 222 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997).

Russian name: Rododendron zolotistyj.

Japanese name: Kibana-shakunage.

Habitat: Subalpine meadows on volcanic slopes to exposed uplands.

Specimens: Tatewaki 17206, Takahashi 21571, 28147 (SAPS); Barkalov 20169 (VLA).

8) **Therorhodium camtschaticum** (Pall.) Small in North Amer. Fl. **29**: 45 (1914); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 11 (1993); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 28 (2002) — *Rhododendron camtschaticum* Pall.; Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 136 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 222 (1995).

Russian name: Rododendron kamchatskij.

Japanese name: Ezo-tsutsuji.

Habitat: Subalpine meadows on volcanic slopes to exposed uplands.

Specimens: Takahashi 21518 (SAPS); Zhuravlev and Ilushko 314, Barkalov 20257 (VLA); Gage 2032, Semsrott 217 (WTU).

9) **Vaccinium uliginosum** L., Sp. Pl.: 350 (1753); Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 151 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 223 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 28 (2002).

Russian name: Golubika.

Japanese name: Kuromame-no-ki (in the broad sense).

Habitat: Subalpine meadows on volcanic slopes to exposed uplands.

Specimens: Takahashi 21531 (SAPS); Zhuravlev and Ilushko 829, Barkalov 20157 (VLA); Gage 2035 (WTU).

10) **Vaccinium vitis-idaea** L., Sp. Pl.: 351 (1753); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 58 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 223 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 28 (2002) — *Rhodococcum vitis-idaea* (L.) Avrorin; Khokhryakov and Mazurenko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 154 (1991).

Russian name: Brusnika obyknovennaya.

Japanese name: Kokemomo.

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Tatewaki 17211, 17301, Takahashi 21532 (SAPS); Zhuravlev and Ilushko 823, Barkalov 20255 (VLA); Gage 2051 (WTU).

#### EMPETRACEAE

1) **Empetrum nigrum** L., Sp. Pl.: 1022 (1753), sensu lato; Takahashi et al. in Acta Phytotax. Geobot. **53**: 28 (2002)—*E.*

*sibiricum* V. Vassil.—*E. albidum* V. Vassil.

Russian name: Shiksha chjornaya (for *E. nigrum*), Shiksha sibirskaya (for *E. sibiricum*), Shiksha belovataya (for *E. albidum*).

Japanese name: Gankôran (in the broad sense).

Habitat: Subalpine meadows on volcanic slopes to exposed uplands.

Specimens: Tatewaki 17213, Takahashi 21506 (SAPS); Zhuravlev and Ilushko 292 (*E. albidum* s.str.), 301, Barkalov 20156, 20227 (VLA); Gage 2055 (WTU).

Note: Intraspecific variation and the distinctions between the species listed above needs clarification.

#### PRIMULACEAE

1) **Primula cuneifolia** Ledeb. in Mém. Acad. Sci. St.-Pét. **5**: 522 (1814); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 147 (1987); Yamazaki in Iwatsuki et al. Fl. Jap. **3a**: 93 (1993), Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 419 (1995).

Russian name: Pervotsvet klinolistnyj.

Japanese name: Ezo-ko-zakura.

Habitat: On marine terrace slopes.

Specimens: Tatewaki 17303, Takahashi 21494, 28198 (SAPS); Barkalov 20238, 20259 (VLA).

2) **Trientalis europaea** L., Sp. Pl.: 344 (1753); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 166 (1987); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 85 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 420 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 28 (2002) — *T. arctica* Fisch. ex Hook.; Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 167 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 420.

Russian name: Sedmichnik yevropejskij (for *T. europaea*), Sedmichnik arkticheskij (for *T. arctica*).

Japanese name: Tsumatori-sô (in the broad sense).

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Takahashi 21442, 21576 (SAPS); Barkalov 20172 (VLA); Gage 2034 (WTU).

#### GENTIANACEAE

1) **Gentiana kurilensis** Grossh. in Komarov, Fl. URSS **18**: 750 (1952) — *G. kawakamii* Makino p.p. — *G. nipponica* auct., non Maxim.; Charkevich in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **7**: 261 (1995) — *G. jamesii* auct., non Hemsl.

Russian name: Gorechavka kuril'skaya.

Japanese name: Rishiri-rindô (in the broad sense).

Habitat: Subalpine meadows in low elevation.

Specimens: Tatewaki 17290, 17309 (SAPS).

2) **Gentianella auriculata** (Pall.) Gillett in Ann. Miss. Bot. Gard. **44**: 261 (1957); Toyokuni and Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 146 (1993); Charkevich in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **7**: 269 (1995); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 270 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 29 (2002).

Russian name: Gorechavochka ushastaya.

Japanese name: Chishima-rindô.

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Takahashi 21467 (SAPS); Zhuravlev and Ilushko 318 (VLA); Gage 2033, Semsrott 196 (WTU).

3) **Halenia corniculata** (L.) Cornaz in Bull. Soc. Sci. Nat. Neuch, tel **25**: 171 (1897); Toyokuni and Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 140 (1993); Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **7**: 278 (1995); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 271 (1995).

Russian name: Galeniya rozhkovidnaya.

Japanese name: Hana-ikari.

Habitat: Coastal meadows.

Specimens: Takahashi 21569 (SAPS); Gage 2054 (WTU).

4) **Swertia tetrapetala** Pall., Fl. Ross. **1**(2): 99, fig. 2 (1789); Toyokuni and Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 143 (1993); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997) — *Ophelia tetrapetala* (Pall.) Grossh.; Charkevicz in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **7**: 276 (1995); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 271 (1995).

Russian name: Svertsiya chetyrehkhepnaya (for *Swertia tetrapetala*), Ofeliya chetyrehkhepnaya (for *Ophelia tetrapetala*).

Japanese name: Chishima-senburi.

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Takahashi 21480, 21526, 28188, Yabe s.n. (SAPS); Zhuravlev and Ilushko 334, Barkalov 20144 (VLA); Semsrott 197 (WTU).

#### RUBIACEAE

1) **Galium kamtschaticum** Steller ex Roem. et Schult., Syst. Veg. Mant. **3**: 182 (1827); Petelin in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 221 (1991), the author names as “Steller ex Schult. et Schult.f.”; Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 235 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 461 (1995), the author names as “Steller ex Schult. et Schult.f.”.

Russian name: Podmarennik kamchatskij.

Japanese name: Ezono-yotsuba-mugura.

Habitat: Under alder bushes on slope.

Specimens: Takahashi 21446, 28193 (SAPS); Barkalov 20184 (VLA).

2) **Galium trifidum** L. var. **brevipedunculatum** Regel, Tent. Fl. Ussur.: 77 (1861); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 237 (1993) — *G. trifidum* L.; Petelin in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 225 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 462 (1995).

Russian name: Podmarennik trekhrazdelnyj (for *G. trifidum*).

Japanese name: Hosobano-yotsuba-mugura.

Habitat: Wet meadows around the lake.

Specimens: Takahashi 21459, 21498, 28203 (SAPS); Zhuravlev and Ilushko 718, Barkalov 20233 (VLA).

#### BORAGINACEAE

1) **Mertensia maritima** (L.) S.F.Gray subsp. **asiatica** Takeda in J. Bot. **49**: 222 (1911); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 253 (1993); Takahashi et al. in Acta Phytotax. Geobot. **48**: 39 (1997) — *M. maritima* (L.) S.F.Gray; Starchenko in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 259 (1991);

Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 122 (1995).

Russian name: Mertenziya primorskaya (for *M. maritima*).

Japanese name: Hama-benkeisô.

Habitat: On sandy beach.

Specimens: Takahashi 21517 (SAPS); Zhuravlev and Ilushko 148 (VLA); Gage 2056 (WTU).

#### SCROPHULARIACEAE

1) **Euphrasia mollis** Ledeb. ex Wettst., Monogr. Euphrasia: 141, fig. 4, 205-210, table 125 (1896); Ivanina in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 362 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 474 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 134 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 29 (2002).

Russian name: Ochanka myagkaya.

Japanese name: Karafuto-kogomegusa (in the broad sense).

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Takahashi 21463 (white fls.), 21464 (yellow fls.), 21471, 21537 (white fls.), 21538 (yellow fls.) (SAPS); Zhuravlev and Ilushko 773, 774, Barkalov 20128 (VLA); Gage 2028 (WTU).

2) **Pedicularis chamissonis** Steven in Mem. Soc. Nat. Moscou **6**: 20 (1823); Ivanina in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 358 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 478 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997); Takahashi et al. in Acta Phytotax. Geobot. **53**: 29 (2002).

Russian name: Mytnik Shamisso.

Japanese name: Yotsuba-shiogama (in the broad sense).

Habitat: Subalpine meadows on volcanic slopes and on marine terrace.

Specimens: Takahashi 21451, 28176 (SAPS); Zhuravlev and Ilushko 793, 794, Barkalov 20149 (VLA); Gage 2006 (WTU). Note: A white flowered form is found (Fig. 8).

3) **Pedicularis labradorica** Wirsing, Eclog. Bot.: tab. 10 (1778); Ivanina in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 350 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 479 (1995).

Russian name: Mytnik labradorskij.

Japanese name: Chishima-shiogama.

Habitat: Tundras near seashore.

Specimens: Takahashi 28136 (SAPS), Yabe s.n. in 2000 (SAPS); Barkalov 20220 (VLA).

4) **Pennellianthus frutescens** (Lamb.) Crosswhite in Amer. Midl. Nat. **83**: 362 (1970); Ivanina in Charkevicz et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 293 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 480 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 29 (2002) — *Penstemon frutescens* Lamb.; Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 329 (1993); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997).

Russian name: Pennelliant kustarnikovyj.

Japanese name: Iwabukuro.

Habitat: On pumice.

Specimens: Takahashi 21543, 28189 (white fls!; Fig. 9), 28190 (SAPS); Zhuravlev and Ilushko 803, 804, Barkalov 20164, 20183 (VLA); Gage 2009, Semsrott 231 (WTU).



5) **Veronica americana** (Rafin.) Schwein. ex Benth. in DC., Prodr. **10**: 468 (1846); Ivanina in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 320 (1991); Yamazaki in Iwatsuki et al., Fl. Jap. **3a**: 357 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 483 (1995).

Russian name: Veronika amerikanskaya.  
Japanese name: Ezo-no-kawajisha.  
Habitat: By streams in low elevation.  
Specimen: Takahashi 21461 (SAPS).

6) **Veronica stelleri** Pall. ex Link in Spreng., Schrad. & Link, Jahrb. Gewachsk. **1**: 40 (1820); Ivanina in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **5**: 323 (1991); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 486 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 29 (2002).

Russian name: Veronika Stellera.  
Japanese name: Chishima-kuwagata.  
Habitat: Borders of dry stream bed and costal meadows.  
Specimens: Takahashi 21469, 21553, 28163 (SAPS); Zhuravlev and Ilushko 809, 810, 811, Barkalov 20120, 20249, 20274 (VLA); Gage 2079 (WTU).

#### LENTIBULARIACEAE

1) **Pinguicula vulgaris** L. var. **macroceras** (Pall. ex Link) Herder in Acta Hort. Petrop **1**: 380 (1872); Kadono in Iwatsuki et al., Fl. Jap. **3a**: 400 (1993) — *P. macroceras* Pall. ex Link; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 305 (1995); Tsvelev in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 261 (1996).

Russian name: Zhiryanka krupnoshporotsvetnaya.  
Japanese name: Mushitori-sumire.  
Habitat: Meadows near bog on marine terrace.  
Specimen: Takahashi 28175 (SAPS).

#### CAPRIFOLIACEAE

1) **Linnaea borealis** L., Sp. Pl.: 631 (1753); Ohba in Iwatsuki et al., Fl. Jap. **3a**: 431 (1993); Nedoluzhko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 297 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 158 (1995).

Russian name: Linneya severnaya.  
Japanese name: Linne-sô.  
Habitat: Marine terrace slope.  
Specimens: Tatewaki 17203, Takahashi 21479 (SAPS); Zhuravlev and Ilushko 200 (VLA).

2) **Lonicera caerulea** L., Sp. Pl.: 174 (1753) Nedoluzhko in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **2**: 285 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 158 (1995) — *L. caerulea* L. subsp. *edulis* (Turcz.) Hultén; Ohba in Iwatsuki et al., Fl. Jap. **3a**: 438 (1993).

Russian name: Zhimolost' golubaya.  
Japanese name: Ke-yonomi (in the broad sense).  
Habitat: Coastal meadows and marine terrace slope.  
Specimens: Takahashi 21485 (SAPS); Zhuravlev and Ilushko 206, Barkalov 20139, 20275 (VLA); Gage 2059 (WTU).  
Note: In Nedoluzhko (1987), *L. caerulea* L. is native to the Kurils and *L. edulis* Turcz. ex Freyn (= *L. caerulea* subsp. *edulis*) is regarded as the more continental species which is not native to the Kurils. But according to Japanese literature (e.g., Ohba 1993), the latter *L. caerulea* subsp. *edulis* is regarded as the

species growing in Sakhalin and the Kurils. There may be differences on the recognition of the infraspecific taxa of *L. caerulea* s.l. between Russia and Japan. Infraspecific variation of *L. caerulea* s.l. needs further clarification.

#### CAMPANULACEAE

1) **Campanula chamissonis** Fed. in Fl. URSS **24**: 279 (1957); Shimizu in Iwatsuki et al., Fl. Jap. **3a**: 412 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 154 (1995); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 295 (1996); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997).

Russian name: Kolokol'chik Shamisso.  
Japanese name: Chishima-gikyû.  
Habitat: On sandy soil by streams.  
Specimen: Barkalov 20185 (VLA).

2) **Campanula lasiocarpa** Cham. in Linnaea **4**: 39 (1829); Shimizu in Iwatsuki et al., Fl. Jap. **3a**: 412 (1993); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 155 (1995); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 297 (1996); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 134 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 30 (2002).

Russian name: Kolokol'chik pushistoplodnyj.  
Japanese name: Iwa-gikyô.  
Habitat: Subalpine meadows on volcanic slopes and volcanic pumice field.  
Specimens: Takahashi 21507, 21508 (SAPS); Zhuravlev and Ilushko 193, Barkalov 20229, 20244 (VLA); Gage 2016, 2031, 2083, Semsrott 181, 233 (WTU).

3) **Peracarpa carnos**a (Wall.) Hook.f. et Thoms. var. **circaeoides** (F.Schmidt ex Miq.) Makino, Ill. Fl. Nippon: 82, fig. 245 (1940); Takahashi et al. in Acta Phytotax. Geobot. **53**: 30 (2002) — *P. circaeoides* (F.Schmidt ex Miq.) Feer; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 156 (1995); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **8**: 299 (1996).

Russian name: Meshkoplodnik dvulepstinikovidnyj.  
Japanese name: Tani-gikyô.  
Habitat: Under alder and tall grasses in meadows.  
Specimens: Zhuravlev and Ilushko 196, Barkalov 20272 (VLA); Semsrott 237 (WTU).

#### ASTERACEAE

1) **Achillea alpina** L. subsp. **camtschatica** (Rupr. ex Heimerl) Kitam. in Acta Phytotax. Geobot. **23**: 3 (1968); Koyama in Iwatsuki et al., Fl. Jap. **3b**: 77 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 30 (2002) — *A. sibirica* Ledeb. p.p. — *Ptarmica camtschatica* (Rupr. ex Hiemerl) Kom.; Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 102 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 92 (1995).

Russian name: Chikhotnik kamchatskij (for *Ptarmica camtschatica*).  
Japanese name: Shumshu-nokogirisô.  
Habitat: On stabilized sand dunes and in meadows along streams.

Specimens: Takahashi 21539 (SAPS); Zhuravlev and Ilushko 74, Barkalov 20222 (VLA); Semsrott 191 (WTU).

- 2) **Anaphalis margaritacea** (L.) Benth. et Hook.f., Gen. Pl. **2**: 303 (1873); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 184 (1992), the author names as “(L.) A.Gray”; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 37 (1995), the author names as “(L.) A.Gray”; Koyama in Iwatsuki et al., Fl. Jap. **3b**: 109 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 134 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 30 (2002).  
 Russian name: Anafalis zemchuzhnyj.  
 Japanese name: Yamahahako.  
 Habitat: On low slopes.  
 Specimens: Takahashi 21460 (SAPS); Zhuravlev and Ilushko 7, Barkalov 20263 (VLA); Gage 2012 (WTU).
- 3) **Arctanthemum arcticum** (L.) Tzvelev in Novosti Sist. Vyssh. Rast. **22**: 274 (1985); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 109 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 39 (1995); Takahashi et al. in Acta Phytotax. Geobot. **53**: 30 (2002)—*Dendranthema arcticum* (L.) Tzvelev subsp. *arcticum*; Koyama in Iwatsuki et al., Fl. Jap. **3b**: 93 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 134 (1999).  
 Russian name: Arktotsvetnik arkticheskij.  
 Japanese name: Chishima-ko-hamagiku.  
 Habitat: On seashore.  
 Specimens: Takahashi 28134 (SAPS); Barkalov 20211 (VLA); Semsrott 216, 227 (WTU).
- 4) **Arnica unalascensis** Less. in Linnaea **6**: 238 (1831); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 27 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 39 (1995); Koyama in Iwatsuki et al., Fl. Jap. **3b**: 35 (1995), “*unalascensis*”; Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997), “*unalascensis*”.  
 Russian name: Arnika unalashkinskaya.  
 Japanese name: Ezo-usagi-giku.  
 Habitat: Subalpine meadows.  
 Specimen: Barkalov 20284 (VLA).  
 Note: In some Japanese literature the spelling “*unalascensis*” has been used for the specific epithet.
- 5) **Artemisia unalaskensis** Rydb., North Amer. Fl. **34**: 266 (1916); Korobkov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 127 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 43 (1995); Koyama in Iwatsuki et al., Fl. Jap. **3b**: 86 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 134 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 31 (2002).  
 Russian name: Polyn’ unalyashkinskaya.  
 Japanese name: Chishima-yomogi.  
 Habitat: On low slopes and tall grass meadows.  
 Specimens: Takahashi 21491 (SAPS); Zhuravlev and Ilushko 14, Barkalov 20123 (VLA); Gage 2005 (WTU).
- 6) **Cirsium kamschaticum** Ledeb. ex DC., Prodr. **6**: 644 (1837); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 305 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 51 (1995); Kadota in Iwatsuki et al., Fl. Jap. **3b**: 139 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997), the author name as “Ledeb.”; Takahashi et al. in J. Phytogeogr. Taxon. **47**: 134 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 31 (2002).  
 Russian name: Bodyak kamchatskij.  
 Japanese name: Chishima-azami.  
 Habitat: On low moist slopes and tall grass meadows.  
 Specimens: Takahashi 21452 (SAPS); Zhuravlev and Ilushko 47, 48, Barkalov 20273 (VLA); Gage 2020 (WTU).
- 7) **Hieracium triste** Willd. ex Spreng., Syst. Veg. **3**: 640 (1826); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 77 (1995)—*Stenotheca tristis* (Willd. ex Spreng.) Schljak. in Arct. Fl. SSSR **10**: 387 (1987); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 326 (1992).  
 Russian name: Uzkojachejnyk pechalnyj (for *Stenotheca tristis*).  
 Habitat: Subalpine meadows on volcanic slopes.  
 Specimen: Barkalov 20148 (VLA).
- 8) **Petasites japonicus** (Siebold et Zucc.) Maxim. subsp. **giganteus** (F.Schmidt ex Trautv.) Kitam. in Mem. Coll. Sci. Kyoto Univ. ser. B. **16**: 164 (1942); Koyama in Iwatsuki et al., Fl. Jap. **3b**: 36 (1995), “*japonicum*”; Takahashi et al. in Acta Phytotax. Geobot. **48**: 40 (1997)—*P. amplus* Kitam. in Acta Phytotax. Geobot. **1**: 115 (1932); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 215 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 86 (1995).  
 Russian name: Belokopytnik shirokij.  
 Japanese name: Akita-buki.  
 Habitat: On low moist slopes (introduced?, only found near ruins).  
 Specimen: Takahashi 21548 (SAPS).
- 9) **Picris hieracioides** L. subsp. **kamschatica** (Ledeb.) Hultén, Fl. Kamtchatka **4**: 217 (1930); Koyama in Iwatsuki et al., Fl. Jap. **3b**: 4 (1995)—*P. kamschatica* Ledeb. in Mém. Acad. Sci. St.-Pét. **5**: 557 (1815); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 331 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 87 (1995).  
 Russian name: Gorlyukha kamchatskaya.  
 Japanese name: Kanchi-kôzorina.  
 Habitat: On stabilized sand dunes.  
 Specimens: Takahashi 21443, 28166 (SAPS); Zhuravlev and Ilushko 64, Barkalov 20146 (VLA); Gage 2004 (WTU).
- 10) **Saussurea riederi** Herder in Bull. Soc. Nat. Moscou **41**(2): 35 (1868); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 292 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 95 (1995); Koyama in Iwatsuki et al., Fl. Jap. **3b**: 158 (1995).  
 Russian name: Sossyureya Ridera.  
 Japanese name: Nagaba-kita-azami.  
 Habitat: Subalpine meadows.  
 Specimens: Takahashi 21556 (SAPS); Zhuravlev and Ilushko 83 (VLA); Gage 2019 (WTU).
- 11) **Senecio cannabifolius** Less. in Linnaea **6**: 242 (1831); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **6**: 244 (1992); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 97 (1995); Koyama in Iwatsuki et al., Fl. Jap. **3b**: 41 (1995).

Russian name: Krestovnik konoplelistnyj.

Japanese name: Hangon-sô.

Habitat: Coastal meadows and tall grass meadows on lower slopes.

Specimens: Takahashi 21454 (SAPS); Zhuravlev and Ilushko 95, 97, Barkalov 20130 (VLA); Gage 2060 (WTU).

12) **Senecio pseudoarnica** Less. in *Linnaea* **6**: 240 (1831); Barkalov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **6**: 243 (1992); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 98 (1995); Koyama in Iwatsuki et al., *Fl. Jap.* **3b**: 42 (1995); Takahashi et al. in *Acta Phytotax. Geobot.* **48**: 40 (1997).

Russian name: Krestovnik lzhearnikovyj.

Japanese name: Ezo-oguruma.

Habitat: On seashore.

Specimens: Takahashi 21439 (SAPS); Gage 2002 (WTU); Barkalov 20271 (VLA).

13) **Solidago virgaurea** L. subsp. **leiocarpa** (Benth.) Hultén, *Fl. Aleut. Isl.*: 315 (1937); Koyama in Iwatsuki et al., *Fl. Jap.* **3b**: 57 (1995); Takahashi et al. in *Acta Phytotax. Geobot.* **48**: 40 (1997)—*S. decurrens* Lour.; Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 100 (1995)—*S. paramuschirensis* Barkalov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **6**: 52 (1992)—*S. virgaurea* L. sensu lato: Takahashi et al. in *J. Phytogeogr. Taxon.* **47**: 134 (1999).

Russian name: Zolotarnik paramushirskij (for *S. paramuschirensis*).

Japanese name: Miyama-akino-kirinsô (for *S. virgaurea* subsp. *leiocarpa*).

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Takahashi 21523 (SAPS); Barkalov 20153, 20251 (VLA); Gage 2061 (WTU).

Note: Taxonomy and nomenclature of the *Solidago virgaurea* group is very complex, so this name is tentatively adopted here mainly based on Japanese opinion.

14) **Taraxacum ceratophorum** (Ledeb.) DC., *Prodr.* **7**(1): 146 (1838); Tzvelev in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **6**: 376 (1992); Czerepanov, *Vasc. Pl. Russia Adj. Stat.*: 103 (1995).

Russian name: Oduvanchik rogatyj.

Japanese name: Kanchi-hime-tanpopo.

Habitat: Meadows on volcanic slopes.

Specimen: Barkalov 20226 (VLA).

15) **Taraxacum ketoense** Tatew. et Kitam. in *Acta Phytotax. Geobot.* **3**: 106 (1934); Tzvelev in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **6**: 380 (1992), "*ketojense*"; Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 104 (1995); Takahashi et al. in *Acta Phytotax. Geobot.* **53**: 31 (2002).

Russian name: Oduvanchik ketojskij.

Japanese name: Ketoj-tanpopo.

Habitat: Coastal meadows.

Specimen: Barkalov 20231 (VLA).

16) **Taraxacum perlatescens** Dahlst. in *Ark. Bot. (Stockholm)* **20A**(1): 13, fig. 8 (1926); Tzvelev in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **6**: 382 (1992); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 105 (1995).

Russian name: Oduvanchik rasshirenyj.

Japanese name: Araitō-tanpopo.

Habitat: Meadows by rocks.

Specimens: Zhuravlev and Ilushko 103, Barkalov 20235 (VLA).

17) **Taraxacum shikotanense** Kitam. in *Acta Phytotax. Geobot.* **2**: 126 (1933); Tzvelev in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **6**: 383 (1992); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 106 (1995); Takahashi et al. in *Acta Phytotax. Geobot.* **48**: 40 (1997); Takahashi et al. in *Acta Phytotax. Geobot.* **53**: 31 (2002).

Russian name: Oduvanchik shikotanskij.

Japanese name: Shikotan-tanpopo.

Habitat: Coastal sandy meadows.

Specimens: Takahashi 21502, 21515 (SAPS); Gage 2014 (WTU).

## LILIACEAE

1) **Fritillaria camschatcensis** (L.) Ker Gawl. in *Curtis' Bot. Mag.* **30**: sub tab. 1216 (1809); Barkalov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **2**: 370 (1987); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 305 (1995).

Russian name: Ryabchik kamchatskij.

Japanese name: Kuro-yuri.

Habitat: On big rocks in coastal meadows.

Specimen: Takahashi 21580 (SAPS).

Note: In many Japanese literature the spelling "*camschatcensis*" has been used for the specific epithet.

2) **Lilium debile** Kittlitz in *Denkwürd.* **2**: 261, 321 (1858); Barkalov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **2**: 366 (1987); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 307 (1995)—*L. medeoloides* auct. p.p., non A.Gray; Takahashi et al. in *Acta Phytotax. Geobot.* **48**: 40 (1997).

Russian name: Liliya slabaya.

Japanese name: Kuruma-yuri.

Habitat: Meadows on lower slopes to subalpine meadows on volcanic slopes.

Specimens: Takahashi 21525 (SAPS); Barkalov 20267 (VLA).

3) **Lloydia serotina** (L.) Reichenb., *Fl. Germ. Exscurs.*: 102 (1830); Barkalov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **2**: 373 (1987); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 308 (1995); Takahashi et al. in *Acta Phytotax. Geobot.* **48**: 40 (1997).

Russian name: Llojdiya pozdnyaya.

Japanese name: Chishima-amana.

Habitat: On rocks by upper of river.

Specimen: Barkalov 20199 (VLA).

4) **Maianthemum dilatatum** (Wood) A.Nels. et J.F.Macbr. in *Bot. Gaz.* **61**: 30 (1916); Barkalov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* **2**: 405 (1987); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 190 (1995); Takahashi et al. in *Acta Phytotax. Geobot.* **48**: 40 (1997); Takahashi et al. in *J. Phytogeogr. Taxon.* **47**: 135 (1999); Takahashi et al. in *Acta Phytotax. Geobot.* **53**: 31 (2002).

Russian name: Majnik shirokolistnyj.

Japanese name: Maizuru-sô.

Habitat: Subalpine meadows along seasonal streamlets on volcanic slopes.

Specimens: Takahashi 21476, 21581 (SAPS); Zhuravlev and Ilushko 455, Barkalov 20258 (VLA); Gage 2081, Semsrott 198 (WTU).

5) **Streptopus amplexifolius** (L.) DC. in Lam. et DC., Fl. Fr., ed. 3, 3: 174 (1805); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 2: 408 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 190 (1995).

Russian name: Streptopus steblyemylyushchij.

Japanese name: Ôba-takeshimaran (in the broad sense).

Habitat: Under alder bushes in dry creek bed.

Specimen: Semsrott 223 (WTU).

6) **Trillium camschatcense** Ker Gawl. in Curtis' Bot. Mag. 22: sub. tab. 855, in adnot. (1805); Barkalov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 3: 172 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 492 (1995)—*T. kamtschaticum* Pall.

Russian name: Trillium kamchatskij.

Japanese name: Ôbanano-enreisô.

Habitat: Under alder bushes on slope.

Specimen: Barkalov 20204 (VLA).

#### IRIDACEAE

1) **Iris setosa** Pall. ex Link in Sprengel et al., Jahrb. Bot. Gart. Berlin 1(3): 71 (1820); Pavlova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 2: 420 (1987); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 282 (1995); Takahashi et al. in Acta Phytotax. Geobot. 48: 41 (1997), the author name as "Pall."

Russian name: Kasatik shtsetinistyj.

Japanese name: Hiôgi-ayame.

Habitat: Meadows on low elevation.

Specimens: Takahashi 21484, 28183, 28184 (white fls.) (SAPS); Zhuravlev and Ilushko 379, Barkalov 20137 (VLA).

#### JUNCACEAE

1) **Juncus filiformis** L., Sp. Pl.: 362 (1753); Novikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 66 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 284 (1995).

Russian name: Sitnik nitevidnyj.

Japanese name: Ezo-hosoi.

Habitat: By small pond.

Specimens: Takahashi 21563, 28158 (SAPS).

2) **Juncus haenkei** E.Mey., Syn. Juncor.: 10 (1822); Novikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 67 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 285 (1995); Takahashi et al. in J. Phytogeogr. Taxon. 47: 135 (1999); Takahashi et al. in Acta Phytotax. Geobot. 53: 31 (2002).

Russian name: Sitnik Genke.

Japanese name: Hama-i.

Habitat: In dry lake bed / late snow field and subalpine meadows along seasonal streamlets on volcanic slopes.

Specimens: Takahashi 21510, 28149 (SAPS); Zhuravlev and Ilushko 397, 399, Barkalov 20225 (VLA); Semsrott 180, 194 (WTU).

3) **Luzula arcuata** (Wahlenb.) Sw. subsp. **unalaschkensis** (Buchenau) Hult n in Arkiv Bot. 7(1): 32 (1968); Takahashi et

al. in Acta Phytotax. Geobot. 53: 31 (2002)—*L. unalaschkensis* (Buchenau) Satake in J. Jp. Bot. 14: 260 (1938); Novikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 84 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 287 (1995).

Russian name: Ozhika unalashkinskaya.

Japanese name: Kumoma-suzumenohie.

Habitat: On volcanic ash (pumice).

Specimens: Takahashi 28168 (SAPS); Barkalov 20162, 20250 (VLA); Semsrott 232 (WTU).

4) **Luzula capitata** (Miq.) Kom., Fl. Kamch 1: 288 (1927); Novikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 86 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 286 (1995); Takahashi et al. in Acta Phytotax. Geobot. 48: 41 (1997), the author names as "(Miq.) Miq."

Russian name: Ozhika golovchataya.

Japanese name: Suzumeno-yari.

Habitat: Coastal sandy meadows.

Specimens: Takahashi 21509, 21572 (SAPS).

Note: For the author name we follow Czerepanov (1995).

5) **Luzula kjellmanniana** Miyabe et Kudô in Trans. Sapporo Nat. Hist. Soc. 5: 38 (1913); Novikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 88 (1985), "*kjellmaniana*"; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 286 (1995), "*kjellmaniana*"; Takahashi et al. in Acta Phytotax. Geobot. 48: 41 (1997); Takahashi et al. in J. Phytogeogr. Taxon. 47: 135 (1999); Takahashi et al. in Acta Phytotax. Geobot. 53: 32 (2002).

Russian name: Ozhika Chjellmana [Ch'ellmana].

Japanese name: Chishima-suzumenohie.

Habitat: Meadows in low elevation to subalpine meadows on volcanic slopes.

Specimens: Takahashi 21493 (SAPS); Zhuravlev and Ilushko 392, Barkalov 20260 (VLA); Semsrott 182 (WTU).

6) **Luzula parviflora** (Ehrh.) Desv. in J. Bot. Appl. (Paris) 1: 144 (1808); Novikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 81 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 286 (1995).

Russian name: Ozhika melkotsvetkovaya.

Habitat: Along stream sides.

Specimen: Barkalov 20191 (VLA).

7) **Luzula plumosa** E.Meyer in Linnaea 22: 387 (1849); Novikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 80 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 286 (1995).

Russian name: Ozhika operennaya.

Japanese name: Nukaboshi-sô (in the broad sense).

Habitat: Meadows on the terrace and coast.

Specimens: Takahashi 21578, 28177 (SAPS).

#### POACEAE

1) **Agrostis clavata** Trin. in Spreng., Neue Entdeck. 2: 55 (1821); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 210 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 342 (1995).

Russian name: Polevitsa bulavovidnaya.

Japanese name: Yama-nukabo.

Habitat: On marine terrace slope and wet sandy places

around lake.

Specimens: Takahashi 21490 (SAPS); Zhuravlev and Ilushko 539, Barkalov 20160, 20201, 20270 (VLA).

2) **Agrostis flaccida** Hack. in Bull. Herb. Boiss. 7: 649 (1899); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 207 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 343 (1995); Takahashi et al. in Acta Phytotax. Geobot. 53: 32 (2002).

Russian name: Polevitsa gibkaya.

Japanese name: Miyama-nukabo.

Habitat: In dry lake / late snow field.

Specimens: Takahashi 21540a (SAPS); Zhuravlev and Ilushko 545, Barkalov 20152, 20262 (VLA); Gage 2023, Semsrott 179 (WTU).

3) **Agrostis mertensii** Trin. in Linnaea 10: 32 (1836); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 214 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 343 (1995).

Russian name: Polevitsa Mertensa.

Japanese name: Komiya-nukabo.

Habitat: In dry lake / late snow field and subalpine meadows on volcanic slopes.

Specimens: Takahashi 21540b, 28170 (SAPS); Semsrott 174 (WTU).

4) **Calamagrostis langsdorffii** (Link) Trin., Gram. Unifl.: 225, pl. 4, fig. 10 (1824); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 197 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 354 (1995); Takahashi et al. in Acta Phytotax. Geobot. 48: 41 (1997); Takahashi et al. in J. Phytogeogr. Taxon. 47: 135 (1999); Takahashi et al. in Acta Phytotax. Geobot. 53: 32 (2002).

Russian name: Vejnik Langsdorfa.

Japanese name: Iwa-nogariyasu.

Habitat: Coastal meadows in low elevation.

Specimens: Kuwahara s.n., Takahashi 21455, 28153 (SAPS); Zhuravlev and Ilushko 552, 553, Barkalov 20277 (VLA); Semsrott 213 (WTU).

5) **Calamagrostis neglecta** (Ehrh.) Gaertn., Mey. et Schreb. in Fl. Wett. 1: 94 (1799), sensu lato; Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 189 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 354 (1995)—*C. inexpansa* A.Gray; Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 189 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 354 (1995).

Russian name: Vejnik nezamechen'nyj (for *C. neglecta*), Vejnik szhatometel'chatyj (for *C. inexpansa*).

Japanese name: Chishima-gariyasu (in the broad sense).

Habitat: Coastal lakes.

Specimen: Barkalov 20216 (VLA).

Note: The species distinction of *Calamagrostis neglecta* s.l. needs future clarification.

6) **Calamagrostis sesquiflora** (Trin.) Tzvelev in Arct. Fl. SSSR 2: 74 (1964); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 184 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 355 (1995); Takahashi et al. in Acta Phytotax. Geobot. 48: 41 (1997); Takahashi et al. in Acta Phytotax. Geobot. 53: 32 (2002).

Russian name: Vejnik polutoratsvetkovyj.

Japanese name: Miyama-nogariyasu.

Habitat: In dry lake / late snow field and on meadow on volcanic slopes.

Specimen: Takahashi 21566, Kuwahara s.n. (SAPS); Barkalov 20134 (VLA); Semsrott 226 (WTU).

7) **Deschampsia atropurpurea** (Wahl.) Scheele var. **paramushirensis** Kudô in J. Coll. Agr. Hokkaido Univ. 11: 71 (1922); Osada, Ill. Grass. Jap.: 256 (1989)—*Vahlodea flexuosa* (Honda) Ohwi in Acta Phytotax. Geobot. 2: 33 (1933); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 174 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 401 (1995).

Russian name: Valodeya izvilistaya (for *Vahlodea flexuosa*).

Japanese name: Takane-komesusuki.

Habitat: Stream sides on slopes.

Specimens: Takahashi 28182 (SAPS); Barkalov 20138 (VLA).

8a) **Deschampsia cespitosa** (L.) P.Beauv. subsp. **beringensis** (Hultén) W.E.Lawr. in Amer. J. Bot. 32: 302 (1945); Chiapella and Probatova in Bot. J. Linn. Soc. 142: 217 (2003)—*D. beringensis* Hultén in Kungl. Sv. Vet. Akad. Hand. 3: 107 (1927); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 169 (1985); Takahashi et al. in J. Phytogeogr. Taxon. 47: 135 (1999); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 358 (1995).

Russian name: Shchuchnik beringijskij.

Habitat: On seashore.

Specimen: Zhuravlev and Ilushko 581 (VLA).

Note: On the taxonomy of the *Deschampsia cespitosa* complex we follow Chiapella and Probatova (2003). In most Japanese literature the spelling "*caespitosa*" has been used for the specific epithet.

8b) **Deschampsia cespitosa** (L.) P.Beauv. subsp. **borealis** (Trautv.) Á.Löve et D.Löve in Op. Bot. 5: 65 (1961); Chapella and Probatova in Bot. J. Linn. Soc. 142: 217 (2003)—*D. borealis* (Trautv.) Roshev.; Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 172 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 358 (1995).

Russian name: Shchuchnik severnyj.

Habitat: On wet rocks by streams on volcanic slopes.

Specimens: Zhuravlev and Ilushko 576, Barkalov 20189 (VLA).

8c) **Deschampsia cespitosa** (L.) P.Beauv. subsp. **orientalis** Hultén, Kungl. Svensk. Vetensk. Handl. 5: 109 (1927); Chapella and Probatova in Bot. J. Linn. Soc. 142: 222 (2003)—*D. cespitosa* (L.) P.Beauv. var. *festucaefolia* Honda; Osada, Ill. Grass. Jap.: 254 (1989)—*D. paramushirensis* Honda in J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 3(1): 140 (1930); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. 1: 171 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 359 (1995); Takahashi et al. in J. Phytogeogr. Taxon. 47: 135 (1999).

Russian name: Shchuchnik paramushirskij (for *D. paramushirensis*).

Japanese name: Hiroha-no-kome-susuki.

Habitat: In dry lake / late snow field and coastal lakes.

Specimens: Takahashi 21573 (SAPS); Semsrott 192, 195 (WTU); Barkalov 20121 (VLA).

- 9) **Deschampsia flexuosa** (L.) Nees, Gen. Pl. Fl. Germ. **1**: tab. 43 (1833); Osada, Ill. Grass. Jap.: 252 (1989); Takahashi et al. in Acta Phytotax. Geobot. **48**: 41 (1997)—*Lerchenfeldia flexuosa* (L.) Schur, Enum. Pl. Transsilv.: 753 (1866); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 174 (1985)—*Avenella flexuosa* (L.) Drej.; Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 349 (1995).  
 Russian name: Shchuchnik izvilistyj (for *Deschampsia flexuosa*), Lerkhenfeldiya izvilistaya (for *Lerchenfeldia flexuosa*).  
 Japanese name: Kome-susuki.  
 Habitat: Subalpine meadows on volcanic slopes to exposed uplands.  
 Specimens: Kuwahara s.n., Takahashi 21486a, 28140 (SAPS); Zhuravlev and Ilushko 605, Barkalov 20264 (VLA); Gage 2022, Semsrott 171 (WTU).
- 10) **Festuca rubra** L., Sp. Pl.: 74 (1753); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 246 (1985); Osada, Ill. Grass. Jap.: 112 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 370 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 41 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 135 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 32 (2002).  
 Russian name: Ovsyanitsa krasnaya.  
 Japanese name: Ôushinoke-gusa.  
 Habitat: Subalpine meadows on volcanic slopes to seashore.  
 Specimens: Takahashi 21450, 21511, 28181 (SAPS); Zhuravlev and Ilushko 589, Barkalov 20286 (VLA); Gage 2013, Semsrott 225 (WTU).
- 11) **Glyceria alnasteretum** Kom. in Feddes Repert. **13**: 87 (1914); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 328 (1985); Osada, Ill. Grass. Jap.: 214 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 372 (1995).  
 Russian name: Mannik olkhovnikovyj.  
 Japanese name: Miyama-dojôtsunagi.  
 Habitat: Borders of dry stream and coastal meadows and under alder bushes in dry creek bed.  
 Specimens: Takahashi 28191, 28192 (SAPS); Zhuravlev and Ilushko 597, Barkalov 20127, 20278 (VLA); Gage 2084 (WTU).
- 12) **Leymus mollis** (Trin.) Pilger in Bot. Jahrb. **74**: 6 (1945); Osada, Ill. Grass. Jap.: 430 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 378 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 41 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 135 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 32 (2002)—*L. mollis* (Trin.) H.Hara in Bot. Mag. Tokyo **52**: 232 (1938), invalid combination published as a synonym; Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 135 (1985)—*Elymus mollis* Trin.  
 Russian name: Kolosnyak myagkij.  
 Japanese name: Tenki-gusa.  
 Habitat: On seashore.  
 Specimens: Takahashi 21440 (SAPS); Zhuravlev and Ilushko 609, 614, Barkalov 20142 (VLA); Gage 2003 (WTU).
- 13) **Poa arctica** R.Br., Suppl. App. Parry's First Voy. Bot.: 288 (1824); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 272 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 385 (1995).  
 Russian name: Myatlik arkticheskij.  
 Habitat: Tundras near seashores.  
 Specimens: Takahashi 21486b, 28150 (SAPS); Barkalov 20213 (VLA).
- 14) **Poa macrocalyx** Trautv. et C.A.Mey. in Middendorf, Reise Nord. u. Ost. Sib. **1**(2): 103 (1856); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 275 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 386 (1995); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 136 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 33 (2002).  
 Russian name: Myatlik krupnocheshujnyj.  
 Japanese name: Karafuto-ichigotsunagi (in the broad sense).  
 Habitat: On sandy beach to subalpine meadows on volcanic slopes.  
 Specimens: Takahashi 21505, 21547, 21555, 21575, 21545, 28152 (SAPS); Zhuravlev and Ilushko 619, 620, 636, Barkalov 20223, 20240, 20241 (VLA); Gage 2015, 2025, Semsrott 177, 178 (WTU).
- 15) **Poa turneri** Scribn. in Bull. U.S. Dept. Agr., Div. Agrost. **8**: 5 (1897); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 276 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 388 (1995); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 136 (1999).  
 Russian name: Myatlik Ternera.  
 Habitat: On seashores.  
 Specimen: Barkalov 20232 (VLA).
- 16) **Trisetum sibiricum** Rupr., Beitr. Pflanzenk. Russ. Reich. **2**: 65 (1845); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 159 (1985); Osada, Ill. Grass. Jap.: 246 (1989); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 398 (1995).  
 Russian name: Trishchetinnik sibirskij.  
 Japanese name: Chishima-kanitsuri.  
 Habitat: Dried lake bed / late snow field barren and meadows in low elevation.  
 Specimens: Takahashi 21444, 21483, 28151 (SAPS); Zhuravlev and Ilushko 648 (VLA); Gage 2021 (WTU).
- 17) **Trisetum spicatum** (L.) K.Richt. subsp. **alaskanum** (Nash) Hultén, Svensk. Bot. Tidskr. **53**: 210, fig. 3 (1959); Osada, Ill. Grass. Jap.: 238 (1989)—*T. alaskanum* Nash in Bull. New York Bot. Gard. **36**: 155 (1901); Probatova in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **1**: 161 (1985); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 398 (1995).  
 Russian name: Trishchetinnik alyaskinskij.  
 Japanese name: Rishiri-kanitsuri.  
 Habitat: Dried lake bed / late snow barren.  
 Specimens: Takahashi 21557 (SAPS); Zhuravlev and Ilushko 662, Barkalov 20150 (VLA); Semsrott 172, Gage 2024 (WTU).

#### CYPERACEAE

- 1) **Carex caryophyllea** Latour. var. **microtricha** (Franch.) Kük., Cyper. Caric.: 466 (1909); Ohwi in Satake et al., Wild Fl. Jap. Herb. Pl. **1**: 160 (1982)—*C. microtricha* Franch. in Nouv. Arch. Mus. Hist. Nat. (Paris), ser. 3, **9**: 189 (1897); Kozhevnikov

- in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 267 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 204 (1995).  
 Russian name: Osoka melkovolosistaya.  
 Japanese name: Chashiba-suge.  
 Habitat: Meadows on marine terrace.  
 Specimen: Barkalov 20261 (VLA).
- 2) **Carex flavocuspis** Franch. et Sav., Enum. Pl. Jap. **2**: 147, 574 (1877, 1878); Ohwi in Satake et al., Wild Fl. Jap. Herb. Pl. **1**: 161 (1982); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 303 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 202 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 41 (1997).  
 Russian name: Osoka zheltokonechnaya.  
 Japanese name: Miyama-kurosuge.  
 Habitat: Meadows on volcanic ash slopes.  
 Specimens: Takahashi 21565, 28137 (SAPS); Barkalov 20135, 20159 (VLA); Semsrott 224 (WTU).
- 3) **Carex gmelinii** Hook. et Arn. in Bot. Beech. Voy. **3**: 118 (1832); Ohwi in Satake et al., Wild Fl. Jap. Herb. Pl. **1**: 162 (1982); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 306 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 202 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 41 (1997); Takahashi et al. in J. Phytogeogr. Taxon. **47**: 136 (1999); Takahashi et al. in Acta Phytotax. Geobot. **53**: 33 (2002).  
 Russian name: Osoka Gmelina.  
 Japanese name: Nemuro-suge.  
 Habitat: On seashore and subalpine meadows on volcanic slopes.  
 Specimens: Takahashi 21504 (SAPS); Zhuravlev and Ilushko 254 (VLA); Gage 2026 (WTU).
- 4) **Carex hakkodensis** Franch. in Bull. Soc. Philom. Paris, ser. 8, **7**: 28 (1895); Ohwi in Satake et al., Wild Fl. Jap. Herb. Pl. **1**: 161 (1982); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 314 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 203 (1995).  
 Russian name: Osoka khakkodskaya.  
 Japanese name: Itokin-suge.  
 Habitat: Coastal meadows.  
 Specimens: Takahashi 21550 (SAPS); Barkalov 20147 (VLA).
- 5) **Carex krascheninnikovii** Kom. ex. V.Krecz. in Bot. Mat. (Leningrad) **9**: 22 (1941); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 303 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 203 (1995)—*C. flavocuspis* Franch. et Sav. subsp. *krascheninnikovii* (Kom. ex V.Krecz.) Egor.—?*C. nesophila* Holm in Amer. J. Sci. ser. 4, **17**: 315 (1904); Akiyama, Caric. Far East. Reg. Asia: 115 (1955).  
 Russian name: Osoka Krasheninnikova.  
 Japanese name: ?Chishima-miyama-kurosuge (for *C. nesophila*).  
 Habitat: Upper streams on volcanic slopes.  
 Specimens: Barkalov 20129, 20193, 20195, 20198 (VLA).
- 6) **Carex lyngybei** Hornem, Fl. Dan., tab. 1883 (1827); Ohwi in Satake et al., Wild Fl. Jap. Herb. Pl. **1**: 163 (1982)—*C. cryptocarpa* C.A.Mey. in Mém. Prés. Acad. Sci. Pétersb. Div. Sav. **1**: 226, tab. 14 (1831); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 356 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 201 (1995).  
 Russian name: Osoka skrytoplodnaya (for *C. cryptocarpa*).  
 Japanese name: Yarame-suge.  
 Habitat: Coast of lake and by pond.  
 Specimen: Zhuravlev and Ilushko 256 (VLA).
- 7) **Carex oxyandra** (Franch. et Sav.) Kudô, Rep. Veg. North Sagh.: 72 (1923); Ohwi in Satake et al., Wild Fl. Jap. Herb. Pl. **1**: 156 (1982); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 288 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 205 (1995).  
 Russian name: Osoka ostroverkhaya.  
 Japanese name: Hime-suge.  
 Habitat: Subalpine meadows on volcanic slopes.  
 Specimen: Barkalov 20161 (VLA).
- 8) **Carex rariflora** (Wahlenb.) Sm. in Engl. Bot. **35**: 35 (1813); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 334 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 206 (1995).  
 Russian name: Osoka redkotsvetkovaya.  
 Japanese name: Chishima-suge.  
 Habitat: Wet meadows around lake.  
 Specimens: Takahashi 28165 (SAPS); Barkalov 20214 (VLA).
- 9) **Carex rhynchophysa** C.A.Mey. in Suppl. Ind. Sem. Hort. Bot. Petropol. **9**: 9 (1844); Ohwi in Satake et al., Wild Fl. Jap. Herb. Pl. **1**: 149 (1982); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 347 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 207 (1995).  
 Russian name: Osoka vzdutonosaya.  
 Japanese name: Ôkasa-suge.  
 Habitat: On bogs near small lakes.  
 Specimen: Zhuravlev and Ilushko 250 (VLA).
- 10) **Carex scabrinervia** Franch. in Bull. Soc. Philom. Paris, ser. 8, **7**: 37 (1895); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 300 (1988); Czerepanov, Vasc. Pl. Russ. Adj. Stat.: 207 (1995); Takahashi et al. in Acta Phytotax. Geobot. **48**: 42 (1997).  
 Russian name: Osoka sherochovatozhilkovaya.  
 Japanese name: Shikotan-suge.  
 Habitat: Coastal meadows.  
 Specimens: Takahashi 21482, 21522 (SAPS); Barkalov 20136, Bogatov 20252 (VLA); Gage 2063, Semsrott 170, 175 (WTU).
- 11a) **Carex scita** Maxim. var. **koraginensis** (Meinsh.) Kük., Cyper. Caric.: 415 (1909); Akiyama, Caric. Far East. Reg. Asia: 118 (1955)—*C. koraginensis* Meinsh. in Acta Horti Petropol. **18**(3): 351 (1901); Kozhevnikov in Charkevich et al., Pl. Vasc. Orient. Extr. Soviet. **3**: 301 (1988).  
 Russian name: Osoka karaginskaya (for *C. koraginensis*).  
 Japanese name: Kita-chishima-suge (for *C. koraginensis*).  
 Habitat: On wet rocks by streams on volcanic slopes.

Specimen: Barkalov 20186 (VLA).

11b) **Carex scita** Maxim. var. **riishirensis** (Franch.) Kük., *Cyper. Caric.*: 414 (1909); Akiyama, *Caric. Far East. Reg. Asia*: 118 (1955)—*C. riishirensis* Franch. in *Bull. Soc. Philom. Paris*, ser. 8, 7: 88 (1895); Kozhevnikov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 3: 300 (1988); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 207 (1995); Takahashi et al. in *J. Phytogeogr. Taxon.* 47: 136 (1999).

Russian name: Osoka rishirinskaya.

Japanese name: Rishiri-suge.

Habitat: Meadows by lake.

Specimen: Barkalov 20117 (VLA).

12) **Carex stenantha** Franch. et Sav. var. **taisetsuensis** Akiyama in *J. Fac. Sci. Hokkaido Imp. Univ.* ser. 5, 1: 60, tab. 11, fig. 6 (1931); Ohwi in Satake et al., *Wild Fl. Jap. Herb. Pl.* 1: 161 (1982); Takahashi et al. in *Acta Phytotax. Geobot.* 48: 42 (1997)—*C. ktausipali* Meinsh. in *Acta Horti Petropol.* 18(3): 359 (1901); Kozhevnikov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 3: 296 (1988); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 203 (1995).

Russian name: Osoka ktauzipalskaya (for *C. ktausipali*).

Japanese name: Taisetsu-iwa-suge.

Habitat: On pumice field.

Specimens: Takahashi 28169 (SAPS); Barkalov 20182 (VLA); Semsrott 228 (WTU).

13) **Carex stylosa** C.A.Mey. in *Mém. Prés. Acad. Sci. Pétersb. Div. Sav.* 1: 222 (1831); Kozhevnikov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 3: 310 (1988); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 208 (1995); Katsuyama in *J. Jap. Bot.* 70: 233 (1995).

Russian name: Osoka stolbikonosnaya.

Japanese name: Rausu-suge (Katsuyama, 1995).

Habitat: Wet meadows around lake.

Specimens: Takahashi 28133 (SAPS); Barkalov 20132, 20133 (VLA).

14) **Carex thunbergii** Steud. var. **appendiculata** (Trautv. et Mey.) Ohwi in *J. Jap. Bot.* 11: 409 (1935); Akiyama, *Caric. Far East. Reg. Asia*: 76 (1955); Ohwi in Satake et al., *Wild Fl. Jap. Herb. Pl.* 1: 164 (1982)—*C. appendiculata* (Trautv. et Mey.) Kük. in *Bull. Herb. Boiss.* ser. 2, 4: 54 (1904); Kozhevnikov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 3: 364 (1988); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 200 (1995).

Russian name: Osoka pridatkonosnaya.

Japanese name: Ôaze-suge.

Habitat: By small pond and dry lake bed.

Specimens: Takahashi 21560, 28154 (SAPS); Barkalov 20219 (VLA); Semsrott 193 (WTU).

15) **Carex vaginata** Tausch in *Flora* 5: 557 (1821); Akiyama, *Caric. Far East. Reg. Asia*: 153 (1955); Ohwi in Satake et al., *Wild Fl. Jap. Herb. Pl.* 1: 155 (1982)—*C. falcata* Turcz. in *Bull. Soc. Nat. Mosc.* 28(2): 341 (1855); Kozhevnikov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 3: 331 (1988); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 202 (1995).

Russian name: Osoka vlagalishchnaya (for *C. vaginata*),

Osoka serpovidnaya (for *C. falcata*).

Japanese name: Saya-suge or Keyari-suge (for *C. vaginata*).

Habitat: Coastal meadows.

Specimens: Takahashi 21554, 28164 (SAPS); Barkalov 20266 (VLA).

16) **Eleocharis palustris** (L.) Roem. et Schult., *Syst. Veg.* 2: 151 (1817); Kozhevnikov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 3: 210 (1988); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 210 (1995)—*E. intersita* Zinslerl. in *Fl. SSSR* 3: 581 (1935); Ohwi in Satake et al., *Wild Fl. Jap. Herb. Pl.* 1: 173 (1982).

Russian name: Bolotnitsa bolotnaya.

Japanese name: Kuronuma-harii (for *E. intersita*).

Habitat: By small pond.

Specimens: Takahashi 21562, 28155 (SAPS); Barkalov 20217 (VLA); Gage 2047 (WTU).

17) **Eriophorum angustifolium** Honck. subsp. **subarcticum** (Vassil.) Hultén—*E. polystachion* L., *Sp. Pl.*: 52 (1753); Kozhevnikov in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 3: 193 (1988); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 211 (1995).

Russian name: Pushitsa mnogokoloskovaya (for *E. polystachion*).

Japanese name: Shumshu-watasuge.

Habitat: Wet meadows around lake.

Specimens: Tatewaki 17295 (SAPS); Bogatov 20116 (VLA).

## ORCHIDACEAE

1) **Orchis aristata** Fisch. ex Lindl., *Gen. Sp. Orch.*: 262 (1835); Takahashi et al. in *Acta Phytotax. Geobot.* 48: 42 (1997), the author name as "Fisch."—*Dactylorhiza aristata* (Fisch. ex Lindl.) Soó, *Nom. Nova Gen. Dactylorhiza*: 4 (1962); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 323 (1995); Vyshin in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 8: 308 (1996).

Russian name: Palchatokorennik ostistyy (for *Dactylorhiza aristata*).

Japanese name: Hakusan-chidori.

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Zhuravlev and Ilushko 493, Barkalov 20151 (VLA); Semsrott 183 (WTU).

2) **Platanthera chorisiana** (Cham.) Reichb.f., *Icon. Fl. Germ.* 13-14: 162 (1851); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 329 (1995); Vyshin in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 8: 314 (1996).

Russian name: Lyubka Khorisa.

Japanese name: Takane-tonbo.

Habitat: Subalpine meadows in low elevation.

Specimens: Takahashi 21582, 28172 (SAPS); Barkalov 20140, 20158 (VLA).

3) **Platanthera tipuloides** (L.f.) Lindl., *Gen. Sp. Orch.*: 285 (1835); Czerepanov, *Vasc. Pl. Russ. Adj. Stat.*: 329 (1995); Vyshin in Charkevich et al., *Pl. Vasc. Orient. Extr. Soviet.* 8: 318 (1996); Takahashi et al. in *Acta Phytotax. Geobot.* 48: 42 (1997), the author name as "Lindl."

Russian name: Lyubka komarnikovaya.



Japanese name: Hosobano-kiso-chidori.

Habitat.: Meadows on marine terrace.

Specimens: Takahashi 28139 (SAPS); Barkalov 20141  
(VLA).

## **A Newly Compiled Checklist of the Vascular Plants of the Habomais, the Little Kurils**

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**Abstract** The new floristic checklist of the Habomais, the Little Kurils, was compiled from Barkalov and Eremenko (2003) and Eremenko (2003), and supplemented by the specimens collected by Gage and Joneson in 1998 and Eremenko in 2002. In the checklist, 61 families, 209 genera and 332 species were recognized. Scientific and vernacular names commonly adopted in Russian and Japanese taxonomic references are listed and compared, and some taxonomic notes are also added. This list will contribute the future critical taxonomic and nomenclatural studies on the vascular plants in this region. The plants of each individual island in the Habomais are listed in the table.

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### **Introduction**

Flora of the vascular plants of the Habomais had been scarcely known except for Chernyaeva (1977) before the recent work of Barkalov and Eremenko (2003). The flora of the entire Habomai Islands was clarified by Barkalov and Eremenko (2003), but the knowledge on the flora of each individual island in the Habomais was incomplete yet. In the present study the data of the specimens collected by Gage, S., Joneson, S. L. and Eremenko N. A. on August 19-21, 1998 under the auspices of the International Kuril Island Project (IKIP) and Eremenko N. A. in 2001, 2002 and 2005 was added to those of Barkalov and Eremenko (2003). Thus, more complete floristic checklist was compiled for this region.

These islands (total area 102 km<sup>2</sup>, maximum elevation less than 50 m) are situated near to Hokkaido, even the most far island Polonskogo lies only about 50km east of the Cape of Nosappu of the Nemuro peninsula in eastern Hokkaido. Geologically and geographically speaking, the Habomais are regarded as the extension of the Nemuro peninsula. Thus, we can expect that most plant species of the Habomais are native to eastern Hokkaido. As we can comparatively easily recognize the plant species in common between the Habomais and Hokkaido, the correspondence of the plant scientific names between Russia and Japan was presented in the checklist. The checklist will contribute the future critical taxonomic and nomenclatural studies of the vascular plants in the

northeastern Asia.

### **Materials and Methods**

The checklist is the enumeration of the vascular plants of the Habomais. The Habomais are composed of five main islands (from west to east; Tanfilyeva, Anuchina, Iuriy, Zelenyj and Polonskogo) and small islands and rocks (Fig. 1 – 4). The circumscription and order of families in the angiosperms follows Melchior (1964), for the ferns and fern allies we follow Iwatsuki et al. (1995a). Within each family the species are listed in alphabetically.

Russian scientific names follow Barkalov and Eremenko (2003), here cited as [BE/R]. If the plants are not listed in Barkalov and Eremenko (2003), the literature is cited in the brackets like as [Eremenko (2003)]. The Japanese scientific names follow "Flora of Japan" (Iwatsuki et al. 1993, 1995a, 1995b, 1999, 2001), here cited as [FJ/J]; and/or "Wild Flowers of Japan" (Satake et al. 1981, 1982a, 1982b, 1989a, 1989b; Iwatsuki 1992), cited as [WF/J]. In this checklist the Russian scientific name is equivalent to the available Japanese scientific name, but the correct names are not necessarily insisted here. Future cooperative and critical taxonomic study will work out the disagreements of the scientific names adopted by Russia and Japan. Other Russian important opinions; Charkevich (1985, 1987, 1988, 1992, 1995,

1996), Czerepanov (1995), and/or new opinions are noticed in the “Note” in case of necessity. Other Japanese opinions; for *Aconitum* by Kadota (1987), for Salicaceae by Ohashi (2000, 2001), for Poaceae by Osada (1989) and for *Sasa* by Ohwi and Kitagawa (1983), and so on are similarly noticed in the “Note”. For the information on the naturalized plants to Japan, Shimizu (2003) was used.

The names of authors of the plant names follows Brummitt and Powell (1992) except for “Worosch.” (see Takahashi et al. 2006). Distribution of the species within the Habomais is listed in Table 1.

Barkalov and Eremenko (2003) is based on the specimens collected by Eremenko, N. A., Ilushko, M. V. and Zhuravlev, Y. N. in 1998 (IKIP). Those are deposited in the Herbarium, Institute of Biology and Soil Science, Russian Academy of Sciences, Far Eastern Branch, Vladivostok (VLA) and in the Herbarium of the Natural Reserve “Kuril’sky” (Yuzhno-Kuril’sk). Furthermore the specimens of the other collectors; Chernyaeva, A. M., Khoroshailov, N. G., Butovsky, B. G., Rosenberg, V. A., Vassil’yev, N. G., Nevedomskaya, I. A., Popov, N. A., and Nechayev, V. A. are also used, and those are deposited

in VLA and the Main Botanical Garden of RAS, Moscow (MHA) and Institute of Marine Geology and Geophysics of FEB RAS (Yuzhno-Sakhalinsk). And those by Gage and Joneson are in the Herbarium, Department of Botany, University of Washington, Seattle (WTU).

## Results and Discussion

In the following checklist, 61 families, 209 genera and 332 species were enumerated for the vascular plants of the Habomais. The dominant families are: Asteraceae (42 spp.), Poaceae (41 spp.), Rosaceae (20 spp.), Cyperaceae (18 spp.), Ranunculaceae (13 spp.), Polygonaceae (12 spp.), Apiaceae (11 spp.), Caryophyllaceae (10 spp.), Liliaceae (10 spp.), Juncaceae (10 spp.), Fabaceae (9 spp.), Lamiaceae (9 spp.), Brassicaceae (8 spp.) and Ericaceae (8 spp.). Other families contain less than seven species. The dominant genera including more than five species are: *Carex* (12 spp.), *Juncus* (9 spp.), *Artemisia* (7 spp.), *Agrostis* (6 spp.) and *Calamagrostis* (6 spp.).

Including the disagreement on the author names and the spelling, over 150 scientific names adopted in Russian

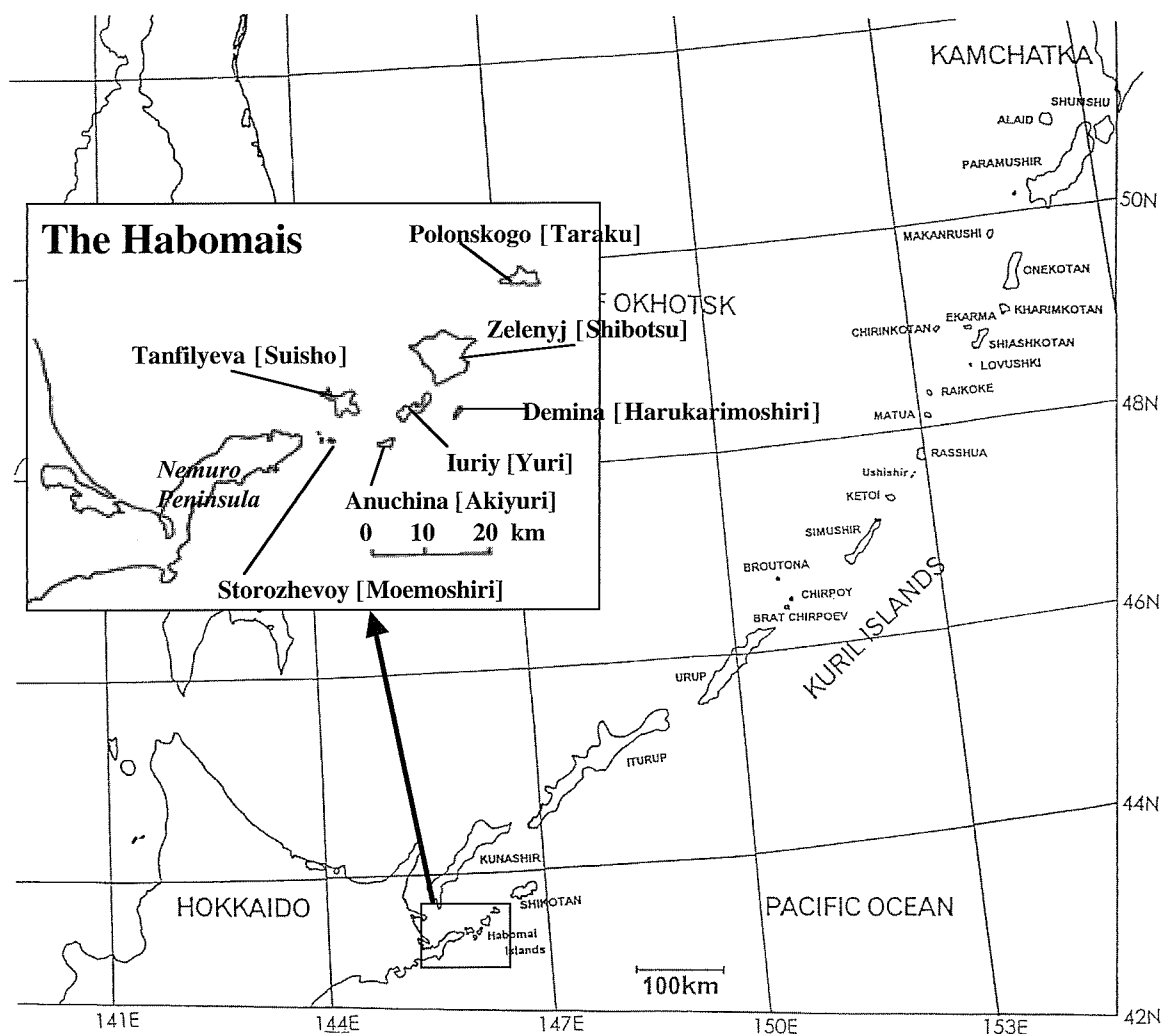


Figure 1. Map of the Habomai Islands.



Figure 2. Meadow with *Corydalis ambigua*, *Iris setosa* and *Veratrum grandiflorum* on Demina Island.



Figure 3. Seacoast on Storozhevoy Island.

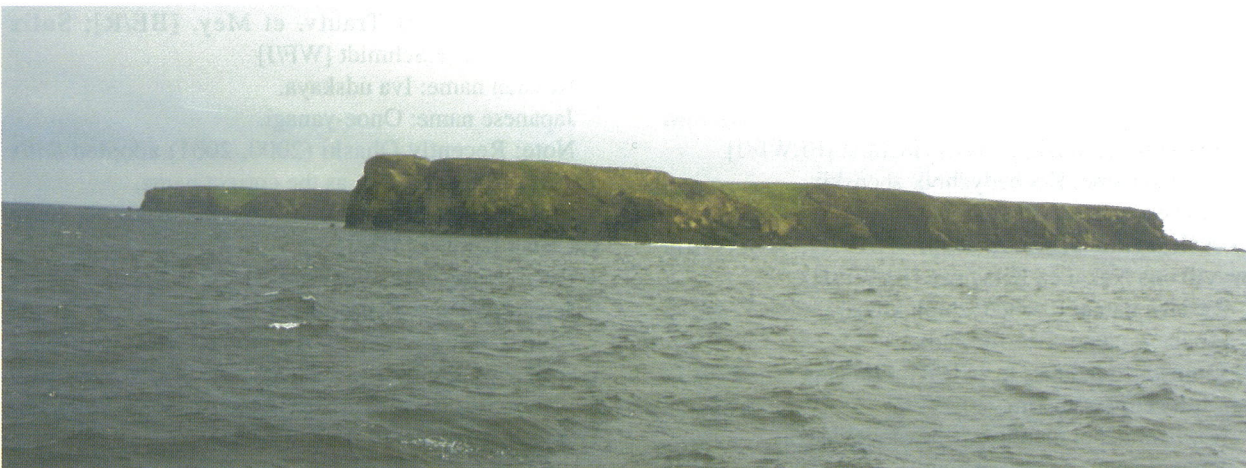


Figure 4. Demina Island.

references (Barkalov and Eremenko 2003; Eremenko 2003) are in conflict with those adopted in at least one of commonly used Japanese references; “Flora of Japan” (Iwatsuki et al. 1999, 1993, 1995a, 1995b, 2001) or “Wild Flowers of Japan” (Satake et al. 1981, 1982a, 1982b, 1989a, 1989b; Iwatsuki 1992). These many disagreements constitute a significant obstacle to the progress of botany in Russia and Japan. The taxonomic and nomenclatural problems should be resolved through a new international scientific project.

## Checklist of the Vascular Plants of the Habomais, the Little Kurils

### 1. LYCOPODIACEAE

#### 1) *Lycopodium clavatum* L. [BE/R][FJ,WF/J]

Russian name: Plaun bulavovidnyj.

Japanese name: Hikageno-kazuda.

## 2. EQUISETACEAE

### 1) *Equisetum arvense* L. [BE/R][FJ,WF/J]

Russian name: Khvoshch polevoj.

Japanese name: Sugina.

### 2) *Equisetum hyemale* L. [BE/R][FJ,WF/J]

Russian name: Khvoshch zimuyushchij.

Japanese name: Tokusa.

### 3) *Equisetum palustre* L. [BE/R][FJ,WF/J]

Russian name: Khvoshch bolotnyj.

Japanese name: Inu-sugina.

## 3. OPHIOGLOSSACEAE

### 1) *Botrychium robustum* (Rupr.) Underw. [BE/R];

### *Botrychium multifidum* (S.G.Gmel.) Rupr. var. *robustum* (Rupr. ex Milde) C.Chr. [FJ,WF/J]

Russian name: Grozdovnik mostchnyj.

Japanese name: Ezo-huyuno-hanawarabi.

## 4. HYMENOPHYLLACEAE

### 1) *Mecodium wrightii* (Bosch) Copel. [BE/R];

### *Hymenophyllum wrightii* Bosch [FJ,WF/J]

Russian name: Mekodij Raita.

Japanese name: Koke-shinobu.

## 5. DENNSTAEDTIACEAE

### 1) *Pteridium aquilinum* (L.) Kuhn [BE/R]; *Pteridium*

### *aquilinum* (L.) Kuhn var. *latiusculum* (Desv.) Underw. ex Hell. [FJ,WF/J]

Russian name: Orlyak obyknovennyj.

Japanese name: Warabi.

## 6. THELYPTERIDACEAE

### 1) *Thelypteris thelypteroides* (Michx.) Holub [BE/R];

### *Thelypteris palustris* (Salisb.) Schott [FJ,WF/J]

Russian name: Telipteris telipterisovidnyj.

Japanese name: Hime-shida.

## 7. WOODSIACEAE

### 1) *Athyrium filix-femina* (L.) Roth [BE/R]; *Athyrium*

### *melanolepis* (Franch. et Sav.) H.Christ [FJ,WF/J]

Russian name: Kochedyzhnik zhenskij.

Japanese name: Miyama-meshida

### 2) *Athyrium sinense* Rupr. [BE/R]; *Athyrium*

### *brevifrons* Nakai ex Kitagawa [FJ,WF/J]

Russian name: Kochedyzhnik kitaiskij.

Japanese name: Ezo-meshida.

### 3) *Onoclea sensibilis* L. [BE/R]; *Onoclea sensibilis* L.

### var. *interrupta* Maxim. [FJ,WF/J]

Russian name: Onokleya chuvstvitel'naya.

Japanese name: Kôya-warabi.

## 8. MYRICACEAE

### 1) *Myrica tomentosa* (DC.) Asch. et Graebn. [BE/R];

### *Gale belgica* Duham. var. *tomentosa* (C.DC.) Yamazaki [WF/J]

Russian name: Voskovnik pushistyj.

Japanese name: Yachi-yanagi.

Note: Ohwi and Kitagawa (1983) adopted *Myrica gale* L. var. *tomentosa* C.DC. as the correct name.

## 9. SALICACEAE

### 1) *Populus jesoensis* Nakai [BE/R][WF/J]

Russian name: Topol' hokkaidskij.

Japanese name: Ezo-yama-narashi, Chôsen-yama-narashi.

Note: Ohashi (2001) regarded *Populus davidiana* Dode and *P. jesoensis* Nakai as a conspecific, and he adopted *P. tremula* L. var. *davidiana* (Dode) C.K.Schneid. as the correct name of this species.

### 2) *Salix fuscescens* Andersson [Chernyaeva (1977)/R]; *Salix paludicola* Koidz. [WF/J]

Russian name: Iva bureyushchaya.

Japanese name: Miyama-yachi-yanagi.

Note: This species was not listed in Barkalov and Eremenko (2003), but Czernyaeva (1977) recorded it from Zelenyj. In Hokkaido, this species is found only on alpine wet meadows of Mts. Taisetsu, and not found on the lowland of eastern Hokkaido. Ohashi (2000) adopted *Salix fuscescens* Andersson as the correct name instead of *S. paludicola* Koidz.

### 3) *Salix gilgiana* Seem. [BE/R]; *Salix miyabeana* Seemen [WF/J]

Russian name: Iva Gil'ga.

Japanese name: Ezo-no-kawa-yanagi.

Note: Ohashi (200, 2001) adopted *Salix miyabeana* Seemen subsp. *gilgiana* (Seemen) H.Ohashi as the correct name.

### 4) *Salix hultenii* Flod. [BE/R][WF/J]

Russian name: Iva Khul'tena.

Japanese name: Maruba-no-bakko-yanagi.

Note: Ohashi (2000, 2001) regarded *Salix hultenii* Flod. and *S. bakko* Kimura as a conspecific, and he adopted *S. caprea* L. as the correct name. Charkevicz (1995) mentioned *S. caprea* L. subsp. *hultenii* (Flod.) Kom. equivalent for this species listed here.

### 5) *Salix udensis* Trautv. et Mey. [BE/R]; *Salix sachalinensis* F.Schmidt [WF/J]

Russian name: Iva uds kaya.

Japanese name: Onoe-yanagi.

Note: Recently Ohashi (2000, 2001) adopted *Salix udensis* Trautv. et Mey. as the correct name.

### 6) *Salix yezoensis* (C.K.Schneid.) Kimura [BE/R]; *Salix pet-susu* Kimura [WF/J]

Russian name: Iva iezskaya.

Japanese name: Ezo-no-kinu-yanagi.

Note: Ohashi (2000, 2001) adopted *Salix schwerinii* E.Wolf as the correct name. Charkevicz (1995) mentioned *S. schwerinii* E.Wolf subsp. *yezoensis* (C.K.Schneid.) Worosch. equivalent for this species.

## 10. BETULACEAE

### 1) *Alnus hirsuta* (Spach) Fisch. ex Rupr. [BE/R]; *Alnus hirsuta* Turcz. [WF/J]

Russian name: Ol'ha volosistaya.

Japanese name: Ke-yama-han'noki.

### 2) *Duschekia maximowiczii* (Call. ex C.K.Schneid.) Pouzar [BE/R]; *Alnus maximowiczii* Call. [WF/J]

Russian name: Ol'khovnik Maksimovicha.

Japanese name: Miyama-han'noki.

11. URTICACEAE

1) **Urtica platyphylla** Wedd. [BE/R][WF/J]

Russian name: Krapiva ploskolistnaya.

Japanese name: Ezo-irakusa.

12. POLYGONACEAE

1) **Acetosa lapponica** (Hii-tonen) Holub [BE/R]; **Rumex montanus** Desf. [WF/J]

Russian name: Shchavel' laplandskij.

Japanese name: Takane-suiba.

2) **Acetosella angiocarpa** (Murb.) A.Löve [BE/R]; **Rumex acetosella** L. [WF/J]—Naturalized

Russian name: Shchavelek pokrytoplodnyj.

Japanese name: Hime-suiba.

Note: Charkevicz (1989) recognized *Acetosella angiocarpa* (Murb.) A.Löve and *A. vulgaris* (Koch) Fourr. (= *Rumex acetosella* L. s.l.) as two separate species.

3) **Persicaria maculata** (Raf.) S.F.Gray [BE/R]; **Persicaria vulgaris** Webb et Moq. [WF/J]—Naturalized?

Russian name: Goretz pochechuinyj.

Japanese name: Haru-tade.

Note: In Japan, this species is not treated as the naturalized plant (Shimizu 2003), but Satake et al. (1982b) commented favorably on its naturalization from Europe. Barkalov and Eremenko (2003) treated it as one of the naturalized plants in the southern Kurils.

4) **Persicaria scabra** (Moench) Mold. [BE/R][WF/J]

Russian name: Goretz sherokhovatyj.

Japanese name: Sanae-tade.

5) **Polygonum aviculare** L. [BE/R][WF/J]—Naturalized

Russian name: Sporysh ptichij.

Japanese name: Michi-yanagi.

Note: This species is treated as the prehistoric naturalized plant in Japan (Shimizu 2003). Barkalov and Eremenko (2003) regarded it as one of the naturalized plants in the southern Kurils.

6) **Rumex crispus** L. [BE/R][WF/J]—Naturalized

Russian name: Shchavel'nik kurchavyj.

Japanese name: Nagaba-gishigishi.

7) **Rumex gmelinii** Turcz. ex Ledeb. [BE/R]; **Rumex gmelinii** Turcz. ["*gmelini*", WF/J]

Russian name: Shchavel'nik Gmelina.

Japanese name: Karafuto-no-daiô.

8) **Rumex longifolius** DC. [BE/R][WF/J]—Naturalized?

Russian name: Shchavel'nik dlinnolistnyj.

Japanese name: No-daiô.

Note: This species is not treated as the naturalized plant in Japan (Satake et al. 1982b, Shimizu 2003), but Barkalov and Eremenko (2003) regarded it as one of the naturalized plants in the southern Kurils.

9) **Rumex obtusifolius** L. [BE/R][WF/J]—Naturalized

Russian name: Shchavel'nik tupolistnyj.

Japanese name: Ezo-no-gishigishi.

10) **Rumex ochotskius** Rech.f. [BE/R]; **Rumex maritimus** L. [WF/J]

Russian name: Shchavel'nik okhotskij.

Japanese name: Kogane-gishigishi.

Note: Charkevicz (1989) recognized *Rumex ochotskius* Rech.f. and *R. maritimus* L. as two separate species.

11) **Truellum sieboldii** (Meisn.) Soják [BE/R];

**Persicaria sieboldii** (Meisn.) Ohki [WF/J]

Russian name: Kolyuchestebel'nik Zibol'da.

Japanese name: Akino-unagi-tsukami.

12) **Truellum thunbergii** (Siebold et Zucc.) Soják [BE/R]; **Persicaria thunbergii** (Siebold et Zucc.) H.Gross [WF/J]

Russian name: Kolyuchestebel'nik Tunberga.

Japanese name: Mizo-soba.

13. CARYOPHYLLACEAE

1) **Cerastium fischerianum** Ser. [BE/R][WF/J]

Russian name: Yaskolka Fishera.

Japanese name: Ôbana-miminagusa.

2) **Cerastium holosteoides** Fries [BE/R]; **Cerastium holosteoides** Fries var. **holosteoides** [WF/J]—Naturalized?

Russian name: Yaskolka dernistaya.

Japanese name: Ô-mimina-gusa.

Note: The other var. *hallaisanense* of this species is treated as the prehistoric naturalized plant in Japan (Shimizu 2003). Barkalov and Eremenko (2003) regarded this species as one of the naturalized plants in the southern Kurils.

3) **Dianthus superbus** L. [BE/R]; **Dianthus superbus** L. var. **superbus** [WF/J]

Russian name: Gvozdika pyshnaya.

Japanese name: Ezo-kawara-nadeshiko.

4) **Fimbripetalum radians** (L.) Ikonn. [BE/R]; **Stellaira radians** L. [WF/J]

Russian name: Bakhromchatolepestnik luchistyj.

Japanese name: Ezo-ôyama-hakobe.

5) **Honkenya oblongifolia** Torr. et Gray ["*Honckenya*", BE/R]; **Honkenya peplodes** (L.) Ehrh. var. **major** Hook. [WF/J]

Russian name: Khonkeniya prodolgovatolistnaya.

Japanese name: Hama-hakobe.

6) **Moehringia lateriflora** (L.) Fenzl [BE/R][WF/J]

Russian name: Meringiya bokotsvetnaya.

Japanese name: Ôyama-fusuma.

7) **Oberna behen** (L.) Ikonn. [BE/R]; **Silene vulgaris** (Moench) Garcke [WF/J]—Naturalized

Russian name: Khlopushka obyknovennaya.

Japanese name: Shiratama-sô.

8) **Sagina maxima** A.Gray var. **crassicaulis** (S.Wats.) H.Hara [BE/R]; **Sagina maxima** A.Gray forma **crassicaulis** Mizush. [WF/J]

Russian name: Mshanka tolstostebel'naya.

Japanese name: Ezo-hama-tsumekusa.

Note: Charkevicz (1996) adopted *S. crassicaulis* S.Wats. as the correct name. The author name for var. *crassicaulis* is "(S.Wats.) Worosch." but not "(S.Wats.) H.Hara" in Charkevicz (1996).

9) **Stellaria longifolia** Muhl. ex Willd. [BE/R]; **Stellaria longifolia** L. [WF/J]

Russian name: Zvezdchatka dlinnolistnaya.

Japanese name: Nagaba-tsumekusa.

Note: The author name "Muhl." had been often written "Mühl." or "Muehl.", but here we followed Brummitt and Powell (1992).

10) **Stellaria media** (L.) Vill. [BE/R][WF/J]—Naturalized

Russian name: Zvezdchatka srednyaya or Mokritsa.

Japanese name: Hakobe, Ko-hakobe.

Note: This species is treated as the prehistoric naturalized plant in Japan (Shimizu 2003). Barkalov and Eremenko (2003) regarded it as one of the naturalized plants in the southern Kurils.

#### 14. CHENOPODIACEAE

1) **Atriplex patens** (Litv.) Iljin [BE/R]; **Atriplex gmelinii** C.A.Mey. [WF/J]

Russian name: Lebeda ponikayushchaya.

Japanese name: Hosoba-hama-akaza.

Note: Charkevich (1988) recognized *Atriplex patens* (Litv.) Iljin and *A. gmelinii* C.A.Mey. as two separate species.

2) **Atriplex subcordata** Kitag. [BE/R][WF/J]

Russian name: Lebeda pochti-serdtsevidnaya.

Japanese name: Hama-akaza.

3) **Chenopodium album** L. [BE/R][WF/J]—Naturalized?

Russian name: Mar' belaya.

Japanese name: Shiroza.

Note: This species is not treated as the naturalized plant in Japan (Satake et al. 1982b, Shimizu 2003). Russian botanists regard it as one of the naturalized plants in the Kurils, but as the native plant in the mainland of the Far East.

4) **Salsola komarovii** Iljin [BE/R][WF/J]

Russian name: Solyanka Komarova.

Japanese name: Oka-hijiki.

#### 15. RANUNCULACEAE

1) **Aconitum kurilense** Takeda [BE/R]; not listed [WF/J]

Russian name: Borets kuril'skij.

Japanese name: Shikotan-torikabuto.

Note: Kadota (1987) adopted *Aconitum maximum* Pall. ex DC. subsp. *kurilense* (Takeda) Kadota as the correct name.

2) **Aconitum maximum** Pall. ex DC. [BE/R]; not listed [WF/J]

Russian name: Borets bol'shoj.

Japanese name: Ô-chishima-torikabuto.

Note: Kadota (1987) recognized two subspecies; subsp. *maximum* and subsp. *kurilense* in *A. maximum*, and this taxon listed here is regarded as *A. maximum* subsp. *maximum* according to Kadota's opinion.

3) **Aconitum sachalinense** F.Schmidt [BE/R][WF/J]

Russian name: Borets sakhalinskij.

Japanese name: Karafuto-bushi.

Note: Kadota (1987) recognized two subspecies; subsp. *sachalinense* and subsp. *yezoense* in *A. sachalinense*, and this species listed here is regarded as *A. sachalinense* subsp. *sachalinense* in the Kadota's sense. Charkevich (1995) mentioned *A. sachalinense* F.Schmidt subsp. *neokurilense* (Worosch.) Lufarov equivalent for the plants of the Habomais.

4) **Anemonastrum villosissimum** (DC.) Starodub. [BE/R]; **Anemone narcissiflora** L. var. **sachalinensis** Miyabe et Miyake [WF/J]

Russian name: Vetrenik mokhnateishyj.

Japanese name: Ezo-no-hakusan-ichige.

Note: *Anemonastrum villosissimum* (DC.) Starodub. and *Anemonastrum sachalinensis* (Juz.) Starodub. (= *Anemone narcissiflora* L. var. *sachalinensis* Miyabe et Miyake, *A. sachalinensis* Juz.) are regarded as two different species in Charkevich (1995). The author name for Russian scientific name is "(DC.) Holub" in Czerepanov (1995).

5) **Anemonidium dichotomum** (L.) Holub [BE/R]; **Anemone dichotoma** L. [WF/J]

Russian name: Vetrovnik vil'chatyj.

Japanese name: Futamata-ichige.

6) **Anemonoides debilis** (Fisch. ex Turcz.) Holub. [BE/R]; **Anemone debilis** Fisch. [WF/J]

Russian name: Vetrovochnik slabyj.

Japanese name: Hime-ichige.

7) **Batrachium trichophyllum** (Chaix) Bosch [BE/R];

?**Ranunculus yezoensis** Nakai [WF/J]

Russian name: Shelkovnik volosistyj.

Japanese name: ?Chitose-baikamo.

Note: Charkevich (1995; Fig. 35) recorded *Batrachium kauffmannii* (Clerc) V.I.Krecz. from the Habomais. The species distinction of *Batrachium* in the Habomais needs future clarification.

8) **Cimicifuga simplex** (Wormsk. ex DC.) Turcz. [BE/R]; **Cimicifuga simplex** Wormsk. [WF/J]

Russian name: Klopogon prostoj.

Japanese name: Sarashina-shôma.

Note: Nakai and Ohashi (1995) recognized the correct author name as "(DC.) Turcz." for this species.

9) **Ranunculus quelpaertensis** (H.Lév.) Nakai [BE/R];

**Ranunculus silerifolius** H.Lév. [WF/J]

Russian name: Lyutik chedjudinskij.

Japanese name: Kitsune-no-botan.

10) **Ranunculus repens** L. [collected by Eremenko in 2002/R][WF/J]

Russian name: Lyutik polzuchij.

Japanese name: Hai-kinpôge.

11) **Ranunculus transochotensis** H.Hara [BE/R];

**Ranunculus grandis** Honda var. **austrokurilensis** (Tatew.) H.Hara [WF/J]

Russian name: Lytik transokhotskij.

Japanese name: Shikotan-kinpôge.

Note: Charkevich (1995) recognized this species listed here as *R. novus* H. Lév. et Vaniot. Future taxonomic study is necessary.

12) **Thalictrum minus** L. [BE/R]; **Thalictrum minus**

L. var. **hypoleucum** (Siebold et Zucc.) Miq. [WF/J]

Russian name: Vasilistnik malyj.

Japanese name: Aki-karamatsu.

Note: *Thalictrum yezoense* Nakai cited by Barkalov and Eremenko (2003) needs further taxonomic clarification.

13) **Thalictrum sachalinense** Lecoy. [Eremenko (2003)/R][WF/J]

Russian name: Vasilistnik sakhalinskij.

Japanese name: Ezo-Karamatsu.

#### 16. NYMPHAEACEAE

1) **Nuphar pumila** (Timm) DC. [BE/R]; **Nuphar**

**pumilum** (Timm) DC. [WF/J]

Russian name: Kubyshka malaya.

Japanese name: Nemuro-kôhone.

Note: Most Japanese literatures had adopted the specific epithet "pumilum" as neuter. But recent Japanese botanists (Kadono 1994, Takahashi et al. 2005) used feminine for this species following the determination by the Committee for Spermatophyta (see Taxon 49, 267).

## 17. CHLORANTHACEAE

1) **Chloranthus japonicus** Siebold [BE/R][WF/J]

Russian name: Khlorant yaponskij.

Japanese name: Hitori-shizuka.

## 18. HYPERICACEAE

1) **Hypericum erectum** Thunb. [BE/R][WF/J]

Russian name: Zverboj pryamostoyachij.

Japanese name: Otogiri-sô.

2) **Hypericum gebleri** Ledeb. [BE/R]; **Hypericum ascyron** L. [WF/J]

Russian name: Zverboj Geblera.

Japanese name: Tomoe-sô.

Note: Charkevicz (1987) recognized *Hypericum gebleri* Ledeb. and *H. ascyron* L. as two separate species.

3) **Hypericum kamtschaticum** Ledeb. [BE/R][WF/J]

Russian name: Zverboj kamchatskij.

Japanese name: Hai-otogiri.

## 19. DROSERACEAE

1) **Drosera rotundifolia** L. [BE/R][FJ,WF/J]

Russian name: Rosyanka kruglolistnaya.

Japanese name: Môsen-goke.

## 20. PAPAVERACEAE

1) **Corydalis ambigua** Cham. et Schldl. [BE/R][WF/J]

Russian name: Khokhlatka izmenchivaya.

Japanese name: Ezo-engosaku.

## 21. BRASSICACEAE

1) **Arabis glauca** H.Boissieu [Eremenko (2003)/R];

**Arabis serrata** Franch. et Sav. var. **glauca** (H.Boissieu) Ohwi [WF/J]

Russian name: Rezukha sizaya.

Japanese name: Ezo-no-iwahatazao.

2) **Arabis stelleri** DC. subsp. **japonica** (A.Gray) Worosch. [BE/R]; **Arabis stelleri** DC. var. **japonica** (A.Gray) F.Schmidt [WF/J]

Russian name: Rezukha yaponskaya.

Japanese name: Hama-hatazao.

Note: Charkevicz (1988) did not recognize the subspecies and adopted *Arabis stelleri* DC. as the correct name. Czerepanov (1995) recognized *A. japonica* (A.Gray) A.Gray at specific rank. Intraspecific variation and the distinctions between *A. stelleri* DC., *A. japonica* (A.Gray) A.Gray and *A. hirsuta* (L.) Scop. needs further clarification.

3) **Barbarea orthoceras** Ledeb. [Eremenko (2003)/R][WF/J]

Russian name: Surepka pryamorogaya.

Japanese name: Yama-garashi.

4) **Capsella bursa-pastoris** (L.) Medik. [BE/R];

**Capsella bursa-pastoris** Medik. [WF/J]–Naturalized

Russian name: Pastush'ya sumka obyknovennaya.

Japanese name: Nazuna.

Note: This species is treated as the prehistoric naturalized plant in Japan (Shimizu 2003). Barkalov and Eremenko (2003) regarded it as one of the naturalized plants in the southern Kurils.

5) **Cardamine regeliana** Miq. [Eremenko (2003)/R][WF/J]

Russian name: Serdechnik Regelya.

Japanese name: Ôba-tanetsukebana.

6) **Cochlearia officinalis** L. [BE/R]; **Cochlearia oblongifolia** DC. [WF/J]

Russian name: Lozhechnitsa lekarstvennaya.

Japanese name: Tomoshiri-sô.

7) **Draba borealis** DC. [BE/R][WF/J]

Russian name: Krupka severnaya.

Japanese name: Ezo-inu-nazuna.

8) **Rorippa palustris** (L.) Bess. [BE/R]; **Rorippa islandica** (Oeder) Borbás [WF/J]

Russian name: Zherushnik bolotnyj.

Japanese name: Sukashi-ta-gobô.

## 22. CRASSULACEAE

1) **Rhodiola sachalinensis** Boriss. [BE/R]; **Rhodiola rosea** L. [FJ,WF/J]

Russian name: Rodiola sakhalinskaya.

Japanese name: Iwa-benkei.

Note: *Rhodiola rosea* was recognized in Charkevicz (1995; Fig. 64) but *R. sachalinensis* was not recognized (Fig. 65) from the Habomais. In Iwatsuki et al. (2001) *R. rosea* was adopted as a widely distributed species with high variability and *R. sachalinensis* was regarded as a synonym of *R. rosea*.

2) **Sedum erythrostictum** Miq. [BE/R]; **?Hylotelephium erythrostictum** (Miq.) H.Ohba [FJ,WF/J]

Russian name: Ochitok krasnonispechrennyj.

Japanese name: ?Benkei-sô.

Note: *Sedum erythrostictum* Miq. was regarded as a synonym of *Hylotelephium erythrostictum* (Miq.) H. Ohba in Iwatsuki et al. (2001), but this species is not native to Hokkaido but to Honshu. So it is doubtful whether this species is found in the Habomais. This needs further taxonomic study.

3) **Sedum kurilense** Worosch. [BE/R]; **Phedimus kamtschaticus** (Fisch. et C.A.Mey.) 't Hart [FJ/J]; **Sedum kamtschaticum** Fisch. [WF/J]

Russian name: Ochitok kurilskij.

Japanese name: Ezo-no-kirin-sô.

Note: Charkevicz (1995) recognized *Sedum kurilense* Worosch. and *S. kamtschaticum* Fisch. (= *Phedimus kamtschaticus* (Fisch. et C.A.Mey.) 't Hart) as two separate species.

4) **Sedum telephium** L. [BE/R]; **Hylotelephium pallescens** (Freyn) H.Ohba [FJ/J]; **Hylotelephium telephium** (L.) H.Ohba [WF/J]

Russian name: Ochitok zayachya kapusta.

Japanese name: Murasaki-benkei-sô.



Note: Nomenclature and the species distinction of the genus *Hylotelephium* in northeastern Asia needs further clarification. According to Cherepanov (1995) the correct name for this plant is *Hylotelephium triphyllum* (Haw.) Holub (= *H. telephium* (L.) H. Ohba, p.p., *Sedum purpureum* (L.) Schult., *S. telephium* sensu Czer.).

5) ***Sedum verticillatum*** L. [BE/R]; ***Hylotelephium verticillatum*** (L.) H. Ohba var. ***verticillatum*** [FJ, WF/J]

Russian name: Ochitok mutovchatyj.

Japanese name: Mitsuba-benkei-sô.

Note: Cherepanov (1995) treated *Hylotelephium verticillatum* (L.) H. Ohba as the correct name for this species.

## 23. SAXIFRAGACEAE

1) ***Hydrangea paniculata*** Siebold [BE/R][FJ/J]; ***Hydrangea paniculata*** Siebold et Zucc. [WF/J]

Russian name: Gortenziya metel'chataya.

Japanese name: Nori-utsugi.

2) ***Parnassia palustris*** L. [BE/R]; ***Parnassia palustris*** L. var. ***palustris*** [FJ/J]; ***Parnassia palustris*** L. var. ***multisetata*** Ledeb. [WF/J]

Russian name: Belozor bolotnyj.

Japanese name: Umebachi-sô.

3) ***Saxifraga bracteata*** D. Don [BE/R][FJ, WF/J]

Russian name: Kamnelomka pritsvetnikovaya.

Japanese name: Kiyoshi-sô.

## 24. ROSACEAE

1) ***Agrimonia japonica*** (Miq.) Koidz. [BE/R]; ***Agrimonia pilosa*** Ledeb. var. ***pilosa*** [FJ/J]; ***Agrimonia pilosa*** Ledeb. var. ***japonica*** (Miq.) Nakai [WF/J]

Russian name: Reptyashok yaponskij.

Japanese name: Kin-mizuhiki.

Note: Charkevicz (1996) adopted *Agrimonia striata* Michx. as the correct name for this species. He also mentioned *A. striata* Michx. subsp. *viscidula* (Bunge) Rumjantsev equivalent for the east Eurasian plants.

2) ***Aruncus dioicus*** (Walter) Fernald [BE/R]; ***Aruncus dioicus*** (Walter) Fernald var. ***kamtschaticus*** (Maxim.) H. Hara [FJ/J]; ***Aruncus dioicus*** (Walter) Fernald var. ***tenuifolius*** (Nakai) H. Hara [WF/J]

Russian name: Volzhanka dvudomnaya.

Japanese name: Yamabuki-shôma.

3) ***Comarum palustre*** L. [BE/R][FJ/J]; ***Potentilla palustris*** (L.) Scop. [WF/J]

Russian name: Sabel'nik bolotnyj.

Japanese name: Kurobana-rôge.

4) ***Filipendula camtschatica*** (Pall.) Maxim. [BE/R][FJ/J]; ***Filipendula kamtschatica*** (Pall.) Maxim. [WF/J]

Russian name: Labaznik kamchatskij.

Japanese name: Oni-shimotsuke.

5) ***Fragaria yezoensis*** H. Hara [BE/R][WF/J]; ***Fragaria nipponica*** Makino [FJ/J]

Russian name: Zemlyanika iezskaya.

Japanese name: Ezo-no-kusa-ichigo (for *F. yezoensis*), Shirobana-no-hebiichigo (for *F. nipponica*).

Note: Charkevicz (1996) recognized *Fragaria nipponica* Makino and *F. yezoensis* H. Hara as two separate species. In Iwatsuki et al. (2001) *F. yezoensis*

H. Hara is regarded as a synonym of *F. nipponica* Makino.

6) ***Geum aleppicum*** Jacq. [BE/R][FJ, WF/J]—Naturalized?

Russian name: Gravitat aleppskij.

Japanese name: Ô-daikon-sô.

Note: This species has not been treated as the naturalized plant in Japan (Satake et al. 1982b; Shimizu 2003), but Barkalov and Eremenko (2003) regarded it as one of the naturalized plants in the southern Kurils.

7) ***Geum fauriei*** H. Lévl. [BE/R]; ***Geum macrophyllum*** Willd. var. ***sachalinense*** (Koidz.) H. Hara [FJ, WF/J]

Russian name: Gravitat Fori.

Japanese name: Karafuto-daikon-sô.

Note: Charkevicz (1996) adopted *Geum macrophyllum* Willd. as the correct name. But he also mentioned *G. macrophyllum* Willd. subsp. *fauriei* (H. Lévl.) Worosch. equivalent for the plants of Kamchatka, Sakhalin, the Kurils and Japan.

8) ***Potentilla egedii*** Wormsk. var. ***grandis*** (Torr. et A. Gray) H. Hara [BE/R]; ***Potentilla anserina*** L. [FJ/J]; ***Potentilla egedei*** Wormsk. var. ***grandis*** (Torr. et A. Gray) H. Hara [WF/J]

Russian name: Lapchatka Egeda.

Japanese name: Ezo-tsuru-kinbai.

Note: Charkevicz (1996) adopted *Potentilla anserina* L. as the correct name. But he also mentioned *P. anserina* L. subsp. *egedii* (Wormsk.) Hiit. equivalent for the plants of Russian Far East.

9) ***Potentilla megalantha*** Takeda [BE/R][FJ, WF/J]

Russian name: Lapchatka krupnotsvetkovaya.

Japanese name: Chishima-kinbai.

Note: Charkevicz (1996) adopted *Potentilla fragiformis* Willd. ex Schldtl. as the correct name, but he also mentioned *P. fragiformis* Willd. ex Schldtl. subsp. *megalantha* (Takeda) Hult. equivalent for the plants of Sakhalin, the Kurils to Japan.

10) ***Potentilla stolonifera*** Lehm. ex Ledeb. [BE/R]; ***Potentilla fragarioides*** L. [FJ/J]; ***Potentilla stolonifera*** Lehm. [WF/J]

Russian name: Lapchatka pobegonosnaya.

Japanese name: Tsuru-kiji-mushiro.

Note: Charkevicz (1996) recognized *Potentilla stolonifera* Lehm. ex Ledeb. and *P. fragarioides* L. as two separate species. In Iwatsuki et al. (2001) the former species is considered as a synonym of the latter.

11) ***Rosa rugosa*** Thunb. [BE/R][FJ, WF/J]

Russian name: Shipovnik morshchinistyj.

Japanese name: Hama-nashi, Hama-nasu.

12) ***Rubus mesogaeus*** Focke ex Diels [BE/R]; ***Rubus mesogaeus*** Focke [FJ, WF/J]

Russian name: Malina nazemnaya.

Japanese name: Kuro-ichigo.

13) ***Rubus sachalinensis*** H. Lévl. [BE/R]; ***Rubus idaeus*** L. [FJ/J]; ***Rubus matsumuranus*** H. Lévl. et Vaniot. [WF/J]

Russian name: Malina sakhalinskaya.

Japanese name: Ezo-ki-ichigo, Ezo-ichigo.

14) ***Sanguisorba parviflora*** (Maxim.) Takeda [BE/R]; ***Sanguisorba tenuifolia*** Fisch. ex Link var. ***tenuifolia*** [FJ/J]; ***Sanguisorba tenuifolia*** Fisch. ex Link var. ***alba***

Trautv. et Mey. [WF/J]

Russian name: Krovokhleбка melkotsvetkovaya.

Japanese name: Nagabo-no-waremokô (for *S. tenuifolia* var. *tenuifolia*), Nagabo-no-shiro-waremokô (for *S. tenuifolia* var. *alba*).

**15) *Sanguisorba tenuifolia*** Fisch. ex Link [BE/R]; ***Sanguisorba tenuifolia*** Fisch. ex Link var. ***grandiflora*** Maxim. [FJ,WF/J]

Russian name: Krovokhleбка tonkolistnaya.

Japanese name: Chishima-waremokô.

Note: Intraspecific variation and the specific distinction of the *Sanguisorba tenuifolia* complex needs clarification.

**16) *Sorbaria stellipila*** (Maxim.) S.K.Schneid. [BE/R]; ***Sorbaria sorbifolia*** (L.) A.Br. var. ***stellipila*** Maxim. [FJ/J]; ***Sorbaria sorbifolia*** (L.) A.Br. [WF/J]

Russian name: Ryabinolistnik zvezdchato-volosistyj.

Japanese name: Hozaki-nanakamado.

Note: Charkevich (1996) adopted *Sorbaria sorbifolia* (L.) A.Br. as the correct name, but he also mentioned *S. sorbifolia* (L.) A.Br. var. *stellipila* Maxim. for the plants of the southern Kurils and Japan.

**17) *Sorbus sambucifolia*** Cham. et Schltld. [BE/R]; ***Sorbus sambucifolia*** (Cham. et Schltld.) M.Roem. [FJ,WF/J]

Russian name: Ryábina buzinolistnaya.

Japanese name: Takane-nanakamado.

**18) *Spiraea beauverdiana*** C.K.Schneid. [BE/R]; ***Spiraea betulifolia*** Pall. var. ***aemiliana*** (C.K.Schneid.) Koidz. [FJ/J]; ***Spiraea betulifolia*** Pall. subsp. ***aemiliana*** (C.K.Schneid.) H.Hara [WF/J]

Russian name: Tavolga Bovera.

Japanese name: Ezo-maruba-shimotsuke.

**19) *Spiraea betulifolia*** Pall. [BE/R]; ***Spiraea betulifolia*** Pall. var. ***betulifolia*** [FJ,WF/J]

Russian name: Tavolga berezolistnaya.

Japanese name: Maruba-shimotsuke.

**20) *Spiraea salicifolia*** L. [BE/R][FJ,WF/J]

Russian name: Tavolga ivolistnaya.

Japanese name: Hozaki-shimotsuke.

## 25. FABACEAE

**1) *Lathyrus japonicus*** Willd. [BE/R]; ***Lathyrus japonicus*** Willd. subsp. ***japonicus*** [FJ,WF/J]

Russian name: China yaponskaya.

Japanese name: Hama-endô.

**2) *Lathyrus pilosus*** Cham. [BE/R]; ***Lathyrus palustris*** L. subsp. ***pilosus*** (Cham.) Hultén [FJ,WF/J]

Russian name: China volosistaya.

Japanese name: Ezo-no-renri-sô.

**3) *Lespedeza bicolor*** Turcz. [BE/R][FJ,WF/J]

Russian name: Lespedetsa dvutsvetnaya.

Japanese name: Yama-hagi.

**4) *Thermopsis lupinoides*** (L.) Link [BE/R][FJ,WF/J]

Russian name: Termopsis lyupinovidnyj.

Japanese name: Sendai-hagi.

**5) *Trifolium hybridum*** L. [BE/R][FJ,WF/J]–Naturalized

Russian name: Klever gibridnyj.

Japanese name: Tachi-oranda-geenge.

**6) *Trifolium pratense*** L. [BE/R][FJ,WF/J]–Naturalized

Russian name: Klever lugovoy or Klever krasnyi.

Japanese name: Murasaki-tsumekusa.

**7) *Trifolium repens*** L. [BE/R][FJ,WF/J]–Naturalized

Russian name: Klever polzuchij or Klever belyi.

Japanese name: Shiro-tsumekusa.

**8) *Vicia cracca*** L. [BE/R][FJ,WF/J]

Russian name: Goroshek myshinyj.

Japanese name: Kusa-fuji.

**9) *Vicia unijuga*** A.Braun [BE/R][WF/J]; ***Vicia unijuga***

A.Braun [FJ/J]

Russian name: Goroshek odnoparnyj.

Japanese name: Nanten-hagi.

## 26. GERANIACEAE

**1) *Geranium erianthum*** DC. [BE/R][FJ,WF/J]

Russian name: Geran' volosistotsvetkovaya.

Japanese name: Chishima-fûro.

**2) *Geranium sibiricum*** L. [BE/R][FJ,WF/J]; ***Geranium sibiricum*** L. var. ***glabrium*** (H.Hara) Ohwi [WF/J]–Naturalized?

Russian name: Geran' sibirskaya.

Japanese name: Ichige-fûro.

Note: Barkalov and Eremenko (2003) regarded it as one of the naturalized plants in the Habomais, but it is not treated as the naturalized plant in Japan (Satake et al. 1982b; Shimizu 2003).

**3) *Geranium yesoense*** Franch. et Sav. [BE/R];

***Geranium yesoense*** Franch. et Sav. var. ***yesoense*** [FJ,WF/J]

Russian name: Geran' iezskaya.

Japanese name: Ezo-fûro.

## 27. CELASTRACEAE

**1) *Celastrus strigillosa*** Nakai [BE/R]; ***Celastrus orbiculatus*** Thunb. var. ***strigillosus*** (Nakai) Makino [FJ,WF/J]

Russian name: Drevogubets shchyotkovidnyj.

Japanese name: Oni-tsuru-umemodoki.

## 28. VITACEAE

**1) *Vitis coignetiae*** Pulliat ex Planch. [BE/R][FJ,WF/J]

Russian name: Vinograd Kon'ye.

Japanese name: Yama-buddô.

## 29. VIOLACEAE

**1) *Viola patrinii*** Ging. [BE/R]; ***Viola patrinii*** DC. ex

Ging. [FJ/J]; ***Viola patrinii*** DC. [WF/J]

Russian name: Fialka Patrena.

Japanese name: Shiro-sumire.

**2) *Viola sachalinensis*** H.Boissieu [BE/R][FJ,WF/J]

Russian name: Fialka sakhalinskaya.

Japanese name: Ainu-tachitsubo-sumire.

## 30. LYTHRACEAE

**1) *Lythrum salicaria*** L. [BE/R][WF/J]; ***Lythrum***

***salicaria*** L. subsp. ***salicaria*** [FJ/J]

Russian name: Derbennik ivolistnyj.

Japanese name: Ezo-miso-hagi.

## 31. ONAGRACEAE

**1) *Chamaenerion angustifolium*** (L.) Scop. [BE/R][WF/

J]; **Chamerion angustifolium** (L.) Holub subsp. **angustifolium** [FJ/J]

Russian name: Ivan-chai uzkolistnyj.

Japanese name: Yanagi-ran.

2) **Circaea alpina** L. [BE/R][WF/J]; **Circaea alpina** L. subsp. **alpina** [FJ/J]

Russian name: Dvulepstinik al'pijskij.

Japanese name: Miyama-tanitade.

3) **Epilobium amurense** Hausskn. [BE/R][WF/J]; **Epilobium amurense** Hausskn. subsp. **amurense** [FJ/J]

Russian name: Kiprej amurskij.

Japanese name: Kegon-akabana.

4) **Epilobium cephalostigma** Hausskn. [BE/R][WF/J]; **Epilobium amurense** Hausskn. subsp. **cephalostigma** (Hausskn.) C.J.Chen, P.C.Hoch et P.H.Raven [FJ/J]

Russian name: Kiprej golovchatoryltsevyj.

Japanese name: Iwa-akabana.

5) **Epilobium maximowiczii** Hausskn. [BE/R]; **Epilobium ciliatum** Raf. subsp. **ciliatum** [FJ/J]; **Epilobium glandulosum** Lehm. var. **asiaticum** H.Hara [WF/J]

Russian name: Kiprej Maksimovicha.

Japanese name: Karafuto-akabana.

6) **Oenothera biennis** L. [BE/R][FJ,WF/J]—Naturalized  
Russian name: Enotera dvuletnyaya.  
Japanese name: Me-matsuyoigusa.

### 32. HIPPURIDACEAE

1) **Hippuris vulgaris** L. [BE/R][FJ,WF/J]

Russian name: Khvostnik obyknovennyj or Vodyanaya sosenka obyknovennaya.

Japanese name: Suginamo.

### 33. CORNACEAE

1) **Chamaepericlymenum suecicum** (L.) Asch. et Graebn. [BE/R][FJ,WF/J]

Russian name: Dyoren shvedskij.

Japanese name: Ezo-gozen-tachibana.

### 34. APIACEAE

1) **Angelica genuflexa** Nutt. ex Torr. et A.Gray [BE/R][FJ/J]; **Angelica genuflexa** Nutt. [WF/J]

Russian name: Dudnik prelomlennyj.

Japanese name: Ôba-senkyû.

2) **Angelica gmelinii** (DC.) M.Pimen. [BE/R]; **Coelopleurum gmelinii** (DC.) Ledeb. [FJ,WF/J]

Russian name: Dudnik Gmelina.

Japanese name: Ezo-no-shishiudo.

3) **Angelica sachalinensis** Maxim. [BE/R]; **Angelica anomala** Avé-Lall. subsp. **sachalinensis** (Maxim.) H.Ohba [FJ/J]; **Angelica anomala** Avé-Lall. [WF/J]

Russian name: Dudnik sakhalinskij.

Japanese name: Ezo-no-yoroigusa.

4) **Anthriscus sylvestris** (L.) Hoffm. [BE/R][FJ/J]; **Anthriscus aemula** Schischk. [WF/J]

Russian name: Kupyr' lesnoi.

Japanese name: Shaku.

5) **Buplerum longiradiatum** Turcz. [BE/R]; **Buplerum longiradiatum** Turcz. var. **breviradiatum** F.Schmidt [FJ/J]; **Buplerum longeradiatum** Turcz.

subsp. **sachalinense** (F.Schmidt) Kitag. var. **sachalinense** [WF/J]

Russian name: Volodushka dlinnoluchevaya.

Japanese name: Hotaru-saiko (for *B. longiradiatum* var. *breviradiatum*), Ezo-hotaru-saiko (for *B. longeradiatum* subsp. *sachalinense* var. *sachalinense*).

Note: According to Japanese literature *Buplerum longiradiatum* var. *shikotanense* (M.Hiroe) Ohwi is native to Shikotan.

6) **Cicuta virosa** L. [BE/R][FJ,WF/J]

Russian name: Vekh yadovityj.

Japanese name: Doku-zero.

7) **Conioselinum chinense** (L.) Britt., Pogg. et Sterns [BE/R]; **Conioselinum kamtschaticum** Rupr. [FJ,WF/J]

Russian name: Girchovnik kitajskij.

Japanese name: Karafuto-ninjin.

Note: *C. chinense* (L.) Britt., Pogg. et Sterns is the correct name (see Takahashi et al. 1999, 2002).

8) **Glehnia littoralis** F.Schmidt ex Miq. [BE/R] [WF/J]; **Glehnia littoralis** F.Schmidt [FJ/J]

Russian name: Gleniya pribrezhnaya.

Japanese name: Hama-bôfû.

9) **Heracleum lanatum** Michx. [BE/R]; **Heracleum sphondylium** L. subsp. **montanum** (Schleich. ex Gaudin) Briq. [FJ/J]; **Heracleum dulce** Fisch. [WF/J]

Russian name: Borshchevik sherstistij.

Japanese name: Ô-hana-udo.

10) **Ligusticum scoticum** L. [BE/R]; **Ligusticum hultenii** Fernald [FJ,WF/J]

Russian name: Ligustikum shotlandskij.

Japanese name: Maruba-tôki.

11) **Pleurospermum uralense** Hoffm. [BE/R]; **Pleurospermum austriacum** Hoffm. subsp. **uralense** (Hoffm.) Sommier [FJ/J]; **Pleurospermum camtschaticum** Hoffm. [WF/J]

Russian name: Rebroplodnik ural'skij.

Japanese name: Ô-kasamochi.

### 35. ERICACEAE

1) **Chamaedaphne calyculata** (L.) Moench [BE/R][FJ,WF/J]

Russian name: Bolotnyj mirt.

Japanese name: Yachi-tsutsuji.

2) **Ledum hypoleucum** Kom. [BE/R]; **Ledum palustre** L. subsp. **diversipilosum** (Nakai) H.Hara [FJ/J]; **Ledum palustre** L. subsp. **diversipilosum** (Nakai) H.Hara var. **diversipilosum** [WF/J]

Russian name: Bagul'nik podbel.

Japanese name: Karafuto-iso-tsutsuji.

Note: In Charkevicz (1991) *Ledum hypoleucum* Kom. and *L. palustriforme* Khokhr. et Mazurenko were recorded from the southern Kurils. Intraspecific variation and the distinctions between the *Ledum* species needs reexamination.

3) **Oxycoccus microcarpus** Turcz. ex Rupr. [BE/R]; **Vaccinium microcarpum** (Turcz. ex Rupr.) Schmalh. [FJ/J]; **Vaccinium microcarpum** (Turcz.) Schmalh. [WF/J]

Russian name: Klyukva melkoplodnaya.

- Japanese name: Hime-tsuru-kokemomo.
- 4) **Oxycoccus palustris** Pers. [BE/R]; **Vaccinium oxycoccus** L. [FJ,WF/J]  
 Russian name: Klyukva bolotnaya.  
 Japanese name: Tsuru-kokemomo.
- 5) **Rhodococcus vitis-idaea** (L.) Avrorin [BE/R]; **Vaccinium vitis-idaea** L. [FJ,WF/J]  
 Russian name: Brusnika obyknovennaya.  
 Japanese name: Koke-momo.  
 Note: Czerepanov (1995) adopted the latter, *Vaccinium vitis-idaea* L. as the correct name.
- 6) **Vaccinium axillare** Nakai [BE/R]; **Vaccinium ovalifolium** Sm. [FJ,WF/J]  
 Russian name: Chernika pazushnaya.  
 Japanese name: Kuro-usugo.
- 7) **Vaccinium praestans** Lamb. [BE/R][FJ,WF/J]  
 Russian name: Krasnika.  
 Japanese name: Iwa-tsutsuji.
- 8) **Vaccinium uliginosum** L. [BE/R][FJ,WF/J]  
 Russian name: Golubika.  
 Japanese name: Kuromame-no-ki (in the broad sense).

### 36. EMPETRACEAE

- 1) **Empetrum albidum** V.Vassil. [BE/R]; **Empetrum nigrum** L. var. **japonicum** K.Koch [FJ,WF/J]  
 Russian name: Shiksha belovataya.  
 Japanese name: Gankô-ran.
- 2) **Empetrum sibiricum** V.Vassil. [BE/R]; **Empetrum nigrum** L. var. **japonicum** K.Koch [FJ,WF/J]  
 Russian name: Shiksha sibirskaya.  
 Japanese name: Gankô-ran.  
 Note: Russian botanists classified *Empetrum* into several species in the Russian Far East, but most Japanese regarded it as a single species in the Northern Hemisphere.

### 37. PRIMULACEAE

- 1) **Glaux maritima** L. [BE/R]; **Glaux maritima** L. var. **obtusifolia** Fernald [FJ,WF/J]  
 Russian name: Glauks primorskij.  
 Japanese name: Umi-midori.
- 2) **Lysimachia davurica** Ledeb. [BE/R]; **Lysimachia vulgaris** L. var. **davurica** (Ledeb.) Kunth [FJ,WF/J]  
 Russian name: Verbejnik daurskij.  
 Japanese name: Kusa-redama.
- 3) **Naumburgia thyrsoflora** (L.) Rchb. [BE/R][FJ/J]; **Lysimachia thyrsoflora** L. [WF/J]  
 Russian name: Naumburgiya kistetsvetkovaya.  
 Japanese name: Yanagi-tora-no-o.
- 4) **Primula fauriei** Franch. [BE/R]; **Primula modesta** Bisset et Moore var. **fauriei** (Franch.) Takeda [FJ,WF/J]  
 Russian name: Pervotsvet Fori.  
 Japanese name: Yukiwari-kozakura.

### 38. GENTIANACEAE

- 1) **Gentiana axillariflora** H.Lév. et Vaniot [BE/R]; **Gentiana triflora** Pall. var. **japonica** (Kusn.) H.Hara [FJ,WF/J]  
 Russian name: Gorechavka pazushnaya.  
 Japanese name: Ezo-rindô.
- 2) **Gentianella auriculata** (Pall.) Gillett [BE/R][FJ,WF/

- J]  
 Russian name: Gorechavochka ushastaya.  
 Japanese name: Chishima-rindô.
- 3) **Halenia corniculata** (L.) Cornaz [BE/R][FJ,WF/J]  
 Russian name: Galeniya rozhkovidnaya.  
 Japanese name: Hana-ikari.
- 4) **Ophelia tetrapetala** (Pall.) Grossh. [BE/R]; **Swertia tetrapetala** Pall. [FJ,WF/J]  
 Russian name: Ofeliya chetyrekhlepestnaya.  
 Japanese name: Chishima-senburi.

### 39. MENYANTHACEAE

- 1) **Menyanthes trifoliata** L. [BE/R][FJ,WF/J]  
 Russian name: Vakhta trekhlistnaya.  
 Japanese name: Mitsu-gashiwa.

### 40. RUBIACEAE

- 1) **Galium boreale** L. [BE/R][FJ/J]; **Galium boreale** L. var. **kamtschaticum** Maxim. [WF/J]  
 Russian name: Podmarennik severnyj.  
 Japanese name: Ezo-kinuta-sô.
- 2) **Galium ruthenicum** Willd. [BE/R]; **Galium verum** L. var. **trachycarpum** DC. [FJ,WF/J]  
 Russian name: Podmarennik russkij.  
 Japanese name: Ezo-kawara-matsuba.
- 3) **Galium trifidum** L. [BE/R]; **Galium trifidum** L. var. **brevipedunculatum** Regel [FJ,WF/J]  
 Russian name: Podmarennik trekhrazdelnyj.  
 Japanese name: Hosobano-yotsuba-mugura.
- 4) **Rubia jesoensis** (Miq.) Miyabe et Miyake [BE/R][FJ,WF/J]  
 Russian name: Marena iezskaya.  
 Japanese name: Akane-mugura.

### 41. BORAGINACEAE

- 1) **Mertensia maritima** (L.) S.F.Gray [BE/R]; **Mertensia maritima** (L.) S.F.Gray subsp. **asiatica** Takeda [FJ,WF/J]  
 Russian name: Mertenziya primorskaya.  
 Japanese name: Hama-benkei-sô.
- 2) **Myosotis sachalinensis** M.Pop. [BE/R]; **Myosotis sylvatica** Ehrh. ex Hoffm. [FJ/J]; **Myosotis sylvatica** (Ehrh.) Hoffm. [WF/J]  
 Russian name: Nezabudka sakhalinskaya.  
 Japanese name: Ezo-murasaki.

### 42. LAMIACEAE

- 1) **Clinopodium chinense** (Benth.) O.Kuntze [BE/R]; **Clinopodium chinense** (Benth.) O.Kuntze var. **parviflorum** (Kudô) H.Hara [FJ/J]; **Clinopodium chinense** (Benth.) O.Kuntze subsp. **grandiflorum** (Maxim.) H.Hara var. **parviflorum** (Kudô) H.Hara [WF/J]  
 Russian name: Pakhuchka kitajskaya.  
 Japanese name: Kuruma-bana.  
 Note: *Clinopodium kunashirensense* Prob. (Charkevicz, 1995) needs further comparison with Japanese plants.
- 2) **Clinopodium sachalinense** (F.Schmidt) Koidz. [BE/R][WF/J]; **Clinopodium micranthum** (Regel) H.Hara var. **sachalinense** (F.Schmidt) Yamazaki et Murata [FJ/

- J]  
 Russian name: Pakhuchka sakhalinskaya.  
 Japanese name: Miyama-tôbana.
- 3) **Lycopus lucidus** Turcz. ex Benth. [BE/R]; **Lycopus lucidus** Turcz. [FJ, WF/J]  
 Russian name: Zyuznik blestyashchij.  
 Japanese name: Shirone.
- 4) **Lycopus uniflorus** Michx. [BE/R][FJ, WF/J]  
 Russian name: Zyuznik odnotsvetkovyj.  
 Japanese name: Ezo-shirone.
- 5) **Mentha canadensis** L. var. **piperascens** (Malinv. ex Holmes) H.Hara [BE/R]; **Mentha arvensis** L. subsp. **piperascens** (Malinv.) H.Hara [FJ/J]; **Mentha arvensis** L. var. **piperascens** Malinv. [WF/J]  
 Russian name: Myata kanadskaya.  
 Japanese name: Hakka.
- Note: Charkevich (1995) adopted *Mentha canadensis* L. as the correct name.
- 6) **Prunella asiatica** Nakai [BE/R]; **Prunella vulgaris** L. subsp. **asiatica** (Nakai) H.Hara [FJ, WF/J]  
 Russian name: Chernogolovka aziatskaya.  
 Japanese name: Utsubo-gusa.
- 7) **Scutellaria strigillosa** Hemsl. [BE/R][FJ, WF/J]  
 Russian name: Shlemnik shchetinistyj.  
 Japanese name: Namiki-sô.
- 8) **Scutellaria yezoënsis** Kudô [BE/R]; **Scutellaria yezoënsis** Kudô [FJ/J]; **Scutellaria strigillosa** Hemsl. var. **yezoënsis** (Kudô) Kitam. [WF/J]  
 Russian name: Shlemnik iezskij.  
 Japanese name: Ezo-namiki-sô.
- 9) **Stachys aspera** Michx. [BE/R]; **Stachys riederi** Cham. var. **riederi** [FJ/J]; **Stachys riederi** Cham. var. **villosa** (Kudô) H.Hara [WF/J]  
 Russian name: Chistets sherokhovatyj.  
 Japanese name: Ezo-inugoma.

#### 43. SCROPHULARIACEAE

- 1) **Euphrasia yezoënsis** H.Hara [BE/R]; **Euphrasia maximowiczii** Wettst. var. **yezoënsis** H.Hara [FJ, WF/J]  
 Russian name: Ochanka iezskaya.  
 Japanese name: Ezo-kogome-gusa.
- 2) **Linaria japonica** Miq. [BE/R][FJ, WF/J]  
 Russian name: L'nyanka yaponskaya.  
 Japanese name: Unran.
- 3) **Pedicularis resupinata** L. [BE/R]; **Pedicularis resupinata** L. subsp. **teucrifolia** (Bieb. ex Steven) Yamazaki [FJ/J]; **Pedicularis resupinata** L. var. **resupinata** [WF/J]  
 Russian name: Mytnik perevernutyj.  
 Japanese name: Birôdo-shiogama (for *P. resupinata* subsp. *teucrifolia*), Shiberia-shiogama (for *P. resupinata* var. *resupinata*).
- 4) **Scrophularia grayana** Maxim. ex Kom. [BE/R][FJ/J]; **Scrophularia grayana** Maxim. [WF/J]  
 Russian name: Norichnik Greya.  
 Japanese name: Ezo-hinano-usutsubo.

#### 44. PLANTAGINACEAE

- 1) **Plantago camtschatica** Link [BE/R]; **Plantago camtschatica** Cham. ex Link [FJ/J]; **Plantago**

**camtschatica** Cham. [WF/J]

Russian name: Podorozhnik kamchatskij.  
 Japanese name: Ezo-ôbako.

2) **Plantago cornuti** Gouan [BE/R]; **Plantago asiatica** L. [FJ, WF/J]

Russian name: Podorozhnik Kornuga  
 Japanese name: Ôbako.

Note: Czerepanov (1995) adopted *Plantago cornuti* Gouan, on the other hand Chakevich (1996) adopted *P. asitatica* L. as the correct name.

3) **Plantago japonica** Franch. et Sav. [Czerepanov (1995), Charkevich (1996)/R]; **Plantago major** L. var. **japonica** (Franch. et Sav.) Miyabe [FJ, WF/J]

Russian name: Podorozhnik yaponskij.  
 Japanese name: Tô-ôbako.

#### 45. CAPRIFOLIACEAE

1) **Lonicera caerulea** L. [BE/R]; **Lonicera caerulea** L. subsp. **edulis** (Turcz.) Hultén [FJ, WF/J]

Russian name: Zhimolost' golubaya.  
 Japanese name: Ke-yonomi.

Note: Charkevich (1987; Fig. 92) regarded *Lonicera edulis* Turcz. ex Freyn as the plants growing more inland regions of northeastern Asia, and regarded *L. caerulea* L. as those of the Okhotsk Sea regions. These treatments may be contrary between Russia and Japan.

2) **Lonicera sachalinensis** (F.Schmidt) Nakai [BE/R]; **Lonicera maximowiczii** (Rupr. ex Maxim.) Rupr. ex Maxim. var. **sachalinensis** F.Schmidt [FJ, WF/J]

Russian name: Zhimolost' sakhalinskaya.  
 Japanese name: Benibana-hyôtanboku.

3) **Sambucus sieboldiana** (Miq.) Schwer. var. **miquelii** (Nakai) H.Hara [BE/R]; **Sambucus racemosa** L. subsp. **kamtschatica** (E. Wolf) Hultén [FJ, WF/J]

Russian name: Buzina Mikeli.  
 Japanese name: Ezo-niwatoko.

Note: Charkevich (1987) adopted *S. sieboldiana* (Miq.) Schwer. as the correct name.

4) **Viburnum sargentii** Koehne [BE/R]; **Viburnum opulus** L. var. **calvescens** (Rehder) H.Hara [FJ, WF/J]

Russian name: Kalina Sarzhenta.  
 Japanese name: Kanboku.

#### 46. ADOXACEAE

1) **Adoxa moschatellina** L. [BE/R][FJ, WF/J]

Russian name: Adoksa muskusnaya.  
 Japanese name: Renpuku-sô.

#### 47. VALERIANACEAE

1) **Patrinia scabiosifolia** Fisch. ex Link [BE/R]; **Patrinia scabiosifolia** Fisch. ex Trevir. [FJ/J]; **Patrinia scabiosaefolia** Fisch. [WF/J]

Russian name: Patreniya skabiozolistnaya.  
 Japanese name: Ominaeshi.

#### 48. CAMPANULACEAE

1) **Adenophora triphylla** (Thunb.) A.DC. [BE/R]; **Adenophora triphylla** (Thunb.) A.DC. var. **japonica** (Regel) H.Hara ["Thunb. ex Murray", FJ/J]; **Adenophora triphylla** (Thunb.) A.DC. var. **japonica** (Regel) H.Hara

[WF/J]

Russian name: Bubenchik trekhlistnyj.

Japanese name: Tsurigane-ninjin.

Note: The author name "Thunb. ex Murray" should be cited as "Thunb." (Bartholomew et al. 1997).

2) **Campanula langsdorffiana** Fisch. ex Trautv. et C.A.Mey. [BE/R]; not listed [FJ,WF/J]

Russian name: Kolokol'chik Langsdorfa.

Japanese name: Hosoba-no-iwa-gikyô.

Note: This species is not native to Hokkaido but found in Sakhalin. This species is very rare in the Kurils, Charkevicz (1996) recorded it from the Habomais only within the Kurils. Miyabe (1890) referred to the specimen collected by Mertens from Urup, but Tatewaki (1957) did not list this species from the Kurils

3) **Campanula lasiocarpa** Cham. [BE/R][FJ,WF/J]

Russian name: Kolokol'chik pushistoplodnyj.

Japanese name: Iwa-gikyô.

4) **Lobelia sessilifolia** Lamb. [BE/R][FJ,WF/J]

Russian name: Lobeliya sidyachelistnaya.

Japanese name: Sawa-gikyô

#### 49. ASTERACEAE

1) **Achillea millefolium** L. [BE/R][WF/J]—Naturalized

Russian name: Tsyachelistnik obyknovennyj.

Japanese name: Seiyô-nokogiri-sô.

2) **Anaphalis margaritacea** (L.) A.Gray [BE/R];

**Anaphalis margaritacea** (L.) Benth. et Hook.f. [FJ,WF/J]

Russian name: Anafalis zhemchuzhnyj.

Japanese name: Yama-hahako.

3) **Artemisia gmelinii** Weber ex Stechm. [BE/R][FJ/J];

**Artemisia iwayomogi** Kitam. [WF/J]

Russian name: Polyn' Gmelina.

Japanese name: Iwa-yomogi.

4) **Artemisia koidzumii** Nakai [BE/R][FJ, WF/J]

Russian name: Polyn' Koidzumi.

Japanese name: Hiroha-urajiro-yomogi.

5) **Artemisia laciniata** Willd. [BE/R][FJ,WF/J]

Russian name: Polyn' dol'chataya.

Japanese name: Shikotan-yomogi.

6) **Artemisia littoricola** Kitam. [BE/R]; **Artemisia japonica** Thunb. subsp. **littoricola** (Kitam.) Kitam. [FJ,WF/J]

Russian name: Polyn' pribrezhnaya.

Japanese name: Hama-otoko-yomogi.

7) **Artemisia montana** Pamp. [BE/R]; **Artemisia montana** (Nakai) Pamp. [FJ,WF/J]

Russian name: Polyn' gornaya.

Japanese name: Ô-yomogi, Ezo-yomogi.

8) **Artemisia stelleriana** Besser [BE/R][FJ,WF/J]

Russian name: Polyn' Stellera.

Japanese name: Shiro-yomogi.

9) **Artemisia unalaskensis** Rydb. [BE/R][FJ,WF/J]

Russian name: Polyn' unalyashkinskaya.

Japanese name: Chishima-yomogi.

10) **Aster glehnii** F.Schmidt [BE/R][“glehni”, FJ,WF/J]

Russian name: Astra Glena.

Japanese name: Ezo-gomana.

11) **Cacalia kamtschatica** (Maxim.) Kudô [BE/R];

**Parasenecio auriculata** (DC.) H.Koyama var. **kamtschatica** (Maxim.) H.Koyama [FJ/J]; **Cacalia auriculata** DC. var. **kamtschatica** (Maxim.) Matsum. [WF/J]

Russian name: Kakaliya kamchatskaya.

Japanese name: Mimi-kômori.

12) **Cacalia robusta** Tolm. [BE/R]; **Parasenecio hastata** (L.) H.Koyama subsp. **orientalis** (Kitam.) H.Koyama var. **orientalis** [FJ/J]; **Cacalia hastata** L. subsp. **orientalis** Kitam. [WF/J]

Russian name: Kakaliya moshnaya.

Japanese name: Yobusuma-sô.

Note: Charkevicz (1992) recognized *Cacalia hastata* L. and *C. robusta* Tolm. as two separate species. According to him, the former is more northern and continental species, and the latter is native to southern regions of Sakhalin and the Kurils.

13) **Chorisis repens** (L.) DC. [BE/R]; **Ixeris repens** (L.) A.Gray [FJ,WF/J]

Russian name: Khorisis polzuchij.

Japanese name: Hama-nigana.

14) **Cichorium intybus** L. [BE/R][Shimizu (2003)/J]—Naturalized

Russian name: Tsikorij obyknovennyj.

Japanese name: Kiku-nigana.

15) **Cirsium charkeviczii** Barkalov [BE/R]; not listed [FJ,WF/J]

Russian name: Bodyak Kharkevicha.

Japanese name: ?Ezo-no-sawa-azami (in the broad sense).

Note: This taxon is not recognized in the Japanese botanists, and it may be possibly included in the infraspecific variation of *Cirsium pectinellum* A.Gray in the sense of Japanese.

16) **Cirsium kamtschaticum** Ledeb. ex DC. [BE/R][FJ/J]; **Cirsium kamtschaticum** Ledeb. [WF/J]

Russian name: Bodyak kamchatskij.

Japanese name: Chishima-azami.

17) **Cirsium pectinellum** A.Gray [BE/R][FJ/J]; **Cirsium kamtschaticum** Ledeb. subsp. **pectinellum** (A.Gray) Kitam. [WF/J]

Russian name: Bodyak grebenchatyj.

Japanese name: Ezo-no-sawa-azami, Shikotan-azami.

Note: The Habomai plants may be equivalent to *Cirsium pectinellum* A.Gray var. *shikotanense* Miyabe et Tatew. which is considered as a synonym of *C. pectinellum* A.Gray (Iwatsuki et al. 1995b).

18) **Erigeron kamtschaticus** DC. [Ereimenko (2003)/R]; **Erigeron acer** L. var. **kamtschaticus** (DC.) Herder [FJ,WF/J]

Russian name: Melkolepestnik kamchatskij.

Japanese name: Mukashi-yomogi.

19) **Erigeron sachalinensis** Botsch. [BE/R]; **Erigeron acer** L. var. **acer** [FJ,WF/J]

Russian name: Melkolepestnik sakhalinskij.

Japanese name: Ezo-mukashi-yomogi.

Note: Charkevicz (1992) recognized *Erigeron sachalinensis* Botsch. and *E. acris* L. (= *E. acer* L.) as two separate species. The former is regarded as the plants of Sakhalin and the southern Kurils, and the latter is as

the plants which are not found in those regions. Further taxonomic study on the *E. acer* group is necessary.

**20) Gnaphalium uliginosum** L. [BE/R][FJ,WF/J]–Naturalized?

Russian name: Sushenitsa topyanaya.

Japanese name: Hime-chichiko-gusa.

Note: In Japan this species is not treated as the naturalized plant (Satake et al. 1981; Shimizu 2003), but Barkalov and Eremenko (2003) considered it as one of the naturalized plants in the southern Kurils. Charkevich (1992) recorded two similar species; *G. uliginosum* L. and *G. pilulare* Wahlenb. from Sakhalin and the southern Kurils. Future critical determination is necessary.

**21) Hieracium umbellatum** L. [BE/R][WF/J]; **Hieracium umbellatum** L. var. **japonicum** H.Hara [FJ/J]

Russian name: Yastrebinka zontichnaya.

Japanese name: Yanagi-tanpopo.

**22) Lagedium sibiricum** (L.) Soják [BE/R]; **Lactuca sibirica** (L.) Benth. ex Maxim. [FJ/J]; **Lactuca sibirica** (L.) Benth. [WF/J]

Russian name: Lagedium sibirskij.

Japanese name: Ezo-murasaki-nigana.

Note: Czerepanov (1995) adopted *Lactuca sibirica* (L.) Maxim. as the correct name.

**23) Lepidotheca suaveolens** (Pursh) Nutt. [BE/R]; **Matricaria matricarioides** (Less.) Porter [FJ,WF/J]–Naturalized

Russian name: Lepidoteka dushistaya.

Japanese name: Ko-shika-giku.

**24) Ligularia hodgsonii** Hook.f. [BE/R][FJ,WF/J]

Russian name: Buzul'nik Khodzhsana.

Japanese name: Tôge-buki.

**25) Petasites amplus** Kitam. [BE/R]; **Petasites japonicus** (Siebold et Zucc.) Maxim. subsp. **giganteus** (F.Schmidt ex Trautv.) Kitam. [FJ/J]; **Petasites japonicus** (Siebold et Zucc.) Maxim. subsp. **giganteus** (F.Schmidt) Kitam. [WF/J]

Russian name: Belokopytnik shirokij.

Japanese name: Akita-buki.

**26) Picris japonica** Thunb. [BE/R]; **Picris hieracioides** L. subsp. **japonica** (Thunb.) Krylov var. **japonica** [FJ/J]; **Picris hieracioides** L. subsp. **japonica** (Thunb.) Krylov [WF/J]

Russian name: Gorlyukha yaponskaya.

Japanese name: Kôzori-na.

**27) Pilosella aurantiaca** (L.) Schulz et Sch. Bip. [BE/R]; **Hieracium aurantiacum** L. [FJ,WF/J]–Naturalized

Russian name: Yastrebinochka oranzhevaya.

Japanese name: Kôrin-tanpopo, Efude-giku.

**28) Ptarmica camtschatica** (Ledeb.) Kom. ex Heimerl [BE/R]; **Achillea alpina** L. subsp. **camtschatica** (Heimerl) Kitam. [FJ,WF/J]

Russian name: Chikhotnik kamchatskij.

Japanese name: Shumushu-nokogiri-sô.

**29) Ptarmica japonica** (Heimerl) Worosch. [BE/R]; **Achillea alpina** L. subsp. **japonica** (Heimerl) Kitam. [FJ,WF/J]

Russian name: Chikhotnik yaponskij.

Japanese name: Horoman-nokogiri-sô, Kita-nokogiri-

sô.

**30) Ptarmica macrocephala** (Rupr.) Kom. [BE/R]; **Achillea ptarmica** L. subsp. **macrocephala** (Rupr.) Heimerl var. **macrocephala** [FJ/J]; **Achillea ptarmica** L. subsp. **macrocephala** (Rupr.) Heimerl [WF/J]

Russian name: Chikhotnik krupnogolovyj.

Japanese name: Ezo-nokogiri-sô.

**31) Saussurea riederi** Herder [BE/R]; **Saussurea riederi** Herder subsp. **yezoensis** (Maxim.) Kitam. var. **yezoensis** [FJ/J]; **Saussurea riederii** Herder subsp. **yezoensis** (Maxim.) Kitam. [WF/J]

Russian name: Sossyureya Ridera.

Japanese name: Nagaba-kita-azami.

**32) Senecio cannabinifolius** Less. [BE/R][FJ,WF/J]

Russian name: Krestovnik konoplelistnyj.

Japanese name: Hangon-sô.

**33) Senecio nemorensis** L. [BE/R][FJ,WF/J]

Russian name: Krestovnik dubravnyj.

Japanese name: Kion.

**34) Senecio pseudoarnica** Less. [BE/R][FJ; “pseudo-arnica”, WF/J]

Russian name: Krestovnik Izhearnikovyj.

Japanese name: Ezo-oguruma.

**35) Solidago dahurica** Kitag. [BE/R]; **Solidago virgaurea** L. subsp. **leiocarpa** (Benth.) Hultén var. **leiocarpa** [FJ/J]; **Solidago virgaurea** L. subsp. **leiocarpa** (Benth.) Hultén f. **japonalpestris** Kitam. [WF/J]

Russian name: Zolotarnik daurskij.

Japanese name: Miyama-aki-no-kirin-sô, Kogane-giku.

**36) Sonchus arenicola** Worosch. [BE/R]; ?**Sonchus brachyotus** DC. [FJ,WF/J]

Russian name: Osot peskolyubivyj.

Japanese name: ?Hachijô-na.

**37) Sonchus arvensis** L. [Eremenko (2003)/R]; **Sonchus arvensis** L. var. **uliginosus** Trautv. [Shimizu (2003)/J]–Naturalized

Russian name: Osot polevoj.

Japanese name: Arechi-nogeshi.

**38) Taraxacum officinale** Wigg. [BE/R]; **Taraxacum officinale** Weber [WF/J]–Naturalized

Russian name: Oduvanchik aptechnyj.

Japanese name: Seiyô-tanpopo.

**39) Taraxacum shikotanense** Kitam. [BE/R][FJ,WF/J]

Russian name: Oduvanchik shikotanskij.

Japanese name: Shikotan-tanpopo.

**40) Taraxacum yetrofuense** Kitam. [BE/R]; not listed [FJ,WF/J]

Russian name: Oduvanchik iturupskij.

Japanese name: Etorofu-tanpopo.

Note: This species has not been recorded from Hokkaido until now. Charkevich (1992) adopted *Taraxacum platycranum* Dahlst. as the correct name.

**41) Tripleurospermum perforatum** (Mérat) M.Lainz [BE/R]; **Matricaria perforata** Mérat [Shimizu (2003)/J]–Naturalized

Russian name: Trekhrebrosemyannik prodyryavlennyj.

Japanese name: Inu-kamitsure.

**42) Tripleurospermum tetragonospermum** (F.Schmidt) Pobed. [BE/R]; **Matricaria**

**tetragonosperma** (F.Schmidt) H.Hara [FJ/J]; **Matricaria tetragonosperma** (F.Schmidt) H.Hara et Kitam. [WF/J]  
Russian name: Trekhrebrosemyannik chetyrekhugol'nosemyannyj.  
Japanese name: Shika-giku.

#### 50. POTAMOGETONACEAE

1) **Potamogeton perfoliatus** L. [collected by Eremenko in 2002/R]; [WF/J]  
Russian name: Rdest pronzyonnolistnyj.  
Japanese name: Hiroha-no-ebimo.

#### 51. ZOSTERACEAE

1) **Phyllospadix iwatensis** Makino [BE/R][WF/J]  
Russian name: Fillospadiks ivatinskij.  
Japanese name: Sugamo.  
2) **Zostera cespitosa** Miki [BE/R]; **Zostera caespitosa** Miki [WF/J]  
Russian name: Vzmornik dernistyj.  
Japanese name: Suge-amamo.

#### 52. LILIACEAE

1) **Allium ochotense** Prokh. [BE/R]; **Allium victorialis** L. subsp. **platyphyllum** Hultén [WF/J]  
Russian name: Luk okhotskij or Cheremsha.  
Japanese name: Gyôja-nin'niku.  
2) **Convallaria keiskei** Miq. [BE/R][WF/J]  
Russian name: Landysh Keizke  
Japanese name: Suzuran.  
3) **Fritillaria camschatcensis** (L.) Ker Gawl. [BE/R][“*camschatcensis*”, WF/J]  
Russian name: Ryabchik kamchatskij.  
Japanese name: Kuro-yuri.  
4) **Gagea nakaiana** Kitag. [BE/R]; **Gagea lutea** (L.) Ker Gawl. [WF/J]  
Russian name: Gusinyj luk Nakai.  
Japanese name: Kibana-no-amana.  
5) **Hemerocallis esculenta** Koidz. [BE/R]; **Hemerocallis dumortieri** Morr. var. **esculenta** (Koidz.) Kitam. [WF/J]  
Russian name: Krasodnev s'yedobnyj.  
Japanese name: Zenteika, Ezo-kanzô.  
6) **Hosta rectifolia** Nakai [BE/R]; **Hosta albomarginata** (Hook.) Ohwi [“*albo-marginata*”, WF/J]  
Russian name: Khosta pryamolistnaya.  
Japanese name: Koba-gibôshi (for *H. albomarginata*), Tachi-gibôshi (for *H. rectifolia*).  
Note: In Satake et al. (1982a) *Hosta albomarginata* is regarded as a species with wide variability, and *H. rectifolia* Nakai is included in it. Our Russian author (V. Y. Barkalov) recognizes that *Hosta albomarginata* (Hook.) Ohwi (= *H. lancifolia* Engl. in Charkevich 1987) and *H. rectifolia* Nakai are well differentiated species in morphological features and habitat (also see Czerepanov 1995). *Hosta albomarginata* occurs rarely in Russia, only in the south of Amurskaya and Primorsky Territories, but *H. rectifolia* is distributed in Sakhalin and the Kurils.  
7) **Lilium debile** Kittlitz [BE/R]; **Lilium medeoloides** A.Gray [WF/J]  
Russian name: Liliya slabaya.

Japanese name: Kuruma-yuri.

8) **Maianthemum dilatatum** (Wood) A.Nelson et J.F.Macbr. [BE/R][WF/J]  
Russian name: Majnik shirokolistnyj.  
Japanese name: Maizuru-sô.

9) **Trillium camschatcense** Ker Gawl. [BE/R]; **Trillium kamschaticum** Pall. [WF/J]

Russian name: Trillium kamchatskij.  
Japanese name: Ôbana-no-enrei-sô.  
Note: The correct name is *T. camschatcense* Ker Gawl. (Nakai and Ito 1991).

10) **Veratrum grandiflorum** (Maxim. ex Baker) Loes.f. [BE/R]; **Veratrum album** L. subsp. **oxysepalum** Hultén [WF/J]

Russian name: Chemeritsa krupnotsvetkovaya.  
Japanese name: Baikéi-sô.  
Note: Charkevich (1987) recognized *Veratrum grandiflorum* (Maxim. ex Baker) Loes.f. and *V. oxysepalum* Turcz. (= *V. album* L. subsp. *oxysepalum* (Turcz.) Hultén) as two separate species.

#### 53. AMARYLLIDACEAE

1) **Narcissus poeticus** L. [Eremenko (2003)/R][WF/J]—Escaped  
Russian name: Narciss poeticheskij or Narciss belyj.  
Japanese name: Kuchibeni-zuisen.  
2) **Narcissus pseudonarcissus** L. [Eremenko (2003)/R][“*pseudo-narcissus*”, WF/J]—Escaped  
Russian name: Narciss lozhnyj or Narciss zholytyj.  
Japanese name: Rappa-zuisen.

#### 54. IRIDACEAE

1) **Iris ensata** Thunb. [BE/R]; **Iris ensata** Thunb. var. **spontanea** (Makino) Nakai [WF/J]  
Russian name: Kasatik mechevidnyj.  
Japanese name: No-hana-shôbu.  
2) **Iris laevigata** Fisch. et C. A. Mey. [BE/R]; **Iris laevigata** Fisch. [WF/J]  
Russian name: Kasatik gladkij.  
Japanese name: Kakitsubata.  
3) **Iris pseudacorus** L. [BE/R][WF/J]—Escaped  
Russian name: Kasatik lozhnoairnyj.  
Japanese name: Ki-shôbu.  
4) **Iris setosa** Pall. ex Link [BE/R]; **Iris setosa** Pall. [WF/J]  
Russian name: Kasatik shchetinistyj.  
Japanese name: Hi-ôgi-ayame.

#### 55. JUNCACEAE

1) **Juncus bufonius** L. [BE/R][WF/J]—Naturalized?  
Russian name: Sitnik zhabij.  
Japanese name: Hime-kôgai-zekishô.  
Note: In Japan, this species has not been treated as the naturalized plant (Satake et al. 1982a; Shimizu 2003). Barkalov and Eremenko (2003) regarded it as one of the naturalized plants in the southern Kurils.  
2) **Juncus decipiens** (Buchenau) Nakai [BE/R]; **Juncus effusus** L. var. **decipiens** Buchenau [WF/J]  
Russian name: Sitnik somnitel'nyj.  
Japanese name: Igusa, I.



3) **Juncus gracillimus** (Buchenau) V. Krecz. et Gontsch. [BE/R][WF/J]

Russian name: Sitnik tonchajshyi.

Japanese name: Doro-i.

4) **Juncus haenkei** E. Mey. [BE/R][WF/J]

Russian name: Sitnik Genke.

Japanese name: Hama-i.

5) **Juncus papillosus** Franch. et Sav. [BE/R][WF/J]

Russian name: Sitnik sosochkovyj.

Japanese name: Ao-kôgai-zekishô.

6) **Juncus prominens** (Buchenau) Miyabe et Kudô [BE/R][WF/J]

Russian name: Sitnik vydayushchij.

Japanese name: Sekishô-i.

7) **Juncus tatewakii** Satake [BE/R]; not listed [WF/J]

Russian name: Sitnik Tatevaki.

Japanese name: Kunashiri-kôgai.

Note: This species is native to Kunashir and the Habomais, but has not been recorded from Hokkaido. *Juncus articulatus* L. in Charkevich (1985) may be this species.

8) **Juncus tenuis** Willd. [BE/R][WF/J]–Naturalized

Russian name: Sitnik tonkij.

Japanese name: Kusa-i.

Note: In Japan this species is treated as the prehistoric naturalized plant (Shimizu 2003). Barkalov and Eremenko (2003) regarded it as one of the naturalized plants in the southern Kurils.

9) **Juncus yokoscensis** (Franch. et Sav.) Satake [BE/R][WF/J]

Russian name: Sitnik iokosukskij.

Japanese name: Inu-i, Hira-i.

10) **Luzula capitata** (Miq.) Kom. [BE/R]; **Luzula capitata** (Miq.) Miq. [WF/J]

Russian name: Ozhika golovchataya.

Japanese name: Suzume-no-yari.

## 56. POACEAE

1) **Achnatherum extremiorientale** (H.Hara) Keng ex Tzvel. [BE/R]; **Stipa pekinensis** Hance [WF/J]

Russian name: Chij dal'nevostochnyj.

Japanese name: Hane-gaya.

2) **Agrostis clavata** Trin. [BE/R][WF/J]

Russian name: Polevitsa bulavovidnaya.

Japanese name: Yama-nukabo.

3) **Agrostis flaccida** Hack. [BE/R][WF/J]

Russian name: Polevitsa gibkaya.

Japanese name: Miyama-nukabo.

4) **Agrostis gigantea** Roth [BE/R]; **Agrostis alba** L. [WF/J]–Naturalized

Russian name: Polevitsa gigantskaya.

Japanese name: Konuka-gusa.

Note: Osada (1989) adopted *A. gigantea* Roth as the correct name.

5) **Agrostis scabra** Willd. [BE/R][WF/J]

Russian name: Polevitsa sherokhovataya.

Japanese name: Ezo-nukabo.

6) **Agrostis stolonifera** L. [BE/R][WF/J]–Naturalized

Russian name: Polevitsa pobegoobrazuyushchaya.

Japanese name: Hai-konuka-gusa.

7) **Agrostis tenuis** Sibth. [BE/R]; **Agrostis capillaris** L. [Shimizu (2003)/J]–Naturalized

Russian name: Polevitsa tonkaya.

Japanese name: Ito-konuka-gusa.

Note: Czerepanov (1995) adopted *A. capillaris* L. as the correct name.

8) **Arctopoa eminens** (C.Presl) Prob. [BE/R]; **Poa eminens** C.Presl. [WF/J]

Russian name: Arktomyatlik vydelyayushchij.

Japanese name: Oni-ichigotsunagi.

9) **Beckmannia syzigachne** (Steud.) Fern. [BE/R][WF/J]

Russian name: Bekmaniya vostochnaya.

Japanese name: Kazunoko-gusa.

10) **Calamagrostis barbata** V.Vassil. [BE/R]; **Calamagrostis langsdorffii** (Link) Trin. [WF/J]

Russian name: Vejnik borodatyj.

Japanese name: ?Iwa-nogariyasu (in the broad sense).

Note: This taxon is not usually recognized in Japan and may be included in *Calamagrostis langsdorffii* s.l. (cf., Osada 1989).

11) **Calamagrostis extremiorientalis** (Tzvel.) Prob. [BE/R]; **Calamagrostis epigeios** (L.) Roth [WF/J]

Russian name: Vejnik dal'nevostochnyj.

Japanese name: Yama-awa.

12) **Calamagrostis hakonensis** Franch. et Sav. [BE/R][WF/J]

Russian name: Vejnik khakonskij.

Japanese name: Hime-nogariyasu.

13) **Calamagrostis inexpansa** A.Gray [BE/R]; **Calamagrostis neglecta** (Ehrh.) G.Gaertn., B.Mey. et Scherb. var. **aculeolata** (Hack.) Miyabe et Kudô [WF/J]

Russian name: Vejnik szhatometel'chatyj.

Japanese name: Chishima-gariyasu.

Note: Czerepanov (1995), Barkalov and Eremenko (2003) regarded the above-mentioned Japanese species name as a synonym of the Russian species name.

14) **Calamagrostis langsdorffii** (Link) Trin. [BE/R][WF/J]

Russian name: Vejnik Langsdorfa.

Japanese name: Iwa-nogariyasu.

15) **Calamagrostis neglecta** (Ehrh.) G.Gaertn., B.Mey. et Scherb. [BE/R]; not listed [WF/J]

Russian name: Vejnik nezamechennyj.

Japanese name: ?Chishima-gariyasu (in the broad sense).

Note: On *Calamagrostis neglecta* s.l., further taxonomic study is necessary.

16) **Dactylis glomerata** L. [BE/R][WF/J]–Naturalized

Russian name: Yezha sbornaya.

Japanese name: Kamo-gaya.

17) **Elymus dahuricus** Turcz. ex Griseb. [BE/R]; **Elymus dahuricus** Turcz. [WF/J]

Russian name: Pyrejnik daurskij.

Japanese name: Hama-mugi.

Note: Osada (1989) adopted the author names "Turcz. ex Griseb."

18) **Elymus woroschilowii** Prob. [BE/R]; not listed [WF/J]

Russian name: Pyrejnik Voroshilova.

Note: This is the new name for *Elymus dahuricus* subsp. *pacificus* Prob. (Charkevicz, 1985), which is not clear to Japanese botanists. Charkevicz (1985) recognized three species of the *E. dahuricus* complex; *E. dahuricus* Turcz. ex Griseb., *E. excelsus* Turcz. ex Griseb. and *E. woroschilowii* Prob. from the Habomais. This needs future clarification.

**19) Elytrigia repens** (L.) Nevski [BE/R]; **Agropyron repens** (L.) Beauv. [WF/J]—Naturalized?

Russian name: Pyrej polzuchij.

Japanese name: Shiba-mugi.

Note: Osada (1989) adopted *Elymus repens* (L.) Gould as the correct name. This species is treated as one of the naturalized plants in Japan (Shimizu 2003).

**20) Festuca ovina** L. [BE/R][WF/J]

Russian name: Ovsyanitsa ovech'ya.

Japanese name: Ushinoke-gusa.

**21) Festuca pratensis** Huds. [BE/R]; **Festuca elatior** L. [WF/J]—Naturalized

Russian name: Ovsyanitsa lugovaya.

Japanese name: Hiroha-no-ushinokegusa.

Note: Osada (1989) adopted the scientific name *Festuca pratensis* Huds., but recent Russian botanists (Tzvelev 1999, Barkalov and Taran 2004) adopt *Schedonorus pratensis* (Huds.) P.Beauv. as the correct name.

**22) Festuca rubra** L. [BE/R][WF/J]

Russian name: Ovsyanitsa krasnaya.

Japanese name: Ô-ushinoke-gusa.

**23) Hierochloë sachalinensis** (Printz.) Worosch. [BE/R]; **Hierochloe odorata** (L.) P.Beauv. var. **pubescens** Krylov [WF/J]

Russian name: Zubrovka sakhalinskaya.

Japanese name: Kôbô.

Note: Intraspecific variation and the species distinction of *Hierochloe odorata* s.l. and the related species needs clarification.

**24) Holcus lanatus** L. [BE/R][WF/J]—Naturalized

Russian name: Bukharnik sherstistyj.

Japanese name: Shirage-gaya.

**25) Hordeum jubatum** L. [BE/R][Shimizu (2003)/J]—Naturalized

Russian name: Yachmen' grivastyj.

Japanese name: Hoso-noge-mugi.

Note: Osada (1989) also adopted the species name *H. jubatum* L., but recent Russian botanists (Tzvelev 1999, Barkalov and Taran 2004) adopt *Critesion jubatum* (L.) Nevski as the correct name.

**26) Leymus mollis** (Trin.) H.Hara [BE/R]; **Elymus mollis** Trin. [WF/J]

Russian name: Kolosnyak myagkij.

Japanese name: Tenki-gusa, Hama-nin'niku.

Note: Hara's recombination was published as a synonym, so this is an invalid name. Therefore *Leymus mollis* (Trin.) Pilger is the correct name (Osada 1989).

**27) Miscanthus sinensis** Anderss. [BE/R][WF/J]

Russian name: Veerotsvetnik kitajskij or Miskantus kitajskij.

Japanese name: Susuki.

**28) Molinia japonica** Hack. [BE/R]; **Molinia japonica**

(Hack.) Hayata [WF/J]

Russian name: Moliniya yaponskaya.

Japanese name: Numa-gaya.

Note: Czerepanov (1995) adopted *Molinopsis japonica* (Hack.) Hayata as the correct name.

**29) Phalaroides arundinacea** (L.) Rausch. [BE/R];

**Phalaris arundinacea** L. [WF/J]

Russian name: Rogoznik trostnikovidnyj.

Japanese name: Kusa-yoshi.

**30) Phleum pratense** L. [BE/R][WF/J]—Naturalized

Russian name: Timofeevka lugovaya.

Japanese name: Ô-awagaeri.

**31) Phragmites australis** (Cav.) Trin. ex Steud. [BE/R];

**Phragmites communis** Trin. [WF/J]

Russian name: Trostnik yuzhnyj.

Japanese name: Yoshi.

**32) Poa annua** L. [BE/R][WF/J]—Naturalized

Russian name: Myatlik odnoletnij.

Japanese name: Suzume-no-katabira.

Note: Most Japanese plants of this species have been naturalized since the Meiji era, but some plants are considered to be native to Japan (Shimizu 2003).

**33) Poa macrocalyx** Trautv. et C. A. Mey. [BE/R][WF/J]

Russian name: Myatlik krupnocheshujnyj.

Japanese name: Karafuto-ichigotsunagi.

**34) Poa palustris** L. [BE/R][WF/J]

Russian name: Myatlik bolotnyj.

Japanese name: Numa-ichigotsunagi.

**35) Poa pratensis** L. [BE/R][WF/J]—Naturalized

Russian name: Myatlik lugovoj.

Japanese name: Nagaha-gusa.

**36) Poa tatewakiana** Ohwi [BE/R]; not listed [WF/J]

Russian name: Myatlik Tatevaki.

Japanese name: Hosobana-somosomo (for *P. macrocalyx* var. *tatewakiana*).

Note: Osada (1989) adopted *Poa macrocalyx* Trautv. et Mey. var. *tatewakiana* (Ohwi) Ohwi as the correct name. Further taxonomic study is necessary for the *Poa macrocalyx* complex.

**37) Puccinellia kurilensis** (Takeda) Honda [BE/R];

**Puccinellia pumila** (Vasey) Hitchc. [WF/J]

Russian name: Beskilnitsa kuril'skaya.

Japanese name: Chishima-dojoyôtsunagi.

Note: Osada (1989) adopted *Puccinellia kurilensis* (Takeda) Honda as the correct name.

**38) Sasa depauperata** (Takeda) Nakai [BE/R]; not listed [WF/J]

Russian name: Saza melkometel'chataya.

Japanese name: Shikotan-zasa.

Note: The species concept of the genus *Sasa* is not consistent among the botanists. Ohwi and Kitagawa (1983) adopted *Sasa yahikoensis* Makino var. *depauperata* (Takeda) S. Suzuki as the correct name.

**39) Sasa kurilensis** (Rupr.) Makino et Shibata [BE/R][WF/J]

Russian name: Saza kuril'skaya.

Japanese name: Chishima-zasa.

**40) Sasa senanensis** (Franch. et Sav.) Rehder [BE/R]; not listed [WF/J]

Russian name: Saza sinanskaya.

Japanese name: Kumai-zasa.

Note: Ohwi and Kitagawa (1983) adopted *S. senanensis*.

**41) *Trisetum umbratile* (Kitag.) Kitag. [BE/R];**

**?*Trisetum sibiricum* Rupr. [WF/J]**

Russian name: Trishchetinnik tenevoj.

Japanese name: ?Chishima-kanitsuri (in the broad sense).

Note: This species is also recognized as *Trisetum sibiricum* subsp. *umbratile* (Kitag.) Tzvelev (Tzvelev 1976). But this taxon is not clear to Japanese botanists (cf., Osada 1989)

## 57. ARACEAE

**1) *Arisaema japonicum* Blume [BE/R]; *Arisaema serratum* (Thunb.) Schott [WF/J]**

Russian name: Arizema yamonskaya.

Japanese name: Mamushi-gusa.

Note: Ohashi and Murata (1980) regarded *A. japonicum* Blume as a synonym of *A. serratum* (Thunb.) Schott.

**2) *Calla palustris* L. [BE/R][WF/J]**

Russian name: Belokryl'nik bolotnyj.

Japanese name: Hime-kaiu.

**3) *Lysichiton camtschaticense* (L.) Schott [BE/R][WF/J]**

Russian name: Lizikhiton kamchatskij.

Japanese name: Mizu-bashô.

**4) *Symplocarpus renifolius* Schott ex Tzvelev [BE/R];**

***Symplocarpus foetidus* Nutt. var. *latissimus* (Makino)**

**H.Hara [WF/J]**

Russian name: Simplokarpus pochkolistnyj.

Japanese name: Zazen-sô.

## 58. LEMNACEAE

**1) *Lemna trisulca* L. [BE/R][WF/J]**

Russian name: Ryaska troichataya.

Japanese name: Hinjimo.

Note: Recent Russian botanists (Tzvelev 1999, Barkalov and Taran 2004) adopted *Staurogeton trisulcus* (L.) Schur as the correct name. This species is distributed in Zelenyj due to the distribution map, but not noted from the Habomais in the text (Barkalov and Eremenko 2003).

## 59. TYPHACEAE

**1) *Typha latifolia* L. [BE/R][WF/J]**

Russian name: Rogoz shirokolistnyj.

Japanese name: Gama.

## 60. CYPERACEAE

**1) *Carex aomorensis* Franch. [BE/R]; *Carex capillacea***

**Boott var. *sachalinensis* (F.Schmidt) Ohwi [WF/J]**

Russian name: Osoka aomorijskaya.

Japanese name: Michinoku-hari-suge.

**2) *Carex cespitosa* L. [BE/R]; *Carex caespitosa* L.**

**["*caespitosa*", WF/J]**

Russian name: Osoka dernistaya.

Japanese name: Kabu-suge.

**3) *Carex cryptocarpa* C.A.Mey. [BE/R]; *Carex***

***lyngbyei* Hornem. [WF/J]**

Russian name: Osoka skrytoplodnaya.

Japanese name: Yarame-suge.

**4) *Carex gmelinii* Hook. et Arn. [BE/R][WF/J]**

Russian name: Osoka Gmelina.

Japanese name: Nemuro-suge.

**5) *Carex koidzumii* Honda [BE/R]; *Carex lasiocarpa***

**Ehrh. var. *occultans* (Franch.) Kük. [WF/J]**

Russian name: Osoka Koidzumi.

Japanese name: Mujina-suge.

**6) *Carex macrocephala* Willd. ex Spreng. [BE/R];**

***Carex macrocephala* Willd. [WF/J]**

Russian name: Osoka krupnoplodnaya.

Japanese name: Ezo-no-kôbô-mugi.

**7) *Carex pumila* Thunb. [BE/R][WF/J]**

Russian name: Osoka maloroslaya.

Japanese name: Kôbô-shiba.

**8) *Carex rhynchophysa* C.A.Mey. [Eremenko (2003)/R][WF/J]**

Russian name: Osoka vzdutonosaya.

Japanese name: Ô-kasa-suge.

**9) *Carex sabynensis* Less. ex Kunth [BE/R]; *Carex sabynensis* Less. [WF/J]**

Russian name: Osoka shabinskaya.

Japanese name: Kamikawa-suge.

**10) *Carex scabrinervia* Franch. [BE/R]; *Carex scita* var.**

***riishirensis* (Franch.) Kük. [WF/J]**

Russian name: Osoka sherokhovatozhilkovaya.

Japanese name: Shikotan-suge (for *C. scabrinervia*),

Rishiri-suge (for *C. scita* var. *riishirensis*).

Note: This species was not recognized in Satake et al.

(1982a), but Akiyama (1955) recognized it.

**11) *Carex schmidtii* Meinsh. [BE/R][WF/J]**

Russian name: Osoka Shmidta.

Japanese name: Shumitto-suge.

**12) *Carex viridula* Michx. [BE/R][WF/J]**

Russian name: Osoka zelyonen'kaya.

Japanese name: Ezo-sawa-suge.

**13) *Eleocharis kamtschatica* (C. A. Mey.) Kom. [BE/R][WF/J]**

Russian name: Bolotnitsa kamchatskaya.

Japanese name: Hime-hari-i.

**14) *Eleocharis palustris* (L.) Roem. et Schult. [BE/R];**

***Eleocharis intersita* Zinserl. [WF/J]**

Russian name: Bolotnitsa bolotnaya.

Japanese name: Kuro-numa-hari-i.

**15) *Eleocharis wichurae* Boeck [BE/R][WF/J]**

Russian name: Bolotnitsa Vikhury.

Japanese name: Shikaku-i.

**16) *Eriophorum gracile* Koch [BE/R][WF/J]**

Russian name: Pushitsa strojnaya.

Japanese name: Sagi-suge.

**17) *Eriophorum vaginatum* L. [BE/R][WF/J]**

Russian name: Pushitsa vlagalishchnaya.

Japanese name: Wata-suge.

**18) *Scirpus tabernaemontani* C.C.Gmel. [BE/R][WF/J]**

Russian name: Kamysh Tabernemontana.

Japanese name: Futo-i.

## 61. ORCHIDACEAE

- 1) **Dactylorhiza aristata** (Fisch. ex Lindl.) Soó [Eremenko (2003)/R]; **Orchis aristata** Fisch. [WF/J]  
Russian name: Pal'chatokorennik ostistyj.  
Japanese name: Hakusan-chidori.
- 2) **Gymnadenia conopsea** (L.) R.Br. [BE/R][WF/J]  
Russian name: Kokushnik komarnikovyj.  
Japanese name: Tegata-chidori.
- 3) **Platanthera ditmariana** Kom. [Eremenko (2003)/R]; **Platanthera chorisiana** (Cham.) Rchb.f. var. **elata** Finet [WF/J]  
Russian name: Lyubka Ditmara.  
Japanese name: Miyake-ran.
- 4) **Platanthera extremiorientalis** Nevski [BE/R]; **Platanthera metabifolia** F.Maek. [WF/J]  
Russian name: Lyubka dal'nevostochnaya.  
Japanese name: Ezo-chidori.
- 5) **Platanthera hologlottis** Maxim. [BE/R][WF/J]  
Russian name: Lyubka tsel'nogubaya.  
Japanese name: Mizu-chidori.
- 6) **Spiranthes sinensis** (Pers.) Ames [BE/R]; **Spiranthes sinensis** (Pers.) Ames var. **amoena** (M. Bieb.) H.Hara [WF/J]  
Russian name: Skruchennik kitajskij.  
Japanese name: Neji-bana.

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Table 1. The distribution of the vascular plants in the Habomais.  
The species are ordered alphabetically. Naturalized or escaped plants within parenthesis.

Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.	Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
Acetosa lapponica			B					Artemisia littoricola		B		B			
(Acetosella angiocarpa)				B, J	B			Artemisia montana		B	B	B	B	B	B
(Achillea millefolium)					CH			Artemisia stelleriana	B, G			B, G	B		
Achnatherum extremiorientale		B						Artemisia unalaskensis			B				
Aconitum kurilense	B	B				B		Aruncus dioicus	B, G	B, J		B, G	B		
Aconitum maximum				G		B		Aster glehnii		B	B, G	G, J	B		
Aconitum sachalinense	B	B	B	B	B			Athyrium filix-femina		B	B	B	B		
Adenophora triphylla	B, J	B, G	G	B, J	B			Athyrium sinense		B					
Adoxa moschatellina				B		B		Atriplex patens			B				B
Agriomonia japonica	J	B, G	B	B, J				Atriplex subcordata	G	B					B
Agrostis clavata	B	B	B		B			Barbarea orthoceras		E					E
Agrostis flaccida		B	B	B, G	B, G			Batrachium trichophyllum					B		
(Agrostis gigantea)		B	B		B			Beckmannia syzigachne	B	B	B, J	G	B, J		
Agrostis scabra	B, G	G	B, G, J	B	B			Botrychium robustum	B			B			
(Agrostis scolonifera)	B	G		G	B			Bupleurum longiradiatum	B	B, G		B			
(Agrostis tenuis)		J			B, J			Cacalia kamschatica		B	B, G	B	B		
Allium ochotense						B		Cacalia robusta		G	G	G, J			B
Alnus hirsuta		B						Calamagrostis barbata				B			
Anaphalis margaritacea	B	B, G	B	B	B			Calamagrostis extremiorientalis		B	B		B		
Anemonastrum villosissimum					B			Calamagrostis hakonensis				G	B		
Anemonidium dichotomum					G			Calamagrostis inexpansa			B		B		
Anemonoides debilis				B				Calamagrostis langsdorffii	B, G	B	B, J	B	B	B	
Angelica genuiflexa	J	B			B			Calamagrostis neglecta				B	B, G		
Angelica gmelinii	B, G	B		B	B	B	B	Calla palustris			B				
Angelica sachalinensis		G	G					Campanula langsdorffiana				B			
Anthriscus sylvestris		B				B		Campanula lasiocarpa					B		
Arabis glauca						E		(Capsella bursa-pastoris)							B
Arabis stelleri ssp. japonica			G	B	B	B		Cardamine regeliana						E	
Arctopoa eminens	B	B	J	G	J			Carex aomorensis				G			
Arisaema japonicum		B			B			Carex cespitosa					B		
Artemisia gmelinii		B			B			Carex cryptocarpa	B, G	G	J	G	B		
Artemisia koidzumii		B, G		B				Carex gmelinii			B				
Artemisia laciniata		B, G		B				Carex koidzumii			J		B		

Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
Carex macrocephala			G	B, J	B		
Carex pumila		B, G	B	J			
Carex rhynchophysa					E		
Carex sabyensis				B			
Carex scabrinervia		B					
Carex schmidtii					B		
Carex viridula	B			B, G			
Celastrus strigillosa		B			B		
Cerastium fischerianum		B					
(Cerastium holosteoides)	G	G		B, G			
Chamaedaphne calyculata				B			
Chamaenerion angustifolium		B			B		
Chamaepericlymenum suecicum		B, J	B		B		
(Chenopodium album)	G	B	B	B	G	B	
Chloranthus japonicus		B					
Chorisis repens				B, G			
(Cichorium intybus)					B		
Cicuta virosa			J	G	B, G		
Cimicifuga simplex	J	B, G	B, G	B, J			
Circaea alpina		B			B		
Cirsium charkeviczii			B				
Cirsium kamtschaticum	B		B	B	B	B	
Cirsium pectinellum	B, G	B, J	G	B, G	B, J		B
Clinopodium chinense		B					
Clinopodium sachalinense		B					
Cochlearia officinalis	B					B	
Comarum palustre		B		G			
Conioselinum chinense	B					B	
Convallaria keiskei		B			B		
Corydalis ambigua				B		B	B
(Dactylis glomerata)				B	B		
Dactylorhiza aristata		E					
Dianthus superbus	B	B		B, G	B		
Draba borealis		B				B	
Drosera rotundifolia		G	G	B, G, J			
Duschekia maximowiczii			B				

Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
Eleocharis kamtschatica	J		B	B, G, J	J		
Eleocharis palustris					B, J		
Eleocharis wichurae					B		
Elymus dahuricus	B	B		B	B		
Elymus woroschilowii			B				
Elytrigia repens		G			B'		
Empetrum albidum		B	(G)	B, (G)	B, (G)		
Empetrum sibiricum			B, (G)	B, (G)	(G)		
Epilobium amurense		B					
Epilobium cephalostigma				B			
Epilobium maximowiczii			B				
Equisetum arvense	B, J	B, J	B	B, J	B		
Equisetum hyemale		B					
Equisetum palustre					B		
Erigeron kamtschaticus					E		
Erigeron sachalinensis		B					
Eriophorum gracile			J		B		
Eriophorum vaginatum				B			
Euphrasia yezoensis		B		B	B		
Festuca ovina		B					
(Festuca pratensis)					B		
Festuca rubra	B, G	B			B		
Filipendula camtschatica		B, G	B, G				
Fimbripetalum radians	B				G		
Fragaria yezoensis		B			B		
Fritillaria camtschatcensis				B		B	
Gagea nakaiana				B		B	B
Galium boreale					B		
Galium ruthenicum		B, G		B, G	B, G		
Galium trifidum	B		J, G		B		
Gentiana axillariflora		B	B	B	B, J		
Gentianella auriculata					B		
Geranium erianthum	G	B, G	B	J	B		
(Geranium sibiricum)		B	B	B			
Geranium yezoense	B	B		B			
(Geum aleppicum)		B	B	B	B		

Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
<i>Geum fauriei</i>				G			
<i>Glaux maritima</i>			B, J				
<i>Glehnia littoralis</i>				B			
( <i>Gnaphalium uliginosum</i> )				J			
<i>Gymnadenia conopsea</i>		B		B, G			
<i>Halenia corniculata</i>	J	B, G		B, J	B, G		
<i>Hemerocallis esculenta</i>		G	B	J	B		
<i>Heracleum lanatum</i>	B, J	G	J	G	B, J		B
<i>Hieracium umbellatum</i>			J		J		
<i>Hierochloë sachalinensis</i>				B			
<i>Hippuris vulgaris</i>			B				
( <i>Holcus lanatus</i> )				B	B		
<i>Honkenya oblongifolia</i>	B					B	
( <i>Hordeum jubatum</i> )	B				B		
<i>Hosta rectifolia</i>				B			
<i>Hydrangea paniculata</i>		B	G				
<i>Hypericum erectum</i>		B	B	B	B		
<i>Hypericum gebleri</i>		B					
<i>Hypericum kamschaticum</i>		B					
<i>Iris ensata</i>					B		
<i>Iris laevigata</i>					B		
( <i>Iris pseudacorus</i> )					B		
<i>Iris setosa</i>	B	B	B	B, G	B, J		
( <i>Juncus bufonius</i> )	G		B	B	G		
<i>Juncus decipiens</i>	B	B		B, G	B		
<i>Juncus gracillimus</i>					B		
<i>Juncus haenkei</i>	B		B	G	B, J		
<i>Juncus papillosus</i>		B			B		
<i>Juncus prominens</i>			B				
<i>Juncus tatewakii</i>	B	B		B	B		
( <i>Juncus tenuis</i> )	B	B	B	B			
<i>Juncus yokoscensis</i>		B, J	J		B, G		
<i>Lagedium sibiricum</i>			B		B		
<i>Lathyrus japonicus</i>	G		B, G	B, G	B, G	B	
<i>Lathyrus pilosus</i>	B	B		B, J	B		
<i>Ledum hypoleucum</i>		B	B, G	B, G	B		

Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
<i>Lemna trisulca</i>					B		
( <i>Lepidotheca suaveolens</i> )	J		B	B, J			
<i>Lespedeza bicolor</i>	B	B, G	B	B	B		
<i>Leymus mollis</i>	B, J		G	B, G	B, G	B	B
<i>Ligularia hodgsonii</i>	B, J	B, G	B, G	B, J	B, G		
<i>Ligusticum scoticum</i>	B, J	B, G	B, G	B	G	B	
<i>Lilium debile</i>				B			
<i>Linaria japonica</i>	B, G	B, G	B, G	B, J	B, G		
<i>Lobelia sessilifolia</i>		B	B, J	B, G	B		
<i>Lonicera caerulea</i>		B	B	B	B		
<i>Lonicera sachalinensis</i>					B		
<i>Luzula capitata</i>		J	B, G	B, G	G		
<i>Lycopodium clavatum</i>				B			
<i>Lycopus lucidus</i>					B, J		
<i>Lycopus uniflorus</i>				G	B		
<i>Lysichiton camtschatcense</i>	G	B, G	B, J				
<i>Lysimachia davurica</i>		B					
<i>Lythrum salicaria</i>		B		B, G	B, G		
<i>Maianthemum dilatatum</i>		B			B		
<i>Mecodium wrightii</i>					B		
<i>Mentha canadensis</i> var. <i>piperascens</i>		B	B		B, G		
<i>Menyanthes trifoliata</i>		B	B				
<i>Mertensia maritima</i>	B		B	B	B		
<i>Miscanthus sinensis</i>		B		B	B		
<i>Moehringia lateriflora</i>					B, G		
<i>Molinia japonica</i>				B			
<i>Myosotis sachalinensis</i>		B					
<i>Myrica tomentosa</i>			B, G	B, G	B		
( <i>Narcissus poeticus</i> )		E					
( <i>Narcissus pseudonarcissus</i> )		E					
<i>Naumburgia thyrsoiflora</i>				G	G		
<i>Nuphar pumila</i>			B				
( <i>Oberna behen</i> )					B		
( <i>Oenothera biennis</i> )		J		B, G			
<i>Onoclea sensibilis</i>		B, G, J	B, J	B, G			
<i>Ophelia tetrapetala</i>				B			



Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
<i>Oxycoccus microcarpus</i>				B			
<i>Oxycoccus palustris</i>		B	G		B		
<i>Parnassia palustris</i>			B, J	B, J	B		
<i>Patrinia scabiosifolia</i>	J						
<i>Pedicularis resupinata</i> ( <i>Persicaria maculata</i> )	B, G	J		B, G	G		
<i>Persicaria scabra</i>			B				
<i>Petasites amplus</i>	G	J		G			
<i>Phalaroides arundinacea</i> ( <i>Phleum pratense</i> )	B, G	G, B, G	B, J	B	B, G	B	
<i>Phragmites australis</i>			G-obs	B	B, G-obs		
<i>Phyllospadix iwatanensis</i>	B						
<i>Picris japonica</i> ( <i>Pilosella aurantiaca</i> )	B, J	B, G	B	B, G	J	B	
<i>Plantago camtschatica</i>	B, G	B, G	B, G	B, G	B, J	B	
<i>Plantago cornuti</i>	B	B		B, J	B		
<i>Plantago japonica</i>		G			G		
<i>Platanthera ditmariana</i>		E					
<i>Platanthera extremiorientalis</i>				B			
<i>Platanthera hologlottis</i>		B					
<i>Pleurospermum uralense</i> ( <i>Poa annua</i> )	B, G	G	G	B, G		B	
<i>Poa macrocalyx</i>		B					
<i>Poa palustris</i> ( <i>Poa pratensis</i> )			G		B		
<i>Poa tatewakiana</i> ( <i>Polygonum aviculare</i> )	B	B			B		
<i>Populus jesoensis</i>	G			J			
<i>Potamogeton perfoliatus</i>		E					
<i>Potentilla egedii</i> var. <i>grandis</i>	B	G	B, J		B, G		
<i>Potentilla megalantha</i>	B	G				B	
<i>Potentilla stolonifera</i>	B, G	B		B			
<i>Primula fauriei</i>	B, J	B, G, J		B			
<i>Prunella asiatica</i>		B, G			B		
<i>Ptarmica camtschatica</i>		B	B				
<i>Ptarmica japonica</i>	B	B, G	B, G	B, G, J	B, G	B	B

Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
<i>Ptarmica macrocephala</i>	B, G	G		B			
<i>Pteridium aquilinum</i>		B, G		B	B		
<i>Puccinellia kurilensis</i>			B		B		
<i>Ranunculus quelpaertensis</i>				G			
<i>Ranunculus repens</i>		E					
<i>Ranunculus transochotensis</i>	B, G			B			
<i>Rhodiola sachalinensis</i>	B, J	B					B
<i>Rhodococcum vistis-idaea</i>			B	B	B, G		
<i>Rorippa palustris</i>			B, J				
<i>Rosa rugosa</i>	B, G	B	B, G	B, G	B, G		
<i>Rubia jesoensis</i>		B, G	J	G	B, G		
<i>Rubus mesogaeus</i>		B					
<i>Rubus sachalinensis</i> ( <i>Rumex crispus</i> )		B					B
<i>Rumex gmelinii</i> ( <i>Rumex longifolius</i> )		B, J	B		G		
<i>(Rumex obtusifolius)</i>	J						
<i>Rumex ochotskii</i>			B				
<i>Sagina maxima</i> var. <i>crassicaulis</i>	B	B		G			
<i>Salix fuscescens</i>							CH
<i>Salix gilgiana</i>		B					B
<i>Salix hultenii</i>		B					
<i>Salix udensis</i>							B
<i>Salix yezoensis</i>				B			
<i>Salsola komarovii</i>	B	B	J		B		
<i>Sambucus sieboldiana</i> var. <i>miquelii</i>				B			
<i>Sanguisorba parviflora</i>							B
<i>Sanguisorba tenuifolia</i>	B, J	B, G	B, G	J	B, G		
<i>Sasa depauperata</i>				B	B		
<i>Sasa kurilensis</i>					B		
<i>Sasa senanensis</i>	B						
<i>Saussurea riederi</i>		B, G	B				
<i>Saxifraga bracteata</i>	B			B			B
<i>Scirpus tabernaemontani</i>				J	B, J		
<i>Scrophularia grayana</i>		B, G	G	B, J	G		B
<i>Scutellaria strigillosa</i>			B	B	B		

Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
<i>Scutellaria yezoënsis</i>		B, G	B, G	B, J	B, G		
<i>Sedum erythrodictum</i>	B						
<i>Sedum kurilense</i>		B					
<i>Sedum telephium</i>		B					
<i>Sedum verticillatum</i>		B					
<i>Senecio cannabinifolius</i>		B, G	B, J	G			
<i>Senecio nemorensis</i>		G		G, J	B		
<i>Senecio pseudoarnica</i>	B, J	B, G	B, G	B, G	G	B	B
<i>Solidago dahurica</i>		B, G	B	B, G	B		
<i>Sonchus arenicola</i> ( <i>Sonchus arvensis</i> )	B, J E	B	B		B		
<i>Sorbaria stellipila</i>		B					
<i>Sorbus sambucifolia</i>		B, G		B	B		
<i>Spiraea beauverdiana</i>		B	B	B, G	B		
<i>Spiraea betulifolia</i>		B	B		B		
<i>Spiraea salicifolia</i>		B	B	B	B		
<i>Spiranthes sinensis</i>		B		J	J		
<i>Stachys aspera</i>		B, G	B, G	B, J	B, J		
<i>Stellaria longifolia</i> ( <i>Stellaria media</i> )	B		J				B
<i>Symplocarpus renifolius</i> ( <i>Taraxacum officinale</i> )		G B	B, J	B, G	B		
<i>Taraxacum shikotanense</i>	G		B	B		B	
<i>Taraxacum yetrofuense</i>		B			B		
<i>Thalictrum minus</i>	B	B, G	B, G	B, J	B		
<i>Thalictrum sachalinense</i>				E			
<i>Thelypteris thelypteroides</i>		B	B	B	B		
<i>Thermopsis lupinoides</i> ( <i>Trifolium hybridum</i> )	B, J	B	B	B	B, G		
( <i>Trifolium pratense</i> )	B			B, J	B		
( <i>Trifolium repens</i> )	B	B, G	B	B, J	B, G		
<i>Trillium camschatcense</i> ( <i>Tripleurospermum perforatum</i> )		B		B	B		
<i>Tripleurospermum tetragonospermum</i>	B	B, G	B, G	B, G	B, G		B
<i>Trisetum umbratile</i>		B, J	G	G			
<i>Truellum sieboldii</i>				G	B, J		

Taxa	Anu.	Iur.	Pol.	Tan.	Zel.	Dem.	Sto.
<i>Truellum thunbergii</i>	B				B		
<i>Typha latifolia</i>				B			
<i>Urtica platyphylla</i>			J	G		B	B
<i>Vaccinium axillare</i>			G				
<i>Vaccinium praestans</i>		B, G, J		B	B		
<i>Vaccinium uliginosum</i>		B	B	B	B		
<i>Veratrum grandiflorum</i>				B, G		B	
<i>Viburnum sargentii</i>		B					
<i>Vicia cracca</i>	B	B			B	B	
<i>Vicia unijuga</i>	B, G	B			B		
<i>Viola patrinii</i>		B		G	B		
<i>Viola sachalinensis</i>		B					
<i>Vitis coignetiae</i>		B, G		G	B, G		
<i>Zostera cespitosa</i>					B		

Anu., Anuchina [Akiyuri, 秋勇留]; Iur., Iuriy [Yuri, 勇留]; Pol., Polonskogo [Taraku, 多楽]; Tan., Tanfilyeva [Suisho, 水晶]; Zel., Zelenyj (Zelenyi) [Shibotsu, 志発]; Dem., Demina [Harukarimosiri, ハルカリモシリ (small island, 3km east of Yuri)]; Sto., Storzhevoy [Moemoshiri, 萌茂尻 (small island, 3km south-west of Signal'nyy, 貝殻島)]

B—Barkalov & Eremenko (2003)

CH—Report only by Chernyaeva (1977)

G—Collection by S. Gage

J—Collection by S. L. Joneson

In *Empetrum*, (G) regarded the single species.

obs means observation only.

## Further Chromosome Studies on Vascular Plant Species from Sakhalin, Moneron and Kurile Islands

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**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.

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### 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, Ekarna 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: Onkotan 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 caryologically. 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 pseudochamaemorus* Tolm.

(*R. chamaemorus* L. var. *pseudochamaemorus* (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. pseudochamaemorus* 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. pseudochamaemorus* from Japan (Hokkaido) are known. This species shows some features of *R. arcticus* and might be of hybrid origin (*R. chamaemorus* × *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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## Occurrence of *Eurycerus (Teretifrons) glacialis* Lilljeborg, 1887 (Cladocera, Chydoridae) on Sakhalin Island

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**Abstract** Here we report the first observation of *Eurycerus glacialis* on Sakhalin Island. The abundance of this species in a lake was positively associated with aquatic vegetation. The morphological characteristics of the specimens collected on Sakhalin are described.

**Key words:** Chydoridae, *Eurycerus*, Sakhalin

### Introduction

*Eurycerus (Teretifrons) glacialis*, one of the largest species of cladocerans, inhabits ponds and pools of arctic and subarctic regions and has also been observed at lower latitudes in Europe and North America (Frey 1971). Its distribution at lower latitudes in Europe includes Germany, the Netherlands, Denmark, Scotland, and Ireland (Frey 1975; Duigan & Frey 1987). In Asia, this species has been reported from the Commander Islands and the Kuril Islands (Lilljeborg 1887; Miyadi 1937; Ueno 1938; Minakawa & Tanaka 2000).

During a biological survey expedition, an international team of American, Russian, and Japanese scientists recorded the first observation of *E. glacialis* on Sakhalin Island. *Eurycerus glacialis* was found in a lake (N 53°04.556', E 143°05.622') about 15 km northeast of Neftegorsk and 3 km northwest of Point Matny in Piltun Bay on August 14, 2003. Ninety-six parthenogenetic females were collected by V. V. Bogatov and N. Minakawa, and examined by S. Tanaka. The specimens were deposited at the College of Ocean and Fishery Sciences, University of Washington, Seattle, USA.

### Habitat characteristics

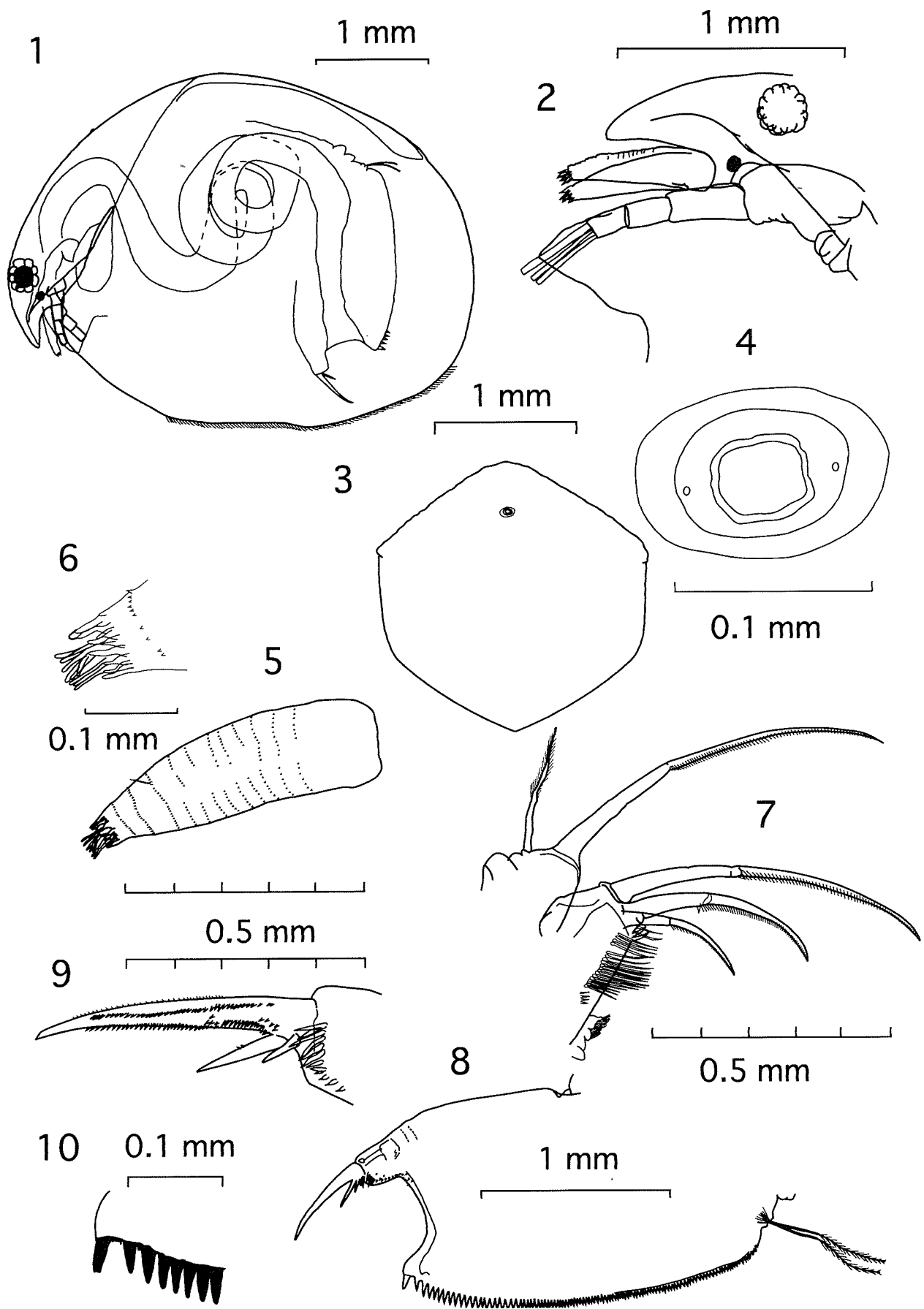
The habitat of *E. glacialis* was characterized by comparing its relative abundance in different habitat types within the lake. Ten transect lines (average length = 29.1 m) were established from the lake shore. An aquatic net (0.3 x 0.2 x 0.2 m; mesh size = 0.5 mm) was dipped into the water along each transect line at 1-m intervals. Habitat type and water depth were recorded at each sampling site. Habitat types were classified according to presence/

absence of three aquatic plant species, *Carex cryptocarpa*, *Sparganium angustifolium*, and *Eleocharis palustris*, which were common in this lake.

*Eurycerus glacialis* was found primarily in shallow water (10–30 cm deep) with a sandy substrate. The abundance of *E. glacialis* was significantly associated with habitat type (ANOVA:  $F = 48.48$ ,  $df = 3$ ,  $P < 0.01$ ), supporting its positive association with aquatic vegetation; in particular, *E. glacialis* was abundant among *S. angustifolium* (Table 1). *Eurycerus glacialis* probably uses vegetation as shelter from predators. Another cladoceran, *Sida crystalline*, also inhabited in this lake.

### Description of parthenogenetic female

Size 2.2–5.9 mm (mean = 4.2; SD = 0.88; n = 96); ratio of height to length 1.43; shell rounded (Fig. 1) with reticulate pattern of irregular hexagonal cells, and golden in color; headshield widest at the fornicis with indentation of dorsal margin (Fig. 3); rostrum longer, bluntly pointed in lateral view (Figs. 1 and 2); antennules projecting beyond tip of rostrum, but not reaching tip of labrum (Fig. 2); antennules with sensory seta (Fig. 5) and 9 terminal aesthetascs (Fig. 6); antennae shorter than antennules (Fig. 2); labrum triangular, anterior margin slightly convex, posterior margin slightly concave (Fig. 2); median headpore large with thickened rim (Fig. 4); 2 lateral pores closely adjacent to rim, separated from one another by approximately 1.5 median pore diameter (Fig. 4); outer distal lobe (ODL) of trunk limb I with 2 setae, one long, 2-segmented, with finely spaced setules along concave margin of distal segment, with no setule distally (Fig. 7); inner distal lobe (IDL) with 3 crasping hooks decreasing in size toward endite; outermost hook longest; innermost hook shortest, approximately equal in length



Figures. Morphological characteristics of *Eurycercus glacialis* found in Sakhalin. 1. Lateral view of parthenogenetic female, 2. Anterior portion of head, 3. Headshield and headpore, 4. Headpore, 5. Antennule, 6. Trunk limb I, 7. Distal lobes, 8. Postabdomen, 9. Postabdominal claw, 10. Frontal part of postabdominal teeth.

Table 1. Abundance (individuals/dip) of *Eurycercus glacialis* associated with three aquatic plant species.

Plant species	Mean	SE	N
<i>Sparganium angustifolium</i>	2.8	0.20	26
<i>Eleocharis palustris</i>	0.8	0.09	116
<i>Carex cryptocarpa</i>	0.5	0.13	60
No vegetation	0.1	0.11	89

to proximal segment of largest hook (Fig. 7); postabdomen broad, flattened plate, subparallel margins, with a row of teeth in darkly pigmented, grey or black, along dorsal margin (Figs. 8 and 10); number of teeth about 100; distalmost tooth only slightly larger than others; teeth gradually decrease in length proximally; distal anal embayment deep, U-shaped (Fig. 8); postabdominal claws robust, gradually tapering to the tip with 2 basal spines; 2 rows of teeth irregularly arranged, one along concave margin, second on medial surface of claw (Fig. 9).

## Discussion

The subgenus *Teretifrons* in the genus *Eurycercus* includes two species, *E. glacialis* and *E. nigracanthus*. Although *E. glacialis* broadly occurs in arctic and subarctic regions, *E. nigracanthus* has been recorded only from Newfoundland (Hann 1990). Based on the morphological differences between these two species summarized by Hann (1990), the specimens from Sakhalin and *E. glacialis* have several characteristics in common. In particular, the shape of the teeth on the dorsal margin of the postabdomen is similar between the Sakhalin specimens and *E. glacialis*, but differs between the Sakhalin specimens and *E. nigracanthus*. The shape of the teeth is a good characteristic by which to differentiate *E. glacialis* from *E. nigracanthus*, because it is a stable characteristic among populations. However, the Sakhalin specimens have a golden shell and darkly pigmented teeth on the dorsal margin of the postabdomen (Figs. 8 and 10), which are characteristic of *E. nigracanthus*. Hann (1990) noted that the pigmentation of the teeth on the dorsal margin of the postabdomen varies among populations.

The known distribution of *E. glacialis* in Far East Asia is restricted to the Commander Islands (Frey 1971), the northern Kuril Islands (Minakawa & Tanaka 2000), and northern Sakhalin (this study). This species has not yet been reported from the Asian continent, including the Kamchatka Peninsula. In contrast, *Eurycercus* (*Eurycercus*) *lamellatus* and *Eurycercus* (*Bullatifrons*) *macracanthus* have not been observed on the islands of Far East Asia. *Eurycercus lamellatus* has been observed

in the Ussuri district in Russia (Ueno 1937), Tibet, and northern China (Chian & Du 1979), while *E. macracanthus* has been recorded from the Amur River near Khabarovsk (Frey 1973) and from the Ussuri district (Tanaka unpublished data).

Inoue (1968) reported *E. glacialis* in Hokkaido (see also Flößner 2000), although we believe that this was a misidentification (Frey 1971). On the other hand, an undescribed species belonging to the subgenus *Bullatifrons* occurs in some lakes on Hokkaido and Honshu (Tanaka 1987), but whether the animal reported by Inoue (1968) is the same undescribed species has not been confirmed.

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## Millipedes (Diplopoda) of the Kurile Islands

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**Abstract** The millipede fauna of the Kurile Islands is reviewed, with 11 recognizable species involved, all arranged in a catalogue-like way. A brief historical account, new faunistic records, a comparative analysis, and zoogeographical notes are given. Remarks and illustrations are provided for all species encountered, including data on the taxonomy, distribution and ecology. All species currently known from Kurile Islands are keyed.

**Key words:** Diplopoda, fauna, keys, distribution, Kurile Islands

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### Introduction

The vast majority of millipedes (Diplopoda) are saprophages; they play important roles in the processes of decomposition of plant debris and in pedogenesis. Currently this class of Myriapoda contains over 11,000 described species classified to 144 families, 16 orders and two subclasses after the new family-level classification (Shelley 2003). However, actual quantity of species is suspected to be near 80,000 (Hoffman 1980).

Millipede fauna of the Russian Far East [= territory encompasses the Magadan, Kamchatka, Amurskaya and Sakhalin (Sakhalin Island + Kurile Islands) areas as well as the Khabarovsk and Primorsky provinces] can be considered as a fairly good investigated. At present the Far East of Russia supports 66 species, 28 genera, 15 families and 5 orders. Information on Diplopoda of this territory is summarized in the faunistical review of millipedes of the Asian part of Russia (Mikhailjova 2004). According to the faunistical list of Miyosi (1959) millipede fauna of Japan contains 180 species, 57 genera, 19 families and 6 orders.

The first record of a millipede in the Kurile Islands belongs to Golovatch (1980). He reported the genus *Underwoodia* from the Kunashir Island as plotted on a map only, but he did not treat this record as conspecific with Far Eastern species *U. kurtischevae* Golovatch, 1980 due to the absence of males. Since then additional and new species were reported or described by Enghoff (1985), Mikhailjova (1988, 1990, 1995, 1996, 1998a), Golovatch *et al.* (1995), Mikhailjova & Basarukin (1995), of which latter was exclusively devoted to the insular fauna of the Russian Far East (Sakhalin Island and

Kuriles). In addition, reviews of the millipede faunas of the Asian part of Russia (Mikhailjova 1993, 2004) and the Russian Far East (Mikhailjova 1998b) contain the information on the diplopods of the Kuriles.

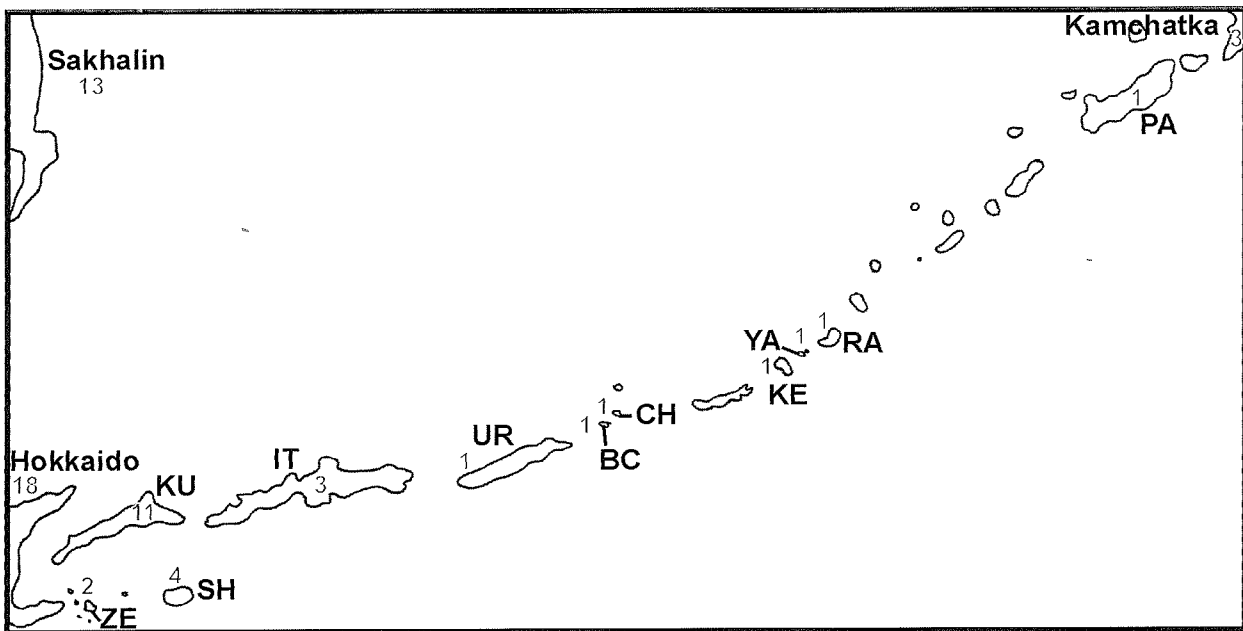
The millipede fauna of the northern part of the Kuriles is practically unknown (only one species has been reported from this territory) in contrast to fairly well investigated fauna of the Kunashir Island. Different specialists collected material in the Archipelago. Great contribution to the collection of Diplopoda of the Kurile and Sakhalin islands was made by the Russian outstanding naturalist Anatoly M. Basarukin as well as Kirill Yu. Eskov and the second author in the course of the International Kuril Island Project (IKIP) in 1994–1995 and the expedition of the second author in 1996–1997.

### Materials and Methods

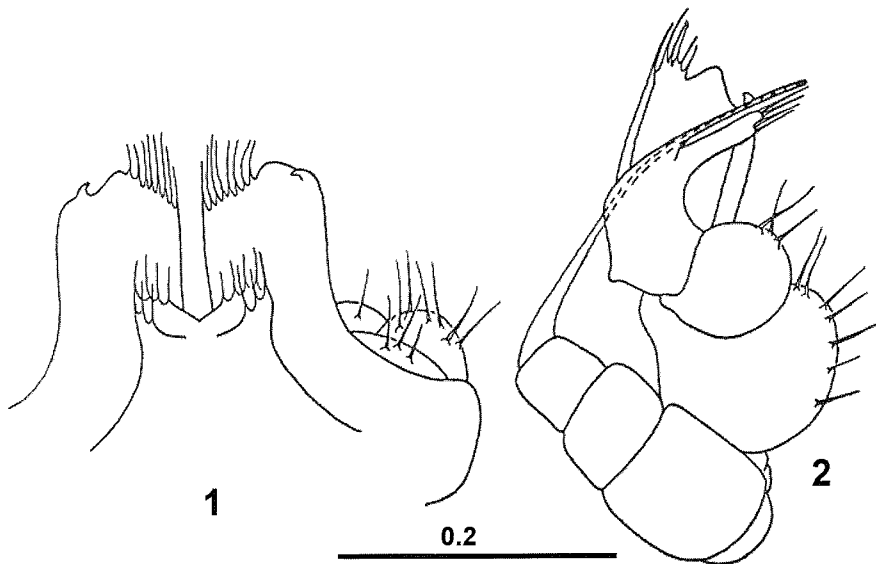
Unidentified material from the Kurile Islands deposited in the Institute of Biology and Soil Science, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok (IBSS) have been located and treated here. Examined and published samples were omitted.

Each species heading references to all published material from the Kuriles as well as original combinations are given. The list of taxa is given after the classification of Hoffman (1980).

Names of the islands have been abbreviated according to IKIP standard: ZE – Zelyonyi, SH – Shikotan, KU – Kunashir, IT – Iturup, UR – Urup, BC – Brat Chirpoev, CH – Chirpoi, KE – Ketoi, YA – Yankicha (Ushishir), RA – Rasshua, PA – Paramushir.



Map 1. Species diversity in Diplopoda within the Kurile Islands and adjacent territories. Quantity of species is written by Arabic numerals; abbreviations as in Table 1.



Figures 1–2.  
*Angarozonium aduncum*  
(Mikhaljova, 1995): 1 gonopods  
(front view); 2 gonopods  
(caudal view). Scale in mm  
(after Mikhaljova and Basarukin  
1995).

## Species surveyed

### Order Polyzoniida Family Polyzoniidae

#### *Angarozonium aduncum* (Mikhaljova, 1995) [Figs 1–2]

*Polyzonium aduncum* Mikhaljova, 1995 in Mikhaljova & Basarukin, 1995: 90–91, 90: map 1, 91: f. 1–3.

*Angarozonium aduncum*: Shelley, 1998: 30; Mikhaljova, 1998b: 12, 11: f. 21–22, 12: map 2; Mikhaljova, 2004: 44–45, 44: f. 20–21, 45: map 2.

*Comments.* This detritivorous species dwells in forest litter and mosses; also it has been reported in *Sphagnum* bogs.

*Distribution.* The species has the insular range including southernmost Sakhalin and Kuriles (Kunashir and Shikotan islands) (Mikhaljova 2004).

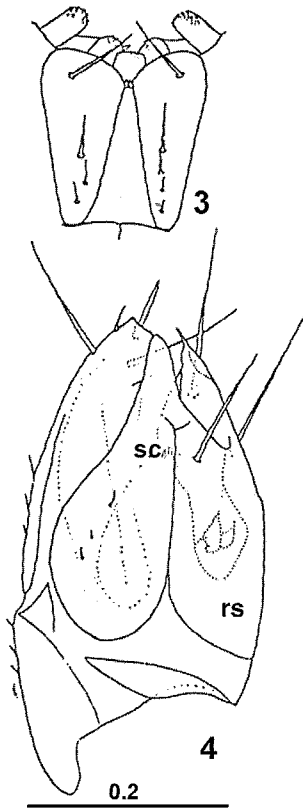
### Order Julida Family Nemasomatidae

#### *Orinisobates microthylax* Enghoff, 1985 [Figs 3–4]

*Orinisobates microthylax*: Mikhaljova, 1993: 16, 12: map 2; Mikhaljova & Basarukin, 1995: 91–92, 90: map 1; Mikhaljova, 1998b: 73, 73: map 19, 72: f. 316–317; Mikhaljova & Golovatch, 2001: 107; Mikhaljova & Korsós, 2003: 219; Mikhaljova & Marusik, 2004: 5; Mikhaljova, 2004: 94–96, 94: map 12, 95: f. 211–212.

*Comments.* This species mostly dwells under bark of logs. However, it occurs also in forest litter. *O. microthylax* is obligatory thelytokion species.

*Distribution.* The species is distributed in central and southern parts of Kamchatka Peninsula, the southern part of the Kuriles, Sakhalin Island, the southern part of Khabarovsk Province and Primorsky Province; it has also



Figures 3–4. *Orinisobates microthylax* Enghoff, 1985: 3 lamellae linguales and promentum of female gnathochilarium; 4 left vulva; rs receptaculum seminis with a pair of internal flaps; sc sclerotisations at base of receptaculum seminis. Scale in mm (after Enghoff 1985).

been recorded in Buryatia, Siberia (Mikhaljova 2004). Its occurrence in Northeast China and Hokkaido Island is very likely.

***Orinisobates soror* Enghoff, 1985 [Figs 5–10]**

*Orinisobates soror* Enghoff, 1985: 48–49, 49: f. 44–49, 50: map (=Fig. 50); Mikhaljova, 1990: 137; Mikhaljova, 1993: 16, 12: map 2; Mikhaljova & Basarukin, 1995: 91, 90: map 1; Mikhaljova, 1998a: 7; Mikhaljova, 1998b: 72–73, 72: f. 312–315, 73: map 19; Mikhaljova, 2004: 92–94, 93: f. 205–210, 94: map 12.

*Comments.* This species lives mostly in lake- and seashore. Also, it was collected in gramineous meadow (Mikhaljova & Basarukin 1995).

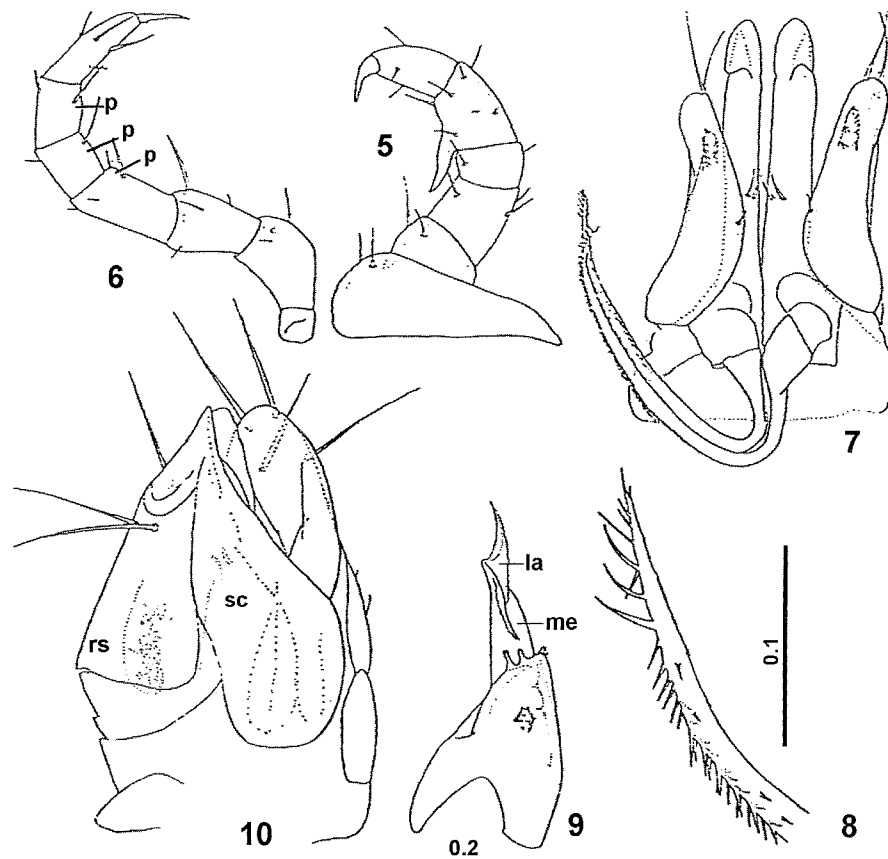
*Distribution.* Like some other species, this species has the insular range. It is known from the South Sakhalin Island and southern-middle Kuriles (Mikhaljova 2004).

**Family Julidae**

***Cylindroiulus latestriatus* (Curtis, 1845) [Fig. 11]**

*Cylindroiulus latestriatus*: Mikhaljova, 1998a: 6; Mikhaljova, 1998b: 61–62, 61: f. 241; Mikhaljova, 2004: 57–58, 57: f. 48, 58: map 5.

*Comments.* This is anthropochorous subcosmopolitan species. In the Kuriles, it has been only found sandy seashore hull near Yuzhno-Kurilsk, Kunashir Island (Mikhaljova 1998a). This record is the definitely



Figures 5–10. *Orinisobates soror* Enghoff, 1985: 5 male first right leg (front view); 6 male midbody leg; 7 anterior gonopods (caudal view); 8 distal part of flagellum; 9 right posterior gonopod (lateral view); 10 right vulva; la lateral lamella; me mesal lamella; p soft pads; rs receptaculum seminis with sperm; sc sclerotisations at base of receptaculum seminis. Scales in mm (after Enghoff 1985).

introduction through human agency.

*Distribution.* The species is widely distributed in Europe and introduced to the North and South America as well as the northern part of Asia. The Asian localities of *Cylindroiulus latestriatus* are rare (Altai Mts, Tomsk City, Kunashir Island) (Mikhaljova 2004).

**Order Chordeumatida**  
**Family Diplomaragnidae**

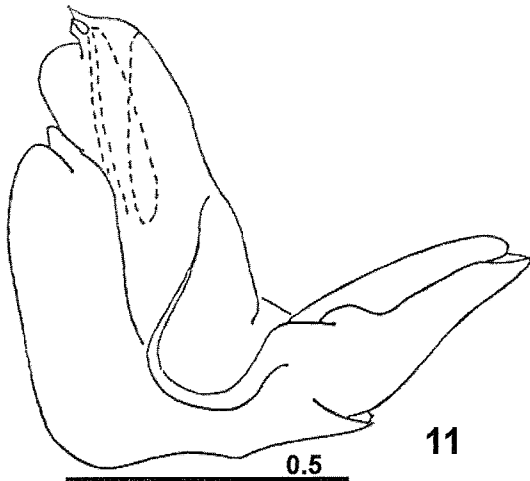


Figure 11. *Cylindroiulus latestriatus* (Curtis, 1845): gonopods (mesal view). Scale in mm (after Mikhaljova 1998b).

***Sakhalineuma curvatum* (Mikhaljova, 1995) [Figs 12–16]**

*Diplomaragna curvata* Mikhaljova, 1995: 83–86, 84: f. 19–23; Mikhaljova & Basarukin, 1995: 94, 93: map 3; Mikhaljova, 1998b: 23, 23: f. 72–74, 19: map 5.

*Sakhalineuma curvatum*: Mikhaljova, 2004: 129–130, 130: f. 299–303, 126: map 17.

*Comments.* The species lives mainly in the litter of broad-leaved forests with bamboo undergrowth. It has been collected on vegetation and seashores.

*Distribution.* This species has the insular range embracing south Sakhalin and the southern Kuriles (Mikhaljova 2004).

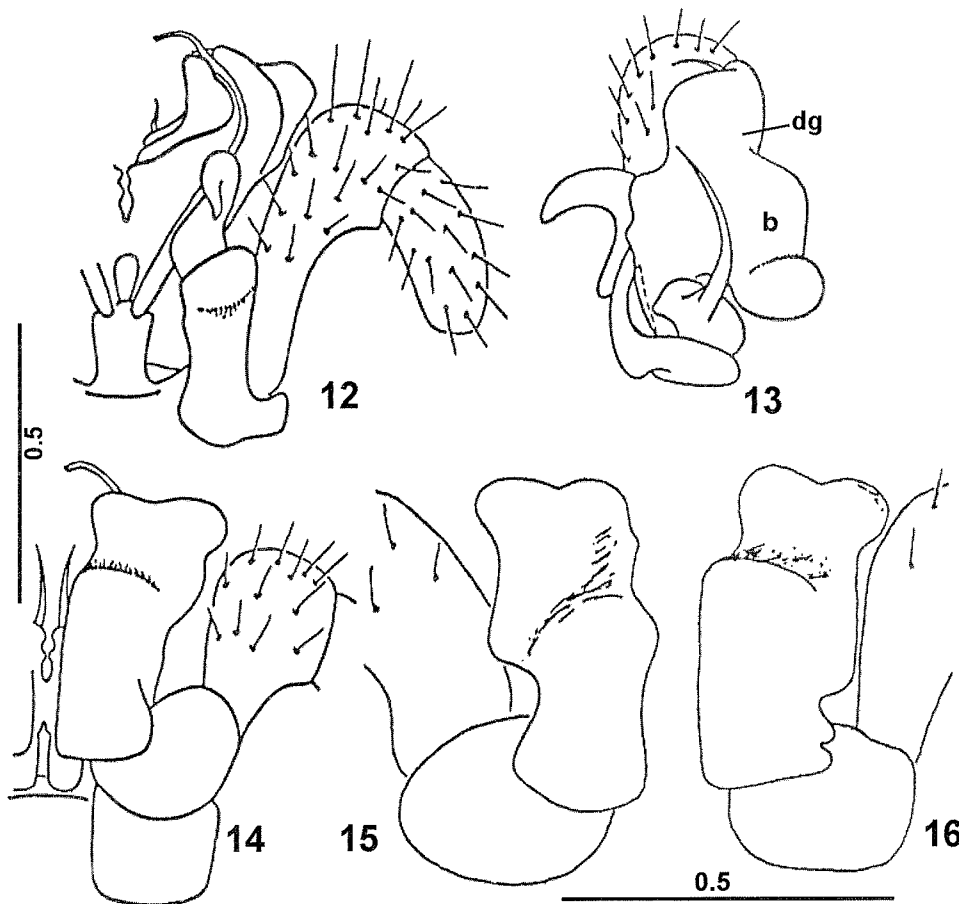
***Sakhalineuma tuberculatum* (Mikhaljova, 1995) [Figs 17–21]**

*Diplomaragna tuberculata* Mikhaljova, 1995: 82–83, 83: f. 13–18; Mikhaljova & Basarukin, 1995: 94, 93: map 3; Mikhaljova, 1998b: 22, 21: f. 63–68, 19: map 5.

*Sakhalineuma tuberculatum*: Mikhaljova, 2004: 126–128, 126: map 17, 127: f. 291–295.

*Material examined.* 1 ♂, 1 ♀ (IBSS), Kuriles, Paramushir Island, NE shore, environs of Severo-Kurilsk, 50°40'N, 156°06'E, 13.09.1996, leg. Marusik Yu. M.

*Comments.* Originally described from the southern Sakhalin Island and Kunashir Island, this species appears to be widespread here; it has not hitherto been recorded



Figures 12–16. *Sakhalineuma curvatum* (Mikhaljova, 1995): 12 gonopods (caudal view); 13 gonopods (mesal view); 14–16 gonopods (front view); b prominence of colpocoxite; dg distal groove of colpocoxite. Scales in mm (12–14 after Mikhaljova 1998b; 15–16 after Mikhaljova 1995).

in the northern part of the Kuriles. This species dwells in leafy forests as well as on seashores and lake banks.

*Distribution.* The range of this species is restricted to the Kuriles (Kunashir and Paramushir islands) and the southern part of Sakhalin Island (Mikhaljova 2004).

### Family Caseyidae

#### *Underwoodia kurtschevae* Golovatch, 1980 [Figs 22–34]

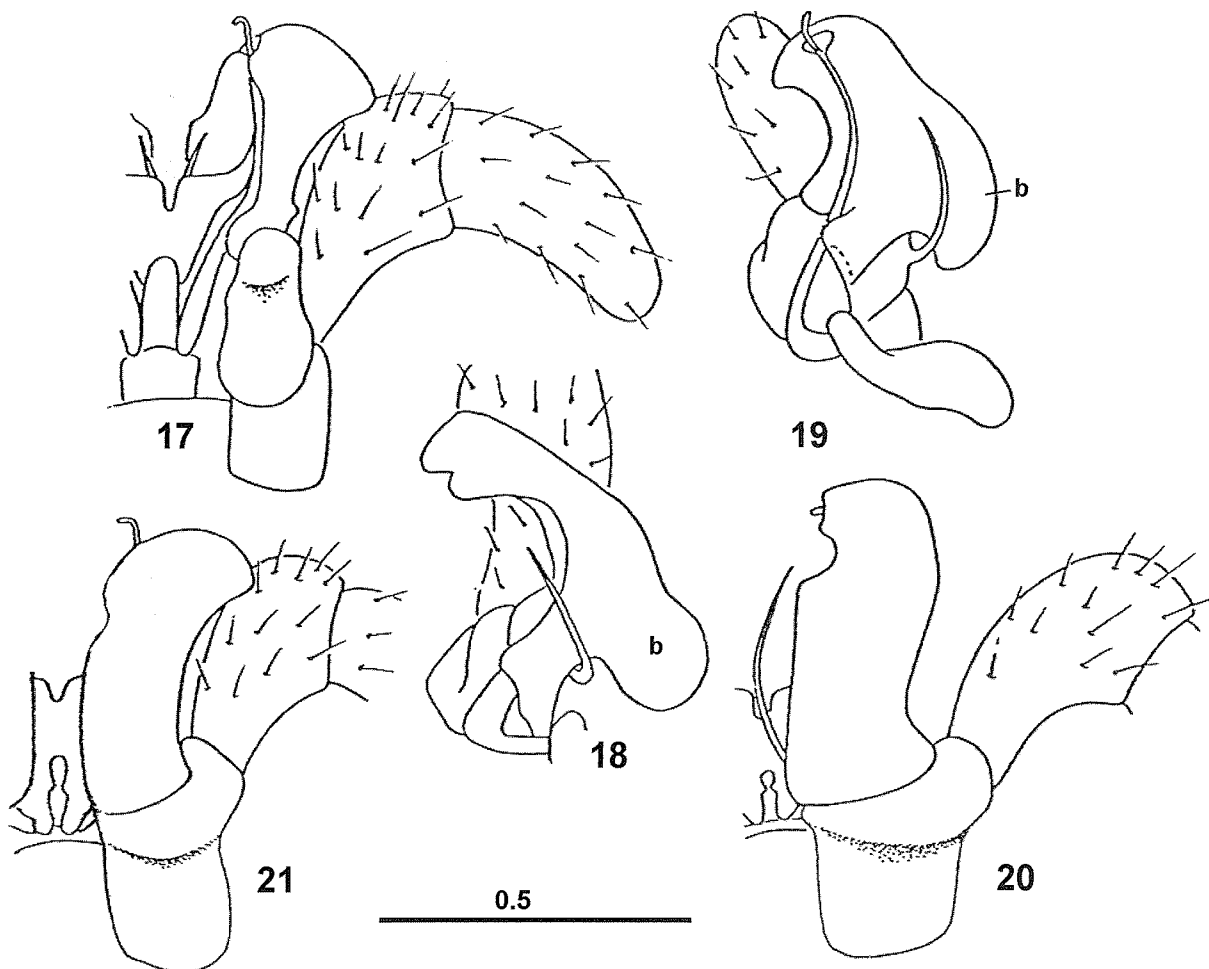
*Underwoodia kurtschevae*: Golovatch, 1980: 199–202, 200: f. 1, 201: map (= f. 2); Mikhaljova, 1990: 137; Mikhaljova, 1993: 17–18; Shelley, 1993: 175, 172: f. 10, 175: map (= f. 12); Mikhaljova & Basarukin, 1995: 92–94, 92: f. 4–7, 93: map 2; Mikhaljova, 1998b: 40–42, 40: map 9, 39: f. 138–141; Mikhaljova & Marusik, 2004: 6; Mikhaljova, 2004: 202–205, 203: f. 505–517, 204: map 26.

*Material examined.* 1 juv. (IBSS), Kuriles, Urup Island, C-SW shore Otkryty Reid S shore, 45°51'N, 149°46'E, 4–5.VIII.1995. – 1 ♀ (IBSS), Kuriles, Urup Island, NW shore Natalii B., S shore near Natalii R., 46°06'N, 150°07'E, 6.VIII.1995. – 2 ♀♀ (IBSS), Kuriles, Urup Island, NW shore Natalii Bay, C shore Obzhytaya R. valley, 46°10'N, 150°08'E, 7.VIII.1995. – 1 ♀ (IBSS), Kuriles, Ketoi Island, N part, Storozheva Cape W of

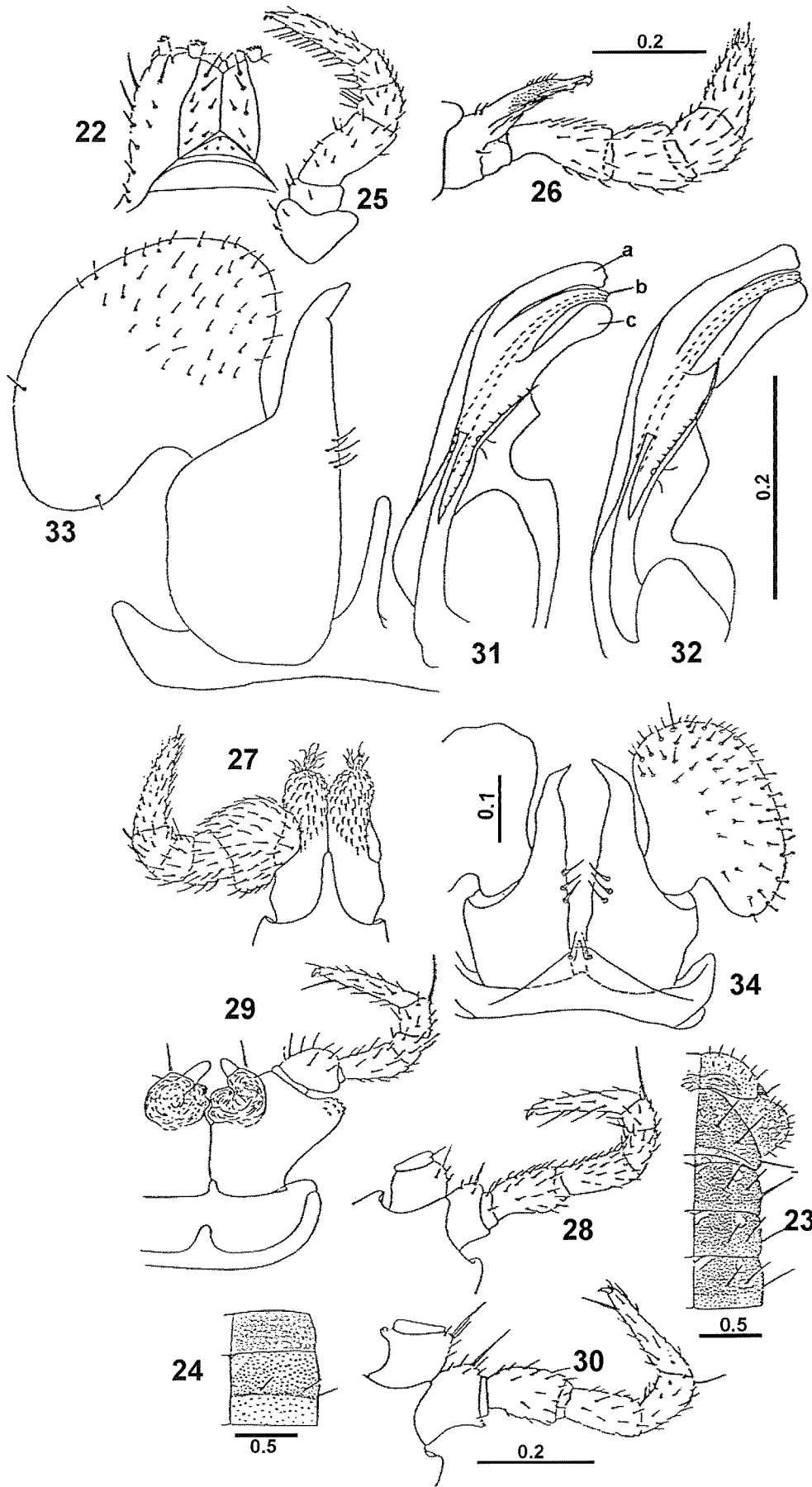
Caskad Waterf., 47°22.60'N, 152°27.48'E, 15.VIII.1995. – 3 ♀♀, 1 juv. (IBSS), Kuriles, Chirpoi Island, NE Part of Peshchanaya Bay, 46°32.52'N, 150°53.90'E, 23.VIII.1995. – 2 juv. (IBSS), Kuriles, Kunashir Island, 5 km E of Yu. Kurilsk, near Sukacheva Cp., 145°51.95'E, 40°04.50'N, bamboo thicket, 21.VIII.1997. – 1 ♀ (IBSS), Kuriles, Kunashir Island, SW of Yu. Kurilsk, Lesnaya River, Kisly Ck., 44°00.72'N, 145°46.28'E, 1.IX.1995. – 1 ♀ (IBSS), Kuriles, Shikotan Island, Krabozavodskoe Vil., 146°45.24'E, 43°50.10'N, canyon with *Abies*, *Taxus*, birch forest with ferns Gramineae and *Carex*, 14.IX.1997. – 1 juv. (IBSS), same locality, under stones along ck., 14.IX.1997; all leg. Yu. M. Marusik.

*Comments.* This is rather common species in the southern part of the Russian Far East. It is characterized by thelytoky with males almost absent in populations. This species has hitherto been reported from Urup Island, Ketoi Island and Chirpoi Island, all plotted on a map; corresponding materials have not been given (Mikhaljova 1998b). These samples are given above.

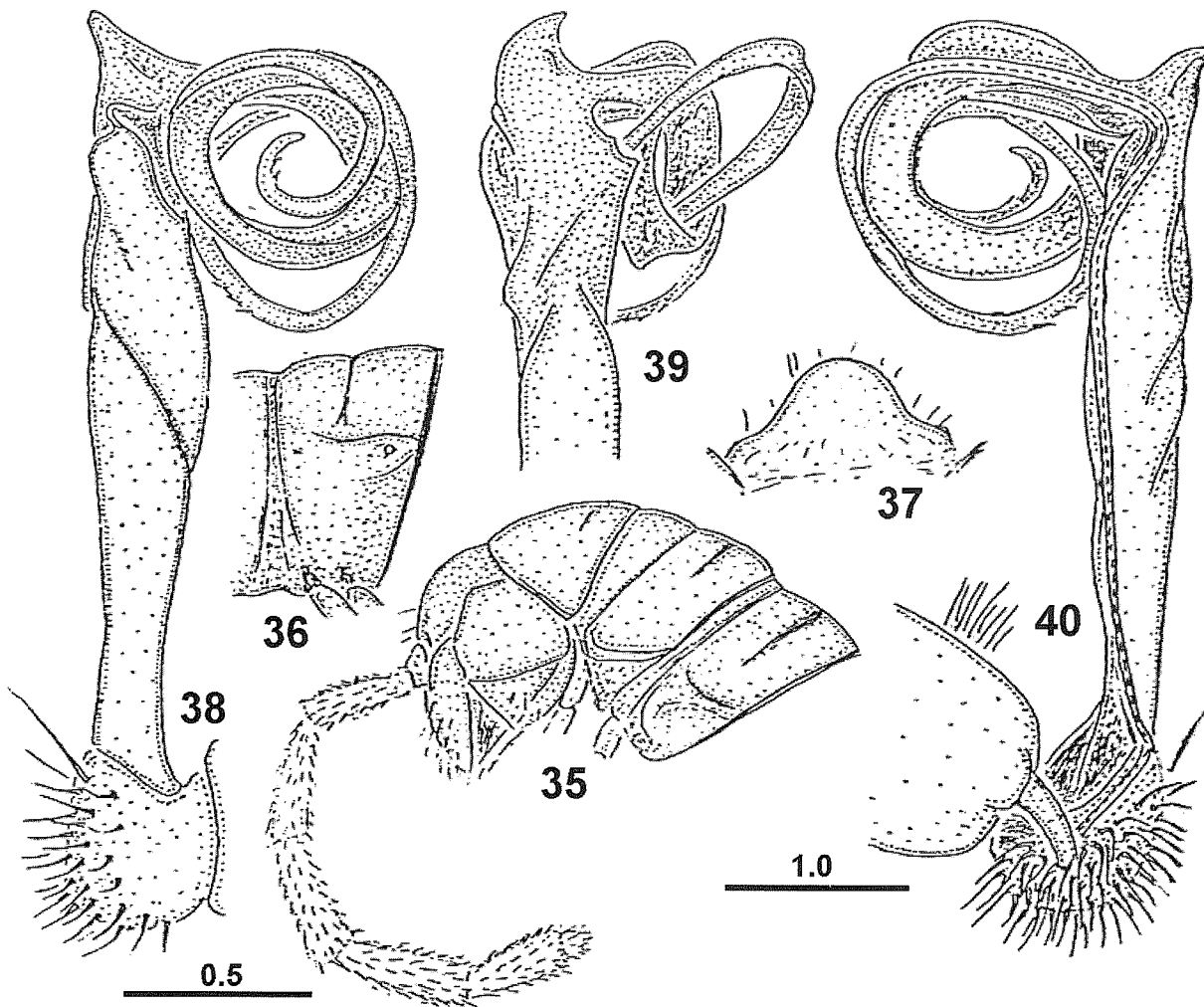
*Distribution.* This species is widespread in the southeastern part of the Russian Far East and reaches as far north as the central part of the Kamchatka Peninsula. The most southern locality is North Korea. In the west border of the species range coincides with Maliyi Khingan Mt. Range, in the east – with the Kurile Islands



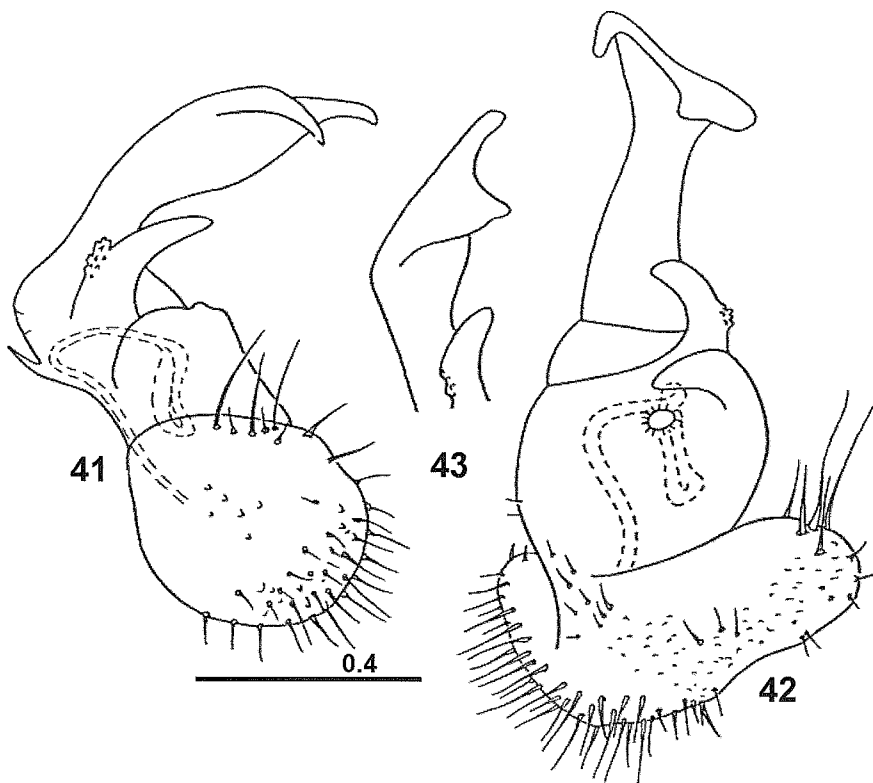
Figures 17–21. *Sakhalineuma tuberculatum* (Mikhaljova, 1995): 17 gonopods (caudal view); 18–19 gonopods (mesal view); 20–21 gonopods (front view); b prominence of colpocoxite. Scale in mm (after Mikhaljova 1998b).



Figures 22–34. *Underwoodia kurtshchevae* Golovatch, 1980: 22 gnathochilarium; 23 fore part of male body (dorsal view); 24 male midbody segment (dorsal view); 25 male first leg; 26 male second leg; 27 male leg pair 3; 28 male leg pair 4; 29 male leg pair 10; 30 male leg pair 11; 31–32 anterior gonopods (caudal view); 33 posterior gonopod (caudal view); 34 posterior gonopods (front view); a mesal branch of colpocoxite; b lateral branch of colpocoxite; c posterior branch of colpocoxite. Scales in mm (22–30, 34 after Golovatch 1980; 31–33 after Mikhaljova and Basarukin 1995).



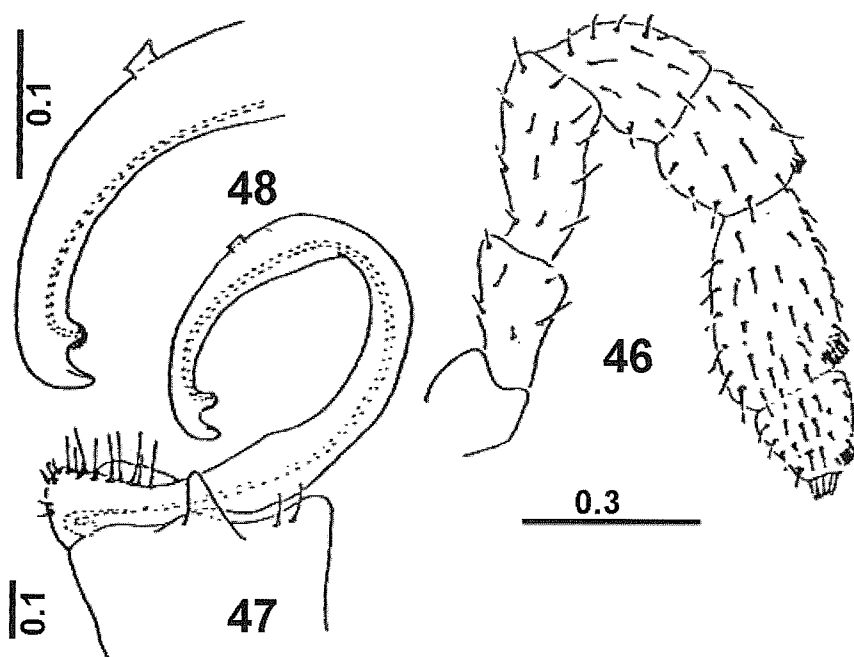
Figures 35–40. *Haplogonosoma implicatum* Brölemann, 1916: 35 fore part of male body; 36 male body segment 10; 37 lamina between male coxae 4; 38 gonopod (lateral view); 39 distal part of gonopod (subventral view); 40 gonopod (mesal view). Scales in mm (after Golovatch *et al.* 1995).



Figures 41–43. *Epanerchodus kunashiricus* Mikhaljova, 1988: 41 gonopod (lateral view); 42 gonopod (ventral view); 43 gonopod telopodite and postfemoral process (43 cephalic and caudal distofemoral processes, according to Golovatch 1991 and Djursvoll *et al.* 2001). Scale in mm (after Mikhaljova 1988).







Figures 46–48. *Uniramidesmus septimus* Mikhaljova, 1990: 46 antenna; 47 gonopod (lateral view); 48 distal part of gonopod telopodite. Scales in mm (after Mikhaljova 1990).

3	(8)	or without paraterga.....3 Telson with a pair of spinnerets. Each metatergite with 3+3 macrochaetae .....	14	(11)	1991; Djursvoll <i>et al.</i> 2001)] with two branches apically (Figs 41–43) .....
		..... Order Chordeumatida			<i>E. kunashiricus</i>
4	(7)	Body segments with medium-sized paraterga. Posterior gonopod bearing colpocoxite with a front prominence (b) (Figs 13, 18–19) .....	15	(10)	Paraterga narrow. Body relatively small (adults < 15 mm long). Gonopods as in Figs 47–48 .....
		..... Family Diplomaragnidae			..... Genus <i>Uniramidesmus</i> , <i>U. septimus</i>
		..... Genus <i>Sakhalineuma</i>			Paraterga relatively poorly-developed, with peritremata, non-serrate at lateral margin (Fig. 36). Body stout, metaterga strongly convex, arched, without traces of bosses. Gonopods (Figs 38–40) free from each other basally .....
5	(6)	Male coxa 11 with a digitiform process. Gonopods as in Figs 17–21; lateral sheath process of posterior gonopod colpocoxite tuberculiform (Figs 18–19) .... <i>S. tuberculatum</i>	16	(9)	..... Family Paradoxosomatidae
		..... Genus <i>Sakhalineuma</i>			..... Genus <i>Haplogonosoma</i> , <i>H. implicatum</i>
6	(5)	Male coxa 11 without processes. Gonopods as in Figs 12–16; lateral sheath process of posterior gonopod colpocoxite cylindrical, curved (Fig. 13) .....	17	(18)	Metatergites without paraterga, body subcylindrical. Eyes present. Adult body with more than 20 segments. .... Order Julida
		..... <i>S. curvatum</i>			Surface of metazonites completely striate. Gonopods as in Fig. 11 .....
7	(4)	Body segments without paraterga or bulges (Fig. 24). Gonopods, including posterior ones, different, as in Figs 31–34 .....	18	(17)	..... Family Julidae
		..... Family Caseyidae			..... Genus <i>Cylindroiulus</i> , <i>C. latestriatus</i>
		..... Genus <i>Underwoodia</i> , <i>U. kurtschevae</i>			Surface of metazonites clearly striate only below ozopore level. Gonopods different .....
8	(3)	Telson without spinnerets. Metatergites without macrochaetae or with simple setae .....	19	(20)	..... Family Nemasomatidae
		..... 9			..... Genus <i>Orinisobates</i>
9	(16)	Metatergites with paraterga. Eyes absent. Adult body with 20 segments, including telson .....	20	(19)	Setae on metazonites distinctly visibly. Gonopods as in Figs 7–9 .....
		..... Order Polydesmida			<i>O. soror</i>
		..... Family Polydesmidae			Setae on metazonites not or hardly visible even at high magnification. Male unknown. Female receptaculum seminis reduced (Fig. 4) .....
10	(15)	Paraterga well-developed, serrate at lateral margin, without peritremata. Body relatively slender; metaterga relatively flat, with three transverse rows of bosses. Gonopod coxites fused medially .....			..... <i>O. microthylax</i>
		..... Family Polydesmidae			
11	(14)	Paraterga broad. Body relatively large (adults >15 mm long). Gonopods as in Figs 41–43, 44–45 .....			
		..... Genus <i>Epanerchodus</i>			
12	(13)	Gonopod telopodite [= Cephalic distofemoral process, using modern terminology (Golovatch 1991; Djursvoll <i>et al.</i> 2001)] without two branches apically (Figs 44–45) .....			
		..... <i>E. cuspidatus</i>			
13	(12)	Gonopod telopodite [= Cephalic distofemoral process, using modern terminology (Golovatch			

## Results and Discussion

At present, 11 species from 8 genera, 7 families and 4 orders of Diplopoda are known to occur in the Kurile Islands (see Table 1 and Map 1). Millipedes have been reported from 11 of 30 islands. Rather this pattern expresses the degree of Diplopod's fauna study. Within the Archipelago millipedes are restricted to the southern Kuriles (Shikotan-Kunashir-Iturup) and the southern part of middle Kuriles (Urup-Ushishir); only one species has been registered in Paramushir of all northern islands.

Like other animals and plants (cf. Pietsch *et al.* 2003) the highest species diversity is recorded in Kunashir Island. Actually the millipede fauna of this island incorporates all species known from the Archipelago. This pattern contrasts the faunas of other invertebrate groups.

Majority of regional species (63.6% of the total number of species) have insular ranges. The distribution areas of three species (27.3%) cover both continental territories and islands. Thus, *Underwoodia kurtschevae* are widely distributed in the Far East of Russia; also it has been reported in North Korea. *Orinisobates microthylax* has the large range covering East Siberia and the Russian Far East. Such pattern probably being accounted for by parthenogenesis characteristic of these species. *Uniramidesmus septimus* is known from the Kuriles, Sakhalin Island and Khabarovsk Province, Far East of Russia.

*Orinisobates soror* and *Underwoodia kurtschevae* are the most widespread species in the Archipelago, they have been reported from 6–7 islands within the South

Kuriles and the southern part of the middle Kuriles.

Synantropic *Cylindroiulus latestriatus* is not the natural component of the fauna. This species has definitely been introduced to Kunashir Island through human agency. It was collected in the semi-natural habitat (Mikhaljova 1998a). *Cylindroiulus latestriatus* is widespread in Europe, introduced into North and South America as well as the Asian part of Russia (Mikhaljova 2004).

Generally, the fauna of Diplopoda of the Kuriles is sufficiently original. The number of species endemic to Sakhalin-Kurile Islands attains 36.4% of the region's total species diversity. *Epanerchodus cuspidatus* and *E. kunashiricus* are endemic to the Kuriles, all accounting 18.2% of all regional species, and all found in Kunashir Island. Of 8 millipede genera currently known from the Kuriles, only *Sakhalineuma* (12.5%) occurs in Sakhalin Island and Kuriles.

As a result, 37.5% of genera (including endemic *Sakhalineuma*) and 45.5% of species are distributed in

Table 1. A list of Diplopoda of the Kurile Islands.

Order, family, species	ZE	SH	KU	IT	UR	BC	CH	KE	YA	RA	PA	other territories
<b>Polyzoniida</b>												
<b>Polyzoniidae</b>												
<i>Angarozonium aduncum</i> (Mikhaljova, 1995)		*	*									SA
<b>Julida</b>												
<b>Nemasomatidae</b>												
<i>Orinisobates microthylax</i> Enghoff, 1985		*	*	**								ES, KA, SA, PP, KH
<i>Orinisobates soror</i> Enghoff, 1985	*	*	*			*			*	*		SA
<b>Julidae</b>												
<i>Cylindroiulus latestriatus</i> (Curtis, 1845)			*									EU, NSA, NA
<b>Chordeumatida</b>												
<b>Diplomaragnidae</b>												
<i>Sakhalineuma curvatum</i> (Mikhaljova, 1995)			*	*								SA
<i>Sakhalineuma tuberculatum</i> (Mikhaljova, 1995)			*								*	SA
<b>Caseyidae</b>												
<i>Underwoodia kurtschevae</i> Golovatch, 1980	*	*	*	*	*		*	*				PP, KH, MKHR SA, KA, NK
<b>Polydesmida</b>												
<b>Paradoxosomatidae</b>												
<i>Haplogonosoma implicatum</i> Brölemann, 1916			*									HI
<b>Polydesmidae</b>												
<i>Epanerchodus kunashiricus</i> Mikhaljova, 1988			*									
<i>Epanerchodus cuspidatus</i> Mikhaljova, 1996			*									
<i>Uniramidesmus septimus</i> Mikhaljova, 1990			*									KH, SA
<b>Total</b>	2	4	11	3	1	1	1	1	1	1	1	

ZE – Zelyonyi, SH – Shikotan, KU – Kunashir, IT – Iturup, UR – Urup, BC – Brat Chirpoev, CH – Chirpoi, KE – Ketoi, YA – Yankicha (Ushishir), RA – Rasshua, PA – Paramushir.

PP – Primorsky Province, KH – Khabarovsk Province, MKHR – Malyi Khingan Mt. Range, SA – Sakhalin Island, KA – Kamchatka Peninsula, ES – East Siberia, NK – North Korea, HI – Honshu Island, EU – Europe, NSA – North and South America, NA – northern part of Asia.

\* – *Orinisobates microthylax* has been reported under the bark of a log introduced as firewood from both southern Sakhalin Island and Primorsky Province (Mikhaljova, 1993).

Table 2. A list of Diplopoda of the Kuriles and adjacent territories (Hokkaido Island, Sakhalin Island and Kamchatka Peninsula).

Order, family, species	Hokkaido	Sakhalin	Kamchatka	Kuriles
<b><u>Polyzoniida</u></b>				
<b>Polyzoniidae</b>				
<i>Angarozonium aduncum</i> (Mikhaljova, 1995)		*		*
<i>Angarozonium amurense</i> (Gerstfeldt, 1859)		*	*	
<b><u>Julida</u></b>				
<b>Nemasomatidae</b>				
<i>Orinisobates microthylax</i> Enghoff, 1985		*	*	*
<i>Orinisobates soror</i> Enghoff, 1985		*		*
<b>Mongoliulidae</b>				
<i>Kopidoiulus longus</i> Shinohara, 1963	*			
<b>Julidae</b>				
<i>Cylindroiulus latestriatus</i> (Curtis, 1845)				*
<i>Japanopachyiulus niponicus</i> Miyosi, 1957	*			
<i>Amblyiulus lobatus</i> (Verhoeff, 1937)	*			
<b>Pseudonemasomatidae</b>				
<i>Pseudonemasoma femerotuberculata</i> Enghoff, 1991	*			
<b><u>Chordeumatida</u></b>				
<b>Diplomaragnidae</b>				
<i>Sakhalineuma basarukini</i> (Mikhaljova, 1995)		*		
<i>Sakhalineuma curvatum</i> (Mikhaljova, 1995)		*		*
<i>Sakhalineuma globuliferum</i> (Mikhaljova, 1995)		*		
<i>Sakhalineuma molodovae</i> Golovatch, 1976		*		
<i>Sakhalineuma sakhalinicum</i> (Mikhaljova, 1995)		*		
<i>Sakhalineuma tuberculatum</i> (Mikhaljova, 1995)		*		*
<i>Diplomaragna gracilipes</i> (Verhoeff, 1914)	*			
<i>Diplomaragna tsurusakii</i> Shear, 1990	*			
<i>Maritimosoma hokkaidense</i> (Verhoeff, 1939)	*			
<b>Conotylidae</b>				
<i>Japanosoma scabrum</i> Verhoeff, 1914	*			
<i>Yasudatyla yasudai</i> Shear & Tsurusaki, 1995	*			
<i>Yasudatyla shariensis</i> Shear & Tsurusaki, 1995	*			
<i>Yasudatyla hidakaensis</i> Shear & Tsurusaki, 1995	*			
<b>Caseyidae</b>				
<i>Underwoodia kurtischevae</i> Golovatch, 1980		*	*	*
<b><u>Polydesmida</u></b>				
<b>Xystodesmidae</b>				
<i>Levizonus montanus</i> (Takakuwa, 1941)	*			
<i>Levizonus takakuwai</i> (Verhoeff, 1941)	*			
<b>Paradoxosomatidae</b>				
<i>Oxidus gracilis</i> (C.L. Koch, 1847)	*	**		
<i>Haplogonosoma implicatum</i> Brölemann, 1916				*
<b>Polydesmidae</b>				
<i>Epanerchodus cuspidatus</i> Mikhaljova, 1996				*
<i>Epanerchodus fontium</i> Verhoeff, 1940	*			
<i>Epanerchodus furculiger</i> Verhoeff, 1937	*			
<i>Epanerchodus gracilis</i> Takakuwa, 1954	*			
<i>Epanerchodus kunashiricus</i> Mikhaljova, 1988				*
<i>Epanerchodus orientalis</i> (Attems, 1901)	*			
<i>Uniramidesmus septimus</i> Mikhaljova, 1990		*		*
<b>Total</b>	18	13	3	11

\*— *Oxidus gracilis* has hitherto been reported from Sakhalin Island only after the sample collected by Takakuwa in 1933 (Chamberlin & Wang, 1953). Unfortunately, the more detailed locality has not been indicated; most likely it is an anthropogeneous habitat.

the Palaearctic Subregion of the Palaearctic Region (zoogeographical subdivisions adopted here is those of Semenov-Tian-Shansky in 1936). Thus, the center of species diversity for the prolific *Epanerchodus* is Japan and Korea. Only two endemic species are known from the Kuriles. The genus *Haplogonosoma* shows connections with the faunas of East and Southeast Asia.

*Orinisobates*, *Underwoodia* and subfamily Polyzoniinae demonstrate faunal connections between the Kuriles and North America (Mikhailjova 2004).

The genera *Uniramidesmus* and *Sakhalineuma* are endemic to the Asian part of Russia. *Uniramidesmus* with its nine species is more abundantly represented in the southern part of the Russian Far East. Only one species occurs in East Siberia. The genus *Sakhalineuma* is confined to Sakhalin Island and the Kuriles; it is the peripheral member of the family Diplomaragnidae, of which the presumed origin centre lies in Central Asia according to Shear (1990).

Table 2 shows a list of the diplopods encountered in territories adjacent to the Kuriles (Hokkaido Island, Sakhalin Island, and Kamchatka Peninsula). The highest species diversity is observed in Hokkaido Island. However, a single species common for Hokkaido Island and the Kuriles has not hitherto been found. In contrast, regional faunas of some other groups of animals contain common species. The only species (*Haplogonosoma implicatum*) is common for the Kuriles and Japan. This species has been recorded in the southern Kuriles and Central Honshu Island. At the generic level only 25% of all regional genera (*Haplogonosoma* and *Epanerchodus*) appear to be shared by the Kurile Islands and Japan.

The Kamchatka Peninsula supports only three species, which are most widespread in Siberia and the Russian Far East. Two species and two genera are common for the Kurile Islands and the Kamchatka Peninsula.

The millipede fauna of Sakhalin Island is most close to the Kurile fauna as compared with the other adjacent territories. It contains seven common species. At the generic level 62.5% of the total number of Kurile genera are distributed in both Sakhalin and Kurile Islands.

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## Terrestrial Hydrophilid Beetles of the Kuril Archipelago (Coleoptera, Hydrophilidae)

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**Abstract** Terrestrial hydrophilid beetles species (Coleoptera: Hydrophilidae) occurring in the Kuril Archipelago in the northwestern Pacific are reviewed. Based on literature records, museum collections and material from recent expeditions, 17 species (including 2 unidentified) are known from this archipelago. A detail report on 5 species is given on the basis of about 1,260 adult specimens collected in the Kuril Islands by International Kuril Island Project (IKIP). IKIP was a joint Japanese-Russian-American expedition conducted between 1994 – 2000.

**Key words:** Hydrophilidae, Coleoptera, Kuril Archipelago, Northwestern Pacific, IKIP

### Introduction

Terrestrial hydrophilid beetles from East Asia (including Far East Russia, Japan and Korea) are rather poorly known. Despite the recent works by Shatrovskiy (1989, 1992) and Hoshina (2006), their taxonomy and distributions in the region remain unsatisfactorily studied.

There have been only scarce reports on terrestrial hydrophilids from the Kuril Islands Archipelago (the eastern boundary of the Okhotsk Sea and a bridge between Hokkaido and the Kamchatka peninsula of Russia) in the past 50 years. Kuwayama (1967) recorded 9 species of the family Hydrophilidae, mainly from the southern Islands. Six of them are terrestrial: *Cercyon quisquilius*, *C. setulosus*, *C. sp. 1* and *C. sp. 2* (undetermined), *Pachysternum haemorrhoum* and *P. h. sibiricum*. All the specimens were identified by Dr. Takehiko Nakane. Shatrovskiy (1989, 1992) recorded 10 additional species: *Cercyon laminatus*, *C. algarum*, *C. aptus*, *C. dux* (this is a questionable record), *C. numerosus*, *C. olibrus*, *C. rotundulus*, *C. symbion*, *C. vagus* and *C. verus*. Three of these, *C. numerosus*, *C. symbion* and *C. verus*, were new to science. In 1998, Ryndevich described a new species, *Cercyon saluki* from Kunashir Island. In total, records of 16 species and 1 subspecies of the terrestrial hydrophilidae from the Kuril Islands can be found in the literature (see Table 1).

During 1995 to 1997, the senior author (M.Ô.) participated as a Coleoptera specialist in the biodiversity research expedition to the Kuril Islands Archipelago, that

is, the International Kuril Island Project (IKIP). IKIP was a joint Japanese-Russian-American expedition carried out between 1994 – 2000. He collected about 7,140 specimens of Coleoptera (18,559 specimens form the class Insecta), from 164 sites on 20 Islands. The total number of terrestrial hydrophilid beetles specimens collected was about 1,260.

In this paper, we record 5 species from 10 islands of the Kurils based on the IKIP-collected specimens as well as some additional specimens from Hokkaido University museum collection. Figures of the male genitalia and SEM photos of the external morphological characters are included.

### Materials and Methods

The following list is based on a combination of literature records and the examination of specimens collected by 1994 – 2000 by IKIP expeditions. This material is deposited chiefly in SEHU (Laboratory of Systematic Entomology, The Hokkaido University Museum, Hokkaido University, Japan). Additional specimens already housed in the collections of SEHU were also studied. The list includes all species of terrestrial Hydrophilidae recorded from the Kurils so far. For detailed data of locality, date and collector see Appendix. A single asterisk (\*) on the island of the "Distribution" indicates records based on the IKIP materials, and a double asterisk (\*\*) shows new records from the island.

## List of species

### Subfamily Sphaeridiinae

#### Tribe Megasternini

#### Genus *Cercyon* Leach, 1817

#### Subgenus *Paracycreon* d'Orchymont, 1942

#### *Cercyon (Paracycreon) laminatus* Sharp, 1873

*Cercyon laminatus* Sharp, 1873, 66 [Japan (Honshû: Hyôgo)].

*Cercyon (Paracycreon) laminatus*: Huijbregts, 1982, 146; Shatrovskij, 1989, 279 [southern Kurils]; Hansen, 1999, 274.

*Cercyon sharpi* Harold, 1878, 68 [Japan (Honshû: Tôkyô)].

Japanese name: Usumon-keshi-gamushi.

Specimens examined. No specimen from the Kurils has been available for this study.

Distribution. Kuril Islands (southern Kurils). Palearctic: Armenia, Austria, Belgium, Britain, Denmark,

Estonia, Finland, France, Germany, Hungary, Israel, Italy, Japan, Lithuania, Netherlands, Russian Fed. (Far East), Spain, Sweden, Switzerland (the occurrence in western palearctic is due to introduction). Oriental: Taiwan. Pacific: Hawaiian Is.

#### Subgenus *Cercyon* Leach, 1817

#### *Cercyon (Cercyon) algarum* Sharp, 1873

*Cercyon algarum* Sharp, 1873, 65 [Japan (Kyûshû: Nagasaki, Amakusa)].

*Cercyon (Cercyon) algarum*: Shatrovskiy, 1989, 281 [southern Kurils].

*Cercyon (Cyceron) algarum*: Shatrovskiy, 1992, 366 [designation of lectotype (Japan, male); Kunashir].

Japanese name: Hime-keshi-gamushi

Specimens examined. No specimen from the Kurils has been available for this study.

Distribution. Kuril Islands (southern Kuril: Kunashir). Palearctic: Japan (Hokkaidô; Honshû; Izu: Hachijô; Kyûshû), Russian Fed. (Far East).

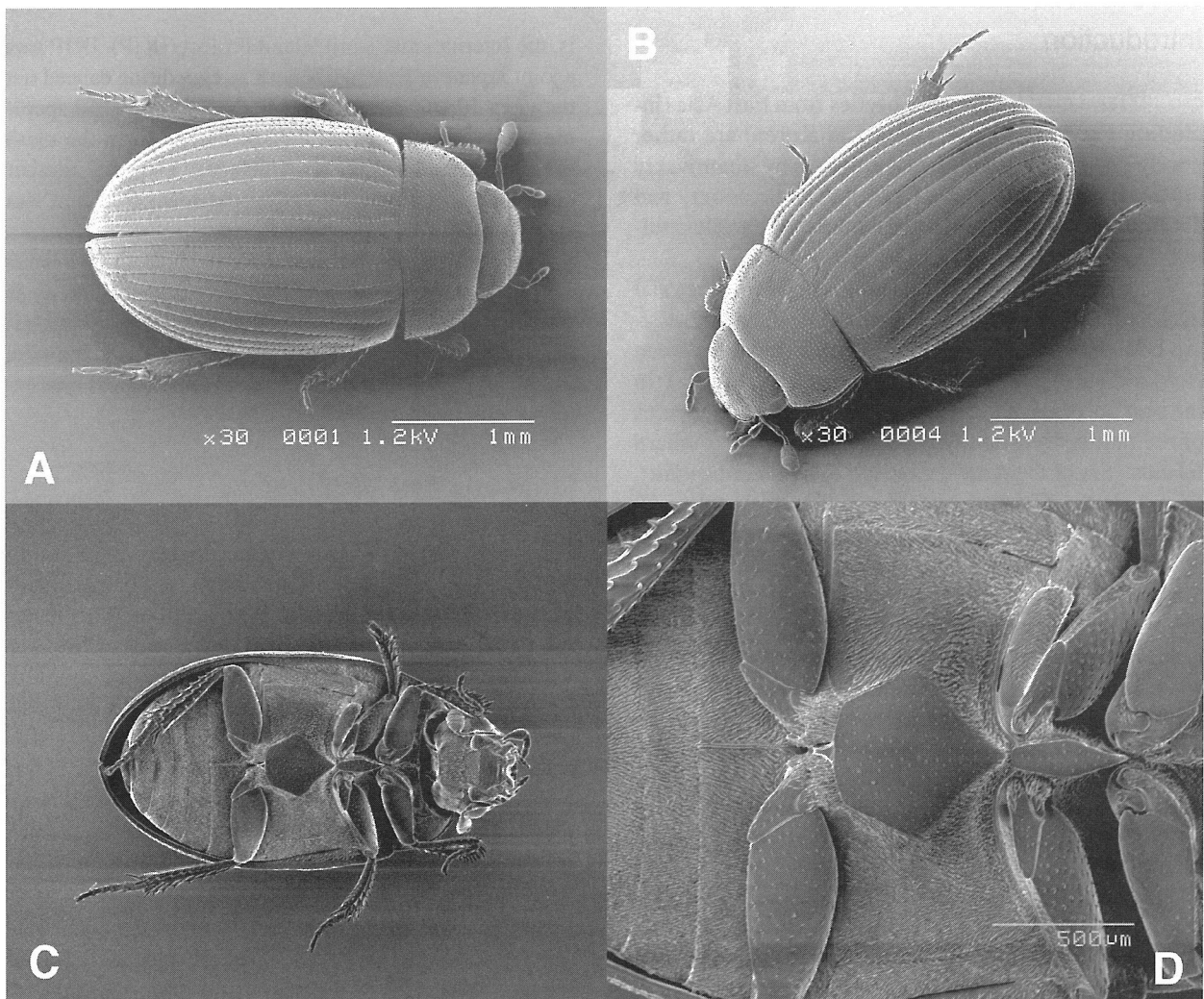


Figure 1. *Cercyon (Cercyon) aptus*. A: Habitus, dorsal view. B: Ditto, oblique view. C: Ditto, ventral view. D: Pro-, meso- and metasterna, ventral view. [A, B: MO-03-086 and C, D: -06-013 from Urup (UR95MO-066)]

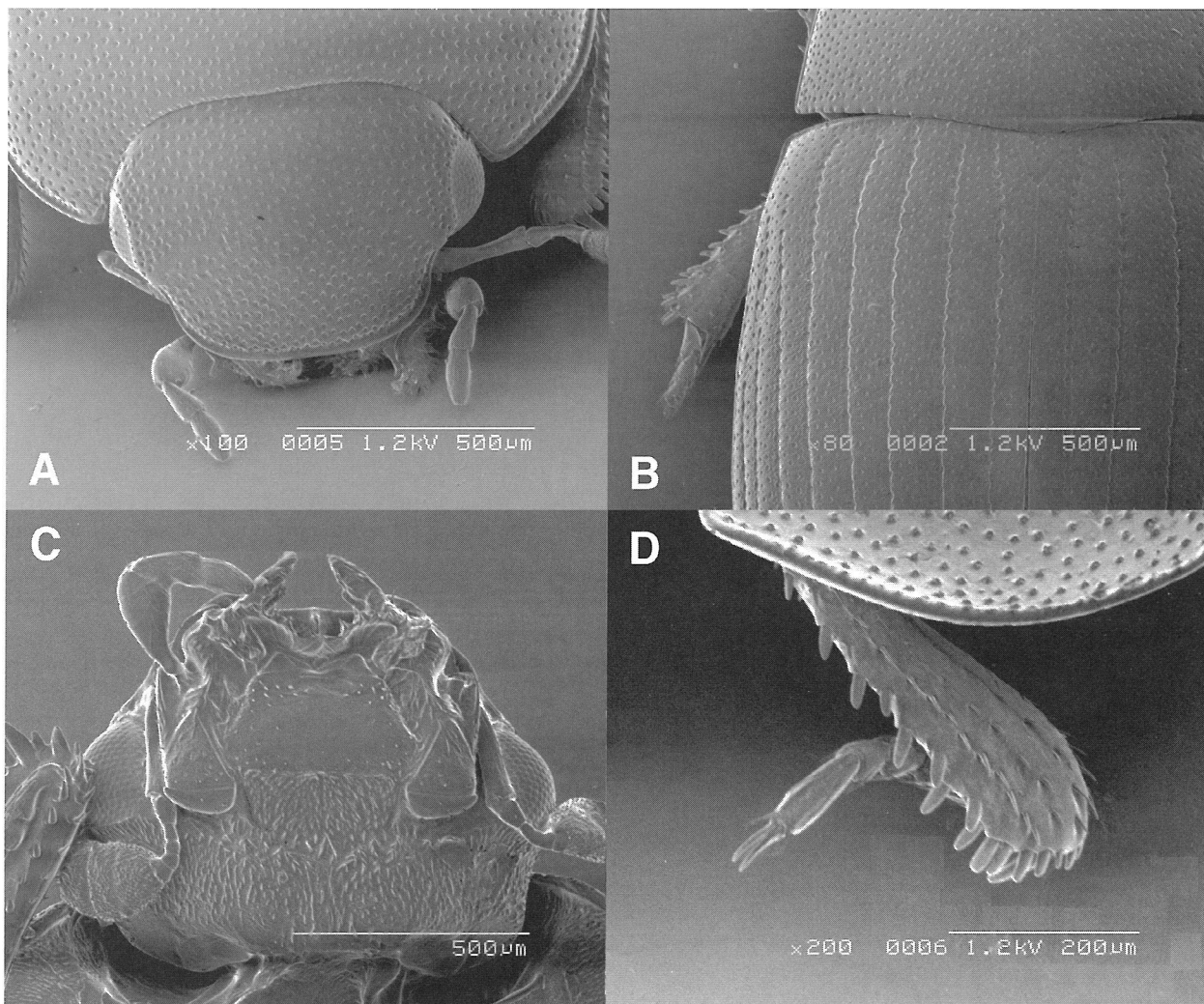


Figure 2. *Cercyon (Cercyon) aptus*. A: Head, dorso-frontal view. B: Basal portion of left elytron, dorsal view. C: Mouthparts, ventral view. D: Protibia, dorsal view. [A – B, D: MO-03-086 and C: -06-013 from Urup (UR95MO-066)]

### *Cercyon (Cercyon) aptus* Sharp, 1873

*Cercyon aptus* Sharp, 1873, 65 [Japan (Kyûshû, Honshû)].

*Cercyon (Cercyon) aptus*: Shatrovskiy, 1989, 281 [southern Kurils]; Hansen, 1999, 275.

*Cercyon (Cycreon) aptus*: Shatrovskiy, 1992, 367 [designation of lectotype (Japan, female); southern Kurils (Kunashir, Itrup, Urup)].

Japanese name: Ko-keshi-gamushi

**Redescription.** Body oval and convex; surface of head and pronotum shiny; elytra not shiny, with microsculpture. Body outline slightly interrupted between pronotum and elytra. There are several color patterns as follows: (1) head black; pronotum, scutellum and elytra blackish-brown; lateral margin of elytra broadly (1/3 of width) rufo-testaceous to testaceous; epipleura black, and pseudopleura dark brown; underside black, posterior margin of mesosterna and sterna brown; antennae, maxillary palpi, mentum and tarsi of leg yellowish-brown; coxae, femora and tibiae of leg dark yellowish-brown, margin of femora blackish brown; (2) head black;

pronotum, scutellum and elytra reddish-brown; posterior fifth of elytra bright yellowish-brown; epipleura and pseudopleura reddish-brown; underside dark blackish-brown; (3) similar to (2), but basal area of elytra (around scutellum) and basal half of interval between suture and 1st elytral stria yellowish-brown; (4) all parts of body yellowish-brown except reddish-brown head; and (5) all parts of body black except yellowish-brown funicles of antennae, maxillary palpi and tarsi.

Clypeus truncated anteriorly, with anterior marginal stria; anterior corner regularly round. Eyes small, separated by 11.6 x their width. Mentum trapezoid, matte, with microsculptures; anterior margin round and carinate; area behind margin widely depressed roundly. Maxillary palpi 0.42 x as long as width of head; second segment swollen apically; last segment swollen and a little longer than penultimate. Antennae about 1.4 x as long as width of head; pedicel hardly 0.25 x as long as scape; club about 1.53 x as long as wide, compact. Head densely covered with coarse and deep punctures that are separated by 0.3 x their diameter, except for an area along epicranial suture; punctures becoming sparser posteriorly. Pronotum widest at basal 2/3 of its length; lateral side regularly round;



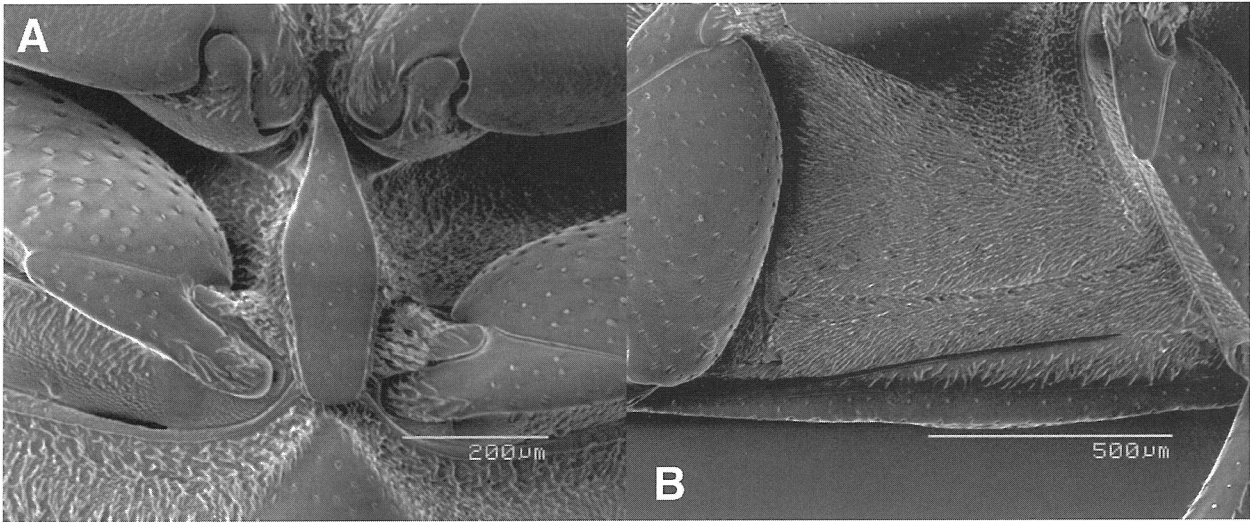


Figure 3. *Cercyon (Cercyon) aptus*. A: Mesosternal tablet, ventral view. B: Left elytral epipleura and metespisternum, ventral view. [MO-06-013 from Urup (UR95MO-066)].

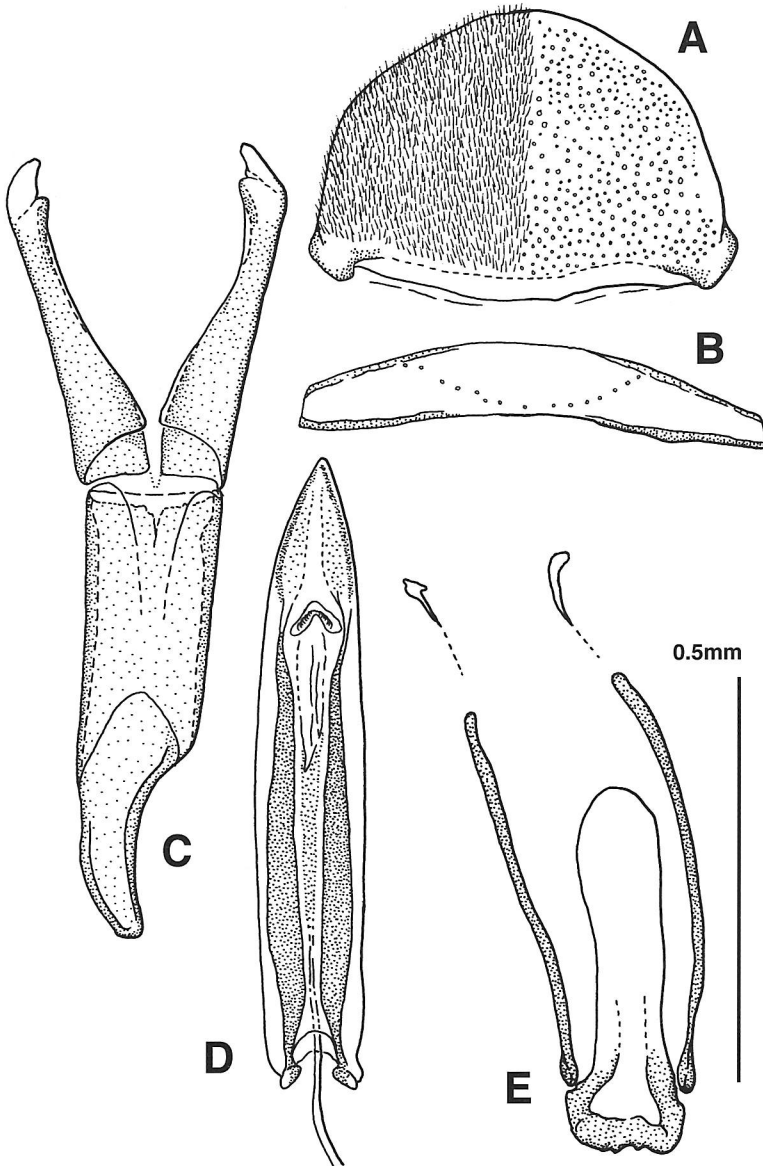


Figure 4. *Cercyon (Cercyon) aptus*. Male genitalia. A: Eighth tergite, dorsal view. B: Eighth sternum, ventral view. C: Aedeagus, dorsal view. D: Median lobe, dorsal view. E: Ninth sternum, dorsal view. [MO-03-035 from Chirpoi (CH95MO-048)].

surface densely covered with coarse punctures separated by 0.3 x their diameter medially and by their own diameter laterally. Elytral sides regularly curved, widest at half of

their length; 10 distinct striae deeply impressed; 1st – 5th striae completely impressed; 6th shortened on basal 1/6; 7th – 10th shortened on basal 1/8; 10th only presented

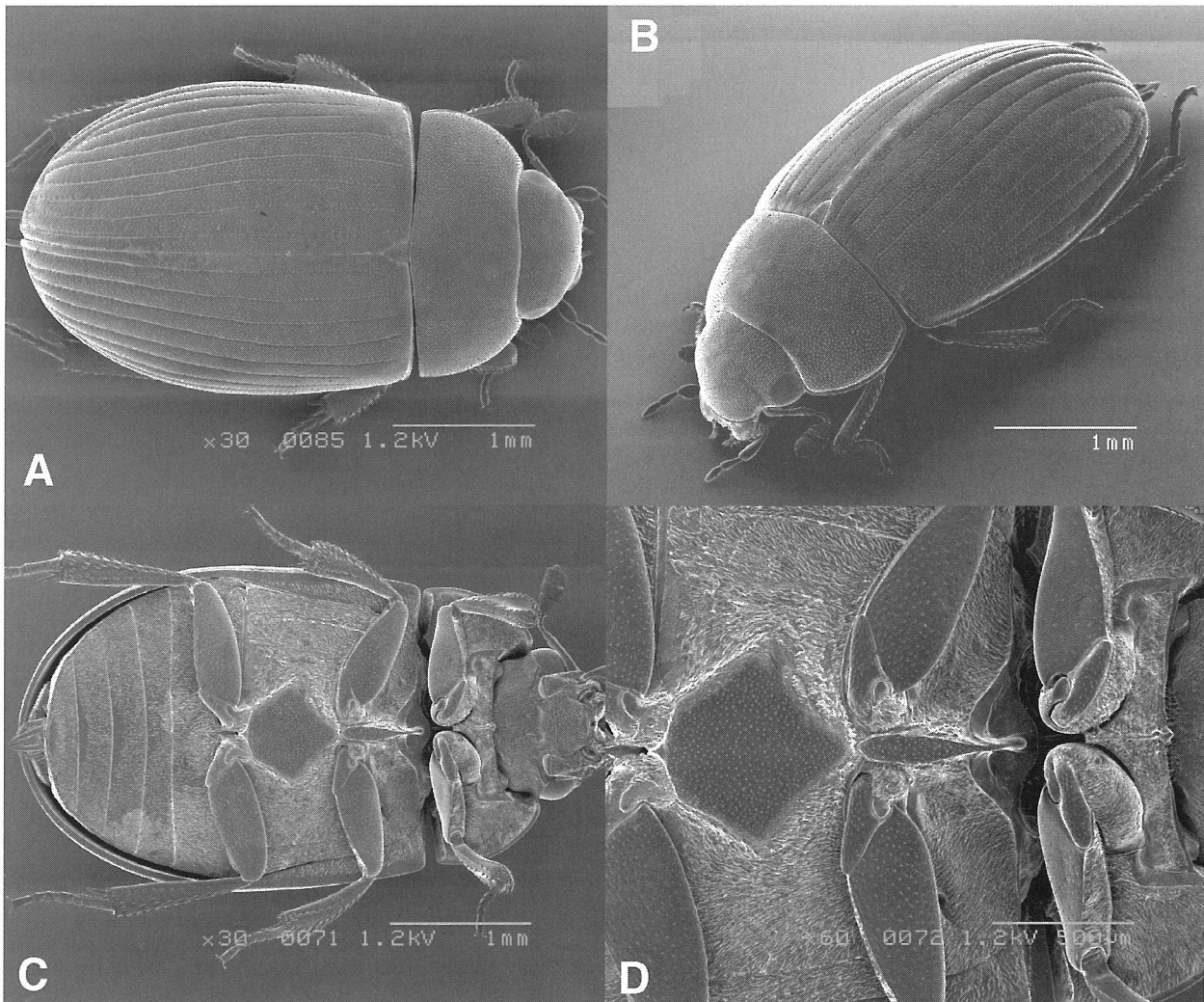


Figure 5. *Cercyon (Cercyon) numerosus*. A: Habitus, dorsal view. B: Ditto, oblique view. C: Ditto, ventral view. D: Pro-, meso- and metasterna, ventral view. [A, B: MO-03-088 and C, D: -082 from Urup (UR96MO-048A)].

on basal 2/3; posterior ends of 5th and 6th united; surface covered with fine punctures that are separated by 2 x their diameter; interspace among punctures densely covered with transverse micro-rugae; rugae becoming finer medio-basally, and densely covered with microsculpture along striae; surface of intervals convex and becoming strongly convex apically. Epipleura and pseudepipleura almost horizontal, glabrous.

Prosternum rather well-developed, tectiform and strongly carinate medially; middle portion not demarcated from antennal groove; antennal grooves well defined laterally and with pubescence, not reaching lateral prothoracic margin. Mesosternal tablet oblong (index length: width 3.33), strongly acute anteriorly and shortly truncated on its posterior end, widest point at anterior 1/3; surface shiny, flat and irregularly and sparsely covered with fine punctures (Fig. 3A); cavities for reception of procoxae very shiny, ending at anterior 2/3 of length of mesosterna. Metasternum with raised pentagonal plate, rather convex and glabrous middle portion of which is slightly projected anteriorly between mesocoxae, contacting the mesosternal tablet at a single point; pentagonal plate shiny, irregularly and sparsely covered

with fine punctures that are separated by 1 – 4 x their diameter; lateral portion without punctures, densely furnished with pubescence. Metepisterna 4.4 x as long as wide, subparallel.

Anterior margin of protibia round. All femora evenly and sparsely covered with fine and setiferous punctures that are separated by 4 – 5 x their diameter; interspace among punctures filled with microscopic sculptures.

Aedeagus and genital segments as in Figure 4; ratio of paramera to basal piece = 0.73.

Body length 2.5 – 3.0 mm, width 1.55 – 1.9 mm.

Specimens examined. Kuril Islands. Iturup: IT96NM-027 (1 ex.). Urup: UR95MO-001 (3 exs.); UR95MO-006 (2 exs.); UR95MO-066 (1 male and 152 exs.); UR95BKU-061 (5 exs.). Chirpoi: CH95MO-048 (16 exs.).

Distribution. Kuril Islands (Kunashir, Itrup, Urup\*, Chirpoi\*\*). Palearctic: Japan, Russian Fed. (Far East).

Remarks. *C. aptus* has a middle sized and rather convex body. It is easily distinguished from the other species by the convex intervals of elytral striae.

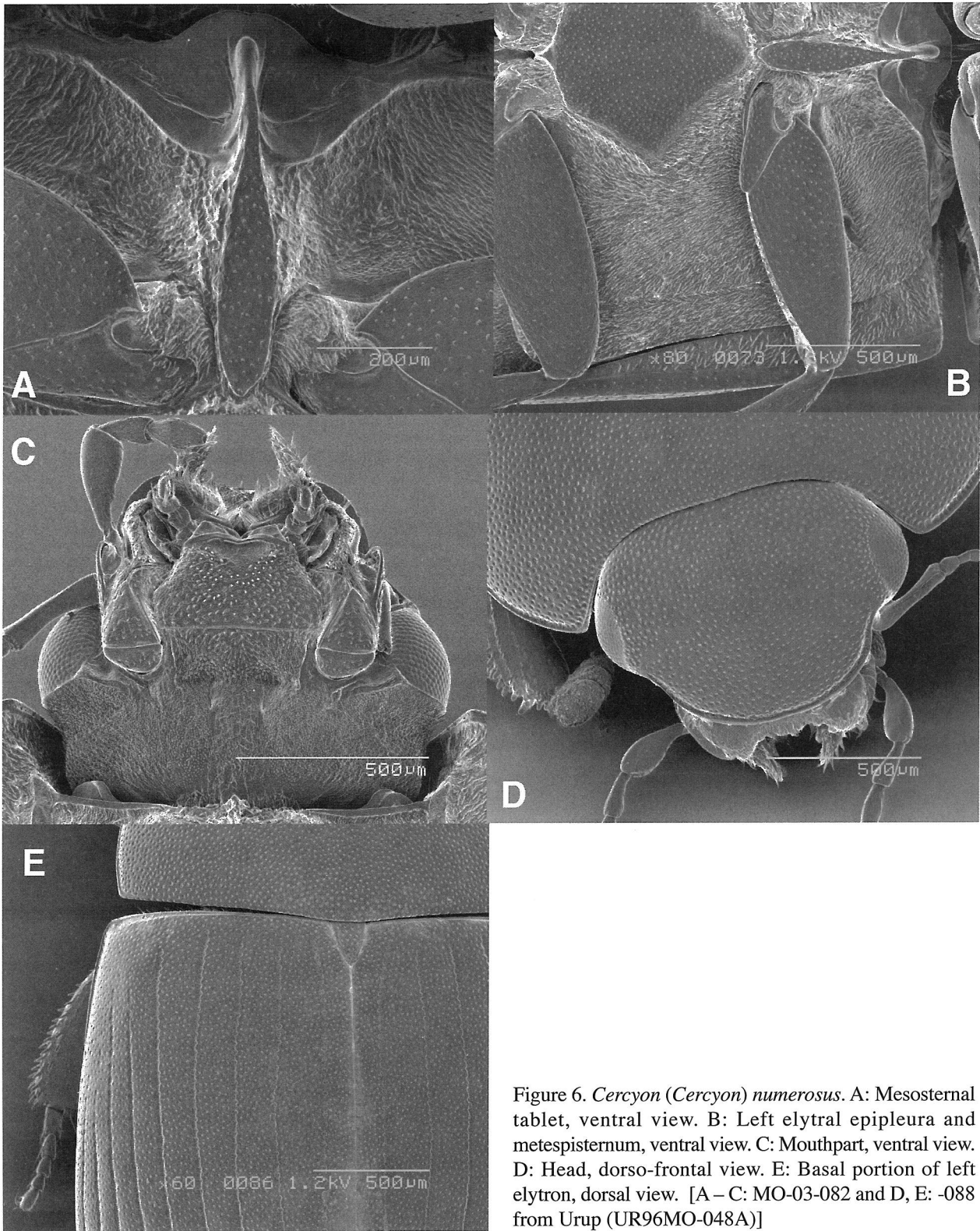


Figure 6. *Cercyon (Cercyon) numerosus*. A: Mesosternal tablet, ventral view. B: Left elytral epipleura and metespisternum, ventral view. C: Mouthpart, ventral view. D: Head, dorso-frontal view. E: Basal portion of left elytron, dorsal view. [A – C: MO-03-082 and D, E: -088 from Urup (UR96MO-048A)]

***Cercyon (Cercyon) dux* Sharp, 1873**

*Cercyon dux* Sharp, 1873, 65 [Japan (Kyūshū)].  
*Cercyon (Cyceron) dux*: Shatrovskiy, 1992, 366 [designation of lectotype].  
*Cercyon (Cercyon) dux*: Shatrovskiy, 1989, 281 [? southern Kuril]; Hansen, 1999, 278.  
 Japanese name: Fuchitori-keshi-gamushi.

Specimens examined. No specimen from Kurils has been available for this study.

Distribution. Kuril Islands (southern Kuril) [questionable]. Palearctic: Japan, Russian Fed. (Far East).

***Cercyon (Cercyon) numerosus* Shatrovskiy, 1989**

*Cercyon (Cercyon) numerosus* Shatrovskiy, 1989, 281 [Primorskiy Krai, southern Kurils, Japan]; Hansen, 1999, 285.

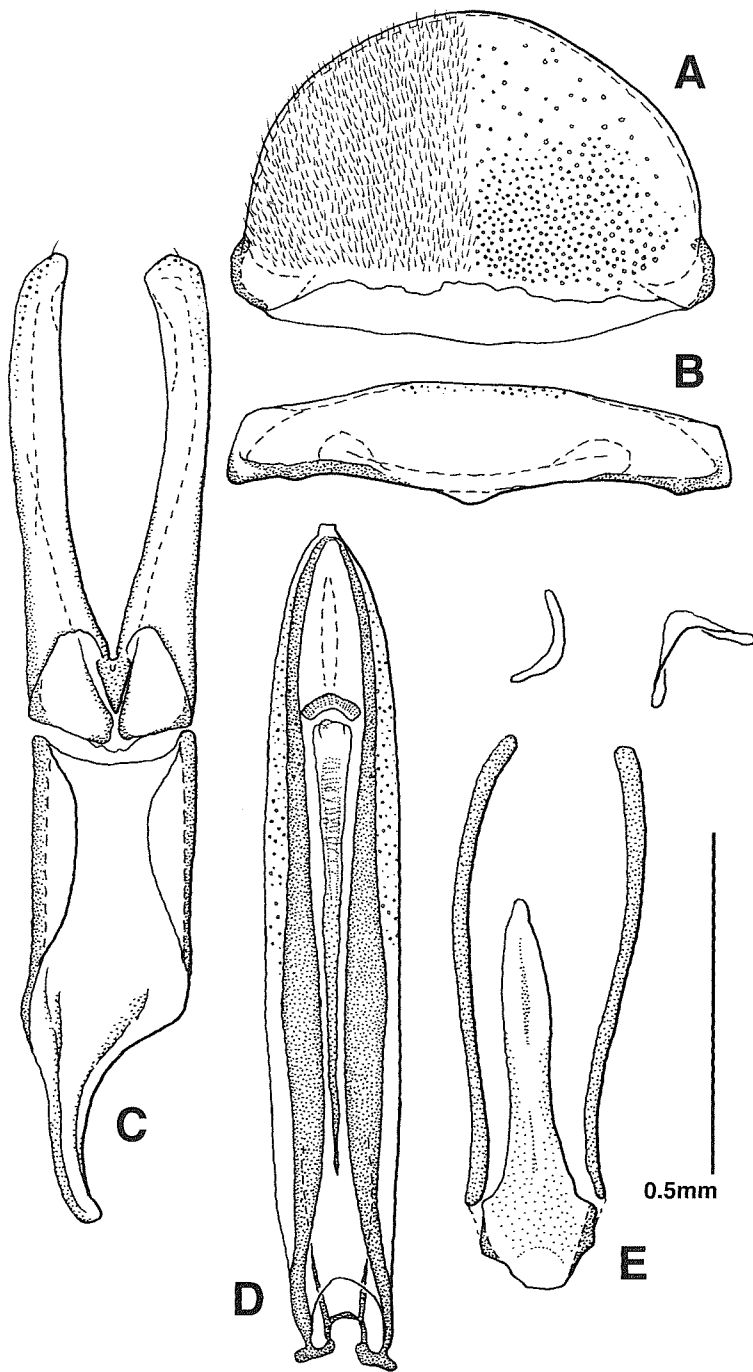


Figure 7. *Cercyon (Cercyon) numerosus*. Male genitalia. A: Eighth tergite, dorsal view. B: Eighth sternum, ventral view. C: Aedeagus, dorsal view. D: Median lobe, dorsal view. E: Ninth sternum, dorsal view. [MO-03-041 from Urup (UR95MO-005)]

*Cercyon (Cyceron) numerosus*: Shatrovskiy, 1992, 366 [Primorskiy, Japan (Kyūshū: Misaki)].

Japanese name: Ezo-keshi-gamushi.

**Redescription.** Body oblong, moderately convex and slightly depress medially; surface not shiny, with microsculpture. Body outline interrupted between pronotum and elytra. There are several color patterns as follows: (1) head and pronotum black; pronotum broadly (1/4 of width) rufo-testaceous to testaceous laterally, inflexed portion of pronotum yellowish-brown; scutellum, elytra and epipleura black; lateral (1/4 of width) and posterior (about 1/4 of length) margins of elytra, and pseudepipleura bright yellowish-brown; underside dark blackish-brown; posterior margin of

mesosterna and sterna testaceous; antennae except club, maxillary palpi, coxae, femora, tibiae and tarsi of leg yellowish-brown; margin of femora blackish-brown; club of antenna black; labium yellow; and (2) head black; pronotum dark brown but broadly (1/4 of width) reddish-brown laterally; inflexed portion of pronotum dark brown; scutellum black; elytra and epipleura bright yellowish-brown, but sometimes only apical spot (between 4th to 6th striae) and narrow sutural margin on posterior 1/4 black.

Clypeus truncated anteriorly, with anterior marginal stria; anterior corner regularly round. Eyes small, separated by 8.6 x their width. Mentum trapezoid, densely covered with deep punctures; interspace among punctures with microsculptures; anterior margin round and with long

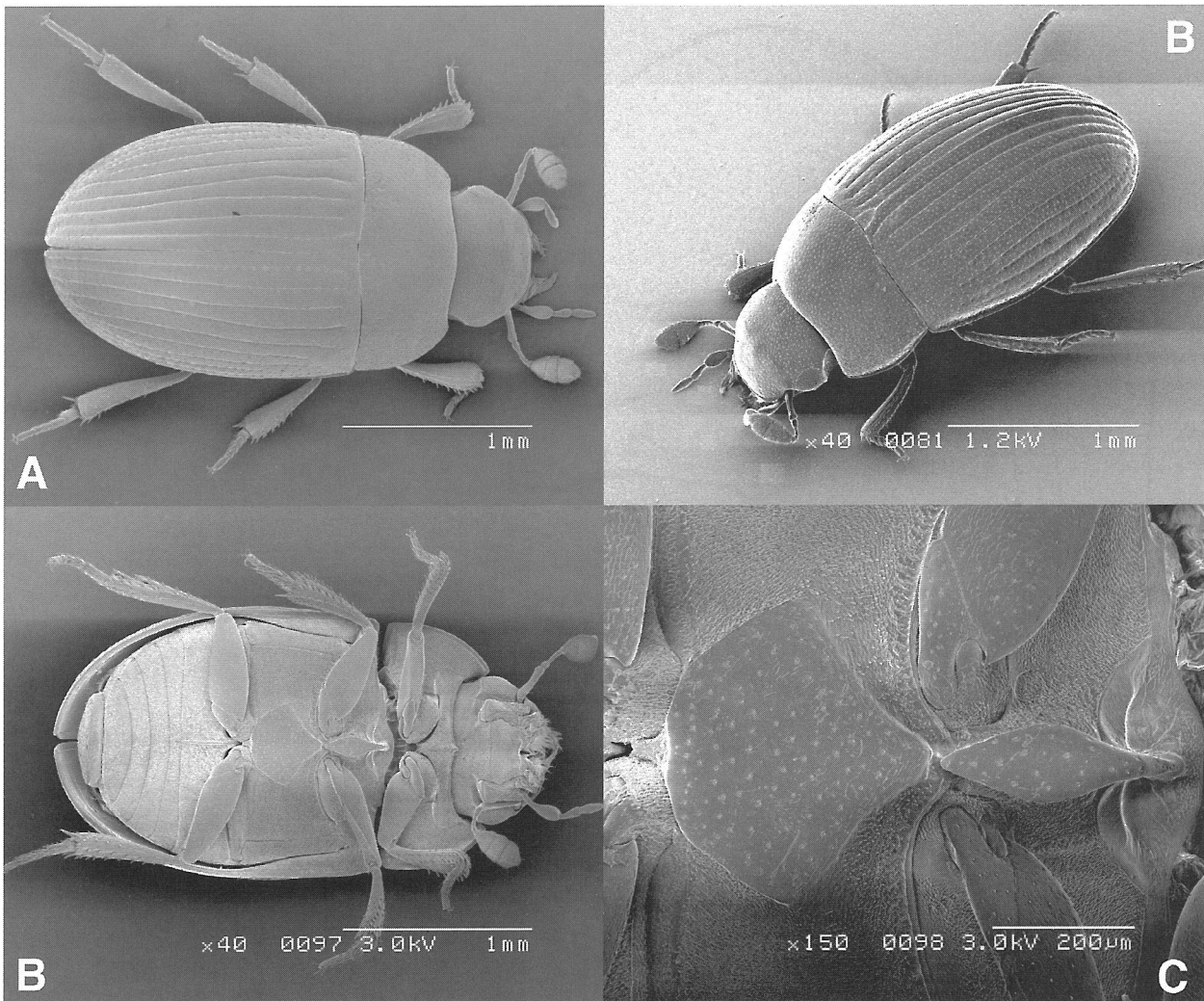


Figure 8. *Cercyon (Cercyon) setulosus*. A: Habitus, dorsal view. B: Ditto, oblique view. C: Ditto, ventral view. D: Pro-, meso- and metasterna, ventral view. [A, B: MO-03-049 from Ekarma (EK96MO-032A) and C, D: -085 from Urup (UR95MO-070)].

setae, widely depressed roundly. Maxillary palpi 0.5 x as long as width of head; second segment swollen apically; last segment swollen and a little longer than penultimate. Antennae about 0.75 x as long as width of head; pedicel hardly 0.21 x as long as scape; club about 1.8 x as long as wide, compact. Head densely covered with fine and deep punctures separated by their own diameter, except for an area along epicranial suture. Pronotum widest at basal 2/3 of its length; lateral side regularly round; with same punctures as those on head. Elytral sides subparallel on anterior half and then convergent on posterior half; 10 distinct, punctated striae present; 1st – 5th striae completely impressed; 6th – 7th shortened on basal 1/6; 8th and 9th shortened on basal half; 10th rudimentary, represented by a row of coarse punctures on basal half; posterior ends of 4th and 5th, and those of 8th and 9th united respectively; secondary stria shortly present on basal 1/6 on interval between 1st and 2nd striae; surface covered with the same fine punctures of head and pronotum; interspaces among punctures with alutaceous microsculpture; surface of intervals flat on anterior half and rather convex posterior. Epipleura and pseudepipleura almost horizontal, glabrous.

Prosternum (Fig. 5D) rather well-developed, moderately tectiform and carinate medially; middle portion not demarcated from antennal groove; antennal grooves well defined laterally and with pubescence, not reaching lateral prothoracic margin. Mesosternal tablet (Fig. 6A) narrowly elongate oval (index length: width 4.66), strongly acute anteriorly and shortly truncated on its posterior end; surface feebly concave and densely covered with fine and setiferous punctures; cavities for reception of procoxae ending at anterior 2/3 of mesosternal tablet. Metasternum with raised pentagonal plate, rather convex and glabrous middle portion of which is slightly projected anteriorly between mesocoxae, contacting the mesosternal tablet at a single point; pentagonal plate covered with fine, longitudinal oblong punctures that are separated by 1 – 2 x their diameter, and medially with a pair of longitudinal impressions that are diverse posteriorly; lateral portion without punctures, densely furnished with pubescence. Metepisterna 6.16 x as long as wide, subparallel.

Anterior margin of protibia round. All femora evenly covered with fine and setiferous punctures; interspace among punctures filled with microscopic sculptures.

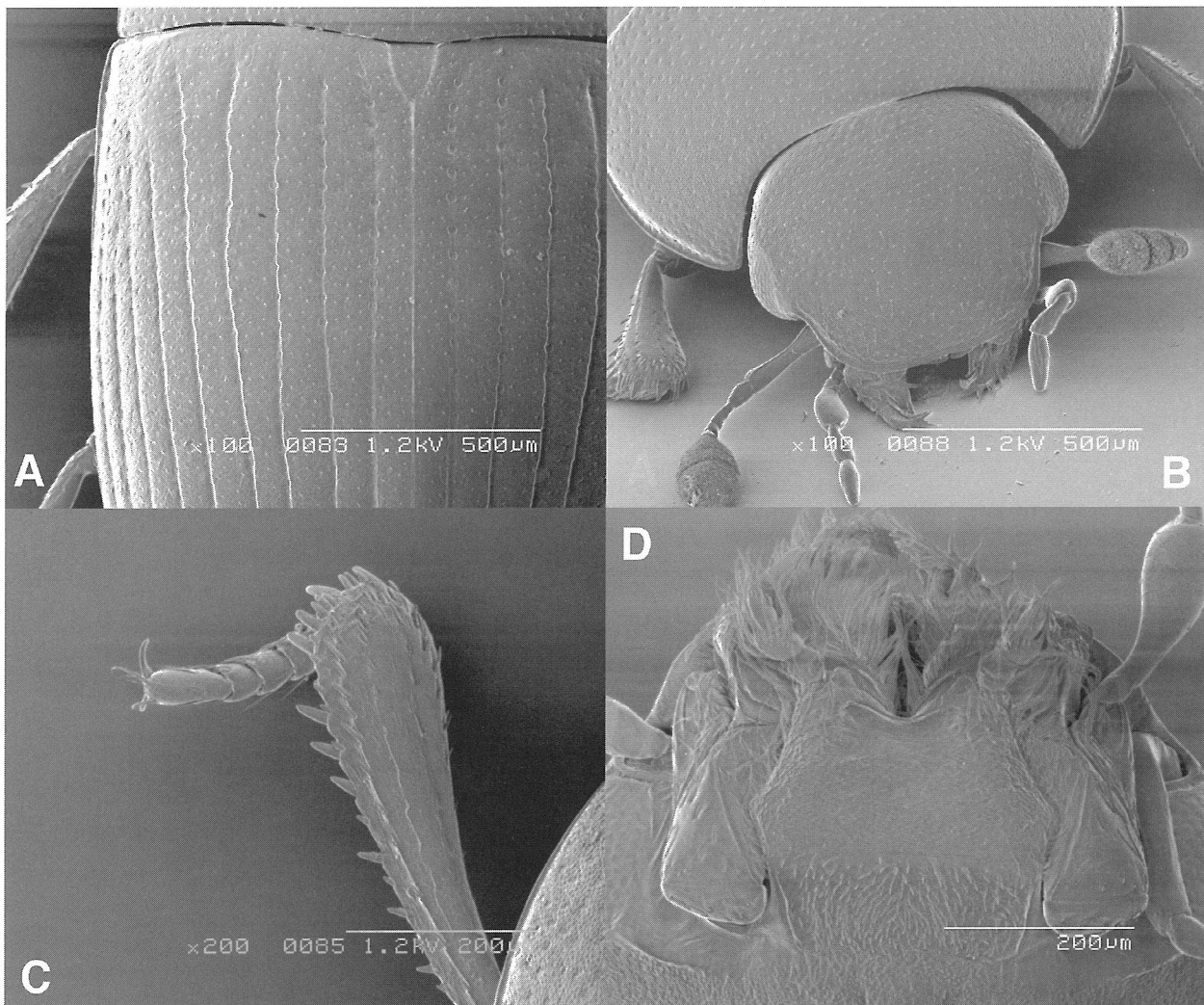


Figure 9. *Cercyon (Cercyon) setulosus*. A: Basal portion of left elytron, dorsal view. B: Head and pronotum, dorso-frontal view. C: Left protibia, dorsal view. D: Mouthpart, ventral view. [A – C: MO-03-049 from Ekarma (EK96MO-032A) and D: -085 from Urup (UR95MO-070)].

Aedeagus and genital segments as in Figures 7; ratio of paramera to basal piece = 1.00.

Body length 3.1 – 3.8 mm, width 2.0 – 2.5 mm.

Specimens examined. Kuril Islands. Urup: UR95MO-005 (1 male); UR95MO-051 (1 male); UR95MO-066 (4 males); UR95MO-070 (1 male); Tokotan, 9 – 23.VIII.1923, Y. Sugihara leg. (2 males). Chirpoi: CH95MO-048 (1 male). Simushir: SI95MO-045 (1 male).

Distribution. Kuril Islands (Urup\*, Chirpoi\*\*, Simushir\*\*). Japan (Kyūshū), Russia Fed. (Far East).

Remarks. *C. numerosus* has a rather large and moderately convex body. It is very similar to *C. symbion*, but the latter is dominant in the northern area of the Kuril Archipelago and its color of the body is more blackish. The ratio of paramera to basal piece of the male genitalia is larger (1.00) and the median lobe is rather long than those of the latter (0.71).

***Cercyon (Cercyon) olibrus* Sharp, 1874**

*Cercyon olibrus* Sharp, 1874, 418 [Japan].

*Cercyon (Cercyon) olibrus*: Shatrovskiy, 1989, 285 [southern Kurils (Kunashir), Khabarovskiy, Amurskiy, Primorskiy Kray]; Hansen, 1999, 286.

Japanese name: Aka-keshi-gamushi.

Specimens examined. No specimen from the Kurils has been available for this study.

Distribution. Kuril Islands (Kunashir). Japan, Russia Fed. (Far East: Khabarovskiy Kray, Amurskiy Kray, Primorskiy Kray, southern Kurils).

***Cercyon (Cercyon) quisquilius* (Linné, 1761)**

*Scarabaeus quisquilius* Linné, 1761: 138.

*Cercyon quisquilius*: Kuwayama, 1967, 134 [Iturup]; Smetana, 1978, 97; Smetana, 1988, 150.

Japanese name: Kibane-keshi-gamushi.

Specimen examined. Kuril Island. Iturup: Rubetsu, 2 – 10.VII.1935, Y. Sugihara (1 ex.).

Distribution. Kuril Islands (Iturup). Palearctic Region. Nearctic Region (introduced). Neotropical Region (introduced). Australian Region (introduced).

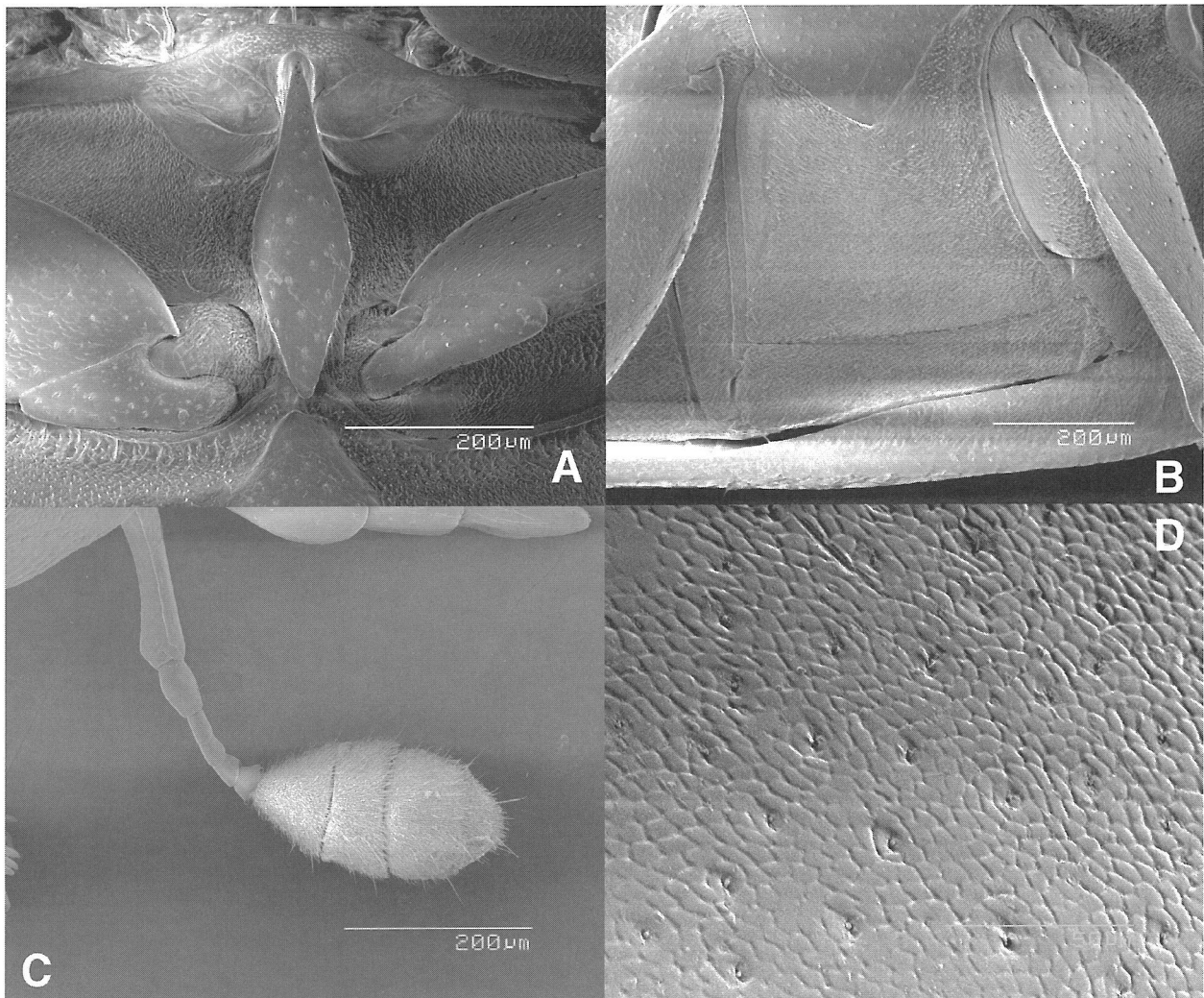


Figure 10. *Cercyon (Cercyon) setulosus*. A: Mesosternal tablet, ventral view. B: Left elytral epipleura and metespisternum, ventral view. C: Right antenna, dorsal view. D: Microstructure of surface of elytra, dorsal view. [A – C: MO-03-085 from Urup (UR95MO-070) and D: -049 from Ekarma (EK96MO-032A)].

Pacific Region (introduced).

***Cercyon (Cercyon) rotundulus* Sharp, 1884**

*Cercyon rotundulus* Sharp, 1884, 460 [Japan: Miyano-shita; Ciuzenji].

*Cercyon (Cercyon) rotundulus*: Shatrovskiy, 1989, 285 [southern Kurils (Kunashir)]; Hansen, 1999, 286.

Japanese name: Maru-keshi-gamushi.

Specimens examined. No specimen from the Kurils has been available for this study.

Distribution. Kuril Islands (Kunashir). Japan, Russia Fed. (Far East: Amurskiy Kray, Primorskiy Kray, southern Kurils).

***Cercyon (Cercyon) saluki* Ryndevich, 1998**

*Cercyon saluki* Ryndevich, 1998, 68 [Russian Fed., Far East, Kurilskiye Ostrova (Kuril Island), Kunashir Is., Mendeleevo]; Hansen, 1999, 288.

Japanese name: Saluki-keshi-gamushi.

Specimens examined. No specimen from the Kurils has been available for this study.

Distribution. Kuril Islands (Kunashir).

***Cercyon (Cercyon) setulosus* Sharp, 1884**

*Cercyon setulosus* Sharp, 1884, 458 [Japan]; Kuwayama, 1967, 134 [Kunashir].

*Cercyon (Cercyon) setulosus*: Hansen, 1999, 289; Shatrovskiy, 1989, 281 [southern Kurils].

*Cercyon (Cyrceon) setulosus*: Shatrovskiy, 1992, 367 [designation of lectotype; southern Kurils (Kunashir, Shikotan, Urup)].

*Cercyon tolfino* Hatch, 1965, 41; Smetana, 1978, 150, synonymized by Shatrovskiy, 1992, 367.

Japanese name: Naga-keshi-gamushi.

Redescription. Body oblong and feebly convex; surface of head and pronotum matte with microsculpture; elytra weakly shiny. Body outline slightly interrupted between pronotum and elytra. There are several color patterns as follows: (1) head black; pronotum, scutellum

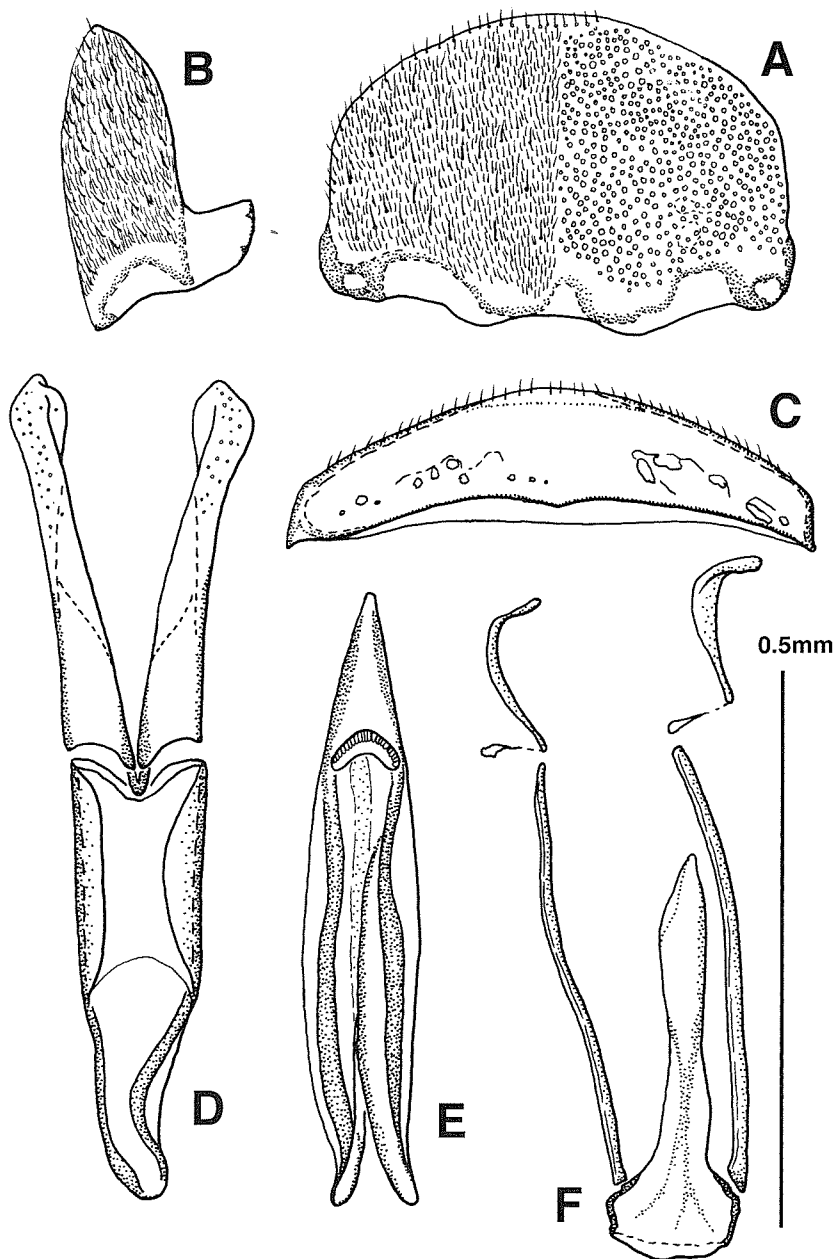


Figure 11. *Cercyon (Cercyon) setulosus*. Male genitalia. A: Eighth tergite, dorsal view. B: Ditto, lateral view. C: Eighth sternum, ventral view. D: Aedeagus, dorsal view. E: Median lobe, dorsal view. F: Ninth sternum, dorsal view. [MO-03-048 from Ekarma (EK96MO-032A)].

and elytra blackish-brown, but lateral margin of elytra broadly (1/3 of width) rufo-testaceous to testaceous; epipleura black, and pseudopleura black to dark brown; underside dark brown; posterior margin of mesosterna and sterna reddish-brown; antennae, maxillary palpi, margin of clypeus, mentum and tarsi of leg yellowish-brown; coxae, femora and tibiae of leg dark reddish-brown; margin of femora blackish-brown; and (2) all parts of body bright reddish-brown, except black head.

Clypeus truncated anteriorly, with anterior marginal stria, the anterior corner regularly round. Eyes small, separated by 10 x their width. Mentum trapezoid, matte, with microsculptures; anterior margin round and carinate, area behind margin widely depressed roundly. Maxillary palpi 0.52 x as long as width of head (between outer margin of eyes); second segment swollen apically; last segment swollen and a little longer than penultimate. Antennae about 0.68 x as long as width of head; pedicel hardly 0.23 x as long as scape; club 2 x as long as wide,

compact. Head evenly covered with fine punctures that are separated by their own diameter, except for an area along epicranial suture; interspace among punctures densely filled with granulate microsculptures. Pronotum widest at base; lateral side regularly round; surface densely covered with fine punctures separated by 1 – 3 x their diameter. Elytral sides regularly curved, widest at half of length; 10 distinct striae deeply impressed; 1st – 5th striae completely impressed; 6th and 7th shortened on basal 1/8; 8th – 9th shortened on basal 1/6; 10th represented as a row of coarse punctures on medio-basal 1/4; posterior ends of 6th and 8th, or of 6th and 7th, and of 5th and 8th united, respectively; surface covered with fine punctures separated by 2 x their diameter; interspaces among punctures densely filled with transverse micro-rugae; surface of intervals almost flat. Epipleura and pseud-epipleura almost horizontal, glabrous.

Prosternum rather well-developed, tectiform and carinate medially; middle portion not demarcated from



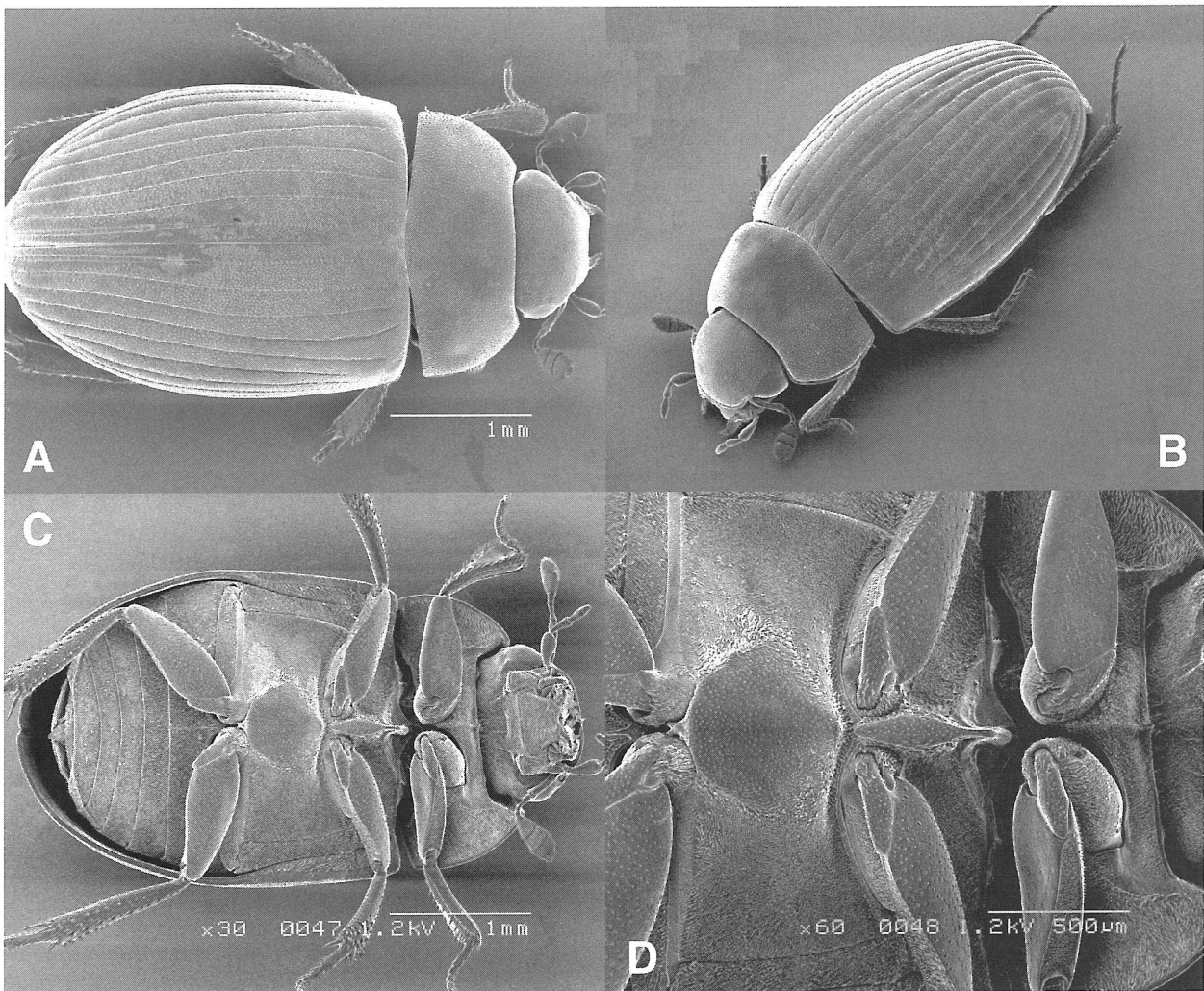


Figure 12. *Cercyon (Cercyon) symbion*. A: Habitus, dorsal view. B: Ditto, oblique view. C: Ditto, ventral view. D: Pro-, meso- and metasterna, ventral view. [A, B: MO-03-083 from Urup (UR96MO-048A) and C, D: -068 from Kharimkotan (KH96MO-022A)].

antennal groove; antennal grooves well defined laterally and with pubescence, not reaching lateral prothoracic margin. Mesosternal tablet fusiform-shaped (index length: width 3.33), strongly acute anteriorly and posteriorly, widest point in the middle; surface shiny, flat, irregularly and sparsely covered with fine punctures (Fig. 10A); cavities for reception of procoxae strongly shiny, ending at anterior 1/3 of length of mesosterna. Metasternum with raised pentagonal plate, rather convex and glabrous middle portion of which is slightly projected anteriorly between mesocoxae, contacting the mesosternal tablet at a single point; pentagonal plate irregularly and sparsely covered with fine punctures separated by 2–5 x their diameter; lateral portion without punctures, densely furnished with pubescence. Metepisterna 5.8 x as long as wide, subparallel.

Anterior margin of protibia round. All femora evenly and sparsely covered with fine and setiferous punctures that are separated by 4–5 x their diameter, and interspaces among punctures with microscopic sculptures.

Aedeagus and genital segments as in Figures 11; ratio of paramera to basal piece = 0.92.

Body length 2.16–2.41 mm, width 1.27–1.39 mm.

Specimens examined. Kuril Islands. Urup: UR95MO-007 (2 exs.), UR95MO-069 (12 exs.), UR95MO-070 (1 male and 68 exs.), UR95YK-046 (1 ex.); UR95VR-035A (1 ex.); UR96MO-051 (3 exs.). Ekaruma: EK96MO-032A (1 male and 5 exs.).

Distribution. Kuril Islands (Shikotan, Kunashir, Urup\*, Ekaruma\*\*). Japan, Russia Fed. (Far East).

Remarks. *C. setulosus* is a rather small and flat species. The microsculptures on surface of head and pronotum are peculiar character-states of this species.

#### *Cercyon (Cercyon) symbion* Shatrovskiy, 1989

*Cercyon (Cercyon) symbion* Shatrovskiy, 1989, 281 [Primorskiy Kray, Sakhalin, southern Kurils, Japan]; Hansen, 1999, 290.

*Cercyon (Cyceron) symbion*: Shatrovskiy, 1992, 366 [Russian Fed.: Primorskiy Kray, Sakhalin, Kuril Islands (Kunashir, Shikotan, Iturup,); Japan (Kyûshû: Misaki)].

Japanese name: Kita-keshi-gamushi.

Redescription. Body oblong, moderately convex and slightly depress medially; surface not shiny, with

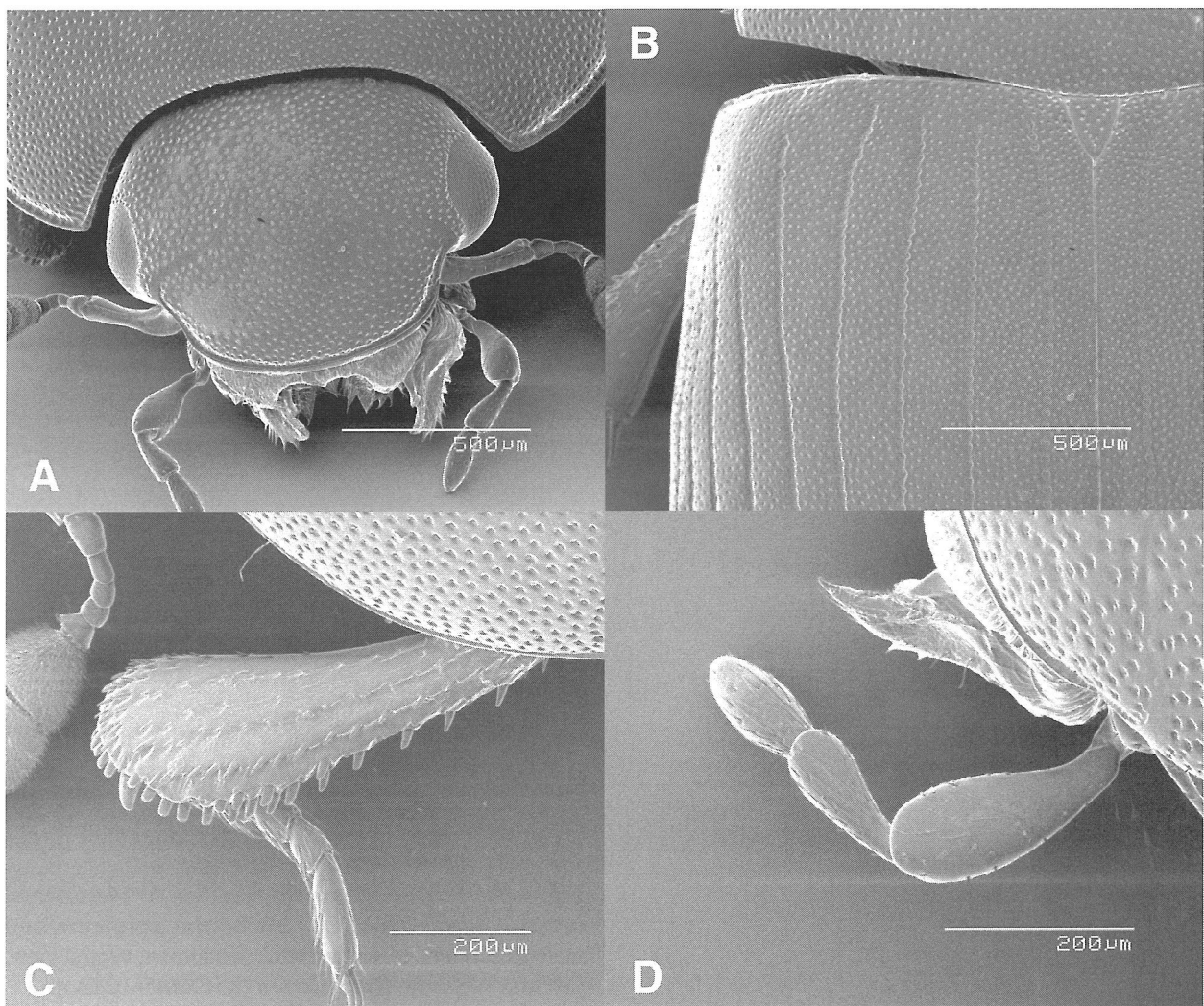


Figure 13. *Cercyon (Cercyon) symbion*. A: Head, front view. B: Basal part of left elytron, dorsal view. C: Left protibia, dorsal view. D: Maxillary palpi, dorsal view. [MO-03-083 from Urup (UR96MO-048A)].

microsculpture. Body outline interrupted between pronotum and elytra. There are several color patterns as follows: (1) head and pronotum black; pronotum broadly (1/4 of width) rufo-testaceous to testaceous laterally; inflexed portion of pronotum yellowish-brown; scutellum, elytra and epipleura black, but lateral (1/4 of width of elytron) and posterior (about 1/4 of length) margins of elytra, and pseudopleura bright yellowish-brown; underside dark blackish-brown; posterior margin of mesosterna and sterna testaceous; antennae except club, maxillary palpi, coxae, femora, tibiae and tarsi of leg yellowish-brown; margin of femora blackish-brown; club of antenna black; labium yellow; and (2) all character-states are the same as with (1) except follows: inflexed portion of pronotum black; lateral (1/10 of width) and apical spot (between 6th to 9th striae) of elytra bright yellowish-brown.

Clypeus truncated anteriorly, with anterior marginal stria; anterior corner regularly round. Eyes small, separated by 7.85 x their width. Mentum trapezoid, densely covered with deep punctures; interspaces among punctures with microsculptures; anterior margin round and with long setae, widely depressed roundly. Maxillary

palpi 0.50 x as long as width of head; second segment swollen apically; last segment swollen and a little longer than penultimate. Antennae about 0.71 x as long as width of head; pedicel hardly 0.2 x as long as scape; club about 1.6 x as long as wide, compact. Head densely covered with fine and deep punctures separated by their own diameter, except for an area along epicranial suture. Pronotum widest at basal 2/3 its length; lateral sides regularly round; with the same punctures as those on head. Elytra subparallel on anterior half and then convergent on posterior half; with 9 distinct, punctated striae; 1st – 5th striae completely impressed; 6th – 7th shortened on basal 1/6; 8th and 9th shortened on basal half; 10th absent; posterior ends of 5th and 8th, and the ones of 6th and 7th united respectively; secondary striae shortly present on basal 1/4 on intervals between 1st to 4th striae; surface covered with the same fine punctures of head and pronotum; interspaces among punctures with alutaceous microsculpture; surface of intervals flat on anterior half and rather convex on posterior. Epipleura and pseudopleura almost horizontal, glabrous.

Prosternum rather well-developed, moderately tectiform and carinate medially; middle portion not

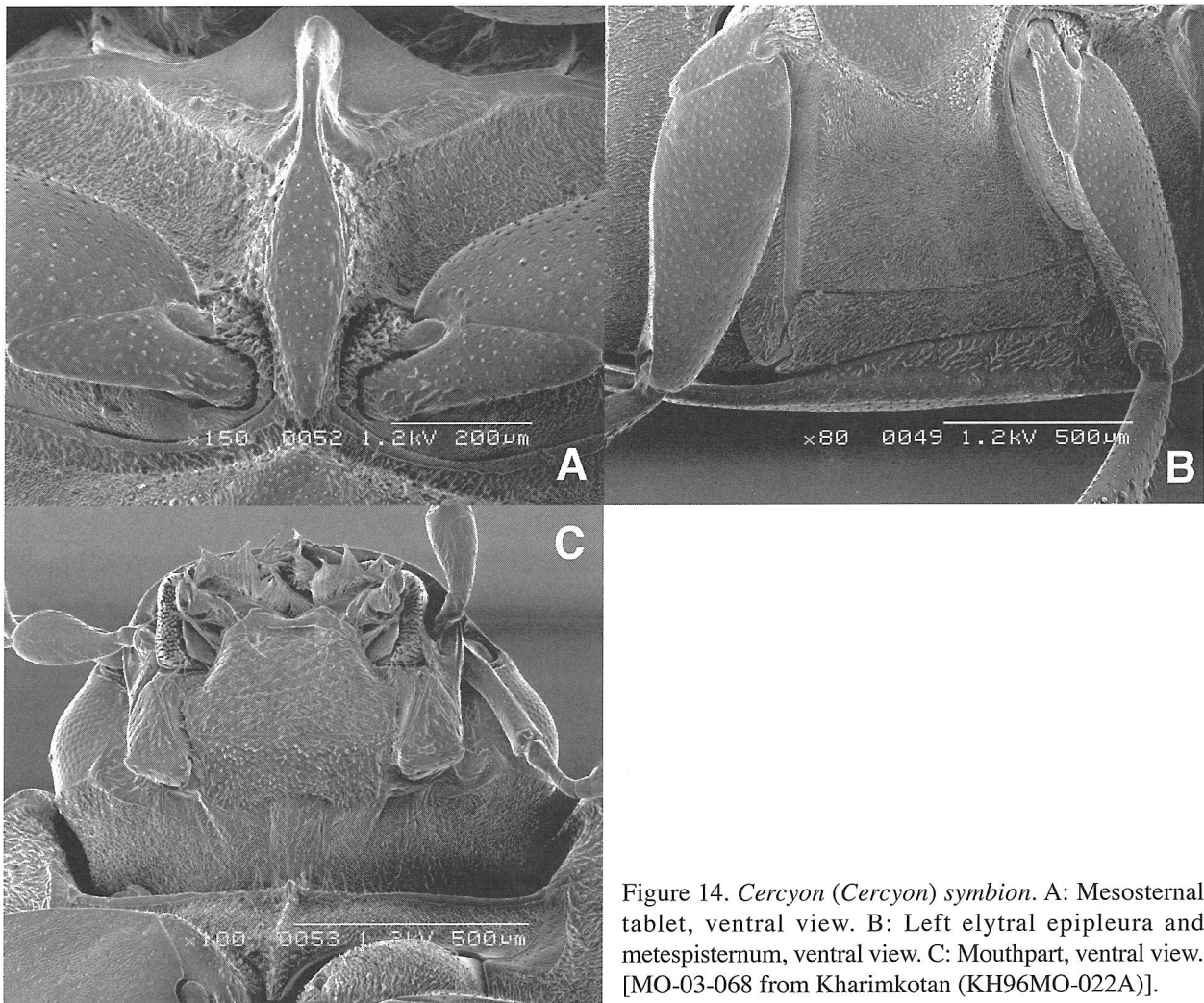


Figure 14. *Cercyon (Cercyon) symbion*. A: Mesosternal tablet, ventral view. B: Left elytral epipleura and metepisternum, ventral view. C: Mouthpart, ventral view. [MO-03-068 from Kharimkotan (KH96MO-022A)].

demarcated from antennal groove; antennal grooves well-defined laterally and with pubescence, not reaching lateral prothoracic margin. Mesosternal tablet narrowly elongate oval (index length: width 3.33), more narrowly and strongly tapered anteriorly than posteriorly; posterior end rounded; surface feebly concave and densely covered with fine punctures (Fig. 14A); cavities for reception of procoxae ending at anterior 2/3 of mesosternal tablet. Metasternum with raised pentagonal plate, rather convex and glabrous middle portion of which is bluntly projected anteriorly between mesocoxae; pentagonal plate covered with fine and longitudinal oblong punctures that are separated by 1 – 2 x their diameter, and with other microscopic punctures intermingled on marginal area of pentagonal plate, and medially with a pair of longitudinal impressions that are diverse posteriorly; lateral portion without punctures, densely furnished with pubescence. Metepisterna 5.87 x as long as wide, subparallel.

Anterior margin of protibia round. All femora evenly covered with fine and setiferous punctures, and interspaces among punctures filled with microscopic sculptures.

Aedeagus and genital segments as in Figures 15; ratio of paramera to basal piece = 0.71.

Body length 3.2 – 3.6 mm, width 2.0 – 2.4 mm.

Specimens examined. Kuril Islands. Urup: UR95MO-005 (1 male); UR95MO-007 (1 male), UR95MO-070 (1 male). Simushir: SI95MO-045 (1 male). Shashkotan: SA96MO-033A (2 males). Kharimkotan: KH96MO-022A (5 males). Alaid: AL97MO-024A (2 males). Paramushir: Murakami-wan, 7.VII.1941, H. Kôno (1 male); PA96MO-005 (3 males); PA97MO-025D (2 males); PA97BKU-034 (2 males). Shumshu: SU97MO-010A (2 males).

Distribution. Kuril Islands (Shikotan, Kunashir, Itrup, Urup\*\*, Alaid\*\*, Kharimkotan\*\*, Paramushir\*\*, Shumshu\*\*); Japan (Kyûshû); Russia Fed. (Far East).

Remarks. *C. symbion* has a rather large sized and moderately convex body. This species is very similar with *C. numerosus* (see Remarks of *C. numerosus*).

#### *Cercyon vagus* Sharp, 1884

*Cercyon vagus* Sharp, 1884, 418 [Japan: Miyanoshta, Oyama].

*Cercyon (Cercyon) vagus*: Shatrovskiy, 1989, 281 [southern Kuril (Kunashir)].

Japanese name: Atoaka -keshi-gamushi.

Distribution. Kuril Islands (Kunashir). Japan; South

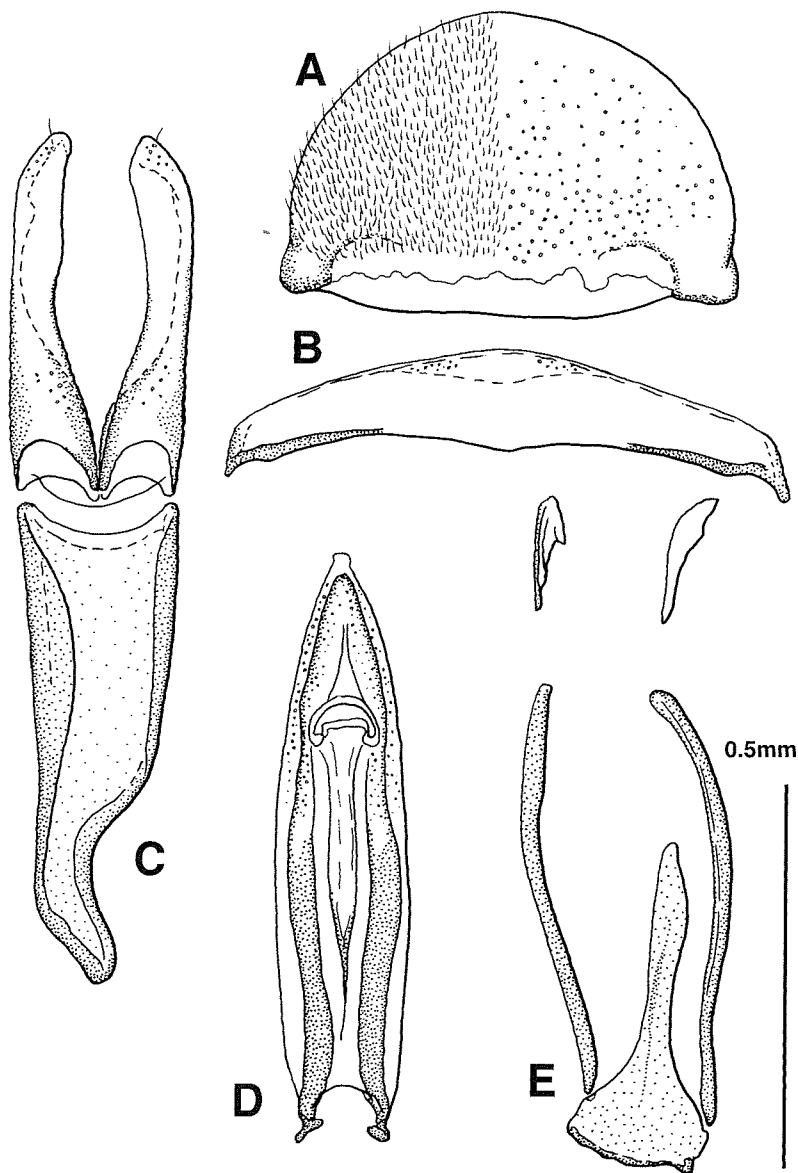


Figure 15. *Cercyon (Cercyon) symbion*. Male genitalia. A: Eighth tergite, dorsal view. B: Eighth sternum, ventral view. C: Aedeagus, dorsal view. D: Median lobe, dorsal view. E: Ninth sternum, dorsal view. [MO-03-042 from Urup (UR95MO-007)]

Korea.

***Cercyon (Cercyon) verus* Shatrovskiy, 1989**

*Cercyon (Cercyon) verus* Shatrovskiy, 1989, 282 [Sakhalin, southern Kurils (Kunashir)]; Shatrovskiy, 1992, 364 [Kurils: Kunashir, Shikotan; Sakhalin]; Hansen, 1999, 292.

Japanese name: Sedaka-kibane-keshi-gamushi.

Redescription. Body oval, rather convex, shiny, without microsculpture. Head and pronotum black; pronotum narrowly rufo-testaceous to testaceous laterally; elytra, inflexed portion of pronotum and elytral epipleura and pseudopleura bright yellowish-brown; anterior margin, narrow sutural margin and round spot in centre of elytra black; underside piceous black; posterior margin of sterna testaceous; antennae except club, maxillary palpi, tibiae and tarsi of leg yellowish-brown; coxae of leg, club of antenna and scutellum black; femora yellowish-brown but basal half black.

Clypeus truncated anteriorly, with anterior marginal

stria; anterior corner regularly round. Eyes rather small, separated by 5 x their width. Mentum glabrous, trapezoid, with transverse rugae; anterior margin truncate. Maxillary palpi almost as long as width of head; second segment swollen apically; last segment swollen and a little longer than penultimate. Antennae about 2/3 x as long as width of head; pedicel hardly 1/4 x as long as scape; club about 2 x as long as wide, compact. Head densely covered with fine and deep punctures that are separated by their own diameter. Pronotum widest at base, moderately narrowed anteriorly, evenly convex, with the same punctures as those of head. Elytra widest at anterior quarter; with 10 distinct, punctated striae; 1st – 6th striae completely impressed; 7th – 10th shortened basally; 10th very short on basal half; surface covered with fine punctures separated by about 3 x their diameter; interspaces among punctures without microsculpture; surface of intervals flat. Epipleura and pseudopleura weakly oblique on anterior half and almost horizontal on posterior, glabrous.

Prosternum rather well-developed, moderately tectiform and carinate medially; middle portion not

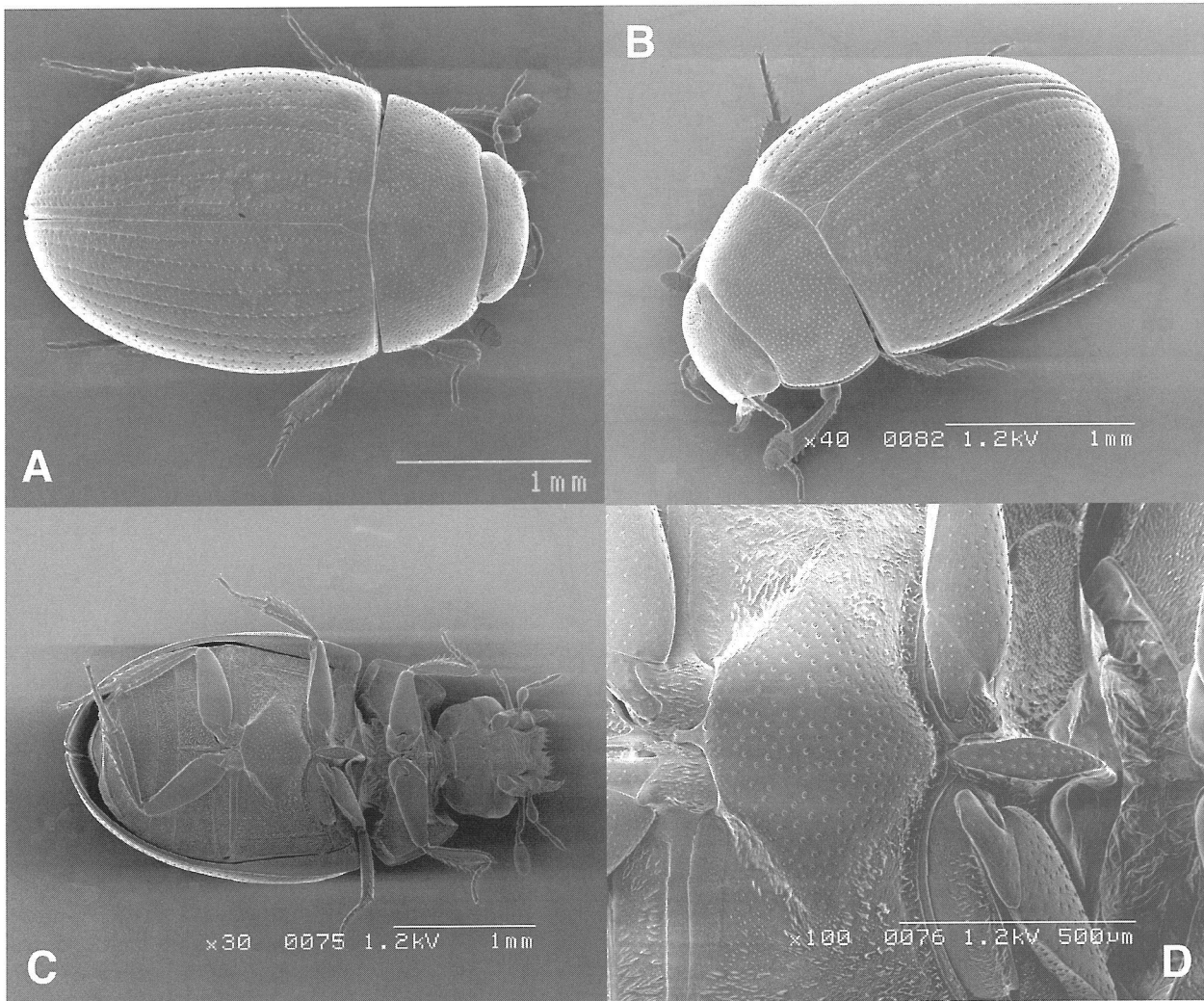


Figure 16. *Cercyon (Cercyon) verus*. A: Habitus, dorsal view. B: Ditto, oblique view. C: Ditto, ventral view. D: Pro-, meso- and metasterna, ventral view. [A, B: MO-03-087 from Urup (UR95MO-064) and C, D: -089 from Urup (UR95MO-008)].

demarcated from antennal groove; antennal grooves well-defined laterally, not reaching lateral prothoracic margin. Mesosternal tablet elongate oblong (index length: width 3.25), acute both anteriorly and posteriorly; surface feebly concave and densely covered with fine and deep punctures (Fig. 17C); cavities for reception of procoxae ending well before mesosternal tablet. Metasternum with raised pentagonal plate, rather convex and glabrous middle portion of which is slightly projected anteriorly between mesocoxae, contacting the mesosternal tablet at a single point; pentagonal plate covered with fine and deep punctures that are separated by 1–4 x their diameter; lateral portion without punctures. Metepisterna 5.62 x as long as wide, subparallel.

Anterior margin of protibia not round, obliquely truncated. All femora glabrous and sparsely covered with microscopic punctures; interspaces among punctures without microscopic sculptures.

Aedeagus and genital segments as in Figures 18; ratio of paramera to basal piece = 0.76.

Body length 1.95–2.57 mm, width 1.36–1.58 mm.

Specimens examined. Kuril Islands. Kunashir:

KU95YMM-115A (1 ex.). Iturup: Rubetsu, 2 – 10.VII.1935, Y. Sugihara (6 exs.). Urup: UR95MO-008 (1 male, 2 females and 56 exs.); UR95MO-009 (4 exs.); UR95MO-055 (1 male and 4 exs.); UR95MO-064 (1 male, 1 female and 18 exs.). Simushir: SI95MO-011 (1 male, 2 females and 35 exs.).

Distribution. Kuril Islands (Shikotan, Kunashir\*, Iturup\*\*, Urup\*\*, Simushir\*\*); Russia Fed. (Far East).

Remarks. *C. verus* is a small and convex species, and is easily distinguished from the other species by the black-yellow coloration of the pronotum and elytra.

#### *Cercyon* sp. 1

*Cercyon* sp. 1: Kuwayama, 1967, 134 [Kunashir].

Distribution. Kuril Islands (Kunashir).

#### *Cercyon* sp. 2

*Cercyon* sp. 2: Kuwayama, 1967, 135 [Iturup].

Distribution. Kuril Islands (Iturup).

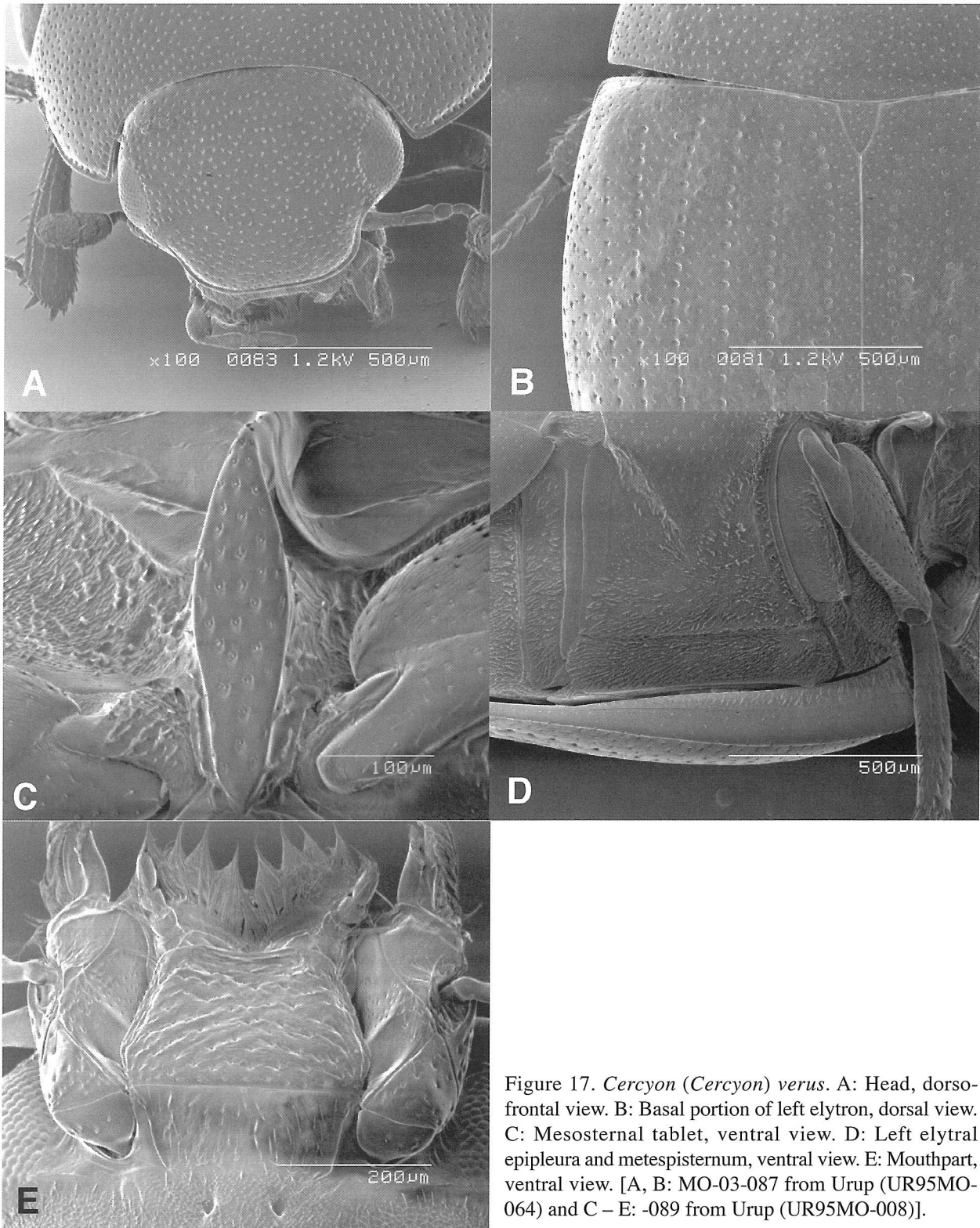


Figure 17. *Cercyon (Cercyon) verus*. A: Head, dorso-frontal view. B: Basal portion of left elytron, dorsal view. C: Mesosternal tablet, ventral view. D: Left elytral epipleura and metespisternum, ventral view. E: Mouthpart, ventral view. [A, B: MO-03-087 from Urup (UR95MO-064) and C – E: -089 from Urup (UR95MO-008)].

**Genus *Pachysternum* Motschulsky, 1863**

***Pachysternum haemorrhoum* Motschulsky, 1866**

*Pachysternum haemorrhoum* Motschulsky, 1866, 168 [Japan]; Kuwayama, 1967, 135 [Shikotan]; Shatrovskiy, 1989, 287 [southern Kurils (Kunashir, Shikotan)]; Hansen, 1999, 307.

*Megasternum distinctum* Sharp, 1873, 66 [Japan], synonymized by Harold, 1878, 69; d'Orchymont, 1926, 373. Japanese name: Maguso-gamushi.

Distribution. Kuril Islands (Shikotan, Kunashir). Palearctic: China, Japan, Korea, Mongolia, Russia Fed. (East Siberia, Far East). Oriental: Philippines.

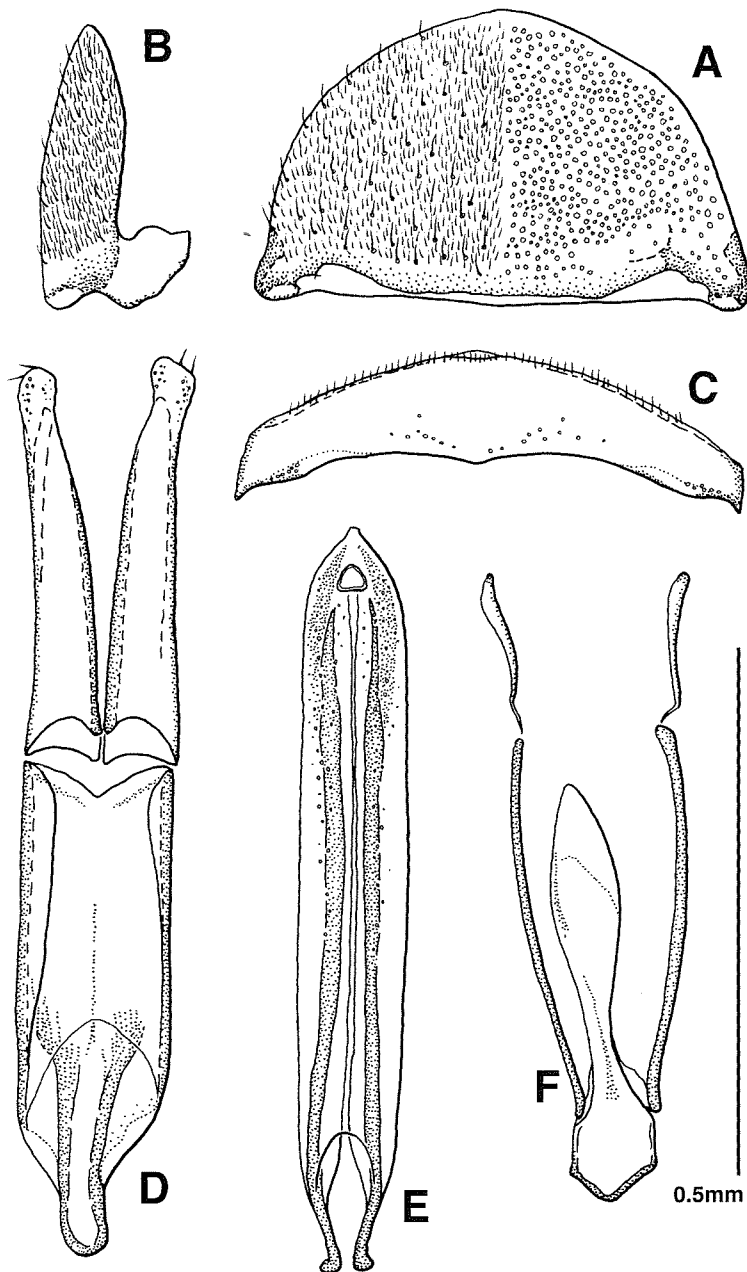


Figure 18. *Cercyon (Cercyon) verus*. Male genitalia. A: Eighth tergite, dorsal view. B: Ditto, lateral view. C: Eighth sternum, ventral view. D: Aedeagus, dorsal view. E: Median lobe, dorsal view. F: Ninth sternum, dorsal view. [MO-03-046 from Simushir (SI95MO-011)].

***Pachysternum haemorrhoum sibiricum* Kuwert, 1890**

*Pachysternum sibiricum* Kuwert, 1890: 172; Kuwayama, 1967, 135 [Shikotan].

*Pachysternum haemorrhoum sibiricum*: Hansen, 1999, 307.

Distribution. Kuril Islands (Kunashir). China (Heilongjiang), Mongolia, Russian Fed. (Far East).

**Key to the species of the terrestrial family Hydrophilidae in the Kuril islands**

- 1 (2) Prosternum without distinct antennal grooves, with no more than shallow concavities, which are only defined laterally by a very obsolete ridge situated very close to the notosternal

- suture. Mesosternum very narrowly and linearly raised medially, or even simply tectiform. .... Genus *Cercyon*
- 2 (1) Prosternum with well defined antennal grooves extending some distance across the hypomeron, and defined laterally or posterolaterally by a well defined arcuate ridge; if antennal groove are indistinct, then the mesosternal elevation forms a well defined tablet, that is either elongate oval or broadly pentagonal ..... Genus *Pachysternum*
- ..... *P. haemorrhoum* Motsch.
- 3 (4) Mesosternal tablet highly carinate medially, narrow, without flat area. .... Subgenus *Paracercyon*
- ..... *C. laminatus* Sharp
- 4 (3) Mesosternal tablet rather broad; its shape usually species-specific. .... Subgenus *Cercyon*
- 5(16) Protibia broad, the apex round; outer margin

Table 1. A list of the terrestrial hydrophilid beetels and their records from Kuril Islands.

Species	IU	TA	PO	ZE	SH	KU	IT	UR	CH	SI	KE	US	RY	RA	MA	SA	EK	CR	KH	ON	MK	AL	PA	SU	Notes	
<i>Cercyon laminatus</i>																									SK(89)	
<i>Cercyon algarum</i>						92																				
<i>Cercyon aptus</i>						92	92	92*	*																	
<i>Cercyon dux</i>																										?SK(89)
<i>Cercyon numerosus</i>								c*	*	*																
<i>Cercyon olibrus</i>						89																				
<i>Cercyon quisquilius</i>							c67																			
<i>Cercyon rotundulus</i>						89																				
<i>Cercyon saluki</i>						98																				
<i>Cercyon setulosus</i>				92		67		92*									*									
<i>Cercyon symbion</i>				92		92	92	*		*							*		*			*	c*	*		
<i>Cercyon vagus</i>						89																				
<i>Cercyon verus</i>				92		89*	c	*		*																
<i>Cercyon</i> sp. 1						67																				
<i>Cercyon</i> sp. 2							67																			
<i>Pachysternum haemorrhoum</i>					67	89																				
<i>Pachysternum haemorrhoum sibiricum</i>						67																				

\*: recorded based on specimens from IKIP

c: recorded based on specimens from collection in Museums

SK: southern Kurils; could not detect the name of island

67: recorded in Kuwayama 1967

89: recorded in Shatrovskiy 1989

92: recorded in Shatrovskiy 1992

98: recorded in Ryndevich 1998



- with one to three rows of strong setae that are pointed downwards. Body longitudinal oblong; surface simple. Elytra with deep punctuated striae (at least on apical half). Habitat under seaweed.
- 6(11) Elytra sparsely punctate; 2nd interspace with less than 6 rows of punctures. Mesosternal tablet, mesosternal pentagonal plate and femur shiny and sparsely punctated.
- 7 (8) Interspaces among elytral striae with a longitudinal shiny and convex area in the middle; area along stria with microscopic structures and matte. .... *C. (C.) aptus* Sharp
- 8 (7) Interspaces among elytral striae convex only on apical half; surface entirely covered with microscopic structures.
- 9(10) Space among punctures of head and pronotum with microscopic structures. Body black; apex of elytra, antennae, maxillar palpi and legs reddish-brown. Body length 2.0 – 2.5 mm. ....  
..... *C. (C.) setulosus* Sharp
- 10 (9) Space among punctures of head and pronotum smooth. Body basically reddish-brown; head black; pronotal lateral sides very bright, the median area with vaguely-outlined blackish macula; ventral side black; antennae and maxillar palpi yellow. Body length 2.6 – 2.8 mm. ....  
..... *C. (C.) algarum* Sharp
- 11 (6) Elytra densely punctated; 2nd interspace with more than 8 various rows of punctures. Surface of femur with microscopic structures. Mesosternal tablet and metasternal pentagonal plate densely punctated, the punctures separated by less than their own diameters. Secure identification of the species is confirmed only by the examination of male genitalia.
- 12(13) Body length more than 4.2 mm. Labrum of male with dense and short oily hairs. Body length 4.2 – 4.3 mm. ....  
..... *C. (C.) dux* Sharp
- 13(12) Body length less than 4.2 mm. Labrum of male without dense hairs.
- 14(15) Body length 3.2 – 3.8 mm. Median lobe of male genitalia rather short. ....  
..... *C. (C.) symbion* Shatrovskiy
- 15(14) Body length 3.3 – 4.1 mm. Median lobe of male genitalia rather long. ....  
..... *C. (C.) numerosus* Shatrovskiy
- 16 (5) Protibia rather narrow, the apex not round; outer margin with a row of long, various setae that are not pointed downwards. Body various shape.
- 17(18) Interspaces among elytral striae convex. Body length, 2.4 mm ..... *C. (C.) vagus* Sharp
- 18(17) Interspaces among elytral striae flat.
- 19(22) Elytra more bright color than the pronotum; yellow, brownish-yellow, red, or reddish-brown; sometimes with black macula on base or middle of elytra.
- 20(21) Body rather oval. Body length, 2.6 – 2.9 mm. ....  
..... *C. (C.) verus* Shatr.
- 21(20) Body oblong; lateral margins of elytra rather parallel. Body length, 1.9 – 2.6 mm. ....  
..... *C. (C.) quisquilius* L.
- 22(19) Color of elytra darker than that of head and pronotum, or appear in the same color of elytra and pronotum; sometimes apex of elytra become brighter.
- 23(24) Color of elytra darker than that of head and pronotum. Body length, 2.2 – 2.9 mm. ....  
..... *C. (C.) saluki* Ryndevich
- 24(23) Same color of elytra and pronotum.
- 25(26) Body color yellowish-brown; head and ventral thoraces darkish-brown; apex of elytra very bright. Dorsal side of body with fine punctures. Body length, 1.9 – 2.4 mm. ....  
..... *C. (C.) olibrus* Sharp
- 26(25) Body color rather dark, reddish-brown. Body length, 2.4 – 2.9 mm. ....  
..... *C. (C.) rotundulus* Sharp

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## Appendix

### KUNASHIR

KU95YMM-115A: 44°00.72'N, 145°46.28'E, Y. M. Marusik, 1/9/1995, CE Part, Lesnaya River, Kisly CK, mixed forest with coniferous dominance, litter: moss and bamboo, hand sifting

### ITURUP

IT96NM-027: 44°46.00'N, 147°11.07'E, N. Minakawa, 8/22/1996, Lesozavodsky; Dabroye Nachalo Bay, hand picked, under seaweeds on sandy beach, about 1 – 3 m from water

### URUP

UR95MO-001: 45°51.49'N, 149°46.95'E, M. Ôhara, 8/4/1995, inland coastal margin of Otkrytyi Bay; environs of Shabalina river, under logs and rocks along shoreline, by hand with aspirator

UR95MO-005: 45°51.04'N, 149°46.12'E, M. Ôhara, 8/5/1995, inland coastal margin of Otkrytyi Bay; environs of Shabalina river valley, under seaweeds, kelp, and rocks along shoreline, by hand with aspirator

UR95MO-006: 46°05.38'N, 50°08.33'E, M. Ôhara, 8/6/1995, inland coastal margin of Natalie Bay; environs of Vesolaya river mouth, under logs and rocks along river banks and coastal shoreline, by hand with aspirator

UR95MO-007: 46°05.38'N, 150°08.33'E, M. Ôhara, 8/7/1995, inland coastal margin of Natalie Bay; environs of Obzhitaya river valley, sandy bars along the river and in adjacent riparian forest, pit fall traps, bait trap, aspirator

UR95MO-008: 46°12.84'N, 150°18.69'E, M. Ôhara, 8/8/1995, inland coastal margin of Novo-kuril'skaya Bay; environs of Bystraya river valley, under logs in grassland with adjacent forest, pit fall traps, bait trap, aspirator

UR95MO-009: 46°12.84'N, 150°18.69'E, M. Ôhara, 8/9/1995, inland coastal margin of Novo-kuril'skaya Bay; environs of Bystraya river valley, under logs; grassland; forest next to wetland

UR95MO-055: 46°01.29'N, 149°59.67'E, M. Ôhara, 8/24/1995, inland coastal margin of Smuglyi Bay; environs of Rybnaya river valley, under leaves of *Petasites japonicus*, by hand

UR95MO-064: 45°34.67'N, 149°24.33'E, M. Ôhara, 8/27/1995, inland coastal margin of Katayeva Bay; environs of Van-der-linda point lighthouse, under faces of cows and pigs, by hand with aspirator

UR95MO-066: 45°48.14'N, 149°54.44'E, M. Ôhara, 8/28/1995, inland coastal margin of Barkhatny Bay; environs of Lopukhovaya river valley, under seaweeds and logs along sandy coastline, by hand with aspirator

UR95MO-069: 45°56.63'N, 150°10.52'E, M. Ôhara, 8/29/1995, inland coastal margin of Negodnaya Bay; environs of Vestrechnyi river

valley, under rocks at base of cliff, by hand with aspirator  
UR95MO-070: 45°56.63'N, 150°10.52'E, M. Ôhara, 8/29/1995, inland coastal margin of Negodnaya Bay; environs of Vestrechnyi river valley, under seaweeds along sandy coastline, by hand with aspirator  
UR95YK-046: 45°56.64'N, 150°10.56'E, M. Ôhara, 8/29/1995, inland coastal margin of Negodnaya Bay; environs of Vestrechnyi river by hand; vegetative litter of coastal grassland  
UR96MO-051: 45°38.81'N, 149°27.87'E, M. Ôhara, 8/21/1996, Tetyva Bay  
UR95BKU-061: 45°47.76'N, 149°54.35'E, B.K. Urbain, 8/28/1995, Inland coastal margin of Barkhatny Bay; environs of Lopukhovaya river, by hand with aspirator, under logs at vegetated margin of coast  
UR95VR-035A: 45°56.60'N, 150°10.44'E, V. Roth, 8/29/1995, Inland coastal margin of Negodnaya Bay; environs of Vstrechnyi river, by hand and forceps

#### **SIMUSHIR**

SI95MO-011: 46°51.36'N, 151°47.19'E, M. Ôhara, 8/11/1995, inland coastal margin of Kitoboytnaya Bay, coastal grassland on the hills close to shoreline, by hand with aspirator  
SI95MO-045: 46°59.16'N, 152°01.21'E, M. Ôhara, 8/22/1995, inland coastal margin of Srednaya Bay, under seaweeds along sandy coastline, by hand with aspirator

#### **SHASHKOTAN**

SA96MO-033A: 48°46.84'N, 154°02.23'E, M. Ôhara, 8/11/1996, inland from Zakatnaya Bay; hand pickup, under seaweed on beach

#### **CHIRPOI**

CH95MO-048: 46°32.53'N, 150°54.22'E, M. Ôhara, 8/23/1995, inland coastal margin of Peschanaya Bay, under seaweeds along sandy coastline, by hand with aspirator

#### **EKARUMA**

EK96MO-032A: 48°57.77'N, 153°55.29'E, M. Ôhara, 8/10/1996, unnamed bay just of the east of cape Shpilevoy, northern corner of island, under seaweed on beach

#### **KHARIMKOTAN**

KH96MO-022A: 49°10.51'N, 154°27.59'E, M. Ôhara, 8/8/1996, Severgina Bay; northern end of Kharimkotan

#### **ALAI**

AL97MO-024A: 50°49.68'N, 155°40.35'E, M. Ôhara, 8/12/1997, inland from Alaidskaya Bay; near abandoned settlement of Atlasova, under seaweed and wood, hand picked

#### **PARAMUSHIR**

PA96MO-005: 50°01.17'N, 155°23.79'E, M. Ôhara, 8/3/1996, Brynkhano Bay, south end of Paramushir, hand pickup, under seaweed, Laminalia  
PA97MO-025D: 50°22.50'N, 155°35.50'E, M. Ôhara, 8/13/1997, inland from Shelekhova Bay; near Shelekhova river and Shelekhovo settlement, under seaweed  
PA97BKU-034: 50°43.95'N, 156°08.82'E, B.K. Urbain Date: 8/4/1997, northeast corner of island; environs of unnamed lake fed by Savushkina river; near Putyatino settlement on coast; along coastline, sucked from under driftwood and within *Honkenya peploides* plants along sandy beach, aspirator

#### **SHUMUSHU**

SU97MO-010A: 50°49.19'N, 156°30.07'E, M. Ôhara, 8/8/1997, about 2 kilometers south of Pochtareva cape; environs of first river north of Koshkina river, on shore; under seaweed, hand picked

## The Subfamily Staphylininae (Coleoptera, Staphylinidae) in the Kuril Archipelago

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**Abstract** A species list of the subfamily Staphylininae of the family Staphylinidae in the Kuril Archipelago is given. Twenty four species are recognized in the Kuril Archipelago based on literature records and the specimens collected during field surveys of the International Kuril Island Project. Of those, *Medhiana paupera*, *Philonthus (Onychophilonthus) tarsalis*, *P. (P.) cf. azabuensis*, *P. (P.) oberti*, *P. (P.) succicola*, *P. (P.) wuesthoffi*, *Ocyopus (Pseudocyopus) nigroaeneus*, *Liusus humeralis*, *Quedius (Microsaurus) mesomelinus*, *Q. (Raphirus) sublimbatus* and *Q. (R.) fulvicollis* are new to Kuril Archipelago, *Othius rosti* is new to Kunashir and Urup, *P. (P.) nudus* is new to Urup, Chirpoi, Simushir, Ushishir, Matua, Shiashkotan, Kharimkotan, Onekotan, Paramushir, Alaid and Shumshu, and *Hadropinus fossor* is new to Urup, Chirpoi and Simushir. Two species, *Othius rufipennis* and *Liusus hilleri*, are excluded from the fauna of the Kuril Archipelago.

**Key words:** Staphylininae, Kuril, new record.

### Introduction

The fauna of staphylinid beetles of the Kuril Archipelago is poorly known. Only fourteen species of the subfamily Staphylininae are known from the islands (70 species are known from Hokkaido, Japan).

A biotic expedition to the Kuril Archipelago (International Kuril Island Project: IKIP), jointly organized by researchers from Japan, USA and Russia, were held from 1994 to 2000. Insect survey and staphylinid beetles collecting were carried out predominantly by the third author (M.Ô.).

Most specimens were identified by the senior author (Y.S.). The staphylinid specimens were deposited in the Hokkaido University Museum, Sapporo, Japan, the Institute of Biology and Soil Science, Russian Academy of Science, Far Eastern Branch, Vladivostok, Russia and the California Academy of Science, San Francisco, USA.

### Results: List of Species

Asterisk in species name indicates new record from the Kuril Archipelago.

#### *Zeteotomus maximus* (Bernhauer)

*Metoponcus maximus* Bernhauer, 1907, Verh. zool.-bot.

Ges. Wien 57: 384 (original description).

*Zeteotomus maximus*: Smetana, 1982, Coleopt. Bull. 36: 309 (record from Kunashir).

*IKIP material*. Not examined.

*Distribution*. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir), China.

*Comments*. This species has not been collected during the IKIP expeditions.

#### *Zeteotomus dilatipennis* (Kirschenblatt)

*Metoponcus dilatipennis* Kirschenblatt, 1948, Ent. Obozr. 30: 48 (original description).

*Zeteotomus dilatipennis*: Smetana, 1982, Coleopt. Bull. 36: 310 (record from Kunashir).

*IKIP material*. Not examined.

*Distribution*. Kuril Archipelago (Kunashir), Ussuri Province, Primorskij Krai.

*Comments*. This species has not been collected during the IKIP expeditions.

#### *Nudobius lentus* (Gravenhorst)

*Staphylinus lentus* Gravenhorst, 1806, Mon. Col. Micr., p. 101 (original description).

*Nudobius lentus*: Smetana, 1982, Coleopt. Bull. 36: 310 (record from Kunashir).

*IKIP material*. Not examined.

*Distribution*. Japan (Hokkaido), Kuril Archipelago (Kunashir), Amur, China, Turkey, Europe.

*Comments*. This species has not been collected during the IKIP expeditions.

**\**Medhiama paupera* (Sharp)**

*Xantholinus paupera* Sharp, 1889, Ann. Mag. nat. Hist., (6) III: 250 (original description).

*Medhiama paupera*: Bordoni, 2002, Museo regionale Sci. nat. Trino, Monografie, 23: 666 (change in combination).

*IKIP material*. KUNASHIR: 1 ♀ [KU97NM004]. ITURUP: 3 ♀ ♀ [IT97NM015]. BRAT-CHIRPOEV: 1 ♂ [BC97MO-039B].

*Distribution*. Japan (Hokkaido, Honshu, Shikoku), Kuril Archipelago (Kunashir, Iturup, Brat-Chirpoev), China, Nepal, India.

*Comments*. New record from the Kuril Archipelago.

***Othius rosti* Bernhauer**

*Othius rosti* Bernhauer, 1907, Verh. zool.-bot. Ges. Wien, 57: 385.

*Othius rosti*: Assing, 1999, Beitr. Ent., 49: 16 (Iturup).

*IKIP material*. ITURUP: 2 ♂ ♂, 2 ♀ ♀ [IT96NM-020]. URUP: 1 ♀ [UR95MO-002]; 1 ♀ [UR95MO-006]; 1 ♂, 1 ♀ [UR95MO-007]; 1 ♂ [UR95VR-035A]; 6 ♂ ♂, 1 ♀ [UR96MO-048B].

*Non-IKIP material*. KUNASHIR: 4 ♂ ♂, 2 ♀ ♀, 16–20 VIII 1993 (no other data).

*Distribution*. Japan (Hokkaido, Honshu), Kuril Archipelago (Kunashir, Iturup, Urup), Sakhalin, Ussuri, Amur.

*Comments*. New record from Kunashir and Urup.

***Gabrius ophion* Smetana**

*Gabrius ophion*: Smetana, 1984, Pan-Pacific Entomologist 60: 146 (record from Kunashir).

*IKIP material*. Not examined.

*Distribution*. Japan (Hokkaido, Honshu, Shikoku), Kuril Archipelago (Kunashir), Korea.

*Comments*. This species has not been collected during the IKIP expeditions.

**\**Philonthus (Onychophilonthus) tarsalis* Smetana**

*Philonthus (Onychophilonthus) tarsalis* Smetana, 1963, Acta ent. Mus. natn. Pragae, 35: 412 (Primorskij Kray).

*IKIP material*. KUNASHIR: 1 ♂, 25 VIII 1996, A. Lelej leg. PARAMUSHIR: 3 ♀ ♀ [PA97MO-006C]; 1 ♂ [PA97MO-020A]. SHUMSHU: 1 ♀ [SU97MO-

013F].

*Non-IKIP material*. KUNASHIR: 2 ♂ ♂, 4 ♀ ♀, 16–20 VIII 1993 (no other data).

*Distribution*. Japan (Honshu), Kuril Archipelago (Kunashir, Paramushir, Shumshu), Southern Ussuri Province, Primorskij Kray.

*Comments*. New record from the Kuril Archipelago (Kunashir, Paramushir, Shumshu).

**\**Philonthus (Philonthus) cf. azabuensis* Dvořák**

*IKIP material*. URUP: 1 ♀ [UR95MO-008].

*Comments*. This species is most similar to *P. azabuensis*, however, it may be an undescribed species.

***Philonthus (Philonthus) caeruleipennis* Mannerheim**

*Philonthus caeruleipennis* Mannerheim, 1830, Mem. Acad. Sci. St. Petersburg. I: 441.

*Philonthus caeruleipennis*: Schillhammer, 1998, Koleopt. Runds. 68: 105 (Kunashir, Iturup).

*IKIP material*. Not examined.

*Distribution*. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir, Iturup), Korea.

*Comments*. This species has not been collected during the IKIP expeditions.

***Philonthus (Philonthus) japonicus* Sharp**

*Philonthus japonicus* Sharp, 1874, Trans. ent. Soc. Lond., p. 40 (original description).

*Philonthus binderi* Roubal, 1910, Verh. zool.-bot. Ges. Wien, 60: 263 (records from Iturup).

*Philonthus japonicus bernhaueri* Roubal: Kôno, 1944, Chishima Gakujutsu Chosa Kenkyutai Hokoku I: 82 (records from Kunashir, Urup, Paramushir).

*IKIP material*. Not examined.

*Distribution*. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir, Urup, Paramushir), Sakhalin, Siberia, China, Korea.

*Comments*. This species has not been collected during the IKIP expeditions.

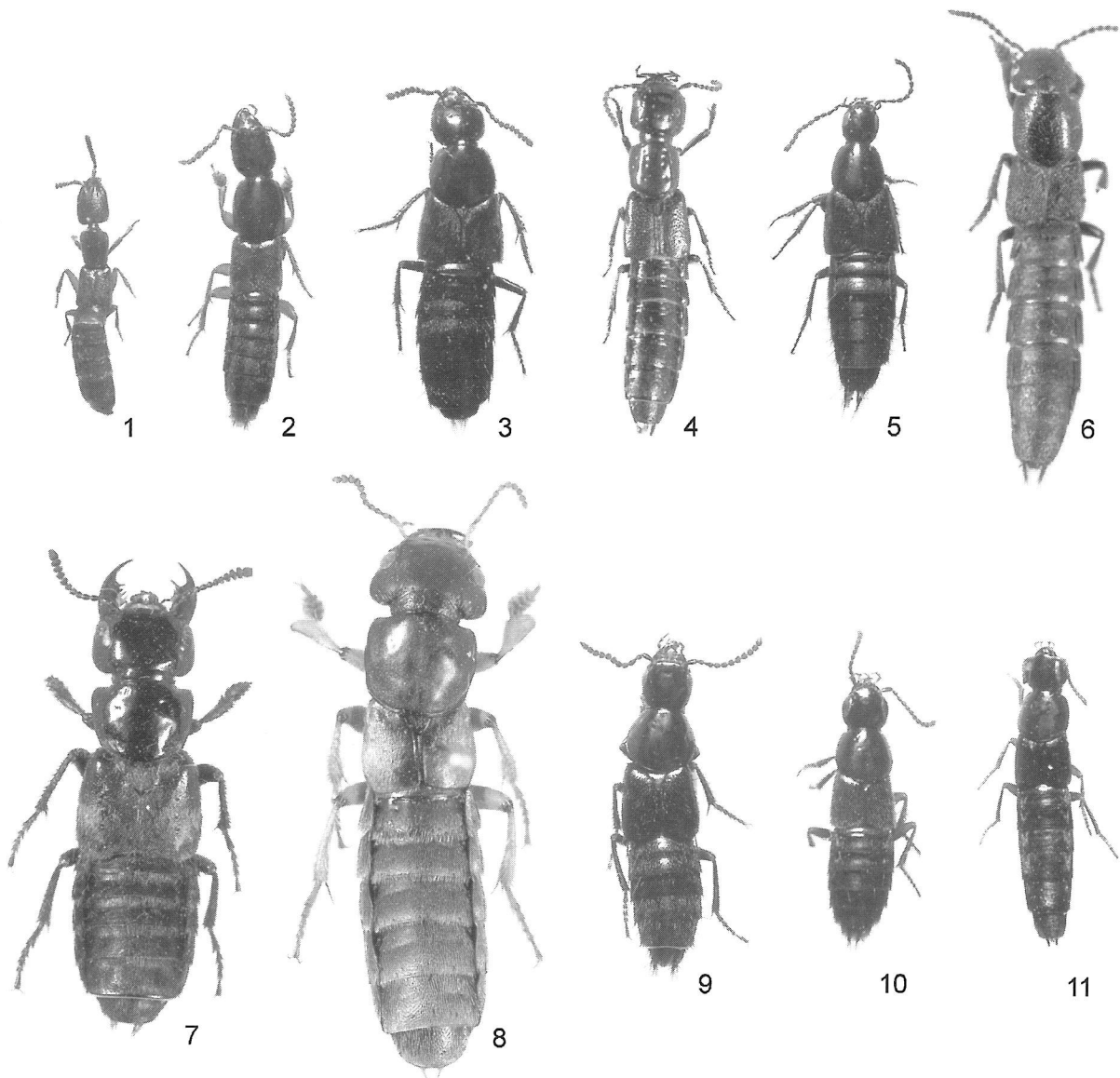
***Philonthus (Philonthus) nudus* Sharp**

*Philonthus nudus* Sharp, 1874, Trans. ent. Soc. Lond., p. 36 (original description).

*Philonthus nudus*: Naomi, Kuranishi, Saito, Maruyama, 2000, Nat. Hist. Res., Special Issue 7: 109 (record from Paramushir).

*Cafius nudus*: Kryvolutskaja, 1973, Entomof. Kuril Archipelago., p. 231 (record from Kuril Archipelago).

*IKIP material*. URUP: 3 exs. [UR95MO-002]; 2 ♀ ♀ [UR95MO-005]; 2 ♂ ♂, 3 ♀ ♀ [UR95MO-008]; 96 exs. [UR95MO-066]; 3 exs. [UR95MO-070]; 2 exs. [UR95PO-028]; 1 ex. [UR95PO-029]; 42 exs. [UR96MO-048B]; 1 ex. [UR96MO-051]; 1 ex.



Figures 1 – 11. Staphylinines collected in the IKIP expeditions. 1. *Medhiama paupera*, 2. *Othius rosti*, 3. *Philonthus tarsalis*, 4. *P. nudus*, 5. *P. wuesthoffi*, 6. *Ocybus nigroaeneus*, 7. *Creophilus maxillosus*, 8. *Hadropinus fossor*, 9. *Quedius mesomelinus*, 10. *Q. sublimbatus*, 11. *Q. fulvicollis*.

[UR95TWP-049]; 9 exs. [UR95VR-016F]; 5 exs. [UR95VR-017A]; 4 exs. [UR95BKU-014]. CHIRPOI: 24 exs. [CH95MO-048]; 4 exs. [CH95VR-028C]; 2 exs. [CH95BKU-048]. SIMUSHIR: 2 ♂, 8 ♀, 18 exs. [SI95MO-032]; 1 ex. [SI95VR-027C]. USHISHIR: 55 exs. [US95MO-018]; 1 ♂, 1 ♀, 2 exs. [US95MO-021]; 14 exs. [US95BKU-038]; 31 exs. [US95VR-022]. MATUA: 57 exs. [MA96MO-044A]. SHIASHKOTAN: 11 exs. [SA96MO-033D]. KHARIMKOTAN: 112 exs. [KH96MO-022B]. ONEKOTAN: 17 exs. [ON96MO-010B]; 1 ex. [ON96MO-019]. PARAMUSHIR: 10 exs. [PA96MO-001A]; 1 ex. [PA97MO-025C]; 1 ex. [PA97MO-031A]. ALAID: 3 exs. [AL97MO-024A]. SHUMSHU: 32 exs. [SU97MO-010A]; 2 exs. [SU97MO-015C].

*Distribution.* Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Urup, Chirpoi, Simushir, Ushishir, Matua, Shiashkotan, Kharimkotan, Onekotan, Paramushir, Alaid, Shumshu), Sakhalin, Ussuri, Korea, China, North America.

*Comments.* Halophilous species. All specimens were collected under seaweed accumulated on the coastal margin.

New record from Urup, Chirpoi, Simushir, Ushishir, Matua, Shiashkotan, Kharimkotan, Onekotan, Paramushir, Alaid and Shumshu.

**\**Philonthus (Philonthus) oberti* Eppelsheim**

*Philonthus (Philonthus) oberti* Eppelsheim, 1889, Horae Soc. Ent. Rossa., 23: 174 (original description).

*Non-IKIP material.* KUNASHIR: 3 ♂♂, 2 ♀♀, 16–20 VIII 1993 (no other data).

*Distribution.* Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir), Siberia, Mongolia, China, Korea.

*Comments.* New record from the Kuril Archipelago.

### ***Philonthus (Philonthus) rutiliventris* Sharp**

*Philonthus rutiliventris* Sharp, 1874, Trans. ent. Soc. Lond., p. 47 (original description).

*Philonthus (Bisnius) rutiliventris:* Kuwayama, 1967, Ins. Fau. South. Kuril Isls., p. 136. (records from Kunashir, Shikotan)

*IKIP specimen.* Not examined.

*Distribution.* Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir, Shikotan), Sakhalin, Siberia, Korea, China.

*Comments.* This species has not been collected during the IKIP expeditions.

### **\**Philonthus (Philonthus) succicola* Thomson**

*Philonthus succicola* Thomson, 1860, Skand. Col. II, p. 157 (original description).

*IKIP material.* PARAMUSHIR: 1 ♂ [PA97MO-006C].

*Distribution.* Kuril Archipelago (Paramushir), Siberia, Tunisia, Europe, Iran, Kazakhstan.

*Comments.* New record from the Kuril Archipelago (Paramushir).

### **\**Philonthus (Philonthus) wuesthoffi* Bernhauer**

*Philonthus wuesthoffi* Bernhauer, 1939, Ent. Nachrbl. 12: 98 (original description).

*IKIP material.* URUP: 1 ♂, 2 ♀♀ [UR95MO-008]; 1 ♂, 3 ♀♀ [UR95MO-009]. PARAMUSHIR: 1 ♂, 2 ♀♀ [PA97MO-006C].

*Distribution.* Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Urup, Paramushir), Sakhalin, Ussuri, Korea, China.

*Comments.* New record from the Kuril Archipelago (Urup, Paramushir).

### ***Phucobius simulator* Sharp**

*Phucobius simulator* Sharp, 1874, Trans. ent. Soc. Lond., p. 35 (original description).

*Phucobius simulator:* Kuwayama, 1967, Ins. Fau. South. Kuril Isls., p. 137. (record from Kunashir).

*IKIP material.* Not examined.

*Distribution.* Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir), Korea, China.

*Comments.* This species has not been collected during the IKIP expeditions.

### **\**Ocybus (Pseudocybus) nigroaeneus* Sharp**

*Ocybus nigroaeneus* Sharp, 1889, Ann. Mag. nat. Hist., (6) III: 109 (original description).

*IKIP material.* KUNASHIR: 1 ex. [KU95VR-038].

*Distribution.* Japan (Hokkaido, Honshu, Shikoku), Kuril Archipelago (Kunashir), Korea, China, Mongolia.

*Comments.* New record from the Kuril Archipelago (Kunashir)

### ***Creophilus maxillosus* (Linnaeus)**

*Staphylinus maxillosus* Linnaeus, 1758, Syst. Nat., ed. X, p. 421 (original description).

*Staphylinus maxillosus:* Kuwayama, 1967, Ins. Fau. South. Kuril Isls., p. 137 (records from Kunashir, Shikotan, Iturup, Urup).

*Creophilus maxillosus:* Kano, 1933, Bull. biogeogr. Soc. Japan, 4: 98 (record from Alaid).

*Creophilus maxillosus:* Kôno, 1944, Chishima Gakujutsu Chosa Kenkyutai Hokoku, I: 83 (records from Kunashir, Shikotan, Iturup, Urup, Paramushir, Alaid, Shumshu).

*Creophilus maxillosus:* Naomi, Kuranishi, Saito, Maruyama, 2000, Nat. Hist. Res., Special Issue 7: 110 (record from Paramushir).

*IKIP material.* ITURUP: 1 ♂ (on the ship). URUP: 1 ♀ [UR95MO-008]. PARAMUSHIR: 1 ♀ [PA97MO-006C]; 1 ♀ [PA97MO-020A]. SHUMSHU: 10 exs. [SU97MO-010A]; 2 exs. [SU97MO-013F]

*Distribution.* Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir, Shikotan, Iturup, Urup, Paramushir, Alaid, Shumshu), Sakhalin, Kamchatka, Siberia, Europe, Cosmopolitan.

*Comments.* This species is known to be a predator of maggots, and is often observed on carcasses of vertebrate animals.

### **\**Liusus humeralis* (Matsumura)**

*Staphylinus (Ocybus) humeralis* Matsumura, 1911, J. Agr. Tohoku Imp. Univ., 4: 113.

*Liusus humeralis:* Watanabe, 1983, Kontyû, 51: 217. (Hokkaido; Southern Sakhalin).

*IKIP material.* ITURUP: 1 ex. [IT96NM-020]. URUP: 1 ♂ [UR95MO-002]; 3 ♂♂, 3 ♀♀ [UR95MO-005]; 1 ♀ [UR95MO-007]; 3 exs. [UR95MO-069]; 20 exs. [UR96MO-048B]; 1 ex. [UR96MO-051]; 1 ex. [UR95VR-029B]; 2 exs. [UR95VR-035A]; 1 ex. [UR95PO-028]. SIMUSHIR: 3 ♂♂, 1 ♀ [SI95BKU-046A]; 1 ♀ [SI95MO-032]; 1 ♀ [SI95MO-042]; 1 ♀ [SI95MO-045]; 1 ex. [SI95VR-024B].

*Distribution.* Japan (Hokkaido, Honshu), Kuril Archipelago (Iturup, Urup, Simushir), Southern Sakhalin, Korea, China.

*Comments.* Halophilous species, often collected together with *Philonthus (Philonthus) nudus*.

New record from the Kuril Archipelago (Iturup, Urup, Simushir).

### ***Hadropinus fossor* Sharp**

*Hadropinus fossor* Sharp, 1889, Ann. Mag. nat. Hist., (6) III: 116.

*Hadropinus fossor*: Kuwayama, 1967, Ins. Fau. South. Kuril Isls., p. 137 (record from Kunashir).

**IKIP material.** KUNASHIR: 1 ex. [KU96NM-030]. URUP: 3 ♂♂, 3 ♀♀ [UR95MO-001]; 1 ex. [UR95MO-005]; 3 ♀♀ [UR95MO-058]; 3 exs. [UR95MO-066]; 1 ex. [UR95VR-029A]; 2 exs. [UR95VR-029B]; 4 exs. [UR95YMM-036]; 1 ex. [UR95BKU-014]; 6 exs. [UR95BKU-061]; 1 ex. [UR95PO-028]. CHIRPOI: 3 ♀♀ [CH95MO-048]. SIMUSHIR: 3 ♂♂, 3 ♀♀ [SI95MO-032]; 1 ex. [SI95PO-060]; 1 ex. [SI95BKU-046A].

**Distribution.** Japan (Hokkaido, Honshu), Kuril Archipelago (Kunashir, Urup, Chirpoi, Simushir), Sakhalin, Ussuri, China.

**Comments.** Large and distinct halophilous species, known to be a predator of gammarus and other halophilous insects. New records from Urup, Chirpoi and Simushir.

### ***Quedius (Quedionuchus) armipes* (Sharp)**

*Quedionuchus armipes* Sharp, 1889, Ann. Mag. nat. Hist., (6) III: 34.

*Quedius (Quedionuchus) armipes*: Smetana, 1995, Elytra, 23: 80. (Kunashir Is.)

**IKIP material.** Not examined.

**Distribution.** Japan (Honshu, Kyushu), Kuril Archipelago (Kunashir).

**Comments.** This species has not been collected during the IKIP expeditions.

### **\**Quedius (Microsaurus) mesomelinus* (Marsham)**

*Staphylinus mesomelinus* Marsham, 1802, Ent. Brit.: 510 (original description).

**IKIP material.** URUP: 1 ♀ [UR95MO-064]. MATUA: 3 ♂♂ [MA96MO-042A]

**Distribution.** Kuril Archipelago (Urup, Matua), Europe, Iceland, Greenland, North America, South America, Australia, New Zealand.

**Comments.** New record from Kuril Archipelago (Urup, Matua).

### **\**Quedius (Raphirus) sublimbatus* Mäklin**

*Quedius sublimbatus* Mäklin, 1853, Bull. Soc. Natur. Moscow 26, 3: 190.

**IKIP material.** ONEKOTAN: 3 ♂♂ [ON96MO-

010B]. PARAMUSHIR: 2 ♂♂ [PA97MO-025C].

**Distribution.** Kuril Archipelago (Onekotan, Paramushir), Kamtschatka, Siberia, Mongolia, Europe, North America.

**Comments.** New record from the Kuril Archipelago (Onekotan, Paramushir).

### **\**Quedius (Raphirus) fulvicollis* (Stephens)**

*Raphirus fulvicollis* Stephens, 1833, Ill. Brit. Ent. 5: 244.

**IKIP material.** URUP: 1 ♀ [UR95BKU-059A]. SIMUSHIR: 1 ♂ [SI95MO-011]; 1 ♂ [SI95MO-043]. KETOI: 1 ♂ [KE95MO-036]; 1 ♂ [KE95VR-025B]. RASSHUA: 1 ♂ [RAS95VR-019A]; 1 ♂ [RAS95MO-014]. SHASHIKOTAN: 1 ♂ [SA96MO-033D]. CHIRINKOTAN: 3 ♂♂, 2 ♀♀ [CR96MO-031D]. PARAMUSHIR: 1 ♂ [PA97YK-010].

**Distribution.** Kuril Archipelago (Urup, Simushir, Ketoi, Rasshua, Shashikotan, Chirinkotan, Paramushir), Kamtschatka, Siberia, Europe, Iceland, North America.

**Comments.** New record from the Kuril Archipelago (Urup, Simushir, Ketoi, Rasshua, Shashikotan, Chirinkotan, Paramushir).

## **Species that should be excluded from the fauna of the Kuril Archipelago**

### ***Othius rufipennis* Sharp**

*Othius rufipennis* Sharp, 1874, Trans. ent. Soc. Lond., p. 49.

*Othiellus rufipennis*: Kuwayama, 1967, Ins. Fau. South. Kuril Isls., p.136. (Kunashir Is.)

**Distribution.** Japan (Kyushu), Korea, China.

**Comments.** This species has not been collected in IKIP, and does not occur on Hokkaido. It is confined to Temperate Zones of East Asia. It is possible that Kuwayama's (1967) record is a misidentification of *Othius rosti*.

### ***Liusus hilleri* (Weise)**

*Hadrotes hilleri* Weise, 1877, Deuts. ent. Z., 21: 93.

*Liusus hilleri*: Kuwayama, 1967, Ins. Fau. South. Kuril Isls., p. 137. (Kunashir Is.)

*Liusus hilleri*: Kryvolutskaja, 1973, Entomof. Kuril Iss., p. 231. (Kuril Islands)

**Distribution.** Japan (Hokkaido, Honshu, Kyushu), Korea. Questionable: Kuril Iss. (Kunashir Is.) .

**Comments.** This species has not been collected during IKIP. Despite examining a number of specimens of the genus *Liusus*, no specimen belonging to the *L. hilleri* was found in the present study. The previous records of this species from Kuril Islands (Kuwayama, 1967; Kryvolutskaja, 1973) are most



probably misidentification of *Liusus humeralis*.

## Acknowledgements

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## Appendix

### KUNASHIR

- KU97NM-004: 44°00.34' N, 145°40.99' E, N. Minakawa, 7/27/1997, 70 m upstream from goby "hot spring", soil and litter under Fuki and Sasa, riparian VEG along small stream (1-1.5 m in width); dense forest w/ large fir, hand picked
- KU96NM-030: N. Minakawa, 8/24/1996, north side of Yuzhno-kurilsky cape, under decaying seaweed on the sandy beach, large rocks on the beach
- KU95VR-038: 44°03.13' N, 145°44.68' E, V. Roth, 9/1/1995, environs of lake Aliger and Lagunnoye, in moss under reeds and grasses in marshland, by hand

### ITURUP

- IT97NM-015: 45°20.04' N, 147°59.80' E, N. Minakawa, 7/30/1997, eastern side of Chirip peninsula; inland coastal margin of Kondrtvnaya Bay, in litter 1 m from bank of creek running into Bay; stream dried up 300 m upstream from shore; 0.5-1 m wide; pool and riffles; litter includes Fuki, Sasa, alder, willow, hand picked
- IT96NM-020: 45°19.79' N, 147°59.75' E, N. Minakawa, 8/19/1996, inland coastal margin of Konservnaya Bay, under rocks and seaweed along coastline, hand picked

### URUP

- UR95MO-001: 45°51.49' N, 149°46.95' E, M. Ôhara, 8/4/1995, inland coastal margin of Otkryti Bay; environs of Shabalina river, under logs and rocks along shoreline, by hand with aspirator
- UR95MO-002: 45°51.49' N, 149°46.95' E, M. Ôhara, 8/4/1995, inland coastal margin of Otkryti Bay; environs of Shabalina river, under logs and rocks along shoreline, by hand with aspirator
- UR95MO-005: 45°51.04' N, 149°46.12' E, M. Ôhara, 8/5/1995, Inland coastal margin of Otkryti Bay; Environs of Shabalina river valley, under seaweeds, kelp, and rocks along shoreline, by hand with aspirator
- UR95MO-006: 46°05.38' N, 150°08.33' E, M. Ôhara, 8/6/1995, 0930-1600, Inland coastal margin of Natalie Bay; Environs of Vesolaya river mouth, under logs and rocks along river banks and coastal shoreline, by hand with aspirator, sweep net
- UR95MO-007: 46°05.38' N, 150°08.33' E, M. Ôhara, 8/7/1995, 0900-1300, Inland coastal margin of Natalie Bay; Environs of Obzhitaya river valley, sandy bars along the river and in adjacent riparian forest, pit fall traps, bait trap, aspirator
- UR95MO-008: 46°12.84' N, 150°18.69' E, M. Ôhara, 8/8/1995, 1300-1830, Inland coastal margin of Novo-kurilskaya Bay; Environs of Bystraya river valley, under logs in grassland with adjacent forest, pit fall traps, bait trap, aspirator
- UR95MO-009: 46°12.84' N, 150°18.69' E, M. Ôhara, 8/9/1995, 0900-1130, Inland coastal margin of Novo-kurilskaya Bay; Environs of Bystraya river valley, under logs; grassland; forest next to wetland, sweep net
- UR95MO-058: 46°01.00' N, 149°58.24' E, M. Ôhara, 8/25/1995, inland coastal margin of Smuglyi Bay; environs of Rybnaya river mouth, under rocks and logs along coastline, by hand with aspirator
- UR95MO-064: 45°34.67' N, 149°24.33' E, M. Ôhara, 8/27/1995, Inland coastal margin of Katayeva Bay; Environs of Van-der-linda point Lighthouse, under faces of cows and pigs, by hand with aspirator
- UR95MO-066: 45°48.14' N, 149°54.44' E, M. Ôhara, 8/28/1995, Inland coastal margin of Barkhatny Bay; Environs of Lopukhovaya river valley, under seaweeds and logs along sandy coastline, by hand with aspirator
- UR95MO-069: 45°56.63' N, 150°10.52' E, M. Ôhara, 8/29/1995, Inland coastal margin of Negodnaya Bay; Environs of Vestrechnyi river valley, under rocks at base of cliff, by hand with aspirator
- UR95MO-070: 45°56.63' N, 150°10.52' E, M. Ôhara, 8/29/1995, 1430-1630, Inland coastal margin of Negodnaya Bay; Environs of Vestrechnyi river valley, under seaweeds along sandy coastline, by hand with aspirator
- UR96MO-048B: 45°35.20' N, 149°32.30' E, M. Ôhara, 8/20/1996, Ukromnaya Bay, under stone and piece of wood on shore, hand picked, forceps
- UR96MO-051: 45°38.81' N, 149°27.87' E, M. Ôhara, 8/21/1996, inland from Tetyava Bay, under seaweed, by hand and forceps
- UR95VR-016F: 46°05.85' N, 150°09.91' E, V. Roth, 8/7/1995, inland coastal margin of Natalie Bay; environs of Obzhitaya river, along sandy beach, by hand and forceps
- UR95VR-017A: 46°12.84' N, 150°19.04' E, V. Roth, 8/9/1995, inland coastal margin of Novokurilskaya Bay; environs of Bystraya river, along sandy coast, by hand and forceps
- UR95VR-029A: 46°01.15' N, 150°58.42' E, V. Roth, 8/24/1995, inland coastal margin of Smuglyi Bay; environs of Rybnaya river, traps set in vegetation around a logpile, 30 can traps
- UR95VR-029B: 46°01.15' N, 150°58.42' E, V. Roth, 8/24/1995, inland coastal margin of Smuglyi Bay; environs of Rybnaya river, riparian vegetation of petasites, by hand and forceps
- UR95VR-035A: 45°56.60' N, 150°10.44' E, V. Roth, 8/29/1995, inland coastal margin of Negodnaya Bay; environs of Vstrechnyi river, by hand and forceps
- UR95PO-028: 46°05.75' N, 150°09.84' E, N. Minakawa, 8/7/1995, inland coastal margin of Natalie Bay; environs of Obzhitaya river; at rockface near river mouth at east end of cove, picked from wall of rockface wet with fresh water, by hand and forceps
- UR95PO-029: 46°05.75' N, 150°09.84' E, N. Minakawa, 8/7/1995, inland coastal margin of Natalie Bay; environs of Obzhitaya river; along beach near river mouth, picked from under woody debris along sandy beach, by hand and forceps
- UR95TWP-049: 45°47.71' N, 49°54.33' E, T.W. Pietsch, 8/28/1995, inland coastal margin of Barkhatny Bay; environs of Lopukhovaya river, under dead grass mats, under woody debris along riparian margin, among tall broad-leafed grass and yellow-flowering herbs, aspirator & sifting by hand
- UR95BKU-014: 45°51.51' N, 149°46.99' E, B.K. Urbain, 8/4/1995, inland coastal margin of Otkryti Bay; environs of Shabalina river mouth, under logs (sand temperature = 15°C) along coastal beach with fine sand, by hand

UR95BKU-059A: 45°35.00' N, 149°24.50' E, B.K. Urbain, 8/26/1995, inland coastal margin of Katayeva Bay, under rocks, in vegetative litter, from lower vegetative layer, and in sphagnum moss of coastal slope meadow dominated by flowering herbs and short grasses with some patches of mosses, by hand with aspirator

UR95BKU-061: 45°47.76' N, 149°54.35' E, B.K. Urbain, 8/28/1995, inland coastal margin of Barkhatny Bay; environs of Lopukhovaya river, under logs at vegetated margin of coast, by hand with aspirator

UR95YMM-036: 46°05.85' N, 150°09.91' E, Y.M. Marusik, 8/7/1995, inland coastal margin of Natalie Bay; environs of Obzhitaya river mouth, in matted herb (*Artemisia* sp.) along vegetated, sandy beach, by hand with aspirator

#### **CHIRPOI**

CH95MO-048: 46°32.53' N, 150°54.22' E, M. Ôhara, 8/23/1995, Inland coastal margin of Peschanaya Bay, under seaweeds along sandy coastline, by hand with aspirator

CH95VR-028C: 46°32.28' N, 150°53.62' E, V. Roth, 8/23/1995, inland coastal margin of Peschanaya Bay, vegetation thick with peas and grass, by hand and forceps

CH95BKU-048: 46°32.54' N, 150°54.18' E, B.K. Urbain, 8/23/1995, inland coastal margin of Peschanaya Bay; within sandy alcove cut out from upper beach meadow, under logs and IN sand from unvegetated sandy alcove, by hand with aspirator

#### **BRAT-CHIRPOEV**

BC97MO-039B: 46°28.28' N, 150°47'88" E, M. Ôhara, 8/20/1997, inland from near cape Garovnikova and lev rock, under stones, hand picked

#### **SIMUSHIR**

SI95MO-011: 46°51.36' N, 151°47.19' E, M. Ôhara, 8/11/1995, Inland coastal margin of Kitoboynaya Bay, coastal grassland on the hills close to shoreline, by hand with aspirator, sweep net

SI95MO-032: 47°05.14' N, 152°07.51' E, M. Ôhara, 8/18/1995, inland coastal margin of Malaya Bay, under dry seaweeds along sandy coastline, by hand with aspirator

SI95MO-042: 46°59.05' N, 152°01.30' E, M. Ôhara, 8/22/1995, inland coastal margin of Srednaya Bay, vegetation of *Konkenya peplodes*, *Stellaria aquatica*, *Senecio pseudo arnica* along upper sandy coastline, by hand with aspirator

SI95MO-045: 46°59.16' N, 152°01.21' E, M. Ôhara, 8/22/1995, Inland coastal margin of Srednaya Bay, under seaweeds along sandy coastline, by hand with aspirator

SI95VR-024B: 47°05.36' N, 152°08.00' E, V. Roth, 8/18/1995, inland coastal margin of Malaya Bay, from intertidal zone of vegetated margin along coast, by hand and forcep

SI95VR-027C: 46°58.98' N, 152°01.28' E, V. Roth, 8/22/1995, inland coastal margin of Srednaya Bay under boards along coarse grained sandy coast, from intertidal to edge of vegetated margin, by hand and forcep

SI95BKU-046A: 46°58.92' N, 152°01.11' E, B.K. Urbain, 8/22/1995, inland coastal margin of Srednaya Bay; along coast, under logs and within coarse sand from upper beach zone vegetated with sparse, low-lying, sand specific plants, by hand with aspirator

SI95PO-060: 46°51' N, 151°47' E, N. Minakawa, 8/11/1995, inland coastal margin of Kitoboynaya Bay, under log on coast, by hand

#### **KETOI**

KE95MO-036: 47°18.02' N, 152°29.90' E, M. Ôhara, 8/19/1995, inland coastal margin in the environs of Stochnyi river, from soil under a stand of dwarf pine (*Pinus pumila*) within a grassland meadow, by hand with aspirator

KE95VR-025B: 47°17.93' N, 152°30.07' E, V. Roth, 8/19/1995, inland coastal margin in the environs of Stochnyi river, meadow on top of cliff with vegetation of grasses, herbs and mosses with some birch and pine, sifter

#### **USHISHIR**

US95MO-018: 47°30.55' N, 152°48.99' E, M. Ôhara, 8/14/1995, Yankicha Island; inland environs of Kraternaya Bay, under large rocks along sandy beach, by hand

US95MO-021: 47°30.54' N, 152°49.00' E, M. Ôhara, 8/14/1995, Yankicha Island; inland environs of Kraternaya Bay, under decaying seabird carcass, by hand with aspirator

US95BKU-038: 47°30.63' N, 152°48.82' E, B.K. Urbain, 8/14/1995, Yankicha Island; inland environs of Kraternaya Bay, under birds carrion, logs and other debris along sandy shoreline, by hand with aspirator

US95VR-022: 47°30.55' N, 152°48.98' E, V. Roth, 8/14/1995, Yankicha Island; inland environs of Kraternaya Bay, along sandy beach, under debris, by hand and forceps

#### **RASSHUA**

RAS95MO-014: 47°43.19' N, 152°58.80' E, M. Ôhara, 8/13/1995, inland from southwest section of island near arches, along rocky shoreline, by hand with aspirator

RAS95VR-019A: 47°43.15' N, 152°58.27' E, V. Roth, 8/12/1995, inland from southwest section of island near the arches, in cavity under rotting wood, by hand and forceps

#### **MATUA**

MA96MO-042A: 48°04.00' N, 153°15.62' E, M. Ôhara, 8/14/1996, Inland from Dvoynaya Bay, under cow dung, by hand pickup with forceps

MA96MO-044A: 48°02.46' N, 153°13.65' E, M. Ôhara, 8/15/1996, Ainu Bay, under log and stone on shore

**SHIASHKOTAN**

SA96MO-033D: 48°46.84' N, 154°02.23' E, M. Ôhara, 8/11/1996, inland from Zakatnaya Bay, under pieces of wood on beach, hand picked

**CHIRINKOTAN**

CR96MO-031D: 48°59.29' N, 153°28.42' E, M. Ôhara, 8/10/1996, small inlet just to the east of Cape Ptichy (northern corner of Island), under pebbles on sea shore, hand picked

**KHARIMKOTAN**

KH96MO-022B: 49°10.51' N, 154°27.59' E, M. Ôhara, 8/8/1996, Severgina Bay, northern end of Island, under stones and wood pieces on sandy beach, hand picked

**ONEKOTAN**

ON96MO-010B: 49°36.71' N, 154°48.86' E, M. Ôhara, 8/4/1996, Nemo Bay; northern part of Island, inland 50 m from river mouth, under stones and wood pieces, hand picked

ON96MO-019: 49°22.91' N, 154°49.16' E, M. Ôhara, 8/7/1997, Mussel Bay, under seaweed and stone on sea shore, hand picked

**ALAUD**

AL97MO-024A: 50°49.68' N, 155°40.35' E, M. Ôhara, 8/12/1997, Inland from Alaidskaya Bay; near abandoned settlement of Atlasova, under seaweed and wood, hand picked

**PARAMUSHIR**

PA96MO-001A: 50°37.73' N, 156°08.21' E, M. Ôhara, 8/1/1996, environs of Utesny reiver, Laminalia, swept, hand picked

PA97MO-006C: 50°40.35' N, 156°08.47' E, M. Ôhara, 8/4/1997, near center of town of Severo-kurilsk, under cow dung hand picked

PA97MO-020A: 50°37.73' N, 156°08.05' E, M. Ôhara, 8/11/1997, inland from Utyosnaya Bay; environs of Utyosnaya river valley, under stones, hand picked

PA97MO-025C: 50°22.50' N, 155°35.50' E, M. Ôhara, 8/13/1997, inland from Shelekhova Bay; near Shelekhova river and Shelekhovo settlement, under stones and wood, hand picked

PA97MO-031A: 50°01.19' N, 155°24.00' E, M. Ôhara, 8/16/1997, inland from western base of Vasil'yeva peninsula, under seaweed on shore, hand picked

PA97YK-010: 50°44.22' N, 156°08.61' E, Y. Kuwahara, 8/4/1997, northeast corner of island; environs of unnamed lake fed by Savushkina river; near Putyatino settlement on coast, BOG, hand picked

**SHUMSHU**

SU97MO-013F: 50°46.24' N, 156°15.57' E, M. Ôhara, 8/9/1997, inland from eastern side of cape Chibuynyi; environs of Bol'shoye lake, under sea bird carcass, hand picked

SU97MO-010A: 50°49.19' N, 156°30.07' E, M. Ôhara, 8/8/1997, about 2 Kilometers south of Pochtareva cape; Environs of first river north of Koshkina river, on shore; under seaweed, hand picked

SU97MO-015C: 50°39.51' N, 156°25.32' E, M. Ôhara, 8/10/1997, inland from Babushkina Bay; environs of Luzhnanka river, under seaweed, hand picked

**On the Systematic Status of *Lathrobium* (s. str.)  
*japonicum kunashiriense* Y. Watanabe (Coleoptera,  
Staphylinidae)**

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*Lathrobium* (s. str.) *japonicum kunashiriense* was originally described by Watanabe (2004, p. 39) from the Island of Kunashiri-tô of the Kuril Islands as a new subspecies of *L. (s. str.) japonicum* Bernhauer (1907, p. 384). It was, however, clarified that the true type locality of this subspecies was not the Island of Kunashiri-tô but the Island of Iturup-tô of the same archipelago. On the other hand, the accurate type locality of *L. (s. str.) japonicum* was not described in Bernhauer's original account. Accordingly, it has become difficult to decide whether or not these two forms are independent geographical race. Examination of ampler specimens obtained from various localities in the Island of Iturup-tô is needed for determining their true systematic status. The correct habitat of *L. (s. str.) japonicum kunashiriense*

is as follows:

Holotype: ♂, Kuril Islands, Iturup Islnd, 40°15.52'N, 147°55.41'E, about 4 km east of Kitovyiby road enviorns of Podoshevka river, 29-VII-1997, E. M. Sayenko leg. [IT97EMS-003].

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WATANABE, Y., 2004. *Lathrobium japonicum* and its new relatives (Coleoptera, Staphylinidae) from the Kuril Islands. In: H. TAKAHASHI AND M. ÔHARA, eds. *Biodiversity and Biogeography of the Kuril Islands and Sakhalin* 1, 37–44.

## A Checklist of Heteroptera of the Kuril Islands and Brief Zoogeographical Survey of the Fauna

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**Abstract** A list of Heteroptera species found in the Kuril Islands, a history of investigation and brief zoogeographical analysis are presented. Heteroptera were found on 24 islands of 30 studied. The check-list encompasses 236 species belonging to 27 families. The number of species found on individual islands ranges from 1 to 218 (Kunashir). The fauna of the southern islands is much more diverse than that of the northern islands. The fauna of the Kuril Islands is more diverse than the faunas of Kamchatka (110) and Sakhalin (226), but much less diverse than the fauna of Hokkaido (450). Ninety-eight species occurring in the Kuril Islands have wide ranges, 98 species are restricted in their distribution to southeast Palaearctic, and 40 species have exclusively island ranges, occurring only in the Kurils and adjacent islands. Only one species of bugs is known to occur exclusively in the Kuril Islands: *Aneurillodes glaberrimus* Kerzhner, 1979.

**Key words:** Heteroptera, true bugs, Kuril Islands, check-list, zoogeography

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### Introduction

The first Heteroptera from the Kuril Islands was reported by Matsumura (1926a, b) who described a new species *Nabis kurilensis* (= *Himacerus dauricus* (Kiritshenko, 1911)). Then Kuwayama (1967) listed 49 species from the South Kurils, some of which were identified to the generic level. These species were identified by S. Miyamoto. Later several species were reported from the Kurils by Kiritshenko (1955, 1959), Konakov (1956), Kerzhner (1962, 1964, 1968, 1972a,b, 1977), and Petrova (1972, 1976). The Kuril Islands' fauna of true bugs was first summarized by Krivolutskaya (1973), who listed 128 species in her book. A check-list was prepared by Kerzhner (1978) and the number of species listed from the Archipelago reached 219. After this paper a few additional species were recorded by Kerzhner & Kanyukova (1983) and Kerzhner (1987a).

Before the International Kuril Island Project (IKIP) began in 1994, Heteroptera were known from 11 islands (Kunashir – 208, Tanfilyeva – 2, Iuriy – 4, Zelyoniy – 7, Shikotan – 76, Iturup – 55, Urup – 9, Simushir – 2, Paramushir – 6, Shumshu – 1 and Atlasova – 4).

After the second-year expedition of the IKIP, in 1995, bugs were collected on two southern islands (Kunashir and Iturup), and in 6 Middle Kuril Islands. Bugs were collected for the first time from 4 islands,

Chirpoi, Ketoi, Matua and Rasshua. Material from this expedition was described by Kerzhner & Marusik (1997) and an updated list of Kuril Heteroptera including 230 species was published.

The latest list of the Kuril Islands Heteroptera was prepared after the IKIP ended (Kerzhner *et al.* 2004). This list contains information about 236 species belonging to 27 families found on 24 islands.

### Materials and Methods

The present paper is based on the latest list (Kerzhner *et al.* 2004), and includes most recent taxonomical changes made after that publication.

By the term Holarctic we mean the biogeographic area lying in the northern Hemisphere approximately north of 30°N. The Palaearctic region is the Old World (Eurasia) part of the Holarctic. The south-east part of the Palaearctic (Central-north-east China, Russian Far East south of Amur River, Korea, most of Japan) has been referred to by several different biogeographic names, including Palaearctic and Manchurian. Here we use two terms, south-east Palaearctic and Manchurian.

NES – northeast Siberia

Kam – Kamchatka

TiS – Tien-Shang

Islands are abbreviated in the manner adopted by the IKIP:

Abbreviation of islands in accordance with their geographical position (south-north) (see Fig. 1)

AL Atlasova  
 AN Antsiferova  
 AU Anuchina  
 BC Brat Chirpoyev  
 BR Broutona  
 CH Chirpoi  
 CR Chirinkotan  
 EK Ekarma  
 IT Iturup  
 IU Iurii  
 KE Ketoi  
 KH Kharimkotan  
 KU Kunashir  
 LV Lovushki Rocks  
 MA Matua  
 MK Makanrushu  
 ON Onekotan  
 PA Paramushir  
 PO Polonskovo  
 RA Rasshua  
 RK Raikoke  
 RY Ryponkicha (Ushishir arch.)  
 SA Shiashkotan  
 SH Shikotan  
 SI Simushir  
 SU Shumshu  
 TA Tanfileva  
 UR Urup  
 US Yankicha (Ushishir arch.)  
 ZE Zelyonyi

AU Anuchina  
 IU Iurii  
 TA Tanfileva  
 ZE Zelyonyi  
 PO Polonskovo  
 SH Shikotan  
 KU Kunashir  
 IT Iturup  
 UR Urup  
 BC Brat Chirpoyev  
 CH Chirpoi  
 BR Broutona  
 SI Simushir  
 KE Ketoi  
 US Yankicha (Ushishir arch.)  
 RY Ryponkicha (Ushishir arch.)  
 RA Rasshua  
 MA Matua  
 RK Raikoke  
 LV Lovushki Rocks  
 SA Shiashkotan  
 EK Ekarma  
 CR Chirinkotan  
 KH Kharimkotan  
 ON Onekotan  
 MK Makanrushu  
 PA Paramushir  
 AN Antsiferova  
 SU Shumshu  
 AL Atlasova

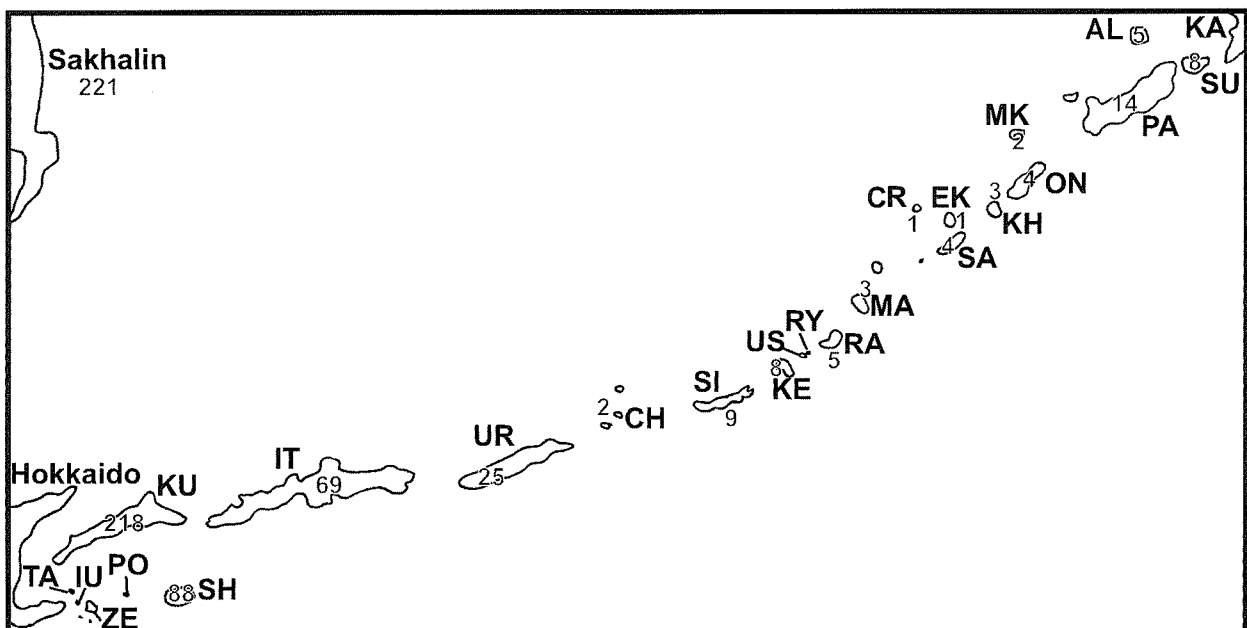


Figure 1. Related position of Kuril Island to each other, adjacent areas and species diversity of islands (number of species on smaller Habomai not shown).

Table 1. Number of species on each island.

IU	8	CH	2	EK	1
TA	10	SI	9	CR	1
ZE	11	KE	8	KH	3
PO	9	US	2	ON	4
SH	88	RY	1	MK	2
KU	218	RA	5	PA	14
IT	69	MA	3	SU	8
UR	25	SA	4	AL	5

Pal. – Palaearctic

Hol. – Holarctic

Man. – Manchurian = southeast Palaearctic

Sib. – Siberian

Jap. – Japan

Kur. – Kurils

## Results

Among the 30 islands and rocks studied true bugs were collected on 24 islands (Table 1). Heteropterans were not found on the following islands: Antsiferova, Anuchina, Brat Chirpoyev, Broutona, Lovushki Rocks, and Raikoke. These islands were visited for short periods of time, often only a few hours, and most probably lack of material from them was a result of inadequate collecting time. Before the IKIP project, bugs were known from only eleven islands.

Altogether 236 species belonging to 27 families have been found on the Archipelago. Species diversity of all families is shown in Table 2. Checklist and distribution of species within the Archipelago, whole geographical range and species richness of each island are shown in Table 6. The most diverse families are Miridae and Lygaeidae with 93 and 31 species respectively. Six families have between 10 and 13 species. All other families are represented by less than 7 species.

More than half (119) of all species found in the Kuril Islands were found on one island only (see Table 3). Most of these species are restricted to Kunashir (111) (see Table 6), 6 species are known from Shikotan and two species are restricted to Iturup. None of the island-specific species were found on the Middle and Northern islands and islands south of Shikotan. A total of 212 species are known exclusively from the South Kuriles. Fifty-three species have been collected on two islands, 33 on three islands. Only 31 species can be treated as more or less widespread in the Archipelago. They were found from 4 to 15 islands. The most widespread species is *Irbisia sericans* (Stål, 1858). It was found on 15 islands belonging to the middle and north groups of islands. The second most widespread species, found on 12 islands, is *Arctocoris kurilensis* Jansson, 1979. It occurs from Kunashir to Shumshu.

Table 2. Species diversity of the Heteroptera families found on the Kuril Islands and diversity of families in Sakhalin.

Family	Kuril Islands	species in common	Sakhalin
1. Acanthosomatidae	10	7	10
2. Alydidae	1	1	2
3. Anthocoridae	11	6	10
4. Aradidae	12	6	9–10
5. Berytidae	1	1	1
6. Ceratocombidae	3		–
7. Cimicidae	1	1	1
8. Corixidae	5	5	8
9. Cydnidae	4		–
10. Gerridae	6	5	9
11. Hydrometridae	1		–
12. Lygaeidae	31	17	25
13. Mesoveliidae	1	1	2
14. Microphysidae	2	1	1
15. Miridae	93	62	91
16. Nabidae	11	5	6
17. Nepidae	1		–
18. Notonectidae	1	0	1
19. Ochteridae	1		–
20. Pentatomidae	13	10	18
21. Pyrrhocoridae	1	1	1?
22. Reduviidae	4	2	4
23. Rhopalidae	2	2	4
24. Saldidae	11	8	13
25. Tingidae	6	2	4
26. Urostylididae	1	0	1
27. Veliidae	2	1	2
Belostomatidae	–		2
Coreidae	–		2
Total	236	144	226–8



Table 3. Abundance (dispersal) of species in Kuril archipelago.

No. of species	No. of islands on which was found
119	1
53	2
33	3
10	4 & 5
3	6 & 8
1	7, 9, 11, 12, & 15

Only 19 species are known from more than one island group (Table 4). Fifteen were found in two island groups: South and Middle, South and North, and Middle and North. Only 4 species have been found in all island groups.

Sixteen species were found on the Middle Kurils and same number are known from the northern group of islands. Nine species are common to the Middle and Northern Kurils.

Two species, *Acalypta marginata* (Wolff, 1804) and *Myrmedobia distinguenda* Reuter, 1884 are known from the Middle Kurils only. One species is restricted exclusively to the Northern group of islands: *Teratocoris saundersi* Douglas & Scott, 1869.

According to the distribution of Heteroptera the most well defined boundary lies between Urup and Chirpoi islands. For 13 species, Urup is a northernmost island in Archipelago, and two more species have a gap between Urup and the northern group of Islands. In addition, two

“northern” species penetrate Chirpoi, but do not reach Urup. Thus Urup-Chirpoi boundary is supported by 17 species (Fig. 2).

Among those species restricted to the southern group of islands and known from more than one island 33 species do not occur north of Kunashir (not penetrating Iturup). Iturup is a northernmost island on Archipelago for 46 species (Fig. 2).

It is worth mentioning that although Iturup and Urup have different numbers of species indicating the northern boundary, 46 and 15 respectively, the value of these species are equal (66% and 60% reciprocally). According to northern species, the boundary Chirpoi/Urup is better defined by 2 species. Only one northern species indicates a Urup/Iturup boundary (Fig. 2).

### Range analysis and comparison with adjacent areas

Eighty-two species or one third of all species (35%) have wide ranges, either Cosmopolitan (1), Holarctic (25) or Palaearctic (56). Another 15 species have fairly large ranges and are distributed in Siberia and south-east Palaearctic (Table 5). Three species are restricted to south-east Palaearctic and Cisokhotia. More than half of all species (133 species or 56%) found in the Kurils are limited in their distribution to south-east Palaearctic (=Palaearcheartic). Most of them (92) are widely distributed in the region and known from China, Korea, Russian Far East (Ussuri-Amur area) and adjacent islands (Japan, Kurils, Sakhalin).

Fourty species have exclusively island ranges.

Six species are known exclusively from the Kurils.

Table 4. Distribution of most spread species found in more than one island group. 1– number of islands, 2– number of island groups.

Species	IU	TA	ZE	PO	SH	KU	IT	UR	CH	SI	KE	US	RY	RAMA	SA	EK	CR	KH	ON	MK	PA	SU	AL	1	2	
<i>Irbisia sericans</i>									•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	15	2
<i>Arctocoris kurilensis</i>						•		•			•			•	•			•	•	•	•	•	•	•	12	3
<i>Europiella artemisiae</i>	•	•	•	•	•	•	•	•														•	•	•	11	2
<i>Apolygus lucorum</i>	•	•	•	•	•	•	•	•		•															9	2
<i>Acompocoris brevis</i>						•	•	•		•	•				•							•	•		8	3
<i>Apolygus nigrovirens</i>		•	•	•	•	•	•	•		•															8	2
<i>Apolygus spinolae</i>		•	•		•	•	•	•		•															7	2
<i>Mecomma ambulans</i>								•		•	•			•								•			5	3
<i>Saldula opacula</i>						•	•				•											•	•		5	3
<i>Stenodema calcarata</i>			•	•	•	•					•														5	2
<i>Trigonotylus caelestialium</i>						•	•	•				•			•										5	2
<i>Saldula saltatoria</i>					•	•													•			•	•		5	2
<i>Bothynotus pilosus</i>						•								•				•				•			4	2
<i>Bryocoris montanus</i>					•	•		•		•															4	2
<i>Saldula palustris</i>					•	•	•														•				4	2
<i>Salda littoralis</i>						•	•															•	•		4	2
<i>Nysius groenlandicus</i>															•							•		•	3	2
<i>Macrosaldula rivularia</i>								•														•			2	2
<i>Saldulafucicola</i>						•																•			2	2

Table 5. Number of species with different ranges.

range name	no of species	no of species
Cosmopolitan		1
Holarctic		25
Palaeartic	98	56
Siberio-Manchurian		15
T-Shang & Manchuria		1
NE Siberia & Manchuria		1
Cisokhotia-Manchuria		1
Cisokhotian	98	2
Kamchatka-Manchurian		1
Manchurian		93
Sakhalin-Kurils-Japan		17
Kurils-Japan		17
Kunashir-Sakhalin	40	4
Kurils-Sakhalin		1
S. Kurils		1
		236

Four of them are restricted to Kunashir: *Harpocera orientalis* Kerzhner, 1979, *Pachylygus festivus* (Kerzhner, 1977), *P. nigrescens* (Kerzhner 1977) and *Paraneurus galiae* (Kerzhner, 1979). One was found only on Shikotan: *Teratocoris depressus* Kerzhner, 1979. One species is known from three southern islands: *Aneurillodes glaberrimus* (Kerzhner, 1979) (Shikotan, Kunashir & Iturup).

Although *Acalypta marginata* (Wolff, 1804) has a

trans-Palaeartic range it is found only on the middle group of islands and is unknown from the south or north Kurils. Another species restricted to the Middle Kurils, has a Euro-Siberian range, *Myrmedobia distinguenda* Reuter, 1884. It is unknown from south-east Palaeartic. Among the few species restricted to the north and north-middle group of islands *Callicorixa producta* (Reuter, 1880), *Nysius groenlandicus* (Zetterstedt, 1838), *Teratocoris saundersi* Douglas & Scott, 1869 and *Macrosaldula rivularia* (J. Sahlberg, 1878) have Holarctic ranges. Another species, *Mecomma ambulans* (Fallén, 1807) has a Palaeartic (Euro-Siberian) distribution. All these species are unknown from south-east Palaeartic.

In comparison to adjacent Sakhalin the known fauna of Heteroptera on the Kuril Islands is more diverse although Sakhalin has larger size (Table 2). Only 221 species of Heteroptera are known, so far, from Sakhalin (Kerzhner 1978; Kanyukova & Kerzhner 1981; Kanyukova 1981, 2003). The diversity of families in Sakhalin is also smaller: 23 in comparison to 27 in the Kurils (Table 1). The fauna of the south Kurils has more southern elements than those of Sakhalin. It is very likely that the fauna of Sakhalin is richer than the fauna of Kurils, but less studied.

In general, two faunas have similarity 66%, although similarity of separate families ranges from 0% to 100%.

The Kamchatka Peninsula and Hokkaido Island, other adjacent areas, have 110 (Kerzhner 1987b) and around 450 species (Vinokurov personal communication) respectively. Although there is a large difference in species diversity between the Kuril Islands and Hokkaido, the fauna of Hokkaido has only two families more (29 altogether).

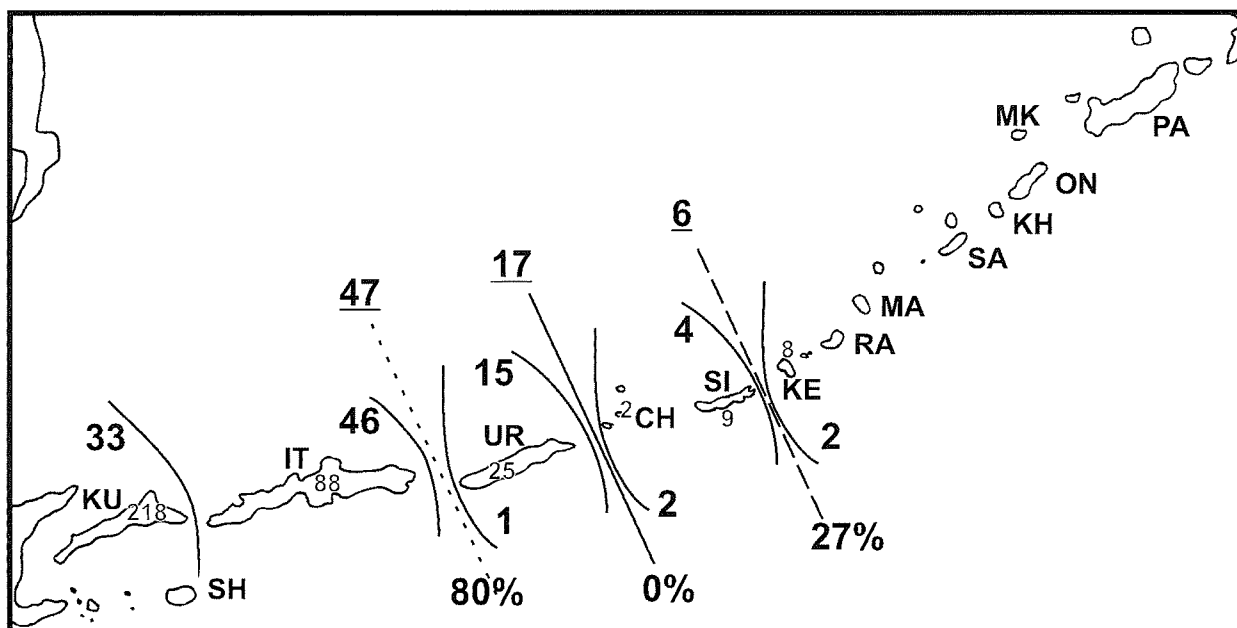


Figure 2. Some zoogeographical borders traced on the base of Heteroptera distribution. “(“ and number below shows number of northern species that are not penetrating southward; “)” and number above shows number of southern species that are not penetrating northward; \ three most important borders: underlined number above – number of species that indicate this border, % below – similarity between adjacent islands.

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Table 6. Distribution of species found in the Kuril Islands.

Species	IU	TA	PO	ZE	SH	KU	IT	UR	CH	SI	KE	US	RY	RA	MA	SA	EK	CR	KH	ON	MK	AL	PA	SU	Distribution	
<b>Ceratocombidae (3)</b>																										
<i>Ceratocombus coleopratus</i> (Zetterstedt, 1819)						*																				Pal.
<i>Ceratocombus corticalis</i> Reuter, 1889					*	*																				Pal.
<i>Ceratocombus japonicus</i> Poppius, 1910						*																				KU+Jap.
<b>Nepidae (1)</b>																										
<i>Ranatra chinensis</i> Mayr, 1865						*																				Man.
<b>Corixidae (5)</b>																										
<i>Hesperocorixa distanti</i> (Kirkaldy, 1899)	*	*	*	*	*	*																				SK+Kur.+Jap.
<i>Arctocorixa kurilensis</i> Jansson, 1979						*		*			*			*	*	*		*	*	*	*	*	*	*	*	Okh.
<i>Callicorixa producta</i> (Reuter, 1880)																								*	*	Hol.
<i>Sigara nigroventralis</i> (Matsumura, 1905)		*			*	*	*	*																		Man.
<i>Sigara toyohirae</i> (Matsumura, 1905)						*																				SK+Kur.+Jap.
<b>Ochteridae (1)</b>																										
<i>Ochterus marginatus</i> (Latreille, 1804)						*																				Pal.
<b>Notonectidae (1)</b>																										
<i>Notonecta triguttata</i> Motschulsky, 1861						*																				Man.
<b>Saldidae (11)</b>																										
<i>Salda littoralis</i> (Linnaeus, 1758)						*	*																*	*		Hol.
<i>Salda kiritshenkoi</i> Cobben, 1985						*																				Man.
<i>Macrosaldula rivularia</i> (J. Sahlberg, 1878)								*															*			Hol.
<i>Saldula nobilis</i> (Horváth, 1884)					*	*	*																			Sib.+Man.
<i>Saldula opacula</i> (Zetterstedt, 1838)						*	*				*												*	*		Hol.
<i>Saldula recticollis</i> (Horváth, 1899)						*																				Man.
<i>Saldula kurentzovi</i> Vinokurov, 1979						*		*																		Man.
<i>Saldula saltatoria</i> (Linnaeus, 1758)					*	*														*			*	*		Hol.
<i>Saldula fucicola</i> (J. Sahlberg, 1870)						*																	*			Pal.
<i>Saldula pallipes</i> (Fabricius, 1794)						*	*	*																		Hol.
<i>Saldula palustris</i> (Douglas & Scott, 1874)					*	*	*																*			Hol.
<b>Mesoveliidae (1)</b>																										
<i>Mesovelia miyamotoi</i> Kerzhner, 1977						*																				Man.
<b>Hydrometridae (1)</b>																										
<i>Hydrometra gracilentata</i> Horvth, 1899						*																				Pal.
<b>Veliidae (2)</b>																										
<i>Microvelia reticulata</i> (Burmeister, 1835)					*	*	*																			Pal.
<i>Pseudovelia tibialis</i> Esaki & Miyamoto, 1955						*																				Man.

Species	IU	TA	PO	ZE	SH	KU	IT	UR	CH	SI	KE	US	RY	RA	MA	SA	EK	CR	KH	ON	MK	AL	PA	SU	Distribution	
<b>Gerridae (6)</b>																										
<i>Aquarius paludum</i> (Fabricius, 1794)						*																				Pal.
<i>Linnoporus genitalis</i> (Miyamoto, 1958)					*	*	*																			SK+Kur.+Jap.
<i>Gerris gracilicornis</i> (Horváth, 1879)						*																				Man.
<i>Gerris yezoensis</i> Miyamoto, 1958					*	*	*																			Man.
<i>Gerris lacustris</i> (Linnaeus, 1758)						*																				Pal.
<i>Gerris latiabdominis</i> Miyamoto, 1958	*					*																				Man.
<b>Nabidae (11)</b>																										
<i>Himacerus apterus</i> (Fabricius, 1798)						*																				Pal.
<i>Himacerus dauricus</i> (Kiritschenko, 1911)						*	*																			Pal.
<i>Nabis sauteri</i> (Poppius, 1915)					*																					Man.
<i>Nabis ussuriensis</i> (Kerzhner, 1962)	*		*	*	*	*																				Man.
<i>Nabis demissus</i> (Kerzhner, 1968)						*																				Man.
<i>Nabis flavomarginatus</i> Scholtz, 1847						*																				Hol.
<i>Nabis limbatus</i> Dahlbom, 1851					*																					Pal.
<i>Nabis americolimbatus</i> (Carayon, 1961)					*	*																				Hol.
<i>Nabis reuteri</i> Jakovlev, 1876						*																				Man.
<i>Nabis ferus</i> (Linnaeus, 1758)						*																				Pal.
<i>Nabis stenoferus</i> Hsiao, 1964					*	*	*																			Man.
<b>Anthocoridae (11)</b>																										
<i>Lyctocoris obscurus</i> Kerzhner, 1979						*																				Man.
<i>Xylocoris cursitans</i> (Fallén, 1807)						*																				Man.
<i>Amphiareus obscuriceps</i> (Poppius, 1909)						*																				Man.
<i>Temnostethus distans</i> Kerzhner, 1972					*	*	*																			KU+SK
<i>Anthocoris kalopanacis</i> Kerzhner, 1977						*																				Man.
<i>Anthocoris japonicus</i> Poppius, 1909						*																				Man.
<i>Anthocoris takahashii</i> Hiura, 1959						*																				SK+Kur.+Jap.
<i>Anthocoris miyamotoi</i> Hiura, 1959					*	*	*																			Man.
<i>Acompocoris brevirostris</i> Kerzhner, 1979						*	*	*		*	*						*							*	*	Okh.+Man.
<i>Orius sauteri</i> (Poppius, 1909)					*	*																				Man.
<i>Bilia esakii</i> Carayon & Miyamoto, 1960						*																				Man.
<b>Cimicidae (1)</b>																										
<i>Cimex lectularius</i> Linnaeus, 1758						*																				Cosm.
<b>Microphysidae (2)</b>																										
<i>Loricula pilosella</i> Miyamoto, 1965					*																					Man.
<i>Myrmedobia distinguenda</i> Reuter, 1884									*	*		*														Pal.
<b>Miridae (93)</b>																										













Species	IU	TA	PO	ZE	SH	KU	IT	UR	CH	SI	KE	US	RY	RA	MA	SA	EK	CR	KH	ON	MK	AL	PA	SU	Distribution
<i>Eysarcoris gibbosus</i> (Jakovlev, 1904)						*																			Man.
<i>Eusarcoris lewisi</i> Distant, 1883					*	*																			SK+Kur.+Jap.
<i>Carbula abbreviata</i> (Motschulsky, 1866)						*																			Man.
<i>Palomena angulosa</i> (Motschulsky, 1861)						*																			Man.
<i>Carpocoris purpureipennis</i> (De Geer, 1773)						*																			Pal.
<i>Dolycoris baccarum</i> (Linnaeus, 1758)						*	*																		Pal.
<i>Eurydema rugosa</i> (Motschulsky, 1861)						*																			Man.
<i>Pentatoma rufipes</i> (Linnaeus, 1758)						*																			Pal.
<i>Picromerus bidens</i> (Linnaeus, 1758)						*																			Pal.
<i>Dinorhynchus dybowski</i> Jakovlev, 1876						*																			Man.
<i>Arma custos</i> (Fabricius, 1794)						*																			Pal.