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

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).

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<td>Sakhalin</td>
<td>Kurils</td>
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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 Iurup <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.

<table>
<thead>
<tr>
<th>Taxa Regions</th>
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</table>

Results and Discussion

Species distribution pattern
ERICACEAE


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.

This species is evergreen dwarf 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).


Japanese name: Komeba-tsugazakura.
[Representative distribution maps]
Sakhalin: Not listed in Smirnov (2002).
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).

*Arctostaphylos uva-ursi* 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 *Arctostaphylos* segregated from *Pieris* in this paper.


Japanese name: Kuma-kokemomo.
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 (Table 1 and 2; S-K index= +1.00). It has not been recorded from the southern middle and middle parts of Sakhalin (Kokhryakov and Mazurenko 1991; Smirnov 2002). The populations found in northern Sakhalin may be supplied mainly from those of eastern Siberia.


Japanese name: Urashima-tsutsuji.

[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 deciduous dwarf shrubs with stems decumbent and ascending apically to 10 cm high, growing especially in stony places. It has a circumpolar arctic-montane distribution in 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.


Japanese name: Chishima-tsugazakura.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).


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 (Kokhryakov and Mazurenko 1991; Yamazaki 1993). The geographical distribution pattern of this species is more or less similar to that of Arctecita 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), Kokhryakov 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 Arctecita nana.


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 (Kokhryakov 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 Kokhryakov 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.


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.

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

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.

[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)
The presence of this species in the Kurils has not been found in the entire Kurils (Tables 1 and 2; S+K= 84, S-K index= -0.93). This geographical distribution pattern in Sakhalin and the Kurils has been generally supported by Khokhryakov and Mazurenko (1991).

11. Harrimannella stelleriana (Pall.) Coville in Proc. Wash. 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).


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.

Harrimannella 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).


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 stems 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.


Japanese name: Hanahirinoki.
[Representative distribution maps]
Sakhalin: Not listed in Smirnov (2002).
Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 52B (as Eubotryoides grayana).

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 (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.


Japanese name: Minezuo.
[Representative distribution maps]
Sakhalin: Smirnov (2002) p. 85, the third from the upper left.
Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 49A.

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).


Japanese name: Koyōraku-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 specieis 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. Phylloclade auletica (Spreng.) A.Heller in Muhlenbergia 1: 1 (1900).

Japanese name: Aono-tsugazakura.
[Representative distribution maps]
Sakhalin: Not listed in Smirnov (2002).
Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 30A.

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

Phylloclade auletica 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.

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.


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).


Japanese name: Karafuto-miyamatsutsugi.

[Representative distribution maps]


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. anthropogon* 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).


Japanese name: Kibana-shakunage.

[Representative distribution maps]


Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 45V.

This species is evergreen shrubs up to 1 m high, growing in alpine shrubs. 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).


Japanese name: Hakusan-shakunage.

[Representative distribution maps]

Sakhalin: Not listed in Smirnov (2002).


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).


Japanese name: Sakai-tutsuji.

[Representative distribution maps]

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


Japanese name: Kome-tsutsuji.

[Rrepresentative distribution maps]


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

Japanese name: Ezo-tsutsuji.

[Rrepresentative distribution maps]


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.

**Therorhodion 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 **Therorhodion** separated from **Rhododendron** was supported by the phylogenetic analysis using the matK data (Kron 1997).


Japanese name: Kumoma-tsutsuji.

[Rrepresentative 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).

**Therorhodion 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).


[Rrepresentative 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, Cyc. 36: no. 1 (1817); **Vaccinium axillare** Nakai in Bot. Mag. Tokyo 35: 135 (1921).

Japanese name: Kurousugo.

[Rrepresentative 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 Vaccinium ovalifolium var. sachalinense for plants of N. Hokkaido and Sakhalin.

Japanese name: Tsuru-kokemomo.
[Representative distribution maps]
Sakhalin: Smirnov (2002) p. 85, the second from the upper right (as Oxyccocus palustris).
Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 57A (as Oxyccocus palustris).

N. Hemisphere: Hultén (1968) p. 736, the upper (as Oxyccocus 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 Vaccinium microcarpum. It has a wide circumpolar distribution of the Northern Hemisphere, with a distribution gap in Alaska and main islands of the Aleutians.

Vaccinium oxyccocus 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).

Japanese name: Iwa-tsutsuji.
[Representative distribution maps]
Sakhalin: Smirnov (2002) p. 86, the second from the upper right.


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).


Japanese name: Oba-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.


Japanese name: Kokemomo.
[Representative distribution maps]
Sakhalin: Smirnov (2002) p. 87, the upper left.

Okhotsk Sea region: Khokhryakov and Mazurenko (1991) Fig. 34B.

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).


Japanese name: Kokemomo.
[Representative distribution maps]
Sakhalin: Smirnov (2002) p. 87, the upper left.

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


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 on 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. (= Tripetala paniculata Sieb. et Zucc.) collected from Mt. Handa, Sakhalin by 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 Khokhraykov and Mazureenko (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 (Khokhraykov and Mazureenko 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 (Khokhraykov and Mazureenko 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 *Therorhodion redowskianum*. All these species 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; *Arcterica 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; *Arcterica 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 *Therorhodion camtschaticum* (S-K index= -0.60) show a distribution bias more or less in favor of the Kurils. Especially *Arcterica 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 *Therorhodion camtschaticum* (S-K index= -0.60) versus *T. redowskianum* (S-K index= +1.00), and more or less differentiated patterns in the pair; *Vaccinium oxyccocus* (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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References


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 “Komatsu” 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’shoye <06-lower r.>, V. Y. Barkalov 10643, Aug. 13, 2001 (SAPS); Northern end of the Gulf of Pomr’, Muzjma <07-lower r.>, S. Sugawara, Aug. 10, 2001 (SAPS); SW of the Gulf of Pomr’, ca 2 km NW from Moskal’vyj <09-lower r.>, T. Fukuda 2253, Aug. 13, 2001 (SAPS); Gulf of Odoptu, Lake Pomor <11-lower r.>, T. Fukuda 1471, Aug. 3, 2001 (SAPS); East of Gulf of Piltun, Vstechnaya <11-lower r.>, T. Fukuda 1521, 1533, Aug. 4, 2001 (SAPS); Gulf of Piltun, Vstrechnaya <11-lower r.>, Y. Kusano, May 6, 1921 (SAPS); Nyiwo, tundra, prope Babushkina Cape, Y. Kuwahara, Aug. 31, 1923 (SAPS); [no locality], T. Ishikawa, Jul. 29, 1894 (SAPS); 

SOUTH. Shisuka-cho, Otasu <56-lower r.>, Y. Hoshino et al., Jul. 8, 1933 (SAPS); Maguntan <57-lower r.>, S. Nito, Aug. 5, 1929 (TI); Motodomari-shicho, Mt. Tosso-za <58-lower r.>, T. Fukuda 1512, Aug. 13, 1922 (SAPS); N of Lake Bol’shoye <51-lower r.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); Lak. Taraika <51-lower r.>, K. Miyabe & T. Miyagi, Jul. 26, 1906 (SAPS); Kitashiretoko Peninsula, Funakoshi <55-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. SHUMSHU <02>. [No Locality]. Komatu, 1909 (TI-2 sheets).]

[North. SHAKHOLSK <03>. [No Locality]. 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. 25, 1935 (SAPS); [no locality], T. Ishikawa, Jul. 25, 1935 (SAPS); Kitashiretoko Peninsula, Naifuto <51-lower r.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); Lak. Taraika <51-lower r.>, K. Miyabe & T. Miyagi, Jul. 26, 1906 (SAPS); Kitashiretoko Peninsula, Funakoshi <55-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).]

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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. 25, 1935 (SAPS); [no locality], T. Ishikawa, Jul. 25, 1935 (SAPS); [no locality], T. Ishikawa, Jul. 25, 1935 (SAPS); Kitashiretoko Peninsula, Naifuto <51-lower r.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); Lak. Taraika <51-lower r.>, K. Miyabe & T. Miyagi, Jul. 26, 1906 (SAPS); Kitashiretoko Peninsula, Funakoshi <55-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).}

Appendix
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 Sakhlin 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.


NORTH. SE from the Cape of Maria, around the Lake Monchigar <04-upper r.>, T. Fukuda 1704, Aug. 6, 2001 (SAPS); Around Pileow, mountain <04-lower r.>, Y. Kudo & B. Ishida 7045, Aug. 24, 1923 (SAPS); Piliwut, dry peat <07-upper L.>, Y. Kusano, May 6, 1921 (SAPS); Uruma, on the hill, alpine meadows <07-lower r.>, 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).
1906 (SAPS); Chiric, 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 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. Nupuripio <57-lower l.>, T. Miyake, Aug. 13, 1907 (SAPS, TNS 380588); Mt. Tosso <57-lower l.>, S. Sugawara 17391, Jul. 25, 1925 (SAPPT); Mt. Tosso <57-lower l.>, G. Yama, Aug. 4, 1926 (KYO); Mt. Tosso <57-lower l.>, N. Hirotsuka, Jul. 20, 1927 (TNS 513986); E. Coast, Mt. Tosso <57-lower l.>, N. Hirotsuka et al., Jul. 23, 1927 (SAPS); Mt. Nupuripio <57-lower l.>, S. Saito, Aug. 3, 1929 (TI-2 sheets); Upper part of Mt. Tosso <57-lower l.>, H. Haru, Aug. 5, 1931 (TI); 80 Km N of Dolinsk, Tsapko to N peak of Mt. Vladimirka <57-lower r.>, H. Takahashi 29575, Aug. 2, 2001 (SAPS); Kishipo, Kitairodake <57-upper r.>, A. Abumiya et al., Aug. 13, 1932 (SAPS); Kishipo, Horonairodake <57-upper r.>, A. Abumiya et al., Aug. 15, 1932 (SAPS); E. Coast, Shiraraka <57-lower r.>, 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.>, Aug., 1932 (SAPS); [no locality], M. Tatewaki 15557, Aug. 24, 1929 (SAPS); Ishikuzurehamado, M. Tatewaki & K. Takahashi 15752, Sep. 4, 1929 (SAPS); Stochny River, H. Takahashi 19565, Aug. 19, 1995 (SAPS). SIMUSHIR <16>. Broughton Bay, I. Kodama, Jun., 1898 (SAPS); Brotton Bay, I. Kato, T. Tatewaki & Y. Tokunaga 111794, 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).


SOUTH. ITURUP <20>. [no locality], K. Yamagata, Oct., 1898 (SAPS); Porosu-Sokiyu, 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, 1929 (TI); Mt. Okkaibetsu, S. Saito, Sep. 5, 1925 (TI); Nomoro-Inemori, 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 (6910), Aug. 28, 1929 (TI-2 sheets, TNS); Horobetsu-Kokkaibetsu, K. Kondo, Aug. 31, 1929 (TI); Mt. Okkaibetsu, Horobetsu–Nomoro, S. Saito 317, Sep. 5, 1929 (TI); Matakotan, I. Ohwi, Jul. 19, 1931 (KYO); [no locality]; K. Numajiri, [no date] (TNS 131013).

5. **Bryanthus gmelinii** D.Don [Chishima-tsubazakura]
7. Cassiope Iycopodioides

Tosso (<lower I.>, N. Hiratsuka (N. Hiratsuka et al.), Jul., 1925 (SAPT); E. Coast, Mt. Tosso (<lower I.>, H. Hara, Aug. 5, 1929 (SAPS); Mt. Tosso (<lower I.>), T. Ohashi, 1932 (KYO).


6. Cassiope ericoides (Pall.) D. Don [Karafuto-iwahige]

<SAKHALIN>

MIDDLE. Upstream of Ho River, Experiment Forest of Kyushu Univ. <42-lower l.>, [no collector’s name], 1930 (SAPS); Upstream of Ho River <42-lower l.>, S. Sugawara 17420, Jul., 1932 (SAPT); Upstream of Ho River <42-lower l.>, S. Sugawara 17421 & 17422, Aug., 1932 (SAPT-3 sheets); Mt. Shisuka-yama <4-upper l.>, R. Kohno, Jul., 1933 (SAPS); Upstream of Shisuka River, divide <4-upper l.>, S. Sugawara 17427, Jul., 1933 (SAPT); Upstream of Shisuka River, divide <4-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 (TNS); Mt. Tosso <57-lower l.>, H. Hara, Aug. 5, 1931 (TNS-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, Nakano1 <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).

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8. Chamaedaphne calyculata (L.) Moench [Yachi-tutsuji] <SAKHALIN>
Aug. 5, 1929 (TI); E. Coast, Manue <59-upper 1.>, T. Miyake, Sep. 22, 1906 (SAPS); E. Coast, Manue <59-upper 1.>, T. Miyake, Aug. 20(?), 1907(?) (SAPS); Odasamu <59-lower 1.>, T. Wada, Sep., 1942 (TI); Aihama <61-lower r.>, S. Sugawara 17432, Aug., 1931 (SAPT); Dohuki <62-lower r.>, G. Nakahara, Jun. 24, 1906 (TNS); Sakaehama <62-upper l.>, S. Komatsu, Aug. 2, 1913 (TI); Sakaehama <62-lower l.>, S. Sugawara 17429, Aug. 10, 1923 (SAP); By Lake Hakuchou <62-lower l.>, S. Sugawara 17430, Jun. 30, 1932 (SAPT); 8 Km N of Dolinsk, N'ya River <62-lower r.>, H. Takahashi 29313, Jul. 23, 2001 (SAPS); Galkinoiaskoe <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. Han, Jul. 31, 1931 (TI- 2 sheets); 6km W of Sokol town, Mal Takoy River <62-lower l.>, H. Hara, Aug. 22, 1913 (TI); Vladimiroiukha <65-upper I.>, B. Ishida 7119, Aug. 25, 1923 (SAPS).


SOUTH. ITURUP <20>. Moyoro Volcano, T. Ishikawa, Sep. 5, 1890 (SAPS), Peretarábets Mt., K. Kimbo, Jun. 1, 1891 (SAPS); Mt. Atoiya, T. Kawakami 289, Aug. 11, 1898 (SAPS); Mt. Chirippu, T. Kawakami 288, Aug. 19, 1898 (SAPS); Moyoro, Chishima-chosassyo, 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. Shiraizumi, 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>


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


MIDDLE. Adatuin <29-lower r.>, Okada, Aug. 23, 1923 (TI); Lueckoff <33-upper r.>, Y. Kudo & M. Tatewaki 6300, Aug. 4, 1922 (SAPS); Nabalskiy Mts., Mt. Changa <34-upper r.>, N. Fuji 01125, Aug. 7, 2002 (MAK 343111); 40 km E of Palevo, Mt. Changa <34-upper r.>, H. Takahashi 30330, Aug. 7, 2002 (SAPS); NW of Pogranichnaya, S banks of the Langeri River <35-lower r.>, N. Fuji 01279, Aug. 11, 2002 (MAK 346152); West of Pilewo <36-lower r.>, K. Jimbo, Aug. 13, 1907 (TNS 53548); Hinan-ekisha-Asobacki <36-lower r.>, Y. Kudo & M. Tatewaki, Jul. 30, 1922 (SAPS); Anbetsu, in the forest <36-lower r.>, T. Ishiyama, Jul. 16, 1927 (SAPS); Anbetsu, Ooiwa-toke <36-lower r.>, 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 (SAP); Vaccinity of R. Jobborotii <37-lower r. to 43>, T. Miyake, Aug. 30, 1906 (SAPS); Higashiyama <38-lower r.>, T. Miyake, Aug. 28, 1906 (SAPS- 2 sheets); Hayabusayama <38-lower r.>, T. Miyake, Aug. 28, 1906 (SAPS); 80 km N of Poronaysk, Mirnyy–Pervomayskoye <38-lower r.>, H. Takahashi 30475, 30476, 30478, 30482 & 30484, Aug. 10, 2002 (SAPS- 5 sheets); 20 km NE of Smirnykh, banks of the Poronay RAA Mirny <lower r.>, N. Fuji 01280, Aug. 10, 2002 (MAK 346153); Shisuka-shicho, Mt. Sekkai-yama (60, 61-rinpan) <39-lower r.>, N. Kudo & K. Kukushkin, Aug. 10, 1928 (SAPS); Shisuka-shicho, Y. Kudo & M. Tatewaki 10305, 10306, Aug. 18, 1928 (SAPS); Shisuka-shicho, Otasuno-mori <45-upper r.>, R. Imaseki, Jul. 17, 1941 (TNS); Shisuka <45-lower r.>, S. Sugawara 17574, Jul. 10, 1934 (SAP); Shisuka-shicho, Naruko River <45-lower r.>, S. Sugawara 17561, 17585, 17586 & 17591, Jul. 16, 1934 (SAP- 4 sheets); Kamishisuka <48-lower r.>, S. Sugawara 17575, 17578 & 17579, Jul. 4, 1934 (SAP- 3 sheets); Poronayski–Leonidovo, moo <48-lower r.>, H. Takahashi 30334, 30345, Aug. 13, 2002 (SAPS- 2 sheets); E. Coast, Ehorokofunai <48-lower r.>, T. Miyake, Aug. 11, 1906 (SAPS- 2 sheets); E. Coast, Nayoro <48-lower r.>, T. Miyake, Sep. 6, 1906 (SAPS); Naitowa (near Nairo) <48-lower r.>, S. Sugawara no number, 17570, 17571 & 17573, Jun. 20, 1928 (SAP- 3 sheets); Kusunokiyama, Experiment Forest of Kyoto Univ. <48-lower r.>, Y. Kobayashi, Jul. 25, 1928 (TNS); Nairo <48-lower r.>, S. Sugawara 17529, 17530, 17562, 17564 & 17565, Aug. 6, 1931 (SAP- 5 sheets); Shisuka <48-upper r.>, K. Miyabe & T. Miyagi, Jul. 23, 1906 (SAPS, TNS); Telpenia Bay, Shisuka <48-upper r.>, T. Miyake Aug. 12, 1906 (SAPS); Duwatakko <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); Sisa <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 (SAP- 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 (SAP); 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. Haru, Jul. 9, 1937 (SAPS- 2 sheets); Shisuka-cho, Otasuno-mori <48-upper r.>, R. Imaseki, Jul. 16, 1941 (TNS); Shisuka, Horonai-gawa, near Ami <48-upper r.>, R. Imaseki, Jul. 17, 1941 (TNS); Shisuka <48-upper r.>, S. Kitamura, Jul. 29, 1942 (KYO); Ami <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, T. Miyake, Aug. 13, 1906 (SAPS); Arakuri <49-upper I.>, S. Sugawara 17550 & 17551, Jun. 19, 1935 (SAPT-2 sheets); Shisuka-shicho, Nishitaraiwa wetland <49-upper I.>, M. Kawashima, Jul. 7, 1935 (SAPS); Shisuka-gun, by Lake Tariuka <49-upper I.>, B. Yoshimura & M. Hara 22, Jul. 10, 1937 (TNS); Tariuka <49-upper r.>, T. Miyake, Aug. 14, 1906 (SAPS); Tariuka <49-upper r.>, S. Sugawara 17559, Aug. 9, 1927 (SAPT); Shisuka-shicho, Tariaka-Nimenjo <49-upper r.>, B. Yoshimura & M. Hara no number & 21, Jul. 10, 1937 (SAPTSheets, TNS); Rukuttama <49-upper r.>, S. Sugawara 17557 & 17558, Jul. 7, 1938 (SAPT-2 sheets); Shisuka-shicho, near Tariuka <49-upper r.>, M. Honda & Y. Kimura, Aug. 16, 1940 (Tl-2 sheets); Jimutuki <50-upper r.>, K. Miyabe & T. Miyagi, Jul. 24, 1906 (SAPS); Shikka Distric, 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); Kitsireshitoko [Peninsula]? <51 to 55>, S. Sugawara 17553, Jul. 25, 1935 (SAPT); Shisuka-shicho, Noto <51-lower r.>, Y. Hoshino et al., Jul. 12, 1933 (SAPS-3 sheets); Shikka Distric, Noto <51-lower r.>, Y. Hoshino et al., Jul. 23, 1933 (SAPS-2 sheets); Kititsitetoko Peninsula, Naito <51-lower r.>, Y. Hoshino et al., Jul. 30, 1933 (SAPS); Shisuka, Kititsitetoko, Mt. Kasyoku­yama <51-lower r.>, S. Sugawara 17540, 17552, 26669, 26674 & 26679, Jul. 22, 1935 (SAPS-3 sheets, SAPT-2 sheets); Lake Solemui <51-lower r.>, K. Miyake & T. Miyagi, Jul. 26, 1906 (SAPS); Kititsitetoko Peninsula, Nusihike <51-lower r.>, Y. Hoshino et al., Jul. 21, 1933 (SAPS); Shikka Distric, Funakoshi <51-lower r.>, Y. Hoshino & S. Sugiyama, Jul. 24, 1933 (SAPS-2 sheets); Shikka Distric, Funakoshi <51-lower r.>, Y. Hoshino et al., Jul. 25, 1933 (SAPS); Shisuka, Nusihike <51-lower r.>, S. Sugawara 26966 & 26979, Jul. 24, 1935 (SAPS-2 sheets); Kititsitetoko Peninsula, Mt. Hokke-yama <51-lower r.>, S. Sugawara 17540-2, Jul. 27, 1935 (SAPT); Naikotoru <52-upper r.>, T. Miyake, Aug. 29, 1906 (TNS); Mt. Isara-yama <52-lower r.>, S. Sugawara 17589, Jul. 17, 1933 (SAPT); Mt. Koton-dake <52-lower r.>, S. Sugawara 17595, Jul. 19, 1933 (SAPT); Mt. Isara-yama <52-lower r.>, S. Sugawara 17555, 17590 & 17592, Jul. 17, 1933 (SAPS-3 sheets); W. Coast, Mt. Ushoro <52-lower 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-lower r.>, T. Miyake, Aug. 31, 1907 (SAPS); E. Coast, Ponkotan <54-, T. Miyake, Sep. 13, 1906 (SAPS); E. Coast, Kotakneshi <54-lower r.>, T. Miyake, Sep. 12, 1906 (SAPS); Kititsitetoko Peninsula, Yoman–Rokoku-iva <55-lower r.>, Y. Hoshino et al., Jul. 21, 1933 (SAPS); Kititsitetoko Peninsula, Harato-misaki–Futatsuiwa <55-lower r.>, Y. Hoshino et al., Jul. 19, 1933 (SAPS); Kititsitetoko Peninsula, Futatsuiwa <55-lower r.>, Y. Hoshino, Jul. 20, 1933 (SAPS); Kititsitetoko Peninsula, Kititsitetokomisaki <55-lower r.>, Y. Hoshino et al., Jul. 20, 1933 (SAPS-2 sheets); Shisuka-shicho, Kititsitetokomisaki <55-lower r.>, S. Sugawara 27130 & 27131, Jul. 25, 1935 (SAPS-2 sheets).
13. *Leucothoe grayana* Maxim. [Hanahirinoki]

**SAKHALIN**

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

**THE KURI LS**


SHIKOTAN <22>. Shokan, K. Miyabe, Jul. 27, 1884 (SAPS); Shokan, 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); Horobetsu–Okkaibetsu, K. Kondo, Aug. 31, 1929 (TI); Kekekowan, 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); Shiokotan-Matsukura, D. Akaishi 20884, Jun. 29, 1934 (SAPS).


**SAKHALIN**


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

16. Phyllodoce aleutica (Spreng.) A. Heller [Aono-tusgazakura]

**<THE KURILS>**


**<THE KURILS>**

17. Menziesia pentandra Maxim. [Koyoraku-tsutsuji]

**<SAKHALIN>**


18. Menziesia pentandra Maxim. [Koyoraku-tsutsuji]

**<SAKHALIN>**


19. Menziesia pentandra Maxim. [Koyoraku-tsutsuji]

**<SAKHALIN>**


15. Menziesia pentandra Maxim. [Koyoraku-tsutsuji]

**<SAKHALIN>**

17. Phyllodoce caerulea (L.) Bab. [Ezono-tsubagakura]

**<SAKHalin>**

**Northern.** S of Peninsula of Schmidt <05-upper r.>, T. Fukuda 2275, 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-lower r.), 39-lower r.], B. Yoshimura & M. Haru (104), Jul. 15, 1937 (SAPS- 3 sheets, TI); Around the border from Ikeda, Mt. Okada-yama <09-lower r.>, 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 (SAPTS- 2 sheets); Shisuka-shicho, Chirie-gun, Mt. Kuroda, 29274, 29273, Aug. 7, 1935 (SAPS- 2 sheets); E. Coast, forests of Funadomari <45-upper r.>, M. Kawashima, Jul. 16, 1935 (SAPS); Shikka Dist., Mt. Kawashima <45-upper r.>, S. Sugawara no number, 17686 & 17687, Aug. 3, 1935 (SAPS- 2 sheets); Shisuka-shicho, Chirie-gun, Mt. Kawashimayama <45-upper r.>, M. Tatewaki & Y. Takahashi 22721, Jun. 21, 1936 (SAPS); Shisuka-shicho, Chirie-gun, Mt. Kawashimayama <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 Dist., Naruko (Nirayama) <45-upper r.>, B. Yoshimura, Aug. 8, 1936 (SAPS); Mt. Shishukadake <47-upper r.>, K. Washimi, Jul. 23, 1931 (KYO); Upstream of Shisuka River, divide <47-upper r.>, S. Sugawara 17678-17680, Aug., 1933 (SAPTS- 3 sheet); Mt. Shishukadake <47-upper r.>, S. Sugawara 17682-17684, Jul., 1934 (SAPTS- 3 sheets); Mt. Miharashi-yama <48-lower r.>, [no collector's name], [no date] (KYO); Mt. Isara-yama <52-lower r.>, S. Sugawara 17681, Aug. 17, 1933 (SAPT).

**THE KURILS.**

**Northern.** Paramushir <03>. Mt. Chai, Kamogawa, Jul. 27, 1930 (SAPS); Murakami-yan, K. Kojima 1453, Jul. 26, 1932 (TNS).

**Southern.** 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. Koriha & R. Yoshi, Jul. 23, 1933 (KYO).

18. Rhododendron adamsii Rehder [Karafuto-miyamatsutsuji]

**<SAKHalin>**

**Northern.** 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-lower r.), 39-lower r.], B. Yoshimura & M. Haru (104), Jul. 15, 1937 (SAPS- 3 sheets, TI); Around the border from Ikeda, Mt. Okada-yama <09-lower r.>, 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 (SAPTS- 2 sheets); Shisuka-shicho, Chirie-gun, Mt. Shirochi-yama <45-upper r.>, S. Sugawara no number, 17723 & 29440, Aug. 7, 1935 (KYO, SAPS, SAPTS); Shikka Dist., Naruko, Mt. Chonosuke <45-upper r.>, B. Yoshimura, Aug. 10, 1936 (SAPS).
Toyohara-gun, Mt. Susuya, H. Sase, Sep. 18, 1937 (SAPS); Jul. 22, 2001 (SAPS); Nakashiretoko, Mt. Sankaku-yarna <67-upper r.>, H. Takahashi T. Miyake, Jun. 13, 1908 (SAPS); Summit of Mt. Susuya <65-upper r.>, K. Washimi, Jun. 7, 1928 (TI); Karibalsl. <73-lower r.>, S. Sugawara 17729, Aug. 16, 1931 (KYO); Mt. Ochiho-Komori, Aug., 1926 (SAPS). SHUMSHU <02>. [no locality], T. Ohashi, Aug. 30, 1907 (SAPS); Mt. Ochopoka <65-upper r.>, S. Sugawara 17731, Aug. 20, 1927 (SAPS); Summit of Mt. Susuya <65-upper r.>, S. Seki, 1895 (SAPS); Bettobu, S. Yokoyama, Sep. 22, 1893 (SAPS); [no locality], T. Ishikawa, Jun. 29, 1894 (SAPS); [no locality], T. Ohashi, Aug. 30, 1907 (SAPS, TNS). 

SOUTH. E. Coast, Mt. Nupuripo <57-lower r.>, T. Miyake, Aug. 13, 1907 (SAPS, TNS); E. Coast, Mt. Tosso <57-lower r.>, N. Hiratsuka et al., Jul. 23, 1927 (SAPS); Mt. Shisuka-dake <47-upper r.>, S. Imagawa, Aug. 12, 1940 (TI); Tsapko to N peak of Mt. Tosso <57-lower r.>, H. Hara, Aug. 5, 1931 (TI); Part of Mt. Tosso <57-lower r.>, H. Numajiri, Aug. 6, 1925 (TNS); Mt. Susuya <65-upper r.>, K. Jimbo, Aug. 13, 1907 (TNS); E. Coast, Mt. Ushoro <52-upper r.>, N. Hirota et al., Jul. 23, 1931 (KYO); Mt. Shisuka-dake <47-upper r.>, S. Komat, Aug. 14, 1929 (SAPS); w. Coast, Mt. Ushoro <52-upper r.>, S. Imagawa, Aug. 8, 2001 (SAPS).


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


23. Therorhodion camtschaticum (Pall.) Small [Ezo-tsutsuji] <SAKHALIN>

MIDDLE Pilevo <36-lower I.>, 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 r.>, M. Kawashima 16, Jul. 21, 1935 (SAPS); Mt. Shisuka-dake <47-lower r.>, K. Washimi, Jul. 23, 1931 (KOY); Upstream of Shisuka River <47-upper r.>, 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, Motomori <51-lower r.>, Y. Hoshino et al., Aug. 3, 1933 (SAPS); Mt. Isara-yama <52-lower r.>, S. Sugawara 17822, Aug. 17, 1933 (SAPT); Mt. Shiritori <54-lower I.>, K. Fujita, Aug. 5, 1928 (SAPS).

SOUTH E. Coast, Mt. Nupiripo <57-lower I.>, T. Miyake, Aug. 13, 1907 (SAPS, TNS); Mt. Tooso <57-lower I.>, G. Yamada, Aug. 4, 1926 (KYO); E. Coast, Mt. Tooso <57-lower I.>, N. Hiratsuka et al., Jul. 20, 1927 (SAPS); E. Coast, Mt. Tooso <57-lower I.>, N. Hiratsuka et al., Jul. 23, 1927 (SAPS); Mt. Tooso <57-lower I.>, N. Hiratsuka, Aug. 7, 1928 (SAPS); Mt. Nupiripo <57-lower I.>, S. Saito, Aug. 3, 1929 (TI, TNS); Summit of Mt. Tooso <57-lower I.>, H. Hara, Aug. 5, 1931 (TI, TNS); Mt. Tooso <57-lower I.>, J. Ohwi, Jul. 22, 1932 (KYO); Mt. Tooso <57-lower I.>, T. Tsuyama, Jul. 24, 1932 (TI); Mt. Tooso <57-lower I.>, S. Sugawara 17825, Jul. 18, 1935 (SAPT); Motodomari-shicho, Mt. Tooso <57-lower I.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI); Tsakpo to N peak of Mt. Vladimirovka <57-lower r.>, 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 I.>, T. Miyake,
Aug. 12, 1907 (SAPS, TNS); Tikhaya village, mouth of Tikhaya River <59-upper r.>, T. Fukuda 2499, Aug. 28, 2001 (SAPS); Mt. Suzuya <65-upper r.>, T. Miyake, Jul. 31, 1907 (SAPS); Summit of Mt. Suzuya <65-upper r.>, K. Numajiri, Aug. 6, 1925 (TNS); Mt. Suzuya <65-upper r.>, S. Sugawara 17828, Jul. 10, 1927 (SAPT); Summit of Mt. Suzuya <65-upper r.>, H. Hara, Aug. 3, 1928 (TI); Chechovskiy Pass—Mt. Chechovka <65-upper r.>, H. Takahashi 29287, Jul. 22, 2001 (SAPS); Peak Chechov, the peak-like rocky place <65-upper r.>, T. Fukuda 1176, Jul. 22, 2001 (SAPS- 2 sheets); Isl. Kaibato, Mt. Daiman <73-lower r.>, Kimoto et al., Jul. 26, 1931 (SAPS).

THE KURILS


25. Vaccinium microcarpum (Turcz. ex Rupr.) Schmalh. 

**SAKHALIN**

Mt. Rausu, H. Ishikawa 3695, Aug. 1, 1923 (SAPS); Mt. Chacha-nupuri, Mt. Koriba & R. Yoshii, Aug. 24, 1933 (KYO); [no collector's name], 1935 (KYO); Mt. Tomari, M. Tatewaki 25496, Aug. 20, 1936 (SAPS); Mt. Chacha, K. Ito, Aug., 1939 (SAPS). SHIKOTAN <222>. [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], 1937 (TNS); [no locality], [no collector's name], 1936 (SAPS); [no locality], K. Miyabe, 30351, Aug. 7, 2002 (SAPS); 40km E of Palevo, Mt. Changa, alt. 1400-1511m <34-upper r.>, H. Takahashi 30351, Aug. 7, 2002 (SAPS); 40km E of Palevo, Mt. Changa, alt. 1120-1437, Sep. 4, 1925 (TI); [no locality], K. Kondo 7827, 1929 (TI-2 sheets); Shakotan-zaki, H. Otani, Aug. 6, 1935 (SAPS); 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); Chibii, 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); Chibii–Umanose, K. Kondo, Sep. 7, 1929 (TI); Shakotan, S. T. Ohno, Jul. 5, 1930 (SAPT, TI); Mt. Tomari, M. Tatewaki 25496, Aug. 1, 1936 (SAPS); Mt. Tomari, K. Miyabe, Sep. 5, 1930 (KYO, mingled with 8. oxycoccus); Shisuka-shicho, near Tairaika <49-upper r.>, M. Honda & Y. Kimura, Aug. 16, 1904 (TI-3 sheets, mingled with 8. oxycoccus); Shisuka-shicho, Tairaika–Nimenjo <49-upper r.>, B. Yoshimura & M. Hari, Jul. 10, 1937 (SAPS); Shisuka-shicho, Nishinoko <50-upper r.>, Y. Hoshino et al., Aug. 17, 1933 (SAPS); Shisuka-shicho, Nokoro <50-upper r.>, M. Kawasima, Jul. 7, 1935 (SAPS); Kitsashiretoko Peninsula, Noto <51-lower r.>, Y. Hoshino et al., Jul. 27, 1933 (SAPS); Kitsashiretoko Peninsula, Kitsashiretoko-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 r.>, S. Saito 995, Aug. 5, 1929 (TI-2 sheets); Hoyori-mura, Maguntan <57-lower r.>, H. Sase, Aug. 13, 1936 (SAPS); Odasamun <59-lower r.>, S. Otogiri, Jul. 1, 1930 (KYO, mingled with 8. oxycoccus); Toyohara-shicho, (Kurokawa) Fukakusa <61-lower r.>, S. Sugawara, Sep. 10, 1925 (SAPS); Kurokawa <62-lower r.>, S. Sugawara 17659, Jul. 15, 1926 (SAPS); Kurokawane <62-lower r.>, H. Hara, Jul. 31, 1931 (TI); Enoura <65-lower r.>, S. Sugawara 17657, Jul. 18, 1929 (SAPT); Korsakovski Dist., Susuya moor, Ozutetsyoke <65-lower r.>, N. Yoshio, Y. Yokawa & M. Suzuki 970705-18, Jul. 5, 1997 (TI); 10km E of Korsakov, N of Prigorondoe, E side of Meraya River <70-lower r.>, H. Takahashi 29425, Jul. 28, 2001 (SAPS); Aniva Bay, Chipsanu <71-lower r.>, T. Miyake, Jul. 19, 1908 (SAPS, TNS); Nagahama-gun, Tobuchi-mura <71-lower r.>, H. Sasa, Sep. 13, 1936 (SAPS); Notoro–Kirodishi <73-lower r.>, K. Kondo, Sep. 3, 1929 (TI). [No Locality], T. Miyake, [no date] (TNS). <THE KURILS>>

26. **Vaccinium ovalifolium** Sm. [Kuro-usugo]

**SAKHALIN**

**NORTH.** Near Pilewo, mountain <40-lower r.>, Y. Kudo & B. Ishida 7047, Aug. 24, 1923 (SAPS); Oha <7-lower r.>, Okada, Sep. 3, 1923 (TI-2 sheets); Papuni, in sylvis <26-lower l.>, Y. Kudo & M. Tatewaki 6358, Aug. 8, 1922 (SAPS).

**MIDDLE.** Alexandrovski <28-lower l.>, S. Takedo, Aug. 19, 1905 (SAPS); Adatsum <29-upper l.>, Okada, Aug. 23, 1923 (TI); 35-40km E of Kirovskoye, N. Chenangskyi Pass <34-upper r.>, N. Fujii 01227, Aug. 8, 2002 (MAK 346156; SAPT); 40km E of Palevo, N. Chenangskyi Pass <34-upper r.>, H. Takahashi 30073, Aug. 8, 2002 (SAPS); NW of Pogranichnoye, S bank of the Langeri River <35-lower r.>; N. Fujii 01228, Aug. 11, 2002 (MAK 346155); Hinan-ekisha-Aobaeki <36-lower l.>, Y. Kudo & Y. Tokunaga, Sep. 2, 1929 (SAPS); Anbetsu, Ooiwa-toge <36-lower l.>, Y. Tokunaga & K. Kawai, Sep. 2, 1929 (SAPS); Aobaeki-Kamionoru <36-lower r.>, Y. Kudo & M. Tatewaki 6203, Jul. 31, 1922 (SAPS); Eastern boundary, Assae <40-lower l.>, Y. Hoshino et al., Aug. 11, 1933 (SAPS); Assae <40-lower l.>, S. Sugawara 17872, Aug. 4, 1935 (SAPT); Ennai <40-lower l.>, S. Sugawara 17870 & 17871, Aug. 5, 1935 (SAPT-2 sheets); Shisusha-shicho, Chirirun, Ennai <40-lower l.>, M. Tatewaki & Y. Takahashi 22457, Jun. 11, 1936 (SAPS); Shisusha-shicho, Chirirun, Ennai <40-lower l.>, M. Tatewaki & Y. Takahashi 22474, Jun. 14, 1936 (SAPS); Shisusha, Ennai, border <40-lower l.>, S. Sugawara 28691, Aug. 5, 1938 (SAPS); Shisusha, Saren <40-lower r.>, S. Sugawara 28652 & 28653, Aug. 4, 1935 (SAPS); Hoe <40-lower r.>, S. Sugawara 17867-17869, Aug. 10, 1931 (SAPT-3 sheets); Shisusha-gun, Hoe <42-lower r.>, S. Sugawara, Aug. 6, 1932 (KYO); Shisusha-shicho, Chirirun, Aihama <61-lower l.>, S. Sugawara 17876, Jun. 29, 1934 (SAPS). T. Miyake, Sep. 3, 1923 (TI-2 sheets); Pupuni, in sylvis <26-lower r.>, A. Ishida 7047, Aug. 24, 1923 (SAPS); Oha <7-lower r.>, Y. Takahashi 22669, Aug. 29, 1923 (SAPS); Peak Chekov (alt.l045 m) <65-upper l.>, Y. Kudo, Jul. 21, 1945 (MAK 346155); Tomarioru <58-lower r.>, H. Hara, Aug. 11, 1940 (TI-3 sheets); Tomarioru <58-lower r.>, [no collector’s name], Aug. 8, 1913 (TI); Manui <59-upper l.>, S. Komatsu 1370, Aug. 4, 1913 (TNS); Higashishiraura <59-lower l.>, [no collector’s name], Aug. 5, 1913 (TI); Manuelando <59-lower r.>, [no collector’s name], Aug. 6, 1913 (TI); Kitaitada <59-lower r.>, [no collector’s name], Aug. 13, 1913 (TI); W. Coast, Notasan <60-lower r.>, T. Miyake, Jun. 28, 1907 (SAPS); Mt. Kabuto-yama <61-lower r.>, S. Sugawara 17879, Jun. 6, 1935 (SAPT); Aihama <61-lower r.>, K. Kimura, Jul. 22, 1932 (KYO-2 sheets); Toyokarashicho, Aikawa, Experiment Forest of Tokyo Univ. <61-lower r.>, M. Honda & Y. Kimura, Aug. 11, 1940 (TI-2 sheets); Fukukasa <61-lower r.>, S. Sugawara 17873, Sep. 2, 1922 (SAPT); Fukukasa <61-lower r.>, S. Sugawara 17882, Jul. 25, 1926 (SAPS); In vicinio opp. Dolinsk <62-lower r.>, A. Gizha et al., Jun. 22, 1953 (TNS); 30km N of Yuzhno-Sakhalininsk, Sokol <62-lower r.>, H. Takahashi 30035, Jul. 30, 2002 (SAPS); Around the mouth of Bakhura River <62-lower r.>, H. Takahashi 29134 & 29136, Jul. 19, 2001 (SAPS); 230km 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); Muoka <63-lower r.>, S. Sugawara 17874, Sep., 1938 (SAPT); Shimizu <64-lower r.>, T. Miyake, Jun. 30, 1906 (SAPS); Oonagari <64-lower r.>, T. Miyake, Jun. 30, 1906 (SAPS); Sekiguchi-toge <64-lower r.>, T. Miyake, Jun. 30, 1906 (SAPS); Ohswa <65-lower r.>, [no collector’s name], Aug. 1, 1913 (TI); Konuma <65-lower l.>, G. Koidzumi, Aug. 11, 1930 (KYO); Toyokara-gun, Toyokita-mura, Konuma <65-lower r.>, H. Sase, Aug. 15, 1937 (SAPS); Aniva Dist., prope Novo-Alexandrovsk <65-lower r.>, G. Proskuriakova & G. Porubinovskaya, Sep. 8, 1973 (MAK 209139, SAPT, TI); Peak Chekov (alt.1045 m) <65-lower r.>, T. Fukuda 1148 & 1173, Jul. 22, 2001 (SAPS); Vspenskoe <65-lower r.>, 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. Ochojoka <65-upper r.>, T. Miyake, Jun. 13, 1908 (SAPS); Mt. Susuya <65-upper r.>, S. Sugawara, Aug. 12, 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. Ochihoko-yama <65-upper r.>, S. Sugawara, Aug. 3, 1929 (TI); Mt. Susuya <65-upper r.>, S. Sugawara 17881, Sep. 14, 1930 (SAPT); Mt. Ochihoko-dake <65-upper r.>, S. Sugawara 17880, Aug. 25, 1931 (SAPT); Toyohara, upstream of Ohswa <65-upper r.>, S. Kitamura, Jul. 11, 1942 (KYO); E. Coast, Omuto <66-lower r.>, T. Miyake, Jun. 10, 1908 (SAPS); Okhotskoe, Sedoky Lake <66-lower l.>, S. Noshiro et al., 57070-26, Jul. 6, 1997 (TI); Mt. Oyakochi <67-lower l.,
27. Vaccinium oxyccoccus L. [Tsuru-kokemomo]  

SAKAHLIN  

NORTH. Near Pilew, lakeside <04-lower r.>, Y. Kudo & B. Išhida 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 Pomm, ca 2 Km NW from Moskaljvo <06-lower r.>, T. Fukuda 2028, Aug. 13, 2001 (SAPS); N end of the Gulf of Pomm; Village Muzjma <07-upper r.>, T. Fukuda 1898, Aug. 10, 1922 (SAPS); Oha <07-lower r.>, Okada, Sep. 3, 1923 (TI); Wisk, near winter house <09-upper r.>, Y. Kudo & B. Ishida 7339, Sep. 2, 1923 (SAPS); Ohka Region, Ekhabi Bay <11-upper r.>, V. Y. Barkalov 10061, Aug. 3, 2001 (SAPS); SW of Gulf of Piltun, Vstrechnaya <11-upper r.>, T. Fukuda 1568, Aug. 4, 2001 (SAPS); SeaCOast of Chai <19-lower r.>, Y. Kusano, May 6, 1921 (SAPS); Ninso, tundra prope Iitus <23-lower r.>, Y. Kudo & M. Tatewaki 6533, Aug. 13, 1922 (SAPS); Parakata, tundra <26-upper r.>, Y. Kudo & M. Tatewaki 6430, Aug. 10, 1922 (SAPS).
28. **Vaccinium praestans** Lam. [Iwa-tsutsuji]

**SAKHALIN**

NORTH. Near Pilevo, forests <48-lower r.>, Y. Kudo & B. Ishida 7120, Aug. 25, 1923 (SAPS); Pupuni, in sylvis <26-lower i.>, B. Yoshimura 8287, Aug. 12, 1930 (SAPS); Kita Nayoshi <41-lower r.>, K. Kawai 7441, Aug. 8, 1930 (SAPS); Kusunokisawa [Kusunokiyama?], Experiment Forest of Kyoto Univ. <48-lower r.>, Y. Kudo & M. Hara 7441, Aug. 8, 1930 (SAPS); Syakotan, Kiritoshi, S. T. Ono, Jui. 10, 1934 (TI); Notoro, J. Ohwi 762, Aug. 9, 1931 (SAPS); Kita Nayoshi <41-lower i.>, K. Miyabe & T. Miyagi 770, Aug. 25, 1932 (SAPS); 10km N of Dolinsk, forests <04-lower r.>, K. Miyabe & T. Miyagi, Jul. 22, 1930 (SAPS); Syakotan, Kiritoshi, S. T. Ono, Jui. 10, 1934 (TI); Furukamappu mire, S of Furukamappunuma-pond, H. Fujita et al. 03-0019, Jui. 13, 2003 (SAPT). SHIKOTAN <22>. (Shakotan–Chipei) [no locality], [no collector's name] (H.Takeda), Jul. 18, 1909 (SAPSN, TNS 29727); Nodoroi-Inemoshiri, S. Saito 1601, Sep. 6, 1925 (TI); Aburakowan, K. Kondo, Sep. 6, 1929 (TI); Poropet–Shakotan, J. Ohwi, Jul. 30, 1931 (KIYO); Noroto, J. Ohwi 762, Aug. 9, 1931 (SAPS); Noroto Riv., J. Ohwi, Aug. 9, 1931 (KIYO); Noroto, J. Ohwi, Aug. 11, 1931 (KIYO); Toiro, M. Tatewaki 20571, Jun. 20, 1934 (SAPS); Shikotan-matsuhara, M. Tatewaki 20649, Jun. 22, 1934 (SAPS); Shikotan-matsuhara, D. Akaishi 20886, Jun. 29, 1934 (SAPS); Syakotan, Kirishito, S. T. Ono, Jul. 10, 1934 (TI).
E. Coast, Shiritoru <54-lower l.>, T. Miyake, Sep. 13, 1909 (SAPS); Shiritoru <54-lower l.>, S. Sugawara 17907, Aug. 2, 1927 (SAPFT); Mimani-niiito <54-lower r.>, H. Hara, Aug. 4, 1931 (TI); Kitashirakotoko Peninsula, Kitashirakotoko-misaki <55-lower r.>, Y. Hoshino et al., Jul. 20, 1933 (SAPS).

SOUTH. Mihama-mura, Lake Shosen [?] <56-6>, H. Hara, Jul. 30, 1936 (TI); E. Coast, Mt. Nupiripo <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. Nupiripo <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 r.>, J. Ohwi, Jul. 22, 1932 (KYO); Mt. Tosso <57-lower l.>, S. Sugawara 17911, Jul. 18, 1935 (SAPT); Motodomari-shicho, Mt. Tosso <57-lower r.>, M. Honda & Y. Kimura, Aug. 12, 1940 (TI); 80 km N of Dolinsk, Mt. Zhdkano <57-lower l.>, H. Takahashi 27894, Jul. 19, 2000 (SAPS); Aniwa Distr., Urymb-Chinshakina Rivers <69-lower r.>, S. Noshiro et al. 970706-61, Jul. 6, 1997 (TI); 30 km SE of Yuzhno-Sakhalsin, S of Ohotskoye <66-lower l.>, H. Takahashi 27894, Jul. 19, 2000 (SAPS); Aniwa Distr., Urymb-Chinshakina Rivers <69-lower r.>, S. Noshiro et al. 970703-36, Jul. 3, 1997 (TI); Mereya <70-lower r.>, K. Miyabe et al., Jul. 14, 1906 (SAPS); Konskoff <70-lower r.>, K. Miyabe & T. Miyagi, Aug. 24, 1906 (SAPS); Near Otomari <70-lower r.>, H. Koidzumi Herbarium, Aug., 1925 (TNS); Chipisani <71-upper l.>, K. Miyabe et al., Jul. 15, 1906 (SAPS); Aniwa Bay, Chipisani <71-lower l.>, T. Miyake, Jul. 17, 1908 (SAPS); Aniwa Bay, Chipisani <71-lower l.>, T. Miyake, Jul. 19, 1908 (SAPS); Nagahama-gun, Tobubuchi-mura, school forest <71-lower r.>, H. Sase, Jul. 8, 1934 (SAPS); Mt. Omaunetuk <72-lower l.>, T. Miyake, Jul. 15, 1908 (SAPS); Kaiba Isl. <73-lower l.>, S. Sugawara 17912, Jun. 25, 1933 (SAPT).

THE KURILS


30. Vaccinium uliginosum L. [Kuronomakenoki]<SAKHALIN>


31. Vaccinium vitis-idaea L. [Kokemomo] 
SASHAKALIN

NORTH. Ado <04-upper r.>, Y. Kudo & B. Ishida 7514, Sep. 7, 1923 (SAPS); Mouth of River Tum’ of the Gulf of Nadezhd, <04-lower r.>, T. Fukuda 1839 & 1867, Aug. 9, 2001 (SAPS– 2 sheets); SE from Cape of Maria, around the Lake Monchig <04-upper r.>, T. Fukuda 1703, Aug. 6, 2001 (SAPS– 2 sheets); Near Pilewe, Larix forests <04-lower r.>, Y. Kudo & B. Ishida 7100, Aug. 25, 1923 (SAPS); Pirituk, dry peat <07-upper r.>, 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); 15 km S of Okha <10-upper r.>, H. Kudo & B. Ishida 7284, Sep. 1, 1923 (SAPS).
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

Introduction

The island of Kharimkotan (area 68 km²) lies between Onekotan and Shishkotan (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 maximoviczii, is well developed from marine terrace to mountain slopes on the north and south-eastern parts of the island. The thickets of Alnus maximoviczii 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 Skvortsova 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 northwest; 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*. 

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bog and scattered sites also occur on the lowland (Fig. 5). The large number of genera and species per family is larger than on the northern slopes of the mountains and along the coastal islands.

1-3) Heath communities

The heaths were found on the northwestern side of the island. We could not find the salt-marshes on Kharimkotan, but Potentilla anserina was rarely found around a lake.

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 vulgaris, and Senecio canadensis 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, Chamaeperculymenum suecicum, Tilia pumulifera, Gentianella auriculata, and Swertia tetrapetala. Euphrasia mollis, Pedicularis chamissonis, Campanula lasiocarpa, Saussurea riederi, Solidago virgaurea subsp. leiocarpa, Maianthemum dilatatum, Luzula kesselmanniana, 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, Arctenia nana, Pennellanthus frutescens (Fig. 3), Luzula arcuata subsp. unalaskensis, and Carex stenantha var. taisetsuenensis occur and form small patches on these habitats. Salix nakamurae characteristically occur on the volcanic slope. Honkenya oblongifolia, a pioneer in the shorelines, and Pennellanthus 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., Volotovskyi 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 Ruppiopsis 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, Onekotan 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 relics 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 niponica 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).

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References


Appendix

List of the vascular plants on Kharimkotan Island, the Kuril Islands. The names of authors of plant names follow Brummitt and Powell (1992) maily, but "Worosch." is adopted except for "Vorosch.". Because he himself has used "Woroshchilov" 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 beneath 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


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


Habitat: Subalpine meadows on volcanic slopes.

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


Russian name: Plaun godichnyj.

Japanese name: Sugi-kazura.

Habitat: Meadows in low elevation and on marine terrace.

Specimens: Takahashi 21527 (SAPS); Zhuravlev and Ilushko 290, Barkalov 20245 (VLA); Semsrott 240 (WTU).


Russian name: Plaun bulavovidnyj.

Japanese name: Hikage-no-kazura.

Habitat: Meadows in low elevation and on marine terrace.

Specimens: Takahashi 21528 (SAPS); Zhuravlev and Ilushko 410, Barkalov 20167 (VLA); Gage 2068 (WTU).


Russian name: Plaun uploshchyonnyj (for *Lycopodium complanatum*), *Difasiastrum uploshchyonnyj* (for *Diphasiastrum complanatum*).

Japanese name: Plaun bolavovidnyj or Plaun kompaktnyy.

Habitat: Meadows around the lake.

Specimen: Takahashi 29150 (SAPS).


Russian name: Plaun temennyj.

Japanese name: Man’nen-sugi.

Habitat: Subalpine meadows along seasonal streams on volcanic slopes.

Specimen: Barkalov 20180 (VLA).


Russian name: Plaun-barenets obyknovenjyj or Baranets obyknovenjyj (for *Huperzia selago*).

Japanese name: Chishima-sugiran.

Habitat: On subalpine meadows.

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

SELAGINELLACEAE


Russian name: Plaunnok plavovidiyj.

Japanese name: Koke-sugiran.

Habitat: Coastal meadows and bog by the lake.

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

EQUISETACEAE


Russian name: Khvoisch 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


Russian name: Grozdonvnik polunymennyj.

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


Russian name: 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).

**SALICACEAE**


Russian name: Iva Nakamura.
Habitat: Subalpine meadows on volcanic slopes.
Specimens: Takahashi 28141, 28142 (SAPS); Zhuravlev and Ilushko 746a, 746, Barkalov 20118, 20206, 20207, 20221 (VLA).

**BETULACEAE**


Russian name: Olkhovnik 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**


Russian name: Krapiva ploskolistnaya.
Japanese name: Ezo-i-rukusa.
Habitat: Coastal tall herb meadows.
Specimens: Takahashi 21453 (SAPS); Zhuravlev and Ilushko 819, Barkalov 20283 (VLA).
POLYGONACEAE


   Russian name: Zmeevik zhevodorodyashchij.
   Japanese name: Mukago-toranoo.
   Habitat: Coastal meadows.
   Specimens: Takahashi 28135, Yabe s.n. (SAPS); Barkalov 20215 (VLA).


   Russian name: Kislichnik dvukhstolbikovyj.
   Japanese name: Jin’yō-suiba.
   Habitat: By streams on volcanic slopes and pumice field.
   Specimens: Takahashi 21542, 28167 (SAPS); Barkalov 20246 (VLA); Gage 2043, Semrsrott 229 (WTU).


   Russian name: Shchavelek pokrytoplodnyj (for *Acetosella angiocarpa*), Shchavelek obyknovennyj (for *Acetosella vulgaris*).
   Japanese name: Hime-suiba (in the broad sense).
   Habitat: On seashore.
   Specimens: Takahashi 21577 (SAPS); Zhuravlev and Ilushko 516 (VLA).

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

PORTULACACEAE


   Russian name: Montsiya klyuchenaya.
   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


   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).


   Russian name: Honkeniya prodolgovatolistnaya.
   Japanese name: Hama-hakobe.
   Habitat: On sandy beach.
   Specimens: Takahashi 21441 (SAPS); Zhuravlev and Ilushko 216 (VLA); Gage 2011 (WTU).


   Russian name: Meringiya bobotkovetnaya.
   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).


   Russian name: Mshanka tolstoetsebelnaya.
   Japanese name: Ezo-hama-tsumekusa.
   Habitat: On sandy and gravelly beaches.
   Specimens: Takahashi 28196 (SAPS); Barkalov 20239 (VLA).


   Russian name: Zvevdchatka chashechkotsvetkova.
   Japanese name: Kanchi-yachi-hakobe.
   Habitat: Damp meadows on coastal slopes and by streams in low elevation.
   Specimens: Takahashi 21458, 21497, 21513, 21567, 21568 (SAPS); Zhuravlev and Ilushko 20228 (VLA); Barkalov 20234 (VLA).


   Russian name: Zvevdchatka 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).

   Russian name: Zvezdchatka iglitselistnaya.
   Japanese name: Shikotan-hakobe.
   Habitat: On rocks by upper of river. Specimen: Barkalov 20200 (VLA).

RANUNCULACEAE

   Russian name: Borets bol'shoj.
   Japanese name: Ochishima-torikabuto.
   Habitat: Coastal tall herbaceous meadows. Specimens: Takahashi 21456 (SAPS); Zhuravlev and Ilushko 727 (VLA).

   Russian name: Vetrenik mokhnateishyj (for Anemonastrum villosissimum).
   Japanese name: Senka-s6, Chishima-ichige.
   Habitat: On meadows by rocks on marine terrace slopes. Specimen: Barkalov 20237 (VLA).

   Russian name: Koptis trekhlistnyj.
   Japanese name: Mitsuba-6ren.
   Habitat: (No locality). Specimen: Tatewaki 17304 (SAPS).

   Russian name: Lyutik rasprostetyj.
   Japanese name: Ito-kinp6ge.
   Habitat: Dried up lake. Specimens: Kuwahara s.n., Takahashi 21574, 28156 (SAPS); Bogatov 20115 (VLA); Gage 2045 (WTU).

   Russian name: Kupalnitsa Ridera.
   Habitat: Meadows at river-mouth. Specimen: Takahashi 28194 (SAPS).

CLUSIACEAE

   Russian name: Zveroboi kamchatskij.
   Japanese name: Hai-otogiri.
   Habitat: Coastal tall herbaceous meadows. Specimens: Takahashi 21519 (SAPS); Zhuravlev and Ilushko 364; Barkalov 20269 (VLA); Gage 2062 (WTU).

DROSERACEAE

   Russian name: Rosyanka kruglolistnaya.
   Japanese name: M6sen-goke.

BRASSICACEAE

   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).

   Russian name: Rezukha sizaya.
   Japanese name: Ezo-no-iwahatazao.
   Habitat: Under tall grasses on stabilized scree by rocks. Specimens: Barkalov 20197, 20256 (VLA).

   Russian name: Rezukha Stellera.
Japanese name: Hama-hatazao (in the broad sense).  
Habitat: Stabilized sand dunes.  
Specimen: Gage 2029 (WTU).


   Russian name: Sureplaka 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).


   Russian name: Serdechnik Regelya.

   Habitat: Along streams.

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


   Russian name: Serdechnik zontichnyj.

   Habitat: (No locality).

   Specimen: Tatewaki 17300 (SAPS).


   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).


   Russian name: Krupka severnaya.

   Japanese name: Ezo-inu-nazuna.

   Habitat: On rocks by upper of river.

   Specimen: Barkalov 20203 (VLA).


   Russian name: Krupka bol’shaya.

   Japanese name: Ishino-nazuna.

   Habitat: (Rocky cliffs at eastern side).

   Specimen: Tatewaki 17308 (SAPS).


   Russian name: Zherushnik bolotnyj.

   Japanese name: Sukashitagobō.

   Habitat: On shore of lake.

   Specimen: Barkalov 20209 (VLA).

### CRASSULACEAE


   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


   Russian name: Selezenochnik kamchatskij.

   Japanese name: Chishima-nekonomeso.

   Habitat: Damp places by stream.

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


   Russian name: Belozor bolotnyj.

   Japanese name: Umbachi-sō.

   Habitat: Subalpine meadows.

   Specimen: Zhuravlev and Ilushko 570, Barkalov 20281 (VLA).


   Russian name: Kaminelomka pritsvetnikovaya.

   Japanese name: Sukashitagobō.

Japanese name: Chishima-kumomagusa.
Habitat: Coastal meadows and subalpine meadows on volcanic slopes.
Specimens: Takahashi 21479 (SAPS); Zhuravlev and Ilushko 757, 759, Barkalov 20202, 20279 (VLA).

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

ROSACEAE


Russian name: Volzhanka dvudomnaya (for A. dioicus).
Japanese name: Yamabuki-shoma.
Habitat: Coastal meadows.
Specimens: Takahashi 21475 (SAPS); Zhuravlev and Ilushko 757, 759, Barkalov 20202, 20279 (VLA).


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).


Russian name: Zemlyanika nipponskaya (for F. nipponica), Zemlyanika iezsskaya (for F. yeoens).
Habitat: Coastal meadows (introduced?).
Specimens: Takahashi 21470, 21481 (SAPS); Zhuravlev and Ilushko 6835 (VLA); Gage 2058 (WTU).


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).


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).


Russian name: Lapchatka kruupnootvetkovaya (for P. megalantha), Lapchatka zemlyanikovidnaya (for P. fragiflorus).
Japanese name: Chishima-kinbai.
Habitat: On seashore and coastal meadows.
Specimens: Takahashi 21514 (SAPS); Zhuravlev and Ilushko 690, 691 (VLA); Gage 2007 (WTU).


Russian name: Rubus arkticheskij, Knyazhenika.
Japanese name: Chishima-ichigo.
Habitat: Coastal meadows.
Specimens: Takahashi 21528 (SAPS); Zhuravlev and Ilushko 683 (VLA).
704, Barkalov 20122 (VLA); Gage 2070 (WTU).


   Russian name: Rubus prizemistjy, Moroshka.  
   Japanese name: Horomui-ichigo (in the broad sense).  
   Habitat: Wet meadows around the lake.  
   Specimen: Takahashi 28161 (SAPS).


   Russian name: Krokovkhlebka tonkolistnaya.  
   Japanese name: Chishima-waremoko (for *S. tenuifolia* var. *grandiflora*).  
   Habitat: Coastal meadows.  
   Specimens: Takahashi 21535 (SAPS); Zhuravlev and Ilushko 716, 717, Barkalov 20124 (VLA).


   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, 717, Barkalov 20124 (VLA).

FABACEAE


   Russian name: Ryabina buzinolistnaya.  
   Japanese name: Takane-nanakamado.  
   Habitat: Shrubs on coastal meadows to subalpine meadows on volcanic slopes.  
   Specimens: Takahashi 21474, 21477 (SAPS); Zhuravlev and Ilushko 712, 717, Barkalov 20124 (VLA).


   Russian name: China yaponskaya.  
   Japanese name: Hama-endō.  
   Habitat: On sandy beach and in dunes.  
   Specimens: Takahashi 21516, 28195 (SAPS); Zhuravlev and Ilushko 423 (VLA); Gage 2010 (WTU).


   Russian name: Ostoedochnik prituplennyj.  
   Japanese name: Kodama-sō.  
   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


   Russian name: Kislitsa obyknovennaya.  
   Japanese name: Ko-miyama-katabami.  
   Habitat: Within mosses on lower slope and in *Pinus pumila* thicket.  
   Specimens: Takahashi 21495 (SAPS); Barkalov 20151 (VLA).

GERANIACEAE


   Russian name: Geran' volosistotsvetkovaya.  
   Japanese name: Chishima-hūro.  
   Habitat: On seashore to low slopes.  
   Specimens: Takahashi 21570 (SAPS); Zhuravlev and Ilushko 346, 354, Barkalov 20131 (VLA); Gage 2050 (WTU).

VIOLACEAE


   Russian name: Kopeechnik Nonny.  
   Japanese name: Chishima-genge (in the broad sense).  
   Habitat: Meadow on marine terrace and in low elevation.  
   Specimens: Takahashi 28145, Yabe s.n. (SAPS); Barkalov 20125 (VLA).


   Russian name: Fialka dvukhvtsetvetkovaya.  
   Japanese name: Kibana-no-komanotsume.  
   Habitat: Meadows on the terrace.  
   Specimens: Takahashi 28178 (SAPS).

3) **Viola epipsila** Ledeb. subsp. *repens* (Turecz.) W.Becker

   Russian name: Fialka sverkhu-golen'kaya.
Japanese name: Tanima-sumire.
Habitat: Damp place on the mountain slope.
Specimen: Takahashi 28174 (SAPS).

Russian name: Fialka Selkernaya.
Habitat: Coastal meadows to mountain slopes.
Specimens: Takahashi 21536, 21551, 28173, 28199 (SAPS); Zhuravlev and Ilushko 821, Barkalov 20126, 20176 (VLA); Gage 2046 (WTU).

Russian name: Kiprej Hornemana.
Habitat: Coastal meadows and stream side on volcanic slopes.
Specimens: Takahashi 21457, 21465, 28201, 28202 (SAPS); Zhuravlev and Ilushko 481, Barkalov 20192, 20236, 20247 (VLA); Gage 2080, Semsrott 239 (WTU).

Russian name: Fialka Selkernaya.
Habitat: In Calamagrostis meadows and under alder bushes on slope.
Specimens: Tatewaki 17306, 17307, Takahashi 28185 (SAPS); Barkalov 20280 (VLA).

ONAGRACEAE

Russian name: Dzulepestnik al’pjskij.
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).

Russian name: Kiprej al’pijskij.
Habitat: Meadows near snow bed.
Specimen: Zhuravlev and Ilushko 475 (VLA).

Russian name: Kiprej zhelezistyj (for E. glandulosum).
Japanese name: Ō-chishima-akabana (for E. glandulosum var. kurileense).
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

Russian name: Khvostnik obyknovennyj.
Japanese name: Suginamo.
Habitat: Small lake.
Specimens: Takahashi 28157 (SAPS); Bogatov 20114 (VLA).

CORNACEAE

Russian name: Dyoren shvedskij.
Japanese name: Ezo-gozen-tachibana.
Habitat: Subalpine meadows on volcanic slopes.
Specimens: Takahashi 21520, 21524 (SAPS); Zhuravlev and Ilushko 466, Barkalov 20163 (VLA); Gage 2052 (WTU).

APIACEAE


Russian name: Dudnik Gmelina.
Japanese name: Ezo-no-shishiujo.
Habitat: On seashore to meadows on lower slopes.
Specimens: Takahashi 21473 (SAPS); Barkalov 20166 (VLA).

2) Arctous alpina

Russian name: Arctous alpina.
Japanese name: Aono-shishiujo.
Habitat: On seashore to meadows on lower slopes.
Specimens: Takahashi 21473 (SAPS); Barkalov 20166 (VLA).

2) Heracleum lanatum

Russian name: Burschevik shershistyi.
Japanese name: Ohana-udo.
Habitat: On seashore.
Specimen: Takahashi 21521 (SAPS).

3) Ligustichum scoticum

Russian name: Mokhrotsvetnik Gmelina.
Japanese name: Chishima-tsubagakura.
Habitat: Mountain tundra.
Specimens: Takahashi 217289, 17297, Takahashi 28144 (SAPS); Barkalov 20179 (VLA).


Russian name: Cassiopeya planovoidnaya.
Japanese name: Iwahige.
Habitat: Subalpine meadows on volcanic slopes to exposed uplands.
Specimens: Takahashi 217215 (SAPS); Barkalov 20143, 20154, 20210, 20265 (VLA).

ERICACEAE

1) Arctericia nana

Russian name: Arterikha nizkaya.
Japanese name: Komeba-tsubagakura.
Habitat: On volcanic pumice and subalpine meadows.
Specimens: Tatawaki 17296, Takahashi 28171 (SAPS); Barkalov 20171 (VLA).

2) Arctous alpina

Russian name: Arktous yaponskij.
Japanese name: Urashima-tsutsuji.
Habitat: Mountain tundra.
Specimens: Tatawaki 17209, 17305, Takahashi 28143 (SAPS); Barkalov 20177 (VLA).

3) Bryanthus gmelinii

Russian name: Mokhrotsvetnik Gmelina.
Japanese name: Chishima-tsubagakura.
Habitat: Mountain tundra.
Specimens: Tatawaki 17289, 17297, Takahashi 28144 (SAPS); Barkalov 20179 (VLA).

4) Cassiope lycopodioideae

Russian name: Cassiopeya planovoidnaya.
Japanese name: Iwahige.
Habitat: Subalpine meadows on volcanic slopes to exposed uplands.
Specimens: Tatawaki 17215 (SAPS); Barkalov 20165 (VLA); Semsrott 215 (WTU).

5) Loiseleuria procumbens

Russian name: Lojzeleuria lezhachaya.
Japanese name: Mine-zuō.
Habitat: Mountain tundra.
Specimens: Tatawaki 17214, 17292, Takahashi 28150 (SAPS); Barkalov 20165 (VLA).

- Russian name: Rododendron zolotistyy.
- Japanese name: Kibana-shakunage.

Habitat: Subalpine meadows on volcanic slopes to exposed uplands.

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


- Russian name: Rododendrom 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).


- Russian name: Shiksha chjomaya.

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

PRIMULACEAE


- Russian name: Pervotsvet klinolistnyj.

Habitat: On marine terrace slopes.

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


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

Japanese name: Tsumatorì-sò (in the broad sense).

Habitat: Subalpine meadows on volcanic slopes.

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

GENTIANACEAE


Russian name: Gorechavka kuril'skaya.

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

Habitat: Subalpine meadows in low elevation.

Specimens: Tatewaki 17290, 17309 (SAPS).


Russian name: Gorechavochka ushastaya.

Japanese name: Chishima-rindo.
Habitat: Subalpine meadows on volcanic slopes. Specimens: Takahashi 21467 (SAPS); Zhuravlev and Ilushko 318 (VLA); Gage 2033, Semsrott 196 (WTU).


Russian name: Galeniya rozhkovidnaya.
Japanese name: Hana-ikari.
Habitat: Coastal meadows.
Specimens: Takahashi 21569 (SAPS); Gage 2054 (WTU).


Russian name: Svertsiya chetyrekhlepestnaya (for Swertia tetrapetala). Ofeliya chetyrekhlepestnaya (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

Russian name: Podmarennik kamchatskij.
Japanese name: Ezono-yotsuba-mugura.
Habitat: Under alder bushes on slope. Specimens: Takahashi 21446, 28193 (SAPS); Barkalov 20184 (VLA).


Russian name: Podmarennik trekhradzhelnyj (for G. trifidum).
Japanese name: Nosobano-yotsuba-mugura.
Habitat: Wet meadows around the lake. Specimens: Takahashi 21459, 21498, 28203 (SAPS); Zhuravlev and Ilushko 718, Barkalov 20233 (VLA).

BORAGINACEAE

Russian name: Mertensiya primorskaya (for M. maritima).
Japanese name: Hama-benkeiso.
Habitat: On sandy beach.
Specimens: Takahashi 21517 (SAPS); Zhuravlev and Ilushko 148 (VLA); Gage 2056 (WTU).

SCROPHULARIACEAE

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).


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).


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).


Russian name: Pennelliant kustarnikovyy.
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).

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


Russian name: Veronika Stellera.
Japanese name: Chishima-gikyū.
Habitat: On sandy soil by streams.
Specimen: Barkalov 20185 (VLA).

LENTIBULARIACEAE


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

CAPRIFOLIACEAE


Russian name: Linneya severnaya.
Japanese name: Linne-sō.
Habitat: Marine terrace slope.
Specimens: Tsutewaki 17203, Takahashi 21479 (SAPS); Zhuravlev and Ilushko 206 (VLA).


Russian name: Zhimolost’ golubaya.
Japanese name: Tani-gikyo.
Habitat: Borders of dry stream bed and costal meadows.
Specimens: Takahashi 21539 (SAPS); Zhuravlev and Ilushko 809, 810, 811, Barkalov 20120, 20249, 20274 (VLA); Gage 2079 (WTU).

3) Peracarpa carnosa (Wall.) Hook.f. et Thoms. var. circiaeoides (F.Schmidt ex Miq.) Makino, Ill. Fl. Nippon: 82, fig. 245 (1940); Takahashi et al. in Acta Phytotax. Geobot. 48: 40 (1997);

Russian name: Kolokol’chik pushistoplodnyj.
Japanese name: Iwa-gikyō.
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).


Russian name: Kolokol’chik Shamisso.
Japanese name: Tani-gikyō.
Habitat: Under alder and tall grasses in meadows.
Specimens: Zhuravlev and Ilushko 196, Barkalov 20272 (VLA); Semsrott 237 (WTU).

ASTERACEAE


Russian name: Chikhhotnik kamchatskij (for Pternica camtschatica).
Japanese name: Shunshu-nokogiriso.
Habitat: On stabilized sand dunes and in meadows along streams.
Specimens: Takahashi 21539 (SAPS); Zhuravlev and Ilushko 74, Barkalov 20222 (VLA); Semsrott 191 (WTU).


Russian name: Krestovnik izheamikovyyj.
Habitat: On seashore.
Specimens: Takahashi 21439 (SAPS); Gage 2002 (WTU); Barkalov 20271 (VLA).


Japanese name: Zolotarnik paramushirskij (for S. paramuschirensis).
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.


Russian name: Oduvanchik rogatyj.
Japanese name: Kanchi-hime-tanpopo.
Habitat: On big rocks in coastal meadows.
Specimen: Takahashi 21580 (SAPS).

Note: In many Japanese literature the spelling “camtschatcensis” has been used for the specific epithet.


Russian name: Oduvanchik rasshirennyj.
Japanese name: Kuro-yuri.
Habitat: On rocks by upper of river.
Specimen: Takahashi 21550 (SAPS).

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


Russian name: Majnik shirokolistnyj.
Japanese name: Kuruma-yuri.
Habitat: Meadows on lower slopes to subalpine meadows on volcanic slopes.
Specimens: Takahashi 21525 (SAPS); Barkalov 20267 (VLA).

LILIACEAE

Russian name: Ryabchik kamchatskij.
Japanese name: Kuro-yuri.
Habitat: On big rocks by upper of river.
Specimen: Takahashi 21550 (SAPS).

Note: In many Japanese literature the spelling “cramschatcensis” has been used for the specific epithet.


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).


Russian name: Lloydia pozdnyaya.
Japanese name: Chishima-ama.
Habitat: On rocks by upper of river.
Specimen: Barkalov 20199 (VLA).


Russian name: Majniki shirokolistnyj.
Japanese name: Maizuru-so.
Habitat: Coastal sandy meadows.
Specimens: Takahashi 21502, 21515 (SAPS); Gage 2014 (WTU).
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).


Russian name: Streptopus stebblebyemlyushchij.
Habitat: Under alder bushes in dry creek bed.
Specimen: Semsrott 223 (WTU).


Russian name: Ozhika shtsetinistyj.
Habitat: Meadows in low elevation to subalpine meadows on volcanic slopes.
Specimens: Takahashi 21484, 28183, 28184 (white fls.) (SAPS); Zhuravlev and Ilushko 379, Barkalov 20204 (VLA).

IRIDACEAE

Russian name: Kasatik shtsetinistyj.
Japanese name: Hõgi-ayame.
Habitat: Meadows on low elevation.
Specimens: Takahashi 21484, 28183, 28184 (white fls.) (SAPS); Zhuravlev and Ilushko 379, Barkalov 20137 (VLA).


Russian name: Juncus filiformis
Habitat: By small pond.
Specimens: Takahashi 21563, 28158 (SAPS).

4) Luzula capitata (Miq.) Kom., Fl. Kamch 1: 288 (1827);


Russian name: Ozhika Chjellmana [Ch’ellmana].
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).


Russian name: Ozhika Golovchataya.
Habitat: Coastal sandy meadows.
Specimens: Takahashi 21509, 21572 (SAPS).

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


Russian name: Luzula capitata (Miq.) Kom., Fl. Kamch 1: 288 (1827);

Russian name: Ozhika golovchataya.
Habitat: Coastal sandy meadows.
Specimens: Takahashi 21493 (SAPS); Zhuravlev and Ilushko 392, Barkalov 20260 (VLA); Semsrott 182 (WTU).

JUNCACEAE

Russian name: Sitnik sritevidnyj.
Japanese name: Ezo-hosoi.
Habitat: By small pond.
Specimens: Takahashi 21563, 28158 (SAPS).


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, 21581 (SAPS); Zhuravlev and Ilushko 397, 399, Barkalov 20225 (VLA); Semsrott 180, 194 (WTU).


Russian name: Ozhika unalashkinskay.
Japanese name: Kumoma-suzumenohie.
Habitat: On volcanic ash (pumice).
Specimens: Takahashi 28168 (SAPS); Barkalov 20162, 20250 (VLA); Semsrott 232 (WTU).

POACEAE

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).


Russian name: Polevitsa gilbaya.

Habitat: In dry lake / late snow field.

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


Russian name: Komiyama-nukabo.

Habitat: Coastal meadows in low elevation.

Specimens: Kuwahara s.n., Takahashi 21455, 28153 (SAPS); Barkalov 20121 (VLA).


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).


Russian name: Vejnik nezamechen’nyj (for C. neglecta), Vejnik szhatometel’chatyj (for C. inexpressa).

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

Habitat: Coastal lakes.

Specimen: Barkalov 20216 (VLA).

Note: On the taxonomy of the Calamagrostis neglecta s.l. needs future clarification.


Russian name: Vejnik polutoratsvetkovyj.

Japanese name: Miyama-nogariyasu.

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

Specimens: Takahashi 21573 (SAPS); Semsrott 192, 195 (SAPS); Barkalov 20154, 20160 (VLA).


Russian name: Valodeya izvilistaya (for Vahlodea flexuosa).

Japanese name: Takeana-komesusuki.

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

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


Russian name: Shchuchnik berengijskij.

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 “cespitosa” has been used for the specific epithet.


Russian name: Shchuchnik severnyj.

Habitat: On wet rocks by streams on volcanic slopes.

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


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

Habitat: Hiroha-no-kome-susuki.

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

Russian name: Shchuchnik izvistyi (for Deschampsia flexuosa), Lerkhenfeldiya izvistaya (for Lerchenfeldia flexuosa).

Japanese name: Kome-susuki.

Habitat: Subalpine meadows on volcanic slopes to exposed uplands.

Specimens: Takahashi 21486a, 28140 (SAPS); Zhuravlev and Ilushko 605, Barkalov 20264 (VLA); Gage 2022, Semsrott 171 (WTU).


Russian name: Osyanitsa krasnaya.

Japanese name: Ōushinoke-gusa.

Habitat: Borders of dry stream and coastal meadows and uplands.

Specimens: Takahashi 21450, 21511, 28181 (SAPS); Zhuravlev and Ilushko 589, Barkalov 20286 (VLA); Gage 2013, Semsrott 225 (WTU).


Russian name: Mannik olkhovnikovyj.

Japanese name: Ushikono-gusa.

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).


Russian name: Kolosnýak myagkij.

Japanese name: Tenki-gusa.

Habitat: On seashores.

Specimens: Takahashi 21440 (SAPS); Zhuravlev and Ilushko 609, 614, Barkalov 20142 (VLA); Gage 2003 (WTU).


Russian name: Myatlík arktiesheski.

Habitat: Tundras near seashores.

Specimens: Takahashi 21486b, 28150 (SAPS); Barkalov 20213 (VLA).


Russian name: Myatlík kruptocheshuynyj.

Japanese name: Kana-futo-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).


Russian name: Myatlík Ternera.

Habitat: On seashores.

Specimen: Barkalov 20232 (VLA).


Russian name: Trishchetinnik sibirskij.

Japanese name: Chishima-kanitsuri.

Habitat: Dried lake bed / late snow barren and meadows in low elevation.

Specimens: Takahashi 21444, 21483, 28151 (SAPS); Zhuravlev and Ilushko 648 (VLA); Gage 2021 (WTU).


Russian name: Trishchetinnik alyaskinskij.

Japanese name: Trishchetinnik alyaskinskij.

Habitat: Dried lake bed / late snow barren.

Specimens: Takahashi 21557 (SAPS); Zhuravlev and Ilushko 662, Barkalov 20150 (VLA); Semsrott 172, Gage 2024 (WTU).

CYPERACEAE

   - Russian name: Osoka melkovolosostaya.
   - Habitat: Meadows on marine terrace.
   - Specimen: Barkalov 20261 (VLA).

   - Russian name: Osoka zhehtokonechnaya.
   - Japanese name: Miyama-kurosuge.
   - Habitat: Meadows on volcanic ash slopes.
   - Specimens: Takahashi 21565, 28137 (SAPS); Barkalov 20135, 20159 (VLA); Semsrott 224 (WTU).

   - Russian name: Osoka khakkodskaya.
   - 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).

   - Russian name: Osoka khakkodskaya.
   - Japanese name: Itokin-suge.
   - Habitat: Coastal meadows.
   - Specimens: Takahashi 21550 (SAPS); Zhuravlev and Ilushko 254 (VLA); Gage 2026 (WTU).

   - Russian name: Osoka Krascheninnikova.
   - Habitat: Upper streams on volcanic slopes.
   - Specimens: Barkalov 20129, 20193, 20195, 20198 (VLA).

   - Russian name: Osoka skrytoplodnaya (for C. cryptocarpa).
   - Japanese name: Yarame-suge.
   - Habitat: Coast of lake and by pond.
   - Specimen: Zhuravlev and Ilushko 256 (VLA).

   - Russian name: Osoka ostroverkhaya.
   - Habitat: Subalpine meadows on volcanic slopes.
   - Specimen: Barkalov 20161 (VLA).

   - Russian name: Osoka redkotsvetkovaya.
   - Japanese name: Chishima-suge.
   - Habitat: Wet meadows around lake.
   - Specimens: Takahashi 28165 (SAPS); Barkalov 20214 (VLA).

   - Russian name: Osoka vzdutonosaya.
   - Japanese name: Okasa-suge.
   - Habitat: On bogs near small lakes.
   - Specimen: Zhuravlev and Ilushko 250 (VLA).

   - Russian name: Osoka skrytoplodnaya (for C. cryptocarpa).
   - Japanese name: Chishima-suge.
   - Habitat: Coastal meadows.
   - Specimens: Takahashi 21482, 21522 (SAPS); Barkalov 20147 (VLA).

   - Russian name: Osoka karaginskaya (for C. koraginensis).
   - Japanese name: Kitag-kishima-suge (for C. koraginensis).
   - Habitat: On wet rocks by streams on volcanic slopes.
Specimen: Barkalov 20186 (VLA).


Russian name: Osoka rishirinskaya.

Japanese name: Rishiri-suge.

Habitat: Meadows by lake.

Specimen: Barkalov 20117 (VLA).


Russian name: Osoka ktausipalskaya (for C. ktausipali).

Japanese name: Taisetsu-riishire-suge.

Habitat: Meadows by lake.

Specimens: Takahashi 21562, 28151 (SAPS); Barkalov 201927 (VLA); Semsrott 228 (WTU).


Russian name: Osoka stolbikonosnaya.

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

Habitat: Wet meadows around lake.

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


Russian name: Osoka pridatkonosnaya.

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

Habitat: By small pond and dry lake bed.

Specimens: Takahashi 21560, 28154 (SAPS); Barkalov 202019 (VLA); Semsrott 193 (WTU).


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).


Russian name: Bolotnitsa bolotnaya.

Japanese name: Kuronuma-hari (for E. intersita).

Habitat: By small pond.

Specimens: Takahashi 21562, 28155 (SAPS); Barkalov 20217 (VLA); Gage 2047 (WTU).


Russian name: Pushitsa mnogokoloskovaya (for E. polystachion).

Japanese name: Shumshu-watasuge.

Habitat: Wet meadows around lake.

Specimens: Tatewaki 17295 (SAPS); Bogatov 20116 (VLA).

ORCHIDACEAE


Russian name: Palchatokorennik ostistyy (for Dactylorhiza aristata).

Japanese name: Shumshu-watasuge.

Habitat: By small pond and dry lake bed.

Specimens: Zhuravlev and Iliushko 493 (VLA); Semsrott 183 (WTU).


Russian name: Lyubka Khorisa.

Japanese name: Takane-tonbo.

Habitat: Subalpine meadows on volcanic slopes.

Specimens: Zharavlev and Hishik 493, Barkalov 20151 (VLA); Semsrott 183 (WTU).


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.

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 Habomais 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 km², 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 Holomais 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 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)]. Other Russian important opinions; Charkevicz (1985, 1987, 1988, 1992, 1995, ...
in VLA and the Main Botanical Garden of RAS, Moscow (MIA) 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.), Lamiales (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
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: Khvoschh polevoj.
   Japanese name: Sugina.
2) Equisetum hyemale L. [BE/R]; FJ,WF/J
   Russian name: Khvoschh zimuyushchnij.
   Japanese name: Tokutsa.
3) Equisetum palustre L. [BE/R]; FJ,WF/J
   Russian name: Khvoschh bolotnyj.
   Japanese name: Inu-sugina.

3. OPHIOGLOSSACEAE
1) Botrychium robustum (Rupr.) Underw. [BE/R];
   FJ,WF/J
   Russian name: Grozdvonik mostchnyj.
   Japanese name: Ezo-bunyono-hanawarabi.

4. HYMENOPHYLLACEAE
1) Hymenophyllum wrightii Bosch [FJ,WF/J]
   Russian name: Koke-shinobu.
   Japanese name: Yachi-yanagi.
2) Botrychium multifidum (S.G.Gmel.) Rupr. var. interrupta Maxim.
   Japanese name: Inu-sugina.
   Russian name: Grozdovnik mostchnyj.
   Russian name: Orlyak obyknovennyj.

5. DENNSTAEDTIACEAE
1) Pteridium aquilinum (L.) Kuhn var. latiusculum (Desv.) Underw. ex Hell. [FJ,WF/J]
   Russian name: Orlyak obyknovenennjj.
   Japanese name: Warabi.
   Russian name: Voskovnik pushistyj.
   Russian name: Grozdovnik mostchnyj.
   Russian name: Orlyak obyknovennyj.

6. THELYPTERIDACEAE
1) Thelypteris thelypteroides (Michx.) Holub [BE/R];
   FJ,WF/J
   Russian name: Telipteris telipterisovidnyj.
   Japanese name: Hime-shida.

7. WOODSIACEAE
1) Athyrium filix-femina (L.) Roth [BE/R];
   FJ,WF/J
   Russian name: Medokij Raita.
   Japanese name: Koke-shinobu.
   Japanese name: Miyama-yachi-yanagi.
   Note: This species was not listed in Barkalov and Eremenko (2003), but Czernyeva (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.

8. MYRICACEAE
1) Myrica tomentosa (DC.) Asch. et Graebn. [BE/R];
   FJ,WF/J
   Russian name: Khvoschh polevoj.
   Japanese name: Sugina.
2) 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.
   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];
   FJ,WF/J
   Russian name: Iva bureyushchaya.
   Japanese name: Miyama-yachi-yanagi.
   Note: Recently Ohashi (2000, 2001) adopted Salix miyabeana Seemen subsp. gilgiana (Seemen) H.Ohashi as the correct name.

3) Salix gilgiana Seem. [BE/R];
   FJ,WF/J
   Russian name: Iva Gil'ga.
   Japanese name: Ezo-no-kawa-yanagi.
   Note: Ohashi (2000, 2001) adopted Salix miyabeana Seemen subsp. gilgiana (Seemen) H.Ohashi as the correct name.

4) Salix hultenii Flod. [BE/R];
   FJ,WF/J
   Russian name: Iva Khul'tena.
   Japanese name: Maruba-no-bakko-yanagi.

5) Salix undensis Trautv. et Mey. [BE/R];
   FJ,WF/J
   Russian name: Iva Izetskaya.
   Japanese name: Ezo-no-kinu-yanagi.
   Note: Ohashi (2000, 2001) adopted Salix undensis 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) 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.

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.
11. URTICACEAE

1) *Urtica platyphylla* Wedd. [BE/R][WF/J]
   - Russian name: Krapiva ploskolistnaya.
   - Japanese name: Ezo-irakusa.

12. POLYGONACEAE

1) *Acetosa lapponica* (Hjitonon) Holub [BE/R]; *Rumex montanus* Desf. [WF/J]
   - Russian name: Shchavel' laplandskij.
   - Japanese name: Takane-suiba.

2) *Acetosella angiocarpa* (Murb.) A.Löve [BE/R];
   - Russian name: Shchavel'nik tupo1istnyj.
   - Russian name: Shchave1'nik kurchavyj.

3) *Persicaria maculata* (Raf.) S.F.Gray
   - Russian name: Gorets skotochnyy.

4) *Persicaria scabra* (Moench) Mold.
   - Russian name: Gorets pokrytoplodnyj.

5) *Polygonum aviculare* L.
   - Russian name: Shchavel'nik okhotskij.

6) *Rumex crispus* L.
   - Russian name: Kryuchenka.

7) *Rumex gmelinii* Turcz. ex Ledeb.
   - Russian name: Gorets pochechuinyj.

8) *Rumex longifolius* DC. [BE/R][WF/J]-Naturalized?
   - Note: Charkevicz (1989) recognized *Acetosella angiocarpa* (Murb.) A.Löve and *A. vulgaris* (Koch) Fourn. (= *Rumex acutatus* L. s.l.) as two separate species.

9) *Rumex obtnsifolius* S.Wats. as the correct name.
   - The other var. *hallaisianense* 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.

10) *Rumex ochotskius* Rech.f. [WF/J]
   - Russian name: Gorets sherokhovatyj.

11) *Truellum sieboldii* (Meisn.) Soják [BE/R];
   - Russian name: Kolyuchestebel'nik Tunberga.

12. POLYGONACEAE

1) *Acetosa lapponica* (Hjitonon) Holub [BE/R]; *Rumex montanus* Desf. [WF/J]
   - Russian name: Shchavel' laplandskij.
   - Japanese name: Ezo-no-gishigishi.

2) *Acetosa montana* Desf.
   - Japanese name: Hime-suiba.

3) *Dianthus superbus* L. [BE/R]; *Dianthus superbus* L. var. *superbus* [WF/J]
   - Russian name: Gvozdika pyshnaya.

4) *Fimbripetalum radians* (L.) Ikonn. [BE/R]; *Stellaria radians* L. [WF/J]
   - Russian name: Bakhromchatolepestnik luchistyj.

   - Russian name: Khonkeniya prodolgovatolistnaya.

6) *Moehringia lateriflora* (L.) Fenzl [BE/R][WF/J]
   - Russian name: Khonkeniya obyknovennaya.

7) *Oberna behen* (L.) Ikonn. [BE/R]; *Silene vulgaris* (Moench) Garcke [WF/J]-Naturalized
   - Russian name: Khlopushka obyknovennaya.

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 tolstoestebel'naya.

9) *Silene vulgaris* (L.) Vill. [BE/R][WF/J]-Naturalized
   - Russian name: Ezo-hama-tsumekusa.

10) *Stellaria longifolia* Muhl. ex Vill. [BE/R]; *Stellaria longifolia* L. [WF/J]
    - Russian name: Zvezdchatak dlinnolistnaya.

11) *Truellum sieboldii* (Meisn.) Soják [BE/R];
    - Russian name: Kolyuchestebel'nik Tunberga.

12. POLYGONACEAE

1) *Cerastium fischerianum* Ser. [BE/R][WF/J]
   - Russian name: Yaskolka Fishera.

2) *Cerastium holosteoides* Fries [BE/R]; *Cerastium holosteoides* Fries var. *holosteoides* [WF/J]-Naturalized?
   - Russian name: Yaskolka dernistaya.

3) *Dianthus superbus* L. [BE/R]; *Dianthus superbus* L. var. *superbus* [WF/J]
   - Russian name: Gvozdika pyshnaya.

4) *Fimbripetalum radians* (L.) Ikonn. [BE/R]; *Stellaria radians* L. [WF/J]
   - Russian name: Bakhromchatolepestnik luchistyj.

   - Russian name: Khonkeniya prodolgovatolistnaya.

6) *Moehringia lateriflora* (L.) Fenzl [BE/R][WF/J]
   - Russian name: Khonkeniya obyknovennaya.

7) *Oberna behen* (L.) Ikonn. [BE/R]; *Silene vulgaris* (Moench) Garcke [WF/J]-Naturalized
   - Russian name: Khlopushka obyknovennaya.

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 tolstoestebel'naya.

9) *Silene vulgaris* (L.) Vill. [BE/R][WF/J]-Naturalized
   - Russian name: Ezo-hama-tsumekusa.

10) *Stellaria longifolia* Muhl. ex Vill. [BE/R]; *Stellaria longifolia* L. [WF/J]
    - Russian name: Zvezdchatak dlinnolistnaya.

11) *Truellum sieboldii* (Meisn.) Soják [BE/R];
14. CHENOPODIACEAE

1) Atriplex patens (Litv.) Iljin [BE/R]; Atriplex gmelini C.A.Mey. [WF/J]
   - Russian name: Lebeda ponikayushchaya.
   - Japanese name: Hosoba-hama-akaza.
   - Note: Charkevicz (1988) recognized Atriplex patens (Litv.) Iljin and A. gmelini 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 komarovi 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-kinp6ge.
   - 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: O-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 sacha linense F.Schmidt [BE/R][WF/J]
   - Russian name: Borets sakhalinskij.
   - Japanese name: Klopogon prostoj.
   - Note: Nakai and Ohashi (1995) recognized the correct author name as "(DC.) Turcz." for this species.

4) Anemonastrum villosissimum (DC.) Starodub. [BE/R]; Anemone sachalinensis L. var. sachalinensis Miyabe et Miyake [WF/J]
   - Russian name: Vetrenik mokhnateishyj.
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: Oba-tanetsukebana.

6) Cochlearia officinalis L. [BE/R]; Cochlearia oblongifolia DC. [WF/J]
   Russian name: Lozhechnitsa lekarstvennaya.
   Japanese name: Tomoshiro-sō.

7) Draba borealis DC. [BE/R][WF/J]
   Russian name: Krupka severnaya.
   Japanese name: Zherushnik bolotnyj.

8) Rorippa palustris (L.) Bess. [BE/R]; Rorippa islandica (Oeder) Borbas [WF/J]
   Russian name: Zherushnik bolotnyj.
   Japanese name: Sukashi-ta-gobō.

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 krasnolispechrennyj.
   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 kamschatcicus (Fisch. et C.A.Mey.) ’t Hart [FJ/J];
   Sedum kamschatcicum Fisch. [WF/J]
   Russian name: Ochitok kurilskij.
   Japanese name: Ezo-no-kirokin-sō.
   Note: Phedimus kamschatcicus (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-so.
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 tripolium* (Haw.). Holub (= *H. telephium* (L.) H. Obba, p.p., *Sedum purpureum* (L.) Schult., *S. telephium* sensu Czer.).

5) *Sedum verticillatum* L. [BE/R]; *Hylotelephium verticillatum* (L.) H.Obba var. *verticillatum* [FJ,WF/J]
   Russian name: Ochitok mutochovatyj.
   Japanese name: Mutsba-benkei-sō.
   Note: Cherepanov (1995) treated *Hylotelephium verticillatum* (L.) H.Obba 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’chaty.
   Japanese name: Kuro-ichigo.

2) *Parnassia palustris* L. [BE/R]; *Parnassia palustris* var. *alba* [FJ/J]; *Parnassia palustris* L. var. *multiseta* Ledeb. [WF/J]
   Russian name: Belozor bolotnyj.
   Japanese name: Umebachi-so.
   Note: Charkevicz (1996) adopted *Parnassia fragarioides* L. as the correct name. But he also mentioned *P. fragarioides* subsp. *viscidula* (Bunge) Rumjantsev as the correct name for this species. He also mentioned *A. striata* Michx. subsp. *viscidula* (Bunge) Rumjantsev as the correct name for the east Eurasian plants.

2) *Aruncus dioicus* (Walter) Fernald [BE/R]; *Aruncus dioicus* (Walter) Fernald var. *kamtschaticus* (Maxim.) H.Hara [WF/J]
   Russian name: Volzhanka dvudomnaya.
   Japanese name: Kuro-ichigo.
   Note: Charkevicz (1996) recognized *Agrimonia striata* Michx. as the correct name for this species. He also mentioned *A. striata* Michx. subsp. *viscidula* (Bunge) Rumjantsev as the correct name for the east Eurasian plants.

3) *Comarum palustre* L. [BE/R][FJ/J]; *Potentilla palustris* (L.) Scop. [WF/J]
   Russian name: Voroneznaja bolotnaja.
   Japanese name: Kamnelornka pritsvetnikovaya.

4) *Filipendula kamtschatica* (Pall.) Maxim. [WF/J]
   Russian name: Lapchatka krupnotsvetkovaya.
   Japanese name: Ochitok mutovchatyj.
   Note: Czerepanov (1995) treated *Filipendula kamtschatica* (Pall.) Maxim. as the correct name for this species. He also mentioned *G. fragiformis* Willd. subsp. *viscidula* (Bunge) Rumjantsev as the correct name. But he also mentioned *P. fragarioides* L. subsp. *viscidula* (Bunge) Rumjantsev as the correct name. But he also mentioned *G. fragiformis* Willd. subsp. *viscidula* (Bunge) Rumjantsev as the correct name. But he also mentioned *G. fragiformis* Willd. subsp. *viscidula* (Bunge) Rumjantsev as the correct name.

5) *Fragaria yezoensis* H.Hara [WF/J]; *Fragaria nipponica* Makino [FJ/J]
   Russian name: Gravilat Fori.
   Japanese name: Horo-ichigo.
   Note: Cherepanov (1996) adopted *Fragaria nipponica* Makino as the correct name. But he also mentioned *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: Gravitaleppskij.
   Russian name: Ō-daikon-sō.
   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.

   Russian name: Gravitaleppskij.
   Japanese name: Karafuto-daikon-sō.
   Note: Charkevicz (1996) adopted *Geum macrophyllum* Willd. as the correct name. But he also mentioned *G. macrophyllum* Willd. subsp. *fauriei* (H.Lév.) Worosch. equivalent for the plants of Kamchatka, Sakhalin, the Kurils and Japan.

   Russian name: Lapchatka Egeda.
   Japanese name: Kojima-enoshima.
   Note: Charkevicz (1996) adopted *Potentilla anserina* L. as the correct name. But he also mentioned *P. anserina* L. subsp. *edegii* (Wormsk.) Hit. equivalent for the plants of Russian Far East.

9) *Potentilla megalantha* Takeda [BE/R][FJ,WF/J]
   Russian name: Lapchatka krupnotsvetkovaya.
   Japanese name: Chishima-enoshima.
   Note: Cherepanov (1996) recognized *Potentilla megalantha* Takeda Hult. as the correct name. But he also mentioned *P. fragarioides* L. as the correct name.

10) *Potentilla stolonifera* Lehm. ex Ledeb. [BE/R]; *Potentilla fragarioides* L. [FJ/J]; *Potentilla stolonifera* Lehm. [WF/J]
    Russian name: Lapchatka pogarbovochka.
    Japanese name: Tsuru-kinbai.
    Note: Cherepanov (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* Thuñb. [BE/R][FJ,WF/J]
    Russian name: Shipovnik morshchinistyj.
    Japanese name: Hama-nashi, Hama-nasu.

12) *Rubus mesogaeus* Focke diels [BE/R]; *Rubus mesogaeus* Focke [FJ,WF/J]
    Russian name: Malina nazemnaya.
    Japanese name: Kuro-ichigo.
    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.

    Russian name: Malina sakhalinskaya.
    Japanese name: Kuro-ichigo.

14) *Sanguisorba parviflora* (Maxim.) Takeda [BE/R]; *Sanguisorba tenuifolia* Fisch. ex Link var. *tenuifolia* [FJ/J]; *Sanguisorba tenuifolia* Fisch. ex Link var. *alba* [WF/J]
25. FABACEAE
1) Lathyrus japonicus Willd. [BE/R]; Lathyrus japonicus Willd. subsp. japonicus [FJ,WF/J]
   - Russian name: China yaponskaya.
   - Japanese name: Hama-endo.

2) Lathyrus pilosus Cham. [BE/R]; Lathyrus palustris L. subsp. pilosus (Cham.) Hultén [FJ,WF/J]
   - Russian name: Derebennik ivolistnyj.
   - Japanese name: Sendai-hagi.

3) Lespedeza bicolor Turcz. [BE/R][FJ,WF/J]
   - Russian name: Ainu-tachitsubo-sumire.

4) Thermopsis lupinoides (L.) Link [BE/R][FJ,WF/J]
   - Russian name: Termopsis lyupinoidnyj.
   - Japanese name: Kusama-gata-nosalsikaya.

5) Trifolium hybridum L. [BE/R][FJ,WF/J]-Naturalized
   - Russian name: Derbennik ivolistnyj.
   - Japanese name: Ezo-miso-hagi.

6) Trifolium pratense L. [BE/R][FJ,WF/J]-Naturalized
   - Russian name: Klever polzuchij or Klever krasnyj.
   - Japanese name: Ezo-miso-hagi.

7) Trifolium repens L. [BE/R][FJ,WF/J]-Naturalized
   - Russian name: Klever polzuchij or Klever krasnyj.
   - Japanese name: Murasaki-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: Geran’ volosistotsvetkovaya.
   - Japanese name: Chishima-furo.

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]
1) Chamaenerion angustifolium (L.) Holub subsp. angustifolium [FJ/J]  
   Russian name: Ivan-chai uzkolistnyj.  
   Japanese name: Yanagi-ran.

2) Cirsium alpinum L. [BE/R][WF/J]; Cirsium alpinum L. subsp. alpina [FJ/J]  
   Russian name: Dvulepennik 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: Ezo-no-shishiudo.

4) Epilobium ciliatum Raf. subsp. ciliatum  
   Russian name: Russian name: Dyoren shvedskij.  
   Japanese name: Iwa-akabana.

5) Epilobium maximowiczii L. [BE/R]; Epilobium ciliatum Raf. subsp. ciliatum [FJ/J]; Epilobium glandulosum Lehm. var. asiaticum H.Hara [WF/J]  
   Russian name: Girchovnik kitajskij.  
   Japanese name: Dvulepestnik al’pijskij.

6) Epilobium palustre  
   Russian name: Klyukva melkoplodnaya.

7) Epilobium sibiricum B.Schr. [BE/R]; Epilobium palustre subsp. diversipilosum (Nakai) H.Hara var. diversipilosum (Nakai) H.Hara subsp. diversipilosum (Nakai) H.Hara subsp. diversipilosum (Nakai) H.Hara subsp. diversipilosum [WF/J]  
   Russian name: Borshchevik sherstistyj.

8) Epilobium maximowiczii L. subsp. alpina  
   Russian name: Jama-bófóu.

9) Heracleum lanatum Michx. [BE/R]; Heracleum siphondylum L. subsp. montanum (Schleich. ex Gaudin) Biq. [FJ/J]; Heracleum dulce Fisch. [WF/J]  
   Russian name: Vekh yadovityj.

10) Ligusticum scoticum Hultenii Fernald [FJ,WF/J]  
    Russian name: Rebroplodnik ural’skij.

11) Pleurospermum uralense Hoffm. [BE/R]; Pleurospermum austriacum Hoffm. subsp. uralense (Hoffm.) Sommier [FJ/J]; Pleurospermum kamtschaticum Hoffm. [WF/J]  
    Russian name: Pleurospermum kamtschaticum Hoffm. [WF/J]  
    Russian name: Rebroplodnik ural’skij.

12) Vaccinium microcarpum (Turcz.) Schmalh. [WF/J]  
    Russian name: Vekh yadovityj.

32. HIPPURIDACEAE  
1) Hippuris vulgaris L. [BE/R][FJ,WF/J]  
   Russian name: Khvostnik obyknovennyj or Vodyanaya soskena obyknovennaya.  
   Japanese name: Me-matsuyoigusa.

33. CORNACEAE  
1) Chamaepericlymenum suecicum (L.) Asch. et Graebn. [BE/R][FJ,WF/J]  
   Russian name: Dyoren shvedskij.  
   Japanese name: Ezo-no-yoroigusa.

34. APIACEAE  
   Russian name: Dudnik prelomlennyj.  
   Japanese name: Angelica genuflexa Nutt. ex Torr. et A.Gray

2) Angelica gmelinii (DC.) M.Pimen. [BE/R]; Cicuta virosa (L.) Khokhr. et Mazurenko subsp. sachalinense (F.Schmidt) Kitag. var. sachalinense [WF/J]  
   Russian name: Bagul’nik podbel.

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: Shaku.

4) Anthriscus sylvestris (L.) Hoffm. [BE/R][FJ,WF/J]; Anthriscus aemula Schischk. [WF/J]  
   Russian name: Kupyr’ lesnoi.

5) Bupleurum longiradiatum Turcz. [BE/R]; Bupleurum longiradiatum Turcz. var. breviradiatum F.Schmidt [FJ/J]; Bupleurum longiradiatum Turcz.

35. ERICACEAE  
1) Chamaedaphne calyculata (L.) Moench [BE/R][FJ,WF/J]  
   Russian name: Bolotnyj mirt.

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.

3) Oxyoccus microcarpus Turcz. ex Rupr. [BE/R]; Vaccinium microcarpum (Turcz. ex Rupr.) Schmalh. [FJ/J]; Vaccinium microcarpum (Turcz.) Schmalh. [WF/J]  
   Russian name: Klyukva melkoplodnaya.
2) Lysimachia davurica Ledeb. var. vulgaris

3) Primulaceae

3) Naumburgia thyrsiflora

38. Gentianaceae

1) Gentiana axillariflora H.Lév. et Vaniot [BE/R]; Gentiana triflora Pall. var. japonica (Kusn.) H.Hara [FJ,WF/J]

Russian name: Ganko-ran.

Japanese name: Akane-mugura.

Note: Russian botanists classified Gentiana into several species in the Russian Far East, but most Japanese regarded it as a single species in the Northern Hemisphere.

4) Gentianella auriculata (Pall.) Gillett


7) Vaccinium praestans Lamb. [BE/R][FJ,WF/J]

Japanese name: Kuro-usugo.

4) Oxycoccus palustris Pers. [BE/R]; Vaccinium oxycoccus L. [FJ,WF/J]

Russian name: Krasnika.

Russian name: Golubika.

40. Rubiaceae

4) Rubia jesoensis (Miq.) Miyabe et Miyake

Russian name: Rzinasha belovataya.

Russian name: Shiksha sibirskaya.

4) Ophelia tetrapetala (Pall.) Grossh. [BE/R]; Swertia tetrapetala Pall. [FJ,WF/J]

Russian name: Gorechavochka pazushnaya.

Russian name: Shiksha sibirskaya.

Russian name: Marenna iezskaya.

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

Japanese name: Iwa-tsutsuji.

Note: Czerepanov (1995) adopted the latter, Vaccinium vitis-idaea L. as the correct name.

3) Menyanthaceae

1) Menyanthes trifoliata L. [BE/R][FJ,WF/J]

Japanese name: Yukiwari-kozakura.

Russian name: Gorechavochka pazushnaya.

Russian name: Shiksha belovataya.

Russian name: Podmarennik severnyj.


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.

Russian name: Podmarennik russkij.

Japanese name: Ezo-kawara-matsuba.

Japanese name: Hana-ikari.

Russian name: Gorechavochka pazushnaya.

Russian name: Shiksha sibirskaya.

Japanese name: Iwa-tsutsuji.

Note: Czerepanov (1995) needs further comparison with Japanese plants.

42. Lamiaceae

1) Clinopodium chinense (Benth.) O.Kuntze [BE/R]; Clinopodium chinense (Benth.) O.Kuntze var. parviflorum (Kudô) H.Hara [FJ,WF/J]; Clinopodium chinense (Benth.) O.Kuntze subsp. grandiflorum (Maxim.) H.Hara var. parviflorum (Kudô) H.Hara [FJ,WF/J]

Russian name: Zheleznaya karela.

Russian name: Gorechavochka pazushnaya.

Russian name: Gorechavochka pazushnaya.

Russian name: Grebezhnaya karela.

Japanese name: Kuruma-bana.

Japanese name: Pakhuchka kitajskaya.

Japanese name: Zheleznaya karela.
3) **Lycopus lucidus** Turcz. ex Benth. [BE/R]; **Lycopus lucidus** Turcz. [FI, WF/J]

Russian name: Zyuuni blestyaushchij.
Japanese name: Shirone.

4) **Lycopus uniflorus** Michx. [BE/R][FI, WF/J]

Russian name: Zyuuni odnoisvetkoviyj.
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 [FI/J]; **Mentha arvensis** L. var. **piperascens** Malinv. [WF/J]

Russian name: Myata kanadskaya.

Note: Charkevicz (1995) adopted *Mentha canadensis* L. as the correct name.

6) **Prunella asiatica** Nakai [BE/R]; **Prunella vulgaris** L. subsp. **asiatica** (Nakai) H.Hara [FI, WF/J]

Russian name: Cherepovskaya aziatyskaya.
Japanese name: Urasabu-gusa.

7) **Scutellaria strigilosa** Hemsl. [BE/R][FI, WF/J]

Russian name: Shlemnik shchetinistyj.

Japanese name: Hakka.

Note: Charkevicz (1995) adopted *Scutellaria grayana* Maxim. ex Kom. subsp. teucriifolia as the correct name.

8) **Scutellaria yezoensis** Kudô [BE/R]; **Scutellaria yezoensis** Kudô [FI/J]; **Scutellaria strigilosa** Hemsl. var. **yezoensis** (Kudô) Kitam. [WF/J]

Russian name: Shlemnik iezskij.

Japanese name: Numiki-sô.

9) **Stachys aspera** Michx. [BE/R]; **Stachys riederi** Cham. var. **riederi** [FI/J]; **Stachys riederi** Cham. var. **villosa** (Kudô) H.Hara [WF/J]

Russian name: Chistets sherokhovatyj.

Japanese name: Ezo-inugoma.

Note: Charkevicz (1987) adopted S. *yezoensis* Kudô as the correct name.

43. SCROPHULARIACEAE

1) **Euphrasia yezoensis** H.Hara [BE/R]; **Euphrasia maximowiczii** Wettst. var. **yezoensis** H.Hara [FI, WF/J]

Russian name: Ochanka iezskaya.

Japanese name: Ochanka iezskaya.

2) **Lonicera caerulea** var. **edulis** (Turcz.) Hultén [FI, WF/J]

Russian name: Zholoist' golubaya.

Japanese name: Ke-yonomi.

Note: Charkevicz (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 sachalinesis** (F.Schmidt) Nakai [BE/R]; **Lonicera maxmowiczii** (Rupr. ex Maxim.) Rupr. ex Maxim. var. **sachalinesis** F.Schmidt [FI, WF/J]

Russian name: Zholoist' sakhalinskaya.

Japanese name: Benibana-hyôtanboku.

3) **Sambucus sieboldiana** (Miq.) Schwer. var. **miquelii** (Nakai) H.Hara [BE/R]; **Sambucus racemosa** L. subsp. **kamtschatcica** (E.Wolf) Hultén [FI, WF/J]

Russian name: Buzina Mikeli.

Japanese name: Ezo-niwatoko.

Note: Charkevicz (1987) adopted *S. sieboldiana* (Miq.) Schwer. as the correct name.

4) **Viburnum sargentii** Koehne [BE/R]; **Viburnum opulus** L. var. **calvescens** (Rehder) H.Hara [FI, WF/J]

Russian name: Kalina Sarzhenta.

Japanese name: Kanboku.

46. ADOXACEAE

1) **Adoxa moschatellina** L. [BE/R][FI, WF/J]

Russian name: Adoksa muskusnaya.

Japanese name: Renpuku-sô.

47. VALERIANACEAE

1) **Patrinia scabiosa** Fisch. ex Link [BE/R]; **Patrinia scabiosa** Fisch. ex Trevir. [FI/J]; **Patrinia scabiosa** Fisch. [WF/J]

Russian name: Patreniya skabiozolistnaya.

Japanese name: Ominashi.

8) **Scrophularia grayana** Maxim. ex Kom. [BE/R][FI/J]; **Scrophularia grayana** Maxim. [WF/J]

Russian name: Norichnik Greya.

Japanese name: Ezo-hinano-usutsubo.

48. CAMPANULACEAE

1) **Adenophora triphylla** (Thunb.) A.DC. [BE/R]; **Adenophora triphylla** (Thunb.) A.DC. var. **japonica** (Regel) H.Hara

Russian name: Adenofora iezskaja.

Japanese name: Ezo-hinano-usutsubo.
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[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: Osoba-no-iwa-gikyō.

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-gikyo.

Note: The author name “Thunb. ex Murray” should be cited as “Thunb.” (Bartholomew et al. 1997).

4) *Lobelia sessilifolia* Lamb. [BE/R][FJ,WF/J]

Russian name: Lobeliya sidyachelistnaya.

Japanese name: Sawa-gikyo.

5) *Artemisia stelleriana* Besser [BE/R][FJ,J]; *Artemisia koidzumii* Nakai [BE/R][FJ,J]; *Artemisia laciniata* Willd. [FJ,WF/J]

Russian name: Polyń’ Gmelina.

Japanese name: Iwa-yomogi.

6) *Cirsium kamtschaticum* Ledeb. ex DC [Eremenko 1920/R]; *Parasenecio auriculata* (DC.) H.Koyama var. *kamtschatica* (Maxim.) H.Koyama [FJ]; *Cacalia auriculata* DC. var. *kamtschatica* (Maxim.) Matsum. [WF/J]

Russian name: Kakaliya kormatskaya.

Japanese name: Mimi-kōmori.


Russian name: Kakaliya moshnaya.

Japanese name: Yobusuma-sō.

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) *Chorisium repens* (L.) DC. [BE/R]; *Ixeris repens* (L.) A.Gray [FJ,WF/J]

Russian name: Khorizis poluchij.


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][J]; *Cirsium kamtschaticum* Ledeb. [WF/J]

Russian name: Bodyak kamchatkskij.

Japanese name: Chishima-azami.


Russian name: Bodyak grebenchaty.

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 (Irwatsuki et al. 1995b).


Russian name: Melkolepestnik kamchatskij.

Japanese name: Murashi-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/RJ,WF/J]; Naturalized?

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. Charkevicz (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]; Hieracium umbellatum L. var. japonicum H.Hara [FJ/J]

Russian name: Yastrebinka zontichnaya.

Japanese name: Akita-buki.

22) Lagedium sibiricum (L.) Sojak [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 Lagedium sibiricum (L.) Maxim. as the correct name.

23) Lepidotea suaveolens (Pursh) Nutt. [BE/R]; Matricaria matricarioides (Less.) Porter [FJ,WF/J]; Naturalized

Russian name: Lepidoteka dushistaya.

Japanese name: Ko-shika-giku.

Note: Czerepanov (1995) adopted Lepidotea suaveolens as the correct name.

24) Ligularia hodgsonii Hook. [BE/R]; Naturalized

Japanese name: Inu-kamitsure.

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: Arechi-nogeshi.

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: Oduvanchik iturupskij.

Japanese name: Hanlon-so.

27) Pilosella aurantiaca (L.) Schulz et Sch. Bip. [BE/R]; Hieracium aurantiacum L. [FJ,WF/J]; Naturalized

Russian name: Krestovnik dubravnij.

28) Pteronica caentchatica (Lede.) Kom. ex Heimerl [BE/R]; Achillea alpina L. subsp. caentchatica (Heimerl) Kitam. [FJ,WF/J]

Russian name: Chikhotnik krugolovoj.

Japanese name: Kogane-kita-azami.

29) Pteronica japonica (Heimerl) Woroch. [BE/R]; Achillea alpina L. subsp. japonica (Heimerl) Kitam. [FJ,WF/J]

Russian name: Chikhotnik yaponskij.

Japanese name: Kogane-kita-azami.

Note: Czerepanov (1995) adopted Pteronica japonica (Heimerl) Woroch. as the correct name.

30) Pteronica macrocephala (Ruopr.) Kom. [BE/R]; Achillea ptarmica L. subsp. macrocephala (Ruopr.) Heimerl var. macrocephala [FJ/J]; Achillea ptarmica L. subsp. macrocephala (Ruopr.) Heimerl [WF/J]

Russian name: Chikhotnik krunpologovoj.


31) Saussurea riederi Herder [BE/R]; Saussurea riederi Herder subsp. yezeoensis (Maxim.) Kitam. var. yezeoensis [FJ/J]; Saussurea riederi Herder subsp. yezeoensis (Maxim.) Kitam. [WF/J]

Russian name: Sossyureya Ridera.

Japanese name: Hangon-sō.

32) Senecio canabilfolius Less. [BE/R]; Senecio canabilfolius Less. [BE/R]; Naturalized

Russian name: Krestovnik konoplelistnyj.

Japanese name: Hangon-sō.

33) Senecio pseudoarnica Less. [BE/R]; Naturalized

Russian name: Krestovnik izhearnikovyj.

Japanese name: Hangon-sō.

34) Senecio pseudoarnica Less. [BE/R]; "pseudoarnica", [WF/J]

Russian name: Krestovnik konoplelistnyj.

35) Solidago dahurica Kitag. [BE/R]; Solidago virgaurea subsp. leiocarpa (Benth.) Hultén var. leiocarpa [FJ/J]; Solidago virgaurea L. subsp. leiocarpa (Benth.) Hultén f. japonalisitrus Kitam. [WF/J]

Russian name: Zolotarnik daurskij.

Japanese name: Miyama-aki-no-kirin-so, Kogane-giku.

36) Sonchus arenicola Woroch. [BE/R]; Sonchus arenicola Woroch. [BE/R]; Naturalized

Russian name: Oduvanchik aptechnyj.

Japanese name: Arechi-nogeshi.

37) Sonchus arvensis Link [BE/R]; Sonchus arvensis Link [BE/R]; Naturalized

Japanese name: Hangon-sō.

38) Taraxacum officinale Wigg. [BE/R]; Taraxacum officinale Wigg. [BE/R]; Naturalized

Russian name: Oduvanchik aptechnyj.

Japanese name: Seiyo-tanpopo.

39) Taraxacum shikotanense Kitam. [BE/R]; Taraxacum shikotanense Kitam. [BE/R]; Naturalized

Russian name: Oduvanchik aptechnyj.

Japanese name: Shikotan-tanpopo.

40) Taraxacum yetrofuense Kitam. [BE/R]; Taraxacum yetrofuense Kitam. [BE/R]; Not listed [FJ,WF/J]

Russian name: Oduvanchik aptechnyj.

Japanese name: Etorofu-tanpopo.

41) Tripleurospermum perforatum (Merat) M.Lainz [BE/R]; Naturalized

Russian name: Tripleurospermum perforatum (Merat) M.Lainz [BE/R]; Krestovnik konoplelistnyj.

Japanese name: Hangon-sō.

42) Tripleurospermum tetragonospermum (F.Schmidt) Pobed. [BE/R]; Matricaria sibirica (L.) Benth.

Russian name: Sossenitsa topyanaya.

Japanese name: Yastrebinka zontichnaya.

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. Charkevicz (1992) recorded two similar species; G. uliginosum L. and G. pilulare Wahlenb., from Sakhalin and the southern Kurils. Future critical determination is necessary.
tetragonosperma (F.Schmidt) H.Hara [FJ/J]; Matricaria tetragonosperma (F.Schmidt) H.Hara et Kitam. [WF/J]

Russian name: Trekhrebrosemannyi chetyrekhugol'nosemyannyy.
Japanese name: Shika-giku.

50. POTAMOGETONACEAE
1) Potamogeton perfoliatus L. [collected by Eremenko in 2002/R]; [WF/J]

Russian name: Rdest pronyzonnolistnyj.
Japanese name: Hiroha-no-ebimo.

2) Zostera cespitosa Miki [BE/R]; Zostera caespitosa Miki [WF/J]

Russian name: Vzmornik derynsyj
Japanese name: Sugamo.

51. ZOSTERACEAE
1) Phyllospadix iwatensis Makino [BE/RJ; [WF/J]

Japanese name: Fillospadiks ivatinskij.

2) Zosteraceae
dumortieri Morr. var. esculenta (Koidz.) Kitam.

Russian name: Rdest pronzyonnolistnyj.

3) Iris pseudacorus L. subsp. oxysepalum (Turcz.) Hultén [WF/J]

Russian name: Cheremsha.
Japanese name: Luk okhotskij.

4) Iris setosa Pall. ex Link

Japanese name: Kasatik gladkij.

5) Fritillaria camschatcensis (L.) Ker Gawl. [BE/RJ]["camtschatcensis", WF/J]

Japanese name: Kasatik mechevidnyj.

52. LILIACEAE
1) Allium ochotense Prokh. [BE/R]; Allium victorialis L. subsp. platyphylhum Hultén [WF/J]

Russian name: Luk okhotskij or Cheremsha.
Japanese name: Gyôja-nin'niku.

2) Convallaria keiskei Miq. [BE/RJ; [WF/J]

Japanese name: Kasatik lozhnoairnyj.

3) Fritillaria camschatcensis (L.) Ker Gawl. [BE/RJ]["camtschatcensis", WF/J]

Japanese name: Kasatik shchetinistyj.

4) Gagea nakaiana Kitag. [BE/R]; Gagea lutea (L.) Ker Gawl. [WF/J]

Russian name: Gusinyj luk Nakai.
Japanese name: Kibana-no-amamo.

5) Hemerocallis esculenta Koidz. [BE/R]; Hemerocallis dumortieri Morr. var. esculenta (Koidz.) Kitam. [WF/J]

Russian name: Russkaya lilia.

6) Hosta rectifolia Nakai [BE/R]; Hosta albomarginata (Hook.) Ohwi ["albo-marginata", WF/J]

Russian name: Khosta pryamolistnaya.

7) Lilium debile Kitlitz [BE/R]; Lilium medeoloides A.Gray [WF/J]

Russian name: Liliya slabaya.

8) Maianthemum dilatatum (Wood) A.Nelson et J.F.Macbr. [BE/RJ;[WF/J]

Russian name: Majnik shirokolistnyj.
Japanese name: Maizuru-sô.

9) Trillium kamtschaticum Pall. [WF/J]

Russian name: Trillium kamotschatskij.

10) Veratrum grandiflorum (Maxim. ex Baker) Loes.f. [BE/R]; Veratrum album L. subsp. oxysepalum Hultén [WF/J]

Russian name: Chemeritsa krupnotsvetkovaya.
Japanese name: Baiksei-sô.

53. AMARYLLIDACEAE
1) Narcissus poeticus L. [Eremenko (2003)/R][WF/J]—Escaped

Russian name: Narciss poeticheskij or Narciss belyj.
Japanese name: Kuchibeni-zuisen.


Russian name: Narciss lozhnjyj or Narciss zholtjy.
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.

2) Iris laevigata Fisch. et C. A. Mey. [BE/R]; [WF/J]

Russian name: Kasatik gladkij.

3) Iris pseudacorus L. [BE/RJ; [WF/J]—Escaped

Russian name: Kasatik lozhnjmaorhyj.

4) Iris setosa Pall. ex Link [BE/R]; Iris setosa Pall. [WF/J]

Russian name: Kasatik shchetinistyj.

55. JUNCACEAE
1) Juncus bufonius

Japanese name: Kuruma-yuri.

2) Maianthemum dilatatum (Wood) A.Nelson et J.F.Macbr. [BE/RJ;[WF/J]

Russian name: Majnik shirokolistnyj.
Japanese name: Maizuru-sô.

3) Trillium kamtschaticum Pall. [WF/J]

Russian name: Trillium kamotschatskij.

4) Iris setosa Pall. ex Link [BE/R]; Iris setosa Pall. [WF/J]

Russian name: Kasatik shchetinistyj.

Japanese name: Hi-ôgi-ayame.

56. JUNCACEAE
1) Juncus bufonius L. [BE/RJ][WF/J]—Naturalized?

Russian name: Sitnik somnitel'nyj.

5) Hosta rectifolia Nakai [BE/R]; Hosta albomarginata (Hook.) Ohwi [=H. lancifolia] (Engl. in Charkevicz 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 Sakhin and the Kurils.

7) Lilium debile Kitlitz [BE/R]; Lilium medeoloides A.Gray [WF/J]

Russian name: Liliya slabaya.

Japanese name: Kuro-yuri.

8) Maianthemum dilatatum (Wood) A. Nelson et J.F. Macbr. [BE/RJ][WF/J]

Russian name: Majnik shirokolistnyj.
Japanese name: Maizuru-sô.

9) Trillium kamtschaticum Pall. [WF/J]

Russian name: Trillium kamotschatskij.

10) Veratrum grandiflorum (Maxim. ex Baker) Loes.f. [BE/R]; Veratrum album L. subsp. oxysepalum Hultén [WF/J]

Russian name: Chemeritsa krupnotsvetkovaya.
Japanese name: Baiksei-sô.

Note: The correct name is T. kamtschaticum Ker Gawl. (Nakai and Ito 1991).

11) Veratrum album L. subsp. 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.


Russian name: Narciss lozhnjyj or Narciss zholtjy.
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.

2) Iris laevigata Fisch. et C. A. Mey. [BE/R]; Iris laevigata Fisch. [WF/J]

Russian name: Kasatik gladkij.

3) Iris pseudacorus L. [BE/R][WF/J]—Escaped

Russian name: Kasatik lozhnmaorhyj.

Japanese name: Ki-shobu.

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/RJ][WF/J]—Naturalized?

Russian name: Sitnik somnitel'nyj.

Japanese name: Sitnik zhabij.
3) Juncus gracillimus (Buch.¹nau) 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 sosochovkij.
   Japanese name: Ao-kôgai-zekishô.
6) Juncus prominens (Buchenau) Miyabe et Kudo [BE/R][WF/J]
   Russian name: Sitnik vdyayushchisjaya.
   Japanese name: Sekishô-i.
7) Juncus tatwekaii Satake [BE/R]; not listed [WF/J]
   Russian name: Sitnik Tatwekaki.
   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 Charkevicz (1985) may be this species.
8) Juncus tenus Wild. [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]; Luzula capitata (Miq.) Kom. [BE/R]; Luzula capitata (Miq.) Miq. [WF/J]
   Russian name: Ozhika golovchataya.
   Japanese name: Suzume-no-yari.

56. POACEAE
1) Achtherum extremitiorientale (H.Hara) Keng ex Tzve!.
   Russian name: Chishima-gariyasu (in the broad sense).
   Japanese name: Iwa-nogariyasu.
   Note: Czerepanov (1995), Barkalov and Eremenko (2003) regarded this species as a synonym of the Russian species name.
2) Agrostis clavata Trin. [BE/R][WF/J]
   Russian name: Polevitsa bulavovidnaya.
   Japanese name: Yama-mugi.
3) Agrostis flaccida Hack. [BE/R][WF/J]
   Russian name: Polevitsa gibkaya.
   Japanese name: Miya-mukabô.
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 sherochkovataya.
   Japanese name: Ezo-nukabô.
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.
   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: Arktomatyndik vydelayushchisjaya.
   Japanese name: Oni-ichigotsunagi.
9) Beckmannia syzigachne (Steud.) Fern. [BE/R][WF/J]
   Russian name: Bekmaniya vostochnaya.
10) Calamagrostis barbata V.Vassil. [BE/R]; Calamagrostis langsdorffii (Link) Trin. [WF/J]
    Russian name: Vejnik dal'nevostochnyj.
    Japanese name: Yama-awa.
11) Calamagrostis hakonensis Franch. et Sav. [BE/R][WF/J]
    Russian name: Vejnik khakonskij.
    Japanese name: Hime-nogariyasu.
12) Calamagrostis langsdorffii (Link) Trin. [WF/J]
    Russian name: Vejnik borodatýj.
    Note: This taxon is not usually recognized in Japan and may be included in Calamagrostis langsdorffii s.l. (cf., Osada 1989).
13) Calamagrostis inexpansa A.Gray [BE/R]; Calamagrostis neglecta (Ehrh.) G.Gaertn., B.Mey. et Scherb. var. aculeolata (Hack.) Miyabe et Kudo [WF/J]
    Russian name: Vejnik shtagometel'chatýj.
    Japanese name: Chishima-gariyasu.
    Note: On Calamagrostis neglecta s.l., further taxonomic study is necessary.
14) Calamagrostis langsdorffii (Link) Trin. [BE/R][WF/J]
    Russian name: Vejnik khalonskij.
    Japanese name: Hime-nogariyasu.
15) Calamagrostis neglecta (Ehrh.) G.Gaertn., B.Mey. et Scherb. [BE/R]; not listed [WF/J]
    Russian name: Vejnik nezamechennyj.
16) Dactylis glomerata L. [BE/R][WF/J]–Naturalized
    Russian name: Yezha sbornaya.
    Japanese name: Chishima-gariyasu.
    Note: On Calamagrostis neglecta s.l., further taxonomic study is necessary.
17) Elymus dahuricus Turcz. ex Griseb. [BE/R]; Elymus dahuricus Turcz. [WF/J]
    Russian name: Pyrejnik Voroshilova.
    Japanese name: Ito-konuka-gusa.
    Note: Czerepanov (1995) 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. (Charkevich, 1985), which is not clear to Japanese botanists. Charkevich (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 polzuchi.

Japanese name: Shibamugi.

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 ovche’ya.

Japanese name: Ushinoke-gusa.

21) *Festuca pratensis* Huds. [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. This species is treated as one of the naturalized plants in Japan (Shimizu 2003).

22) *Festuca rubra* L. [BE/R][WF/J]

Russian name: Ovsyanitsa krasnaya.

Japanese name: Ō-ushinoke-gusa.

23) *Hierochloe sachalinesis* (Printz.) Worosch. [BE/R]; *Hierochloe odorata* (L.) Beauv. var. *pubescens* Krylov [WF/J]

Russian name: Zubrova sakhalinskaya.

Note: Osada (1989) also adopted the species name *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][WF/J]—Naturalized

Russian name: Yachmen’ grivastyj.


Note: Osada (1989) adopted *Hordeum jubatum* L., but recent Russian botanists (Tzvelev 1999, Barkalov and Taran 2004) adopt *Criterium 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 recombinination 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* Anders. [BE/R][WF/J]

Russian name: Veerotsvetnik kitaiskij or Miskantus kitaiskij.

Japanese name: Susuki.

28) *Molinia japonica* Hack. [BE/R]; *Molinia japonica* (Hack.) Hayata [WF/J]

Russian name: Moliniya yaponskaya.

Japanese name: Numagaya.

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 trostnikovидный.

Japanese name: Kusa-yoshi.

30) *Phleum pratense* L. [BE/R][WF/J]—Naturalized

Russian name: Timofoevka lugovaya.

Japanese name: Ō-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 krasnaya.

Japanese name: Karafuto-ichigotsunagi.

Note: Osada (1989) adopted *Poa macrocalyx var. tatewakiana* Ohwi as the correct name.

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 pulmina* (Vasey) Hitche. [WF/J]

Russian name: Beskilnitsa kurilskaja.

Japanese name: Chiishima-dojo-yotsunagi.

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: Shiba-mugi.

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.


41) Trisetum umbratile (Kitag.) Kitag. [BE/R]; ?Trisetum sibiricum Rupr. [WF/J]
Russian name: Trish,chetinnik tenevoj.

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 camtschatcense (L.) Schott [BE/R][WFI]
Russian name: Lizikhiton kamchatskij.
Japanese name: Mizu-basho.

4) Symlocarpus reuifolius Schott ex Tzvelev [BE/R]; Symlocarpus foetidus Nutt. var. latissimus (Makino) H.Hara [WF/J]
Russian name: Simplokarpus pochkolistnyj.
Japanese name: Zazen-so.

58. LEMNACEAE
1) Lemna trisulca L. [BE/R][WF/J]
Russian name: Ryaska troichataya.
Japanese name: Hime-kaiu.

2) Lysichiton camtschatcense (L.) Schott [BE/R][WF/J]
Russian name: Lizikhiton kamchatskij.
Japanese name: Mizu-basho.

4) Symlocarpus renifolius Schott ex Tzvelev [BE/R]; Symlocarpus foetidus Nutt. var. latissimus (Makino) H.Hara [WF/J]
Russian name: Simplokarpus pochkolistnyj.
Japanese name: Zazen-so.

59. TYPHAECACE
1) Typha latifolia L. [BE/R][WF/J]
Russian name: Rogoz shirokolistnyj.
Japanese name: Gama.

60. CYPERACEAE
1) Carex aomoreusis 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.) Kôk. [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 kruhnpolodnaya.
Japanese name: Ezo-no-kobô-mugi.

7) Carex pumila Thund. [BE/R][WF/J]
Russian name: Osoka maloroslaya.
Japanese name: Köbô-shiba.

8) Carex rhynchophyza C.A. Mey. [Eremenko (2003)] [WF/J]
Russian name: Osoka zelyonen 'kaya.
Japanese name: Ezo-sawa-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.) Kôk. [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 interstis Zinsel. [WF/J]
Russian name: Bolotnitsa bolotnaya.

15) Eleocharis wichurae Boeck [BE/R][WF/J]
Russian name: Bolotnitsa vlagalishchnaya.
Japanese name: Ezo-sawa-suge.

16) Eriophorum gracile Koch [BE/R][WF/J]
Russian name: Pushitsa strojnaya.

17) Eriophorum vaginatum L. [BE/R][WF/J]
Russian name: Pushitsa vlagalishchnaya.

18) Scirpus tabernaemontani C.C.Gmel. [BE/R][WF/J]
Russian name: Kamysy Tabernemontana.
Japanese name: Futo-i.
61. ORCHIDACEAE

1) Dactylorhiza aristata (Fisch. ex Lindl.) Soó [Eremenko (2003)/] Orchis aristata Fisch. [WF/J]
   Russian name: Pal’chatokorennik ostisyy.
   Japanese name: Hakusan-chidori.
2) Gymnadenia conopsea (L.) R.Br. [BE/R][WF/J]
   Russian name: Kokusujin komarnikovyy.
   Japanese name: Tegata-chidori.
3) Platanthera ditmariana Kom. [Eremenko (2003)/];
   Platanthera chorisiana (Cham.) Rchb.f. var. elata Finet [WF/J]
   Russian name: Lyubka Ditmara.
   Japanese name: Mamek.
4) Platanthera extremiorientalis Nevski [BE/R];
   Platanthera metabifolia F.Maek. [WF/J]
   Russian name: Lyubka dal’nevoostochnaya.
   Japanese name: Ezon-chidori.
5) Platanthera holologlottis Maxim. [BE/R][WF/J]
   Russian name: Lyubka tsel’nobayba.
   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.

Acknowledgements

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References

Berlin: Gebruder Borntræger. (In German.)


Table 1. The distribution of the vascular plants in the Habomais.

The species are ordered alphabetically. Naturalized or escaped plants within parenthesis.

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Anu., Amuchina [Akiyuri, 奥目名]; Iur., Iuriy [Yuri, 勝留]; Pol., Polonskogo [Taniku, 多聞]; Tan., Tanflyyeva [Suisho, 水島]; Zel., Zelenyj (Zelenyi) [Shibotsu, 志育]; Dem., Demina [Harukarimosiri, ハルカリモシリ (small island, 3km east of Yuri)]; Sto., Storozhevoy [Moemoshiri, 南茂尻 (small island, 3km south-west of Signal'nyy, 貝塚島)]

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

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

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e-mail: probatova@ibss.dvo.ru

Abstract

Chromosome numbers for 86 vascular plant species of 69 genera and 32 families, from Sakhalin, Moneron and Kurile Islands, are given. The chromosome numbers are reported here for the first time for the following 17 species: Arabis japonica, Artemisia punctigera, Calamagrostis urelytra, Callianthemum sachalinense, Cerastium sugawarae, Dianthus sachalinensis, Lonicera tolmatchevii, Melandrium 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 kamschaticum, Draba cinerea, Echinochioa occidentalis, Erysimum pallasii, Sagina crassicaulis and Stellaria fenzlii, new cytotypes were revealed. At present, in Sakhalin, Moneron and the Kurile Islands chromosome numbers have been counted for 536 species. Chromosome numbers are now known for 48 species from Moneron.

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

Introduction

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

Materials and Methods

Counts were made mostly by E.G. Rudyka (R.), on squashed preparations of root tips fixed with Carnoy’s solution, taken from plants in the greenhouse of the Institute of Biology & Soil Science FEB RAS, Vladivostok, where alive plants collected by V.Yu. Barkalov in the field, were preserved. Some plants were grown from seeds taken from herbarium specimens. One count was made by S.A. Shatalova (Sh.). Preparations were stained with iron hematoxylin. Some unpublished or critical data obtained by the late Dr. A.P. Sokolovskyaya (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, Upur Island, Telyatjeva Bay, tall herbs community near maritime slope, 8.VIII.2000, coll. V. Barkalov.
   Chromosome number. 2n=40 (R.).

   Note. Chromosome number 2n=32 in A. ochotense was already known on the Russian Far East, from Kamchatka Peninsula (Sokolovskaya 1963 - as “A. victorialis”). We revealed a new cytotype, with 2n=40. The closely related species A. victorialis 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.).

   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, Ob 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 ploidity 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.).

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

4. Crepis chrysantha (Ledeb.) Turcz.
   Chromosome number. 2n=c.16 (R.).
   Voucher specimen. VLA 8940, Sakhalin, Nabiljsky Range, Champinsky Pass, the upper part of the rivulet (the right affluent of Krhbetovy Spring), the spot elevation “1511 m”, break-stone deposits on the top of the mountain, 8.VIII.2002, coll. V. Barkalov.

   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 Suyan 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. +Phalacroloma annuum (L.) Dumort.
   (Erigeron annuus (L.) Pers.)
Chromosome number. 2n=27 (R.).
Voucher specimen. VLA 9682, Sakhalin, Nevelsky 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, Makarovskiy District, near Maguntan mud volcano, swampy Larix forest, 20.IX.2003, coll. V. Barkalov.


Note. There was only one chromosome number report for S. duiensis before (2n=26), from Khomlsky 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.).

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.


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.


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.


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 the 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., quod 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, Nevelsky 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. Barbea orthoceras Ledeb.
Chromosome number. 2n=16 (R.).
Voucher specimen. VLA 9685, Sakhalin, Nevelsky District, 5 km southwards from Shebunino settlement, maritime slope, near the rivulet, 5.VIII.2004, coll. V. Barkalov.


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 Peschanoy 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.


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.


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
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 Shishkhotan 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, Bolshaya Longri River, on the slope of the mountain, 16.VIII.2001, coll. V. Barkalov; VLA 8690, Sakhalin, Schmidt Peninsula, Severnyj Bay, Nala River, southwestwards from Cape Elizavety, on the scree, 7.VIII. 2001, coll. V. Barkalov.


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 CARYOPHYLLACEAE


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

Voucher specimens. 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.


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, Makarovsky District, near railway station Tsampo, the upper part of Svetlovska River, in birchwood, 11.IX.2003, coll. V. Barkalov.


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 scree, 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.


(D. collinus auct. fl. sachal.)


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

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


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.
   Note. There was no chromosome information for M. sachalinense. This is the only 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. firmanum (Siebold et Zucc.) Rohrb. in the Amur River basin (Probatova and Sokolovskaya, 1995).

27. Moehringia lateriflora (L.) Fenzl.
   Chromosome number. 2n=48 (R.).
   Distribution. Sakhalin, Kuriles; East Asia, Europe, 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 (Garzenkov 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.).
   Chromosome number. 2n=22 (R).
   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=36, 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’ specimens.

FAMILY CHENOPODIACEAE

30. Atriplex subcordata Kitag.
   (A. gmelinii auct., p.p.)
   Chromosome number. 2n=36 (A. S.).
   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

   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**

(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).

**Chromosome number.** 2n=22 (R.).  
**Voucher specimen.** VLA 8815, Moneron Island, in vicinity of the former settlement Starisky, 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, Ekarma Island: 2n=22 (Prohatova 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, Tetyajeva 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’delu 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, Makarovsky 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, Poronajsky District, 2 km westwards from the Cape Sheljtinga, Vostochno-Sakhalinskoye Mts, Slannikova Mt., subalpine belt, break-stone slope, near the top of the mountain, 16.VIII.1991, coll. N. Pavlova.  

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

37. *Oxytropis heleneae* N.S. Pavlova  
**Chromosome number.** 2n=64* (R.).  
**Voucher specimen.** VLA 7611, Sakhalin, Poronajsky District, 2 km eastwards from the Cape Sheljtinga, Vostochno-Sakhalinskoye Mts, 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, Poronajskiy District, 2 km westwards from the Cape Sheljtinga, Vostochno-Sakhalinskskye 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 Til.) Bunge, 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.).  
*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, Makarovskiy 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 specimen. 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.).  
*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.).  
*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 specimen. VLA 9111, Sakhalin, Schmidt Peninsula, Severny Bay, Nala River, southwesterns 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).
47. Chelidonium asiaticum (Hara) Krachulkova

**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. schmidtii”, from Japan (see Bolkhovskikh et al. 1969).

48. Papaver miyabeanum 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 slopes of marine terraces, coastal rocks and sands.

**Note.** There was only one chromosome number report for P. miyabeanum (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 agg. 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*.
(*E. crusgalli* subsp. *spiralis* (Wasing.) Tzvel.)  
*Chromosome number.* 2n=36 (R.).  
*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 Boljshekhekhtsirsky 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.).  
*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* (Gamin 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, glaucous culms (especially in the nodes), glaucous leaves and glumes.

53. *Phragmites australis* (Cav.) Trin. ex Steud.  
(*Ph. communis* Trin.)  
*Chromosome number.* 2n=48 (A. S.).  
*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 glaucous leaf blades, they occur on sea coasts.

*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.).  
*Chromosome number.* 2n=63–64 (R.).  
*Distribution.* Sakhalin. Endemic (?). Described from Sakhalin (Sinegorsk). On sands and screees.  
*Note.* *P. neosachalinensis* have been studied caryologically 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.

*Chromosome number.* 2n=14 (R.).  
*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.
FAMILY POLYANDRACEAE

57. Poa turneri Scribn.

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

Voucher specimen. VLA 8215, Kuriles, Chirpoi Island, Peschanaya Bay, the Leymus mollis community, 14.VIII.1999, coll. V. Barkalov.

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

Note. For P. turneri only one chromosome report existed before: 2n=63 (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. Tzveloyev (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, Shiashtokan Island, near the Cape Obvaljniy, 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 Kolymskoe 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 Bolikhvskikh et al. 1969; Goldblatt 1981; Goldblatt and Johnson 1991, 1994).

FAMILY PRIMULACEAE

60. Primula cuneifolia Ledeb.

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


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 specimen. 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 Bolikhvskikh 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 Bolikhvskikh et al. 1969; Goldblatt and Johnson 1994).

63. Callianthemum sachalinense Miyabe et Tatew.

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

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

**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 (Diu).

**Note.** This is a new cytotype in *C. fistulosa*. Previous data were from Sakhalin - 2n=32, 56 (Sokolovskaya 1960; Probato 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.).


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


66. **Ranunculus sceleratus** L.

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

*Voucher specimen.* VLA 8775, Sakhalin, Ohkinsky 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 (Probatoa and Sokolovskaya 1984), as well as in the Primorsky Territory (several times): in all cases 2n=56 was revealed (Probatoa and Sokolovskaya 1983a; Probatoa, Sokolovskaya *et al.* 2000; Probatoa *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, Jakutia, Balkal Region - 2n=64 was reported, from the Ob 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.).


*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 related 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 specimens.* 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. Probatoa (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 scree 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 (Probata 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. fragifloris subsp. megalantha (Takeda) Hult.)

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


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

Note. P. megalantha was studied before on the Kuriles (Ushishir, Yankicha Island: 2n=70 – Probata and et al. 2000). From Japan there were counts made by Shimotomai (1930a, b); 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, Moneron; Holarctic. Swampy tundras.

Chromosome number. 2n=14 (R. 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.

71. Potentilla stolonifera Lehm. ex Ledeb.

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

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


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

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; Omduff 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.) Worochsh.)

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

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

Distribution. South Sakhalin, South Kuriles (Kunashir Island): Japan. Wet meadows. Descrined 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-Anivsky 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. stichensis C.A. Mey.)

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

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


Note. S. stipulata was previously studied in the North Sakhalin: 2n=28 (Sokolovskaya 1960 - as "S. stichensis"), 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.).


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; Omduff 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 maximovicziana (Teppner) Prob. (W. ternata subsp. maximovicziana Teppner; W. maximovicziana 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 (Dolsink).

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. chinesis 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 SAXIFRAGACEAE

80. Chrysosplenium kantschaticum Fisch.

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

Voucher specimen. VLA 8096, Kuriles, Shishaitosan Island, Cape Obvalnyj, 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. kantschaticum 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.).


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, Chuprova Bay, the rocks by the rivulet, 2.VIII.1999, 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

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.

Acknowledgements

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Occurrence of *Eurycercus (Teretifrons) glacialis* Lilljeborg, 1887 (Cladocera, Chydoridae) on Sakhalin Island

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Abstract Here we report the first observation of *Eurycercus 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

*Eurycercus(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. *Eurycercus 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 cryptoparca*, *Sparganium angustifolium*, and *Eleocharis palustris*, which were common in this lake.

*Eurycercus 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). *Eurycercus glacialis* probably uses vegetation as shelter from predators. Another cladoceran, *Sida crystallina*, 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 fornics 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); 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 grasping hooks decreasing in size toward endite; outermost hook longest; innermost hook shortest, approximately equal in length...
Table 1. Abundance (individuals/dip) of *Eurycercus glacialis* associated with three aquatic plant species.

<table>
<thead>
<tr>
<th>Plant species</th>
<th>Mean</th>
<th>SE</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Sparganium angustifolium</em></td>
<td>2.8</td>
<td>0.20</td>
<td>26</td>
</tr>
<tr>
<td><em>Eleocharis palustris</em></td>
<td>0.8</td>
<td>0.09</td>
<td>116</td>
</tr>
<tr>
<td><em>Carex cryptocarpa</em></td>
<td>0.5</td>
<td>0.13</td>
<td>60</td>
</tr>
<tr>
<td>No vegetation</td>
<td>0.1</td>
<td>0.11</td>
<td>89</td>
</tr>
</tbody>
</table>

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 *Tetertifrons* 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 Flörner 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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FREY, D.G., 1975. The distribution and ecology of *Eurycercus* (Cladocera, Chydoridae) in western
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

Introduction

The vast majority of millipedes (Diplopoda) are saprophages; they play important roles in the processes of decomposition of plant debris and in pedogeneses. 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 (Mikhaljova 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 V. kurtschevae Golovatch, 1980 due to the absence of males. Since then additional and new species were reported or described by Enghoff (1985), Mikhaljova (1988, 1990, 1995, 1996, 1998a), Golovatch et al. (1995), Mikhaljova & 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 (Mikhaljova 1993, 2004) and the Russian Far East (Mikhaljova 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 at 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).

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.

Species surveyed

Order Polyzoniida
Family Polyzoniidae

*Angarozonium aduncum* (Mikhaljova, 1995) [Figs 1–2]


*Comments.* This detrivorous 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]


*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 Khabarovsky 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).

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).

Orinisobates soror *Enghoff, 1985* [Figs 5–10]


*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]


*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 been recorded in Buryatia, Siberia (Mikhaljova 2004). Its occurrence in Northeast China and Hokkaido Island is very likely.

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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 *Cylindrioilus latestriatus* are rare (Altai Mts, Tomsk City, Kunashir Island) (Mikhaljova 2004).

**Order Chordeumatida**

**Family Diplomaragnidae**

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**Sakhalineuma curvatum** (Mikhaljova, 1995) [Figs 12–16]

19–23; Mikhaljova & Basarukin, 1995: 94, 93: map 3;

*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;

*Sakhalineuma tuberculatum*: Mikhaljova, 2004: 126–128,

**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

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Figure 11. *Cylindrioilus latestriatus* (Curtis, 1845): gonopods (mesal view). Scale in mm (after Mikhaljova 1998b).

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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]


**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 Mikhal’jova 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).
Order Polydesmida
Family Paradoxosomatidae

*Haplogonosoma implicatum* Brölemann, 1916 [Figs 35–40]


**Comments.** This species was originally described from Japan (Brölemann 1916). Based on material from Kunashir Island it has later been redescribed more adequately (Golovatch et al. 1995).

**Distribution.** The species has the insular range; it is known from Japan (Central Honshu Island) and Russia (the Kuriles, Kunashir Island) (Mikhaljova 2004).

Family Polydesmidae

*Epanerchodus kunashiricus* Mikhaljova, 1988 [Figs 41–43]


**Comments.** This is a typical inhabitant of forest litter and different plant debris; also it occurs on seashores and lake banks.

**Distribution.** The Kuriles: Kunashir Island (Mikhaljova 2004).

*Uniramidesmus septimus* Mikhaljova, 1990 [Figs 46–48]


**Comments.** Like congeners this species inhabits the litter of coniferous, mixed and broad-leaved forests.

**Distribution.** Originally described from Sakhalin Island and Kunashir Island, this species appears to be widespread there; also it occurs in the southern part of Khabarovsk Province (Mikhaljova 2004), being relatively common (Ganin 1997).

**Key to orders, families and species**

1 (2) Head very small, elongated anteriorly into a rostrum. Body strongly flattened dorsoventrally, without paraterga. External edge of coxal process of anterior gonopods with a small unciform outgrowth (Figs 1–2) ..........
   ........................................................................ Order Polyzoniiidae
   Genus *Angarozonium*, *A. aduncum*

2 (1) Head larger, more or less ovoid, devoid of a rostrum. Body more or less cylindrical, with
or without paraterga........................................3
Telson with a pair of spinnerets. Each metatergite with 3+3 macrochaetae .............. Order Chordeumatida
4 (7)
Body segments with medium-sized paraterga. Posterior gonopod bearing colpocoxite with a front prominence (b) (Figs 13, 18–19) .............. .
.................................. Family Diplomaragnidae
Genus Sakhalineuma
Male coxa 11 with a digitiform process. Gonopods as in Figs 17–21; lateral sheath process of posterior gonopod colpocoxite tuberculiform (Figs 18–19) .... S. tuberculatum

5 (6)
Male coxa 11 without processes. Gonopods as in Figs 12–16; lateral sheath process of posterior gonopod colpocoxite cylindrical, curved (Fig. 13) .................... S. curvatum

6 (5)
Body segments without paraterga or bulges (Fig. 24). Gonopods, including posterior ones, different, as in Figs 31–34 ............. Family Caseyiidae
Genus Underwoodia, U. kurtchevae

7 (4)
Telson without spinnerets. Metatergites without macrochaetae or with simple setae .......... 9
Metatergites with paraterga. Eyes absent. Adult body with 20 segments, including telson ...... Order Polydesmida

8 (3)
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 ..........Family Polydesmidae

9 (16)
Paraterga broad. Body relatively large (adults >15 mm long). Gonopods as in Figs 41–43, 44–45 ............. Genus Epanerchodus

10 (15)
Gonopod telopodite [= Cephalic distofemoral process, using modern terminology (Golovatch 1991; Djursvoll et al. 2001)] with two branches apically (Figs 41–43) ............ E. kunashiricus Paraterga narrow. Body relatively small (adults <15 mm long). Gonopods as in Figs 47–48

11 (14)
Genus Uniramidesmus, U. septimus 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
Neposomatidae

12 (13)
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

13 (12)
Family Paradoxosomatidae
Genus Haplogonosoma, H. implicatum

14 (11)
Metatergites without paraterga, body subcylindrical. Eyes present. Adult body with more than 20 segments. .......... Order Julida
Surface of metazonites completely striate.

15 (10)
Gonopods as in Fig. 11 .............Family Julidae
Genus Cylindroiulus, C. latestriatus

16 (9)
Surface of metazonites clearly striate only below ozopore level. Gonopods different ....

17 (18)
Family Nematosomatidae
Genus Orinisobates

18 (17)
Setae on metazonites distinctly visible.
Gonopods as in Figs 7–9 .............O. soror

19 (20)
Setae on metazonites not or hardly visible even at high magnification. Male unknown. Female receptaculum seminis reduced (Fig. 4) ........

20 (19)
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 kartschevae are widely distributed in the Far East of Russia; also it has been reported in North Korea. Orinisobates microtylax 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 kartschevae 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 Cylindroillus 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). Cylindroillus 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 |
| Polyxoniida                     |        |        |        |        |        |        |        |        |        |          |          |               |
| Polyxoniidae                    |        |        |        |        |        |        |        |        |        |          |          |               |
| Angaroxonium aduncum (Mikhaljova, 1995) | *      | *      |        |        |        |        |        |        |        |          |          | SA               |
| Julida                          |        |        |        |        |        |        |        |        |        |          |          |               |
| Nemasomatidae                   |        |        |        |        |        |        |        |        |        |          |          |               |
| Orinisobates microtylax Enghoff, 1985 | *      | *      | *      |        |        |        |        |        |        |          |          | ES, KA, SA, PP, KH |
| Orinisobates soror Enghoff, 1985 | *      | *      | *      |        |        |        |        |        |        |          |          | SA               |
| Julida                          |        |        |        |        |        |        |        |        |        |          |          |               |
| Cylindroillus latestriatus (Curtis, 1845) | *      |        |        |        |        |        |        |        |        |          |          | EU, NSA, NA     |
| Chordeumatida                   |        |        |        |        |        |        |        |        |        |          |          |               |
| Diplomaragnida                  |        |        |        |        |        |        |        |        |        |          |          |               |
| Sakhalineuma curvatum (Mikhaljova, 1995) | *      | *      |        |        |        |        |        |        |        |          |          | SA               |
| Sakhalineuma tuberculatum (Mikhaljova, 1995) | *      |        |        |        |        |        |        |        |        |          |          | SA               |
| Caseidae                        |        |        |        |        |        |        |        |        |        |          |          |               |
| Underwoodia kartschevae Golovatch, 1980 | *      | *      | *      | *      | *      | *      | *      | *      | *      |          |          | PP, KH, MKHR, SA, KA, NK |
| Polydesmida                     |        |        |        |        |        |        |        |        |        |          |          |               |
| Paradoxosomatidae               |        |        |        |        |        |        |        |        |        |          |          |               |
| Haplogonosoma implicatum Brölemann, 1916 | *      |        |        |        |        |        |        |        |        |          |          | HI               |
| Polydesmidae                    |        |        |        |        |        |        |        |        |        |          |          |               |
| Epanerchodus kunashiricus Mikhaljova, 1988 | *      |        |        |        |        |        |        |        |        |          |          |               |
| Epanerchodus cuspidatus Mikhaljova, 1996 | *      |        |        |        |        |        |        |        |        |          |          |               |
| Uniramidesmus septimus Mikhaljova, 1990 | *      |        |        |        |        |        |        |        |        |          |          |               |
| Total                           | 2      | 4      | 11     | 3      | 1      | 1      | 1      | 1      | 1      |          |          |               |


* – Orinisobates microtylax 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).

<table>
<thead>
<tr>
<th>Order, family, species</th>
<th>Hokkaido</th>
<th>Sakhalin</th>
<th>Kamchatka</th>
<th>Kuriles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Polyzoniida</strong></td>
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<tr>
<td>Polyzoniidae</td>
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<tr>
<td><em>Angaronzonium aduncum</em> (Mikhaljova, 1995)</td>
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<tr>
<td><em>Angaronzonium amarene</em> (Gerstfeldt, 1859)</td>
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<tr>
<td><strong>Julida</strong></td>
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<tr>
<td>Nemasomatidae</td>
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<tr>
<td><em>Orinisobates microthylax</em> Enghoff, 1985</td>
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<tr>
<td><em>Orinisobates soror</em> Enghoff, 1985</td>
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<tr>
<td><strong>Mongoliulidae</strong></td>
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<td><em>Kapidoiulus longus</em> Shinohara, 1963</td>
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<tr>
<td><strong>Junidae</strong></td>
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<tr>
<td><em>Cylindroiulus latestriatus</em> (Curtis, 1845)</td>
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<tr>
<td><em>Japanopachyiulus nponicus</em> Miyosi, 1957</td>
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<td><em>Amblyiulus lobatus</em> (Verhoeff, 1937)</td>
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<tr>
<td><strong>Pseudonemasomatidae</strong></td>
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<tr>
<td><em>Pseudonemasoma femorotuberculata</em> Enghoff, 1991</td>
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<tr>
<td><strong>Chordeumatida</strong></td>
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<tr>
<td>Diplomaragnidae</td>
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<tr>
<td><em>Sakhalineuma basarukini</em> (Mikhaljova, 1995)</td>
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<tr>
<td><em>Sakhalineuma curvatum</em> (Mikhaljova, 1995)</td>
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<td><em>Sakhalineuma globuliferum</em> (Mikhaljova, 1995)</td>
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<tr>
<td><em>Sakhalineuma longiferae</em> Golovatch, 1976</td>
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<tr>
<td><em>Sakhalineuma sakhalinicum</em> (Mikhaljova, 1995)</td>
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<tr>
<td><em>Sakhalineuma tuberculatum</em> (Mikhaljova, 1995)</td>
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<tr>
<td><em>Diplomaragna gracilipes</em> (Verhoeff, 1914)</td>
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<tr>
<td><em>Diplomaragna tsurusukii</em> Shear, 1990</td>
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<tr>
<td><em>Maritinosoma hokkaidense</em> (Verhoeff, 1939)</td>
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<tr>
<td><strong>Conotylidae</strong></td>
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<td><em>Japanosoma scabrum</em> Verhoeff, 1914</td>
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<td><em>Yasudatyla yasudai</em> Shear &amp; Tsurusaki, 1995</td>
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<tr>
<td><em>Yasudatyla shariensis</em> Shear &amp; Tsurusaki, 1995</td>
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<tr>
<td><em>Yasudatyla hidakaensis</em> Shear &amp; Tsurusaki, 1995</td>
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<tr>
<td><strong>Caseyidae</strong></td>
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<tr>
<td><em>Underwoodia kartschevae</em> Golovatch, 1980</td>
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<tr>
<td><strong>Polydesmida</strong></td>
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<td><strong>Xystodesmidae</strong></td>
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<td><em>Levizomes montanus</em> (Takakuwa, 1941)</td>
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<tr>
<td><em>Levizomes takakuwai</em> (Verhoeff, 1941)</td>
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<tr>
<td><strong>Paradoxosomatidae</strong></td>
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<tr>
<td><em>Oxidus gracilis</em> (C.L. Koch, 1847)</td>
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<td><em>Haplogonosoma implicatum</em> Brölemann, 1916</td>
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<tr>
<td><strong>Polydesmidae</strong></td>
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<tr>
<td><em>Epanerchodus cuspidatus</em> Mikhaljova, 1996</td>
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<tr>
<td><em>Epanerchodus fontum</em> Verhoeff, 1940</td>
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<td><em>Epanerchodus furculiger</em> Verhoeff, 1937</td>
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<td><em>Epanerchodus gracilis</em> Takakuwa, 1954</td>
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<tr>
<td><em>Epanerchodus kunashiricus</em> Mikhaljova, 1988</td>
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<tr>
<td><em>Epanerchodus orientalis</em> (Attems, 1901)</td>
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<tr>
<td><em>Uniramidesmus septimus</em> Mikhaljova, 1990</td>
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</table>

Total: 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 Palaearchaeartic Subregion of the Palaeartic 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 (Mikhaljova 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.

Acknowledgements

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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. oligurus, C. rotundulus, C. symbion, C. vago and C. varus. Three of these, C. numerosus, C. symbion and C. varus, 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.O.) 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 (Honshū: Hyōgo)].
*Cercyon sharpi* Harold, 1878, 68 [Japan (Honshū: Tōkyō)].
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 (Kyūshū: Nagasaki, Amakusa)].
*Cercyon (Cercyon) algarum*: Shatrovskiy, 1989, 281 [southern Kurils].
*Cercyon (Cycreon) 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.


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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)]
Cercyon (Cercyon) aptus Sharp, 1873

Cercyon aptus Sharp, 1873, 65 [Japan (Kyūshū, Honshū)].

Cercyon (Cercyon) aptus: Shatrovskiy, 1992, 367 [designation of lectotype (Japan, female); southern Kurils (Kunashir, Iturup, 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 pseudepipleura dark brown; underside dark blackish-brown; (2) head black; pronotum, scutellum and elytra reddish-brown; posterior fifth of elytra bright yellowish-brown; epipleura and pseudepipleura 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)].

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 × 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 pseudopleura 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 × their diameter; lateral portion without punctures, densely furnished with pubescence. Metepisterna 4.4 × 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 × 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.).


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 Urop (UR96MO-048A)]

Specimens examined. No specimen from Kurils has been available for this study.


*Cercyon (Cercyon) numerosus* Shatrovskiy, 1989

Cercyon (Cercyon) numerosus: Shatrovskiy, 1992, 366
[Primorskiy, Japan (Kyushu: 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 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) 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 pseudopleura 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, dorsofrontal 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).


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


Japanese name: Aka-keshi-gamushi.

Specimen examined. Kuril Island. Iturup: Rubetsu, 2 – 10.VII.1935, Y. Sugihara (1 ex.).

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 Ekanma (EK96MO-032A)].

Pacific Region (introduced).

**Cercyon (Cercyon) rotundulus** Sharp, 1884

*Cercyon rotundulus* Sharp, 1884, 460 [Japan: Miyano-shita; Chuzenji].

Japanese name: Maru-keshi-gamushi.

Specimens examined. No specimen from the Kurils has been available for this study.

Distribution. Kuril Islands (Kunashir).

**Cercyon (Cercyon) saluki** Ryndevich, 1998


Japanese name: Saluki-keshi-gamushi.

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)].


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
and elytra blackish-brown, but lateral margin of elytra broadly (1/3 of width) rufo-testaceous to testaceous; epipleura black, and pseudepipleura 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 microrugae; 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

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, 1889, 281 [Primorskiy Kray, Sakhalin, southern Kurils, Japan]; Hansen, 1999, 290.

Cercyon (Cercyon) symbion: Shatrovskiy, 1992, 366 [Russian Fed.: Primorskiy Kray, Sakhalin, Kuril Islands (Kunashir, Shikotan, Iturup,); Japan (Kyushu: 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)].

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 pseudoepipleura 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 pseudoepipleura almost horizontal, glabrous.

Prosternum 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 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.


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: Miyanoshita, Oyama].

*Cercyon (Cercyon) vagus*: Shatrovskiy, 1989, 281 [southern Kuril (Kunashir)].

Japanese name: Atoaka -keshi-gamushi.

Distribution. Kuril Islands (Kunashir). Japan; South
Korea.

*Cercyon (Cercyon) verus* Shatrovskiy, 1989


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 pseudopipleura bright yellowish-brown; anterior margin, narrow sutural margin and round spot in centre of elytra black; underside piceous black; posterior margin of sterna testaceous; underside of pronotum and elytra testaceous; anterior corner regularly round. Eyes rather small, separated by 5 x their width. Mentum glabrous, trapezoidal, 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 pseudopipleura weakly oblique on anterior half and almost horizontal on posterior, glabrous.

Prosternum rather well-developed, moderately tectiform and carinate medially; middle portion not

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)]
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.).


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).
**Genus Pachysternum Motschulsky, 1863**

*Pachysternum haemorrhoum* Motschulsky, 1866


**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 epiopleura and metespi sternum, ventral view. E: Mouthpart, ventral view. [A, B: MO-03-087 from Urup (UR95MO-064) and C – E: -089 from Urup (UR95MO-008)].


**Pachysternum haemorrhoum sibiricum** Kuwert, 1890

*Pachysternum sibiricum* Kuwert, 1890: 172; Kuwayama, 1967, 135 [Shikotan].


**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 areolate ridge; if antennal groove are indistinct, then the mesosternal elevation forms a well defined tablet, that is either elongate oval or broadly pentagonal .............

3 (4) Mesosternal tablet highly carinate medially, narrow, without flat area. .................................

4 (3) Mesosternal tablet rather broad; its shape usually species-specific. .... Subgenus *Cercyon*

5 (16) Protibia broad, the apex round; outer margin

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Table 1. A list of the terrestrial hydrophilid beetles 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                          |
|----------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Cercyon laminatus    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | SK(89) |
| Cercyon algarum      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Cercyon aptus        | 92 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Cercyon dux          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Cercyon numerosus    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Cercyon obliarus     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 89 |    |    |
| Cercyon quisquillius |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 67 |    |    |    |
| Cercyon rotundulus   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 89 |    |    |    |
| Cercyon salaki       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 98 |    |    |    |
| Cercyon setulosus    | 92 | 67 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 92 |    | 92* |    |
| Cercyon symbion      | 92 | 92 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 92 |    |    | 92 |
| Cercyon vagus        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 89 |    |    |    |
| Cercyon verus        | 92 | 89 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 89*|    |    |    |
| Cercyon sp. 1        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 67 |    |    |    |
| Cercyon sp. 2        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 67 |    |    |    |
| Pachysternum haemorrhous |    | 67 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 67 |    |    |    |
| Pachysternum haemorrhous sibiricum |    | 67 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 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.) ajnas 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) Protibiae rather narrow; the apex of 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.


21(20) Body elongate; lateral margins of elytra rather parallel. Body length, 1.9 - 2.6 mm. .......... C. (C.) quisquillus 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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References


HOSHINA, H., 2006. A taxonomic study of the genus Armestus (Coleoptera: Hydrophilidae) from
Appendix

KUNAŠIR

KU95YM-MM-115A: 44°00.72'N, 145°46.28'E, M. Ohara, 8/9/1995, 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, Lesozavodsksy; Dabroye Nachalo Bay, hand picked, under seaweeds on sandy beach, about 1 – 3 m from water

URUP

UR95MO-001: 45°51.49'E, 149°46.95'E, M. Ōhara, 8/4/1995, inland coastal margin of Otkrytiy Bay; environs of Shabalina river, under logs and rocks along shoreline, by hand with aspirator

UR95MO-005: 45°51.04'E, 149°46.12'E, M. Ōhara, 8/5/1995, inland coastal margin of Otkrytiy Bay; environs of Shabalina river valley, under seaweeds, kelp, and logs along shoreline, by hand with aspirator

UR95MO-006: 46°05.38'N, 50°08.33'E, M. Ōhara, 8/6/1995, inland coastal margin of Natalie Bay; environs of Vesohaya river mouth, under logs and rocks along river banks and coastal shoreline, by hand with aspirator

UR95MO-007: 46°05.38'N, 50°08.33'E, M. Ōhara, 8/7/1995, inland coastal margin of Natalie Bay; environs of Ohzhitaya 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. Ōhara, 8/8/1995, inland coastal margin of Novo-kurilskaya Bay; environs of Bystraya river valley, under logs in grassland and adjacent forest, pit fall traps, bait trap, aspirator

UR95MO-009: 46°12.84'N, 150°18.69'E, M. Ōhara, 8/9/1995, inland coastal margin of Novo-kurilskaya Bay; environs of Bystraya river valley, under logs; grassland; forest next to wetland

UR95MO-055: 46°01.29'N, 149°59.67'E, M. Ōhara, 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. Ōhara, 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. Ōhara, 8/28/1995, inland coastal margin of Barkhatty 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. Ōhara, 8/29/1995, inland coastal margin of Negodnaya Bay; environs of Vestrechnyi river
under rocks at base of cliff, by hand with aspirator

UR95MO-070: 45°56.63'N, 150°10.52'E, M. Ohara, 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. Ohara, 8/29/1995, inland coastal margin of Negodnaya Bay; environs of Vestrechnyi river valley, by hand; vegetative litter of coastal grassland

UR96MO-051: 45°38.81'N, 149°27.87'E, M. Ohara, 8/21/1996, Tetyva Bay

UR96BKU-061: 45°34.35'E, 149°54.35'E, B.K. Urbain, 8/28/1996, Inland coastal margin 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 Vestrechnyi river, by hand and forceps

SIMUSHIR

SI95MO-011: 46°51.36'N, 151°47.19'E, M. Ohara, 8/11/1995, inland coastal margin of Kitoboynaya Bay, coastal grassland on the hills close to shoreline, by hand with aspirator

SI95MO-045: 46°59.16'N, 152°01.21'E, M. Ohara, 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. Ohara, 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. Ohara, 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, 152°55.29'E, M. Ohara, 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. Ohara, 8/8/1996, Severgina Bay; northern end of Kharimkotan

ALAI

AL97MO-024A: 50°49.68'N, 155°40.35'E, M. Ohara, 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. Ohara, 8/3/1996, Brynhansovo Bay, south end of Parmushir, hand pickup, under seaweed, Laminalia

PA97MO-025D: 50°22.50'N, 155°35.30'E, M. Ohara, 8/13/1997, inland from 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 Puryatino settlement on coast; along coastline, sucked from under driftwood and within Honkenya peploides plants along sandy beach, aspirator

SU96MO-010A: 50°49.19'N, 156°30.07'E, M. Ohara, 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, Medhiama paupera, Philonthus (Onychophilonthus) tarsalis, P. (P.) cf. azabuensis, P. (P.) oberti, P. (P.) succicola, P. (P.) wuesthojfi, Ocyopus (Pseudocypus) 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, Shishokotan, Kharimkotan, Onokotan, Paramushir, Alaid and Shumshu, and Hadropinus jossor 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)


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 (Kirschchenblatt)

Metoponcus dilatipennis Kirschchenblatt, 1948, Ent. Obozr. 30: 48 (original description).

IKIP material. Not examined.

Distribution. Kuril Archipelago (Kunashir), Ussuri Province, Primorskiy Kray.

Comments. This species has not been collected during the IKIP expeditions.

Nudobius lentus (Gravenhorst)


**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)


**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:** Assing, 1999, Beitr. Ent., 49: 16 (Iturup).

**IKIP material.** ITURUP: 2 ♂ ♀ ♀ [IT96NM-020]. URUP: 1 ♀ [UR95MO-002]; 1 ♂ [UR95MO-006]; 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, Shikoku, Kyushu), Kuril Archipelago (Kunashir, Iturup, Urup), Sakhalin, Ussuri, Amur.

**Comments.** New record from Kunashir and Urup.

*Gabrius ophion* Smetana

Gabrius ophion: Smetanà, 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 (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:** Schillhammer, 1998, Koleopt. Runds. 68: 105 (Kunashir, Iturup).

**IKIP material.** Not examined.
**Distribution.** Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir, Iturup, Urup), Korea.

**Comments.** This species has not been collected during the IKIP expeditions.

*Philonthus (Philonthus) japonicus Sharp


**Philonthus japonicus bernhaueri** Roubal: Kano, 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).


**IKIP material.** URUP: 3 exs. [UR95MO-002]; 2 ♀ ♀ [UR95MO-005]; 2 ♂ ♀ ♀ [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.

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

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


IKIP specimen. Not examined.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Kunashir), Siberia, Mongolia, China, Korea.

Comments. New record from the Kuril Archipelago (Kunashir).

*Philonthus (Philonthus) succicola Thomson


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


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. This species has not been collected during the IKIP expeditions.

Phucobius simulator Sharp

Phucobius simulator Sharp, 1874, Trans. ent. Soc. Lond., p. 35 (original description).


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 (Pseudocypus) nigroaeneus Sharp


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)


Creophilus maxillosus: Kono, 1944, Chishima Gakujutsu Chosa Kenkyutai Hokoku, I: 83 (records from Kunashir, Shokotan, Iturup, Urum, Paramushir, Ailaid, Shumshu).


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 (Iturup, Urum, Paramushir, Ailaid, 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)


IKIP material. ITURUP: 1 ♂ on the ship. URUP: 1 ♀ [UR95MO-020]. PARAMUSHIR: 1 ♀ [PA97MO-006C]; 1 ♀ [PA97MO-020A]. SHUMSHU: 10 exs. [SU97MO-010A]; 2 exs. [SU97MO-013F].

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kuril Archipelago (Urum, Paramushir, Ailaid, 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)


IKIP material. ITURUP: 1 ♀ [IT95NM-020]. URUP: 1 ♂ [UR95MO-002]; 3 ♀ ♀ [UR95MO-005]; 1 ♀ [UR95MO-007]; 3 ♂ ♀ [UR95MO-069]; 20 exs. [UR96MO-048B]; 1 ex. [UR96MO-051]; 1 ex. [UR95VR-029B]; 2 exs. [UR95VR-035A]; 1 ex. [UR95PO-028]. SIMUSHU: 3 ♂♂, 1 ♀ [SI95BU-046A]; 1 ♀ [SI95MO-032]; 1 ♀ [SI95MO-042]; 1 ♀ [SI95MO-045]; 1 ex. [SI95VR-024B].

Distribution. Japan (Hokkaido, Honshu, Kuril Archipelago (Iturup, Urum, 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**


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]. URUP: 1♀ [UR95BKU-059A]. CHIRPOI: 3♀♂ [CH95MO-048]. SIMUSHIR: 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.

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**Quedius (Quedionuchus) armipes (Sharp)**

*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.

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**Quedius (Microsaurus) mesomelinus (Marsham)**

*Staphylinus mesomelinus* Marsham, 1802, Ent. Brit.: 510 (original description).

IKIP material. URUP: 1♀ [UR95BKU-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).

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**Quedius (Raphirus) sublimbatus Mäklin**

IKIP material. ONEKOTAN: 3♂♂ [ON96MO-010B]. PARAMUSHIR: 2♂♂ [PA97MO-025].

**Distribution.** Kuril Archipelago (Onekotan, Paramushir), Kamtschatka, Siberia, Mongolia, Europe, North America.

**Comments.** New record from the Kuril Archipelago (Onekotan, Paramushir).

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**Quedius (Raphirus) fulvicollis (Stephens)**

*Raphirus fulvicollis* Stephens, 1833, Ill. Brit. Ent. 5: 244.


**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, Paramushir).

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**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.


**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)**

*Hadrotees hilleri* Weise, 1877, Deuts. ent. Z., 21: 93.  

**Distribution.** Japan (Hokkaido, Honshu, Kyushu), Korea. Questionable: Kuril Isl. (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**

We wish to express our cordial thanks to Prof. Y. Watanabe of the Tokyo University of Agriculture, Kanagawa, for his kind advice. This work was supported in part by the Japan Society for the Promotion of Science, grant number BSAR-401, Kunio Amaoka, principal investigator; by the Biological Sciences Directorate (Biotic Surveys and Inventories Program) and the International Program Division of the U.S. National Science Foundation, grant numbers DEB-9400821, DEB-9505031, DEB-0071655, and DEB-0202175, Theodore W. Pietsch, principal investigator; and by the Russian Federal Science and Technology Program for "Biological Diversity", state contract number 504-1(00)- II , Viktor V. Bogatov, principal investigator.

**References**


Appendix

KUNASHIR

UC97NM-004: 44°00.34' N, 145°40.99' E, N. Minakawa, 7/27/1997, 70 m upstream from gobey “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

UC97NM-030: N. Minakawa, 8/24/1996, north side of Yuzhno-kurilsky cape, under decaying seaweed on the sandy beach, large rocks on the beach

UC97VR-038: 44°03.15' N, 145°44.68' E, V. Roth, 9/11/1995, 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 Konduitnaya 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 ripples; 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. Ohara, 8/4/1995, inland coastal margin of Otkrytyi 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. Ohara, 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. Ohara, 8/5/1995, Inland coastal margin of Otkrytyi Bay; Enviroms 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. Ohara, 8/6/1995, 0930-1600, Inland coastal margin of Natalie Bay; Enviroms of Vesolaya river mouth, under logs and rocks banks and coastal shoreline, by hand with aspirator, sweep net

UR95MO-007: 46°05.38' N, 150°08.33' E, M. Ohara, 8/7/1995, 0900-1300, Inland coastal margin of Natalie Bay; Enviroms 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. Ohara, 8/8/1995, 1300-1830, Inland coastal margin of Novo-kurilsky Bay; Enviroms of Bystrya 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. Ohara, 8/9/1995, 0900-1130, Inland coastal margin of Novo-kurilsky Bay; Enviroms of Bystrya river valley, under logs; grassland; forest next to wetland, sweep net

UR95MO-058: 46°12.84' N, 150°18.69' E, M. Ohara, 8/25/1995, inland coastal margin of Smuglyi Bay; environs of Rybnaya river mouth, under rocks and logs along shoreline, by hand with aspirator

UR95MO-064: 45°34.67' N, 149°24.33' E, M. Ohara, 8/5/1995, inland coastal margin of Otkrytyi Bay; environs of Shabalina river, point Lighthouse, under faces of cows and pigs, by hand with aspirator

UR95MO-066: 45°34.67' N, 149°24.33' E, M. Ohara, 8/28/1995, Inland coastal margin of Barkhatny Bay; Enviroms of Lokuhovaya river valley, under seaweeds and logs along sandy coastline, by hand with aspirator

UR95MO-069: 45°34.67' N, 149°24.33' E, M. Ohara, 8/28/1995, Inland coastal margin of Novo-kurilsky Bay; Enviroms of Vestrechnyi river valley, under logs at base of cliff, by hand with aspirator

UR95MO-070: 45°34.67' N, 149°24.33' E, M. Ohara, 8/29/1995, Inland coastal margin of Negodnaya Bay; Enviroms of Vestrechnyi river valley, under rocks at base of cliff, by hand with aspirator

UR96MO-048B: 45°35.20' N, 149°32.30' E, M. Ohara, 8/21/1996, inland coastal margin of Konservnaya Bay, under seaweed, by hand and forceps

UR96MO-051: 45°38.81' N, 149°27.87' E, M. Ohara, 8/21/1996, inland coastal margin of Konservnaya Bay, under seaweed, by hand and forceps

UR97VR-016F: 45°48.14' N, 149°54.44' E, M. Ohara, 8/6/1995, Inland coastal margin of Natalie Bay; Enviroms of Obzhitaya river, along sandy beach, by hand and forceps

UR95MO-058: 45°38.81' N, 149°27.87' E, M. Ohara, 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; Enviroms of Obzhitaya river, along sandy beach, by hand and forceps

UR97VR-017A: 46°12.84' N, 150°19.04' E, V. Roth, 8/24/1995, inland coastal margin of Novokurilskaya Bay; Enviroms of Bystrya 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, 20 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°36.60' N, 150°10.44' E, V. Roth, 8/29/1995, inland coastal margin of Negodnaya Bay; environs of Vestrechnyi river, by hand and forceps

UR95MO-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

UR95MO-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

UR97TPW-049: 45°47.71' N, 149°54.33' E, T.W. Pietsch, 8/8/1995, inland coastal margin of Barkhatny Bay; environs of Lokuhovaya river, under dead grass mats, under woody debris along riparian margin, among tall broad-leaved grass and yellow-flowering herbs, aspirator & sifting by hand

UR95KU1-014: 45°51.51' N, 149°46.99' E, B.K. Urban, 8/4/1995, inland coastal margin of Otkrytyi Bay; environs of Shabalina river mouth, under logs (sand temperature = 15°C) along coastal beach with fine sand, by hand

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UR95BKU-039A: 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. Ohara, 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. Ohara, 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. Ohara, 8/11/1995, Inland coastal margin of Kitoboytnaya 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. Ohara, 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. Ohara, 8/21/1995, inland coastal margin of Srednaya Bay, vegetation of Konkenya peploides, Stellaria aquatica, Senecio pseudo arnica along upper sandy coastline, by hand with aspirator

SI95MO-045: 46°59.16' N, 152°01.21' E, M. Ohara, 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 Kitoboytnaya Bay, under log on coast, by hand

KETOI

KE95MO-036: 47°18.02' N, 152°29.90' E, M. Ohara, 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. Ohara, 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. Ohara, 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. Ohara, 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. Ohara, 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. Ohara, 8/15/1996, Ainu Bay, under log and stone on shore
SHIASHKOTAN
SA96MO-033D: 48°46.84' N, 154°02.23' E, M. Ohara, 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. Ohara, 8/10/1996, small inlet just to the east of Cape Prichy (northern corner of Island), under pebbles on sea shore, hand picked

KHARIMKOTAN
KH96MO-022B: 49°10.51’ N, 154°27.59’ E, M. Ohara, 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. Ohara, 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. Ohara, 8/7/1997, Mussel Bay, under seaweed and stone on sea shore, hand picked

ALAIK
AL97MO-024A: 50°49.68’ N, 155°40.35’ E, M. Ohara, 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. Ohara, 8/1/1996, environs of Utesny river, Laminalia, swept, hand picked
PA97MO-006C: 50°40.35’ N, 156°08.47’ E, M. Ohara, 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. Ohara, 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. Ohara, 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. Ohara, 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. Ohara, 8/9/1997, inland from eastern side of cape Chibynyi; environs of Bol’shoye lake, under sea bird carcass, hand picked
SU97MO-010A: 50°49.19’ N, 156°30.07’ E, M. Ohara, 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. Ohara, 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-tó 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-tó but the Island of Iturup-tó 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-tó is needed for determining their true systematic status. The correct habitat of *L. (s. str.) japonicum kunashirense* is as follows:

Holotype: ♀, Kuril Islands, Iturup Island, 40°15.52’N, 147°55.41’E, about 4 km east of Kitovyiby road environs of Podosheva river, 29-VII-1997, E. M. Sayenko leg. [IT97EMS-003].

References

WATANABE, Y., 2004. *Lathrobium japonicum* and its new relatives (Coleoptera, Staphylinidae) from the Kuril Islands. In: H. TAKAHASHI AND M. ÖHARA, 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

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, Keto, 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 Palaearchearctic 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:

<table>
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<tr>
<th>Island</th>
<th>Abbreviation</th>
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<tr>
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</tr>
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</tr>
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</tr>
<tr>
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<td>Chirpoi</td>
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<tr>
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</tr>
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<td>Ekarma</td>
</tr>
<tr>
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<td>Iturup</td>
</tr>
<tr>
<td>IU</td>
<td>Iurii</td>
</tr>
<tr>
<td>KE</td>
<td>Keto</td>
</tr>
<tr>
<td>KH</td>
<td>Kharimkotan</td>
</tr>
<tr>
<td>KU</td>
<td>Kunashir</td>
</tr>
<tr>
<td>LV</td>
<td>Lovushki Rocks</td>
</tr>
<tr>
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<td>Matua</td>
</tr>
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<td>Makanrushi</td>
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<tr>
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<td>Raikoke</td>
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<td>Shishkotan</td>
</tr>
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<tr>
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<td>Tanfileva</td>
</tr>
<tr>
<td>UR</td>
<td>Urup</td>
</tr>
<tr>
<td>US</td>
<td>Yankicha (Ushishir arch.)</td>
</tr>
<tr>
<td>ZE</td>
<td>Zelyonyi</td>
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</tbody>
</table>

Abbreviation of islands in accordance with their geographical position (south-north) (see Fig. 1)

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<tr>
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<th>Abbreviation</th>
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<td>Chirpoi</td>
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<td>Matua</td>
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<tr>
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<td>Tanfileva</td>
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<tr>
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<td>Urup</td>
</tr>
<tr>
<td>US</td>
<td>Yankicha (Ushishir arch.)</td>
</tr>
<tr>
<td>ZE</td>
<td>Zelyonyi</td>
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</tbody>
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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.

<table>
<thead>
<tr>
<th>Island</th>
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</tr>
<tr>
<td>SU</td>
<td>8</td>
</tr>
<tr>
<td>AL</td>
<td>5</td>
</tr>
</tbody>
</table>

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 *Iribisia 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 *Arctocorisa 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.

<table>
<thead>
<tr>
<th>Family</th>
<th>Kuril Islands species</th>
<th>common</th>
<th>Sakhalin</th>
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<tbody>
<tr>
<td>1. Acanthosomatidae</td>
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<td>7</td>
<td>10</td>
</tr>
<tr>
<td>2. Alydidae</td>
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<td>1</td>
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</tr>
<tr>
<td>3. Anthocoridae</td>
<td>11</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>4. Aradidae</td>
<td>12</td>
<td>6</td>
<td>9-10</td>
</tr>
<tr>
<td>5. Berytidae</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6. Ceratocombidae</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Cimicidae</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8. Corixidae</td>
<td>5</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>9. Cydnidae</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Gerridae</td>
<td>6</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>11. Hydrometridae</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>12. Lygaeida</td>
<td>31</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>13. Mesoveliidae</td>
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<td>1</td>
<td>2</td>
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<td>14. Microphysidae</td>
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<td>1</td>
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<td>15. Miridae</td>
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<td>91</td>
</tr>
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<td>16. Nabidae</td>
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<td>6</td>
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<td>17. Nepidae</td>
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<td></td>
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<tr>
<td>18. Notonectidae</td>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td>19. Ochteridae</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>20. Pentatomidae</td>
<td>13</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>21. Pyrrhocoridae</td>
<td>1</td>
<td>1</td>
<td>1?</td>
</tr>
<tr>
<td>22. Reduviidae</td>
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<td>2</td>
<td>4</td>
</tr>
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<td>23. Rhopalidae</td>
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<td>2</td>
<td>4</td>
</tr>
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<td>24. Salidae</td>
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<td>8</td>
<td>13</td>
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<td>25. Tingidae</td>
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<td>4</td>
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<td>26. Urostylididae</td>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td>27. Veliidae</td>
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<td>2</td>
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<tr>
<td>Belostomatidae</td>
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<td></td>
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</tr>
<tr>
<td>Coreidae</td>
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Total 236 144 226-8
Table 3. Abundance (dispersal) of species in Kuril archipelago.

<table>
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<th>No. of species</th>
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<td>119</td>
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<tr>
<td>53</td>
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</tr>
<tr>
<td>33</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>4 &amp; 5</td>
</tr>
<tr>
<td>3</td>
<td>6 &amp; 8</td>
</tr>
<tr>
<td>1</td>
<td>7, 9, 11, 12, &amp; 15</td>
</tr>
</tbody>
</table>

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 Middler 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 Coskhotia. More than half of all species (133 species or 56%) found in the Kurils are limited in their distribution to south-east Palaearctic (=Palaearcheatric). 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).

Forty 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.

| 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 |
|--------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Irbisia sericans         |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Arctocorisa kurilensis   |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Europiella artemisiae    |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Apolygus lucorum         |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Acompocoris brevirostris |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Apolygus nigrovirens     |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Apolygus spinolae        |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Mecomma ambulans         |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Saldula opaca           |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Stenodema calcarata     |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Trigonotylus caelestialium |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Saldula saltatoria      |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Bothynotus pilosus      |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Bryocoris montanus      |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Saldula palastris       |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Saldula littoralis       |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Nysius groenlandicus    |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Macrosaldula rivularia  |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Saldulafuscicola        |    |    |    |    |    |    |    |    |    |    |    |    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
Table 5. Number of species with different ranges.

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<th>range name</th>
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</tr>
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<td>Cosmopolitan</td>
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<td></td>
</tr>
<tr>
<td>Holarctic</td>
<td>98</td>
<td>56</td>
</tr>
<tr>
<td>Siberio-Manchurian</td>
<td>15</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
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<td></td>
</tr>
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<td>Cisokhotia-Manchuria</td>
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<td></td>
</tr>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Manchurian</td>
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<td></td>
</tr>
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<td></td>
</tr>
<tr>
<td>Kurils-Japan</td>
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<td></td>
</tr>
<tr>
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<td>4</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>S. Kurils</td>
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<td>1</td>
</tr>
<tr>
<td></td>
<td>236</td>
<td></td>
</tr>
</tbody>
</table>

Four of them are restricted to Kunashir: *Harpocera orientalis* Kerzhner, 1979, *Pachylygus festivus* (Kerzhner, 1977), *P. nigrescens* (Kerzhner 1977) and *Paraneurus galiæ* (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).

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References

| 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 |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Ceratocombidae (3) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Ceratocombus coleoptratus (Zetterstedt, 1819) | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Ceratocombus corticalis Reuter, 1889 | * | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Ceratocombus japonicus Poppius, 1910 | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Nepidae (1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Ranatra chinensis Mayr, 1865 | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Corixidae (5) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Hesperocorixa distanti (Kirkaldy, 1899) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | SK+Kur.+Jap. |
| Arctocorixa kriilensis Jansson, 1979 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Callixorix producta (Reuter, 1880) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Sigara nigroventralis (Matsumura, 1905) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Sigara toyoohirae (Matsumura, 1905) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Ochteridae (1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Ochterus marginatus (Lateille, 1804) | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Notonectidae (1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Notonecta trigruttata Motschulsky, 1861 | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Saldidae (11) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Salda littoralis (Linnaeus, 1758) | * | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol. |
| Salda kirishenkoi Cobben, 1985 | * | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol. |
| Macrosaldula rivialaria (J. Sahlberg, 1878) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Saldula nobilis (Horváth, 1884) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Saldula opacula (Zetterstedt, 1838) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Saldula recticollis (Horváth, 1899) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Saldula karentgovi Vinokurov, 1979 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Saldula saltatoria (Linnaeus, 1758) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Saldula fucicola (J. Sahlberg, 1870) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Saldula pallipes (Fabricius, 1794) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Saldula palastris (Douglas & Scott, 1874) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Hol. |
| Mesoveliidae (1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Hydrometridae (1) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Hydrometra gracilenta Horváth, 1899 | * |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Veliidae (2) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Microvelia reticulata (Burmeister, 1835) | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | Pal. |
| Species                                      | IU | TA | PO | ZE | SH | KU | IT | UR | CH | SI | KE | US | RA | MA | SA | EK | CR | KH | ON | MK | AL | PA | SU | Distribution     |
|----------------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Aquarius paludum (Fabricius, 1794)           |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Gerris gracilicorvus (Horváth, 1879)         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Gerris yezoensis Miyamoto, 1958               |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Gerris lacustris (Linnaeus, 1758)            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Gerris laeustris (Linnaeus, 1758)            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| *                                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | |
| Nabidae (11)                                 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Himacerus apterus (Fabricius, 1798)          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Himacerus dauricus (Kiritshenko, 1911)       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Nabis sauteri (Poppius, 1915)                |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Nabis damissus (Kerzhner, 1968)              |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Nabis flavimarginatius Scholtz, 1847         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol. |
| Nabis limbatus Dahlborn, 1851                |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Nabis anericotimbatus (Carayon, 1961)        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol. |
| Nabis reuteri Jakovlev, 1876                 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Nabis ferus (Linnaeus, 1758)                 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Nabis stenoferus Hsiao, 1964                 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Anthocoridae (11)                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Lyctocoris obscurus Kerzhner, 1979           |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Xylocoris caristans (Fallén, 1807)           |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Temnostethus distans Kerzhner, 1972          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | KU+SK |
| Anthocoris kalopanacis Kerzhner, 1977        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Anthocoris japonicus Poppius, 1909           |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Anthocoris miyamotoi Hiura, 1959             |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Orius sauteri (Poppius, 1909)                |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Bilis esakii Carayon & Miyamoto, 1960        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Cinicidae (1)                                |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Cinex lectularius Linnaeus, 1758             |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Cosm. |
| Microphysidae (2)                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Loricula pilosella Miyamoto, 1965            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man. |
| Myrmedobia distinguenda Reuter, 1884         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal. |
| Miridae (93)                                 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 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 |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| *Monalocoris filicis* (Linnaeus, 1758) | * | | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| *Bryocoris montanus* Kerzhner, 1972 | * | | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| *Boreotrophus pilosus* (Bohemian, 1852) | | | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| *Alloeotomus simulius* (Uhler, 1896) | | | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| *Deraeocoris ainoicus* Kerzhner, 1979 | * | | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| *Capsus wageneri* (Remane, 1950) | | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| *Capsus pilifer* (Remane, 1950) | | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| *Iribia sericans* (Stål, 1858) | | | | | | | | | | | | | | | | | | | | | | | | | | | | Okh. |
| *Charagochilus angusticollis* Linnavuori, 1961 | | | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| *Polymerus palustris* (Reuter, 1905) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Pal. |
| *Tinginotum rostratum* Kerzhner, 1972 | | | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| *Lygocoris pabulinus* (Linnaeus, 1761) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Hol. |
| *Lygocoris pabulinoides* (Linnavuori, 1961) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | SK+Kur.+Jap. |
| *Neolycus lobatus* (Linnavuori, 1963) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | SK+Kur.+Jap. |
| *Neolycus herberlandti* Kulik, 1965 | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Neolycus honshuensis* (Linnavuori, 1961) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | SK+Kur.+Jap. |
| *Neolycus longiusculus* Kulik, 1965 | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Apolygus nigrovirens* (Kerzhner, 1988) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Apolygus lucorum* (Meyer-Dür, 1843) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Apolygus spinolaee* (Meyer-Dür, 1841) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Apolygus infamis* (Kerzhner, 1977) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Apolygus fraxinieola* (Kerzhner, 1988) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Apolygus fraxincola* (Kerzhner, 1972) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Arbolygus alni* (Kerzhner, 1979) | * | | | | | | | | | | | | | | | | | | | | | | | | | | | KU+SK |
| *Arbolygus rubripes* (Jakovlev, 1876) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Cassanopides potanini* (Reuter, 1906) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Lygus rugulipennis* Poppius, 1911 | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Pal. |
| *Cyphodemidea saundersi* (Reuter, 1896) | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Man. |
| *Orthops scutellatus* Uhler, 1877 | * | * | | * | | | * | | | | | | | | | | | | | | | | | | | | Hol. |
| *Pachylygus festivus* (Kerzhner, 1977) | * | | | | | | | | | | | | | | | | | | | | | | | | | | | KU+Jap. |
| Species                          | IU | TA | PO | ZE | SH | KU | IT | UR | CH | SI | KE | US | RY | RA | MA | SA | BK | CR | KH | ON | MK | AL | PA | SU | Distribution   |
|---------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Pachylygus nigrescens (Kerzhner, 1977) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | KU+Jap.  |
| Salignus duplicatus medius Kerzhner, 1979 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | SK+Kur.  |
| Stenotus binotatus (Fabricius, 1794) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol.    |
| Stenotus rubrivittatus (Matsumura, 1913) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Eurystylus coelestialium (Kirkaldy, 1902) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Orientaemis tricolor (Scott, 1880) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Adelphocoris tenebrosus (Reuter, 1875) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Adelphocoris triannulatus (Stål, 1878) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Adelphocoris lineolatus (Goeze, 1778) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Adelphocoris suturalis (Uhler, 1896) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Adelphocoris quadrupunctatus (Fabricius, 1794) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Adelphocoris picoseostus Kulik, 1965 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Phytocoris scotinus Kerzhner, 1977 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Phytocoris pallidicolusis Kerzhner, 1977 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Phytocoris longipennis Fice, 1861 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Phytocoris novickyi Fieber, 1870 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.    |
| Stenodema sibirica Bergroth, 1914 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Stenodema calcarata (Fallén, 1807) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Dolichomis kuwayamae Miyamoto, 1967 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Trigonotylus viridis (Provancher, 1872) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Trigonotylus caelestialium (Kirkaldy, 1902) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Teratocoris depressus Kerzhner, 1979 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Teratocoris saundersi Douglas & Scott, 1869 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Teratocoris palidum J. Sahlberg, 1870 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Leptopterna kerzhneri Vinokurov, 1982 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Erinis tenuicornis Miyamoto & Hasegawa, 1967 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Orthocephalus funestus Jakovlev, 1881 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Cyllecoris nakanishii Miyamoto, 1969 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Cyllecoris carici (Fallén, 1807) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Blepharidopterus ulmicola Kerzhner, 1977 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Orthotylus pallens (Matsumura, 1911) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.    |
| Orthotylus flavosparsus (C. Sahlberg, 1841) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol.    |
| Species                                    | IU | TA | PO | ZE | SH | KU | IT | UR | CH | SI | KE | US | RA | MA | SA | EK | CR | KH | ON | MK | AL | PA | SU | Distribution       |
|-------------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------------------|
| *Mecomma ambulans* (Fallén, 1807)         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.              |
| *Mecomma cruciata* Kerzhner, 1979         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.              |
| *Pilophorus validicornis* Kerzhner, 1977  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | KU+SK            |
| *Systellonota malaisii* Lindberg, 1934    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.              |
| *Harpocera orientalis* Kerzhner, 1979     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | KU+Jap.          |
| *Plesiodesa striata* Kerzhner, 1979       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | NES+Man.         |
| *Psallas salicis* (Kirschbaum, 1856)      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.              |
| *Psallas falleni* Reuter, 1883            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.              |
| *Psallas cinnabarinus* Kerzhner, 1979      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.              |
| *Psallas vitatus* (Fieber, 1861)          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.              |
| *Europiella decolor* (Uhler, 1893)        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol.             |
| *Europiella artemisiae* (Becker, 1864)    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol.             |
| *Europiella lividella* (Kerzhner, 1979)   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.              |
| *Plagiognathus crenathemis* (Wolff, 1804) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.             |
| **Tingidae** (6)                          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                  |
| *Acalypta gracilis* (Fieber, 1844)        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.             |
| *Acalypta marginata* (Wolff, 1804)        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.             |
| *Derephysia foliacea* (Fallén, 1807)      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.             |
| *Physatocheila orientis* Drake, 1942      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Sib.+Man.        |
| *Agramma japonica* (Drake, 1948)          |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.             |
| **Reduviidae** (4)                        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                  |
| *Empicoris vagabunda* (Linnaeus, 1758)    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol.             |
| *Rhynocoris leucopterus* (Stål, 1859)     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol.             |
| *Coronus dilatatus* (Matsumura, 1913)     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Sib.+Man.        |
| *Pygolampis bidentata* (Goeze, 1778)      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.             |
| **Aradidae** (12)                         |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                  |
| *Aradas transiens* Kiritshenko, 1913      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.             |
| *Aradas crenaticollis* R. Sahlberg, 1848  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.             |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Aradus orientalis Bergroth, 1885 | * | | | | | | | | | | | | | | | | | | | | | | | | | | +Jap. |
| Aradus consentaneus Horváth, 1905 | * | * | * | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| Aradus pictellus Kerzhner, 1972 | * | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| Aradus corticalis (Linnaeus, 1758) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| Aneurilloides glaberrimus (Kerzhner, 1979) | * | * | * | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| Aneurus nitidulus Kormilev, 1955 | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Neaneurus macrotylus (Jakovlev, 1880) | * | * | * | | | | | | | | | | | | | | | | | | | | | | | | Sib.+Man. |
| Paraneurus galiae (Kerzhner, 1979) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| Paraneurus nipponicus (Kormilev & Heiss, 1976) | * | * | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| M e z i r a subs e t o s a Jos ifov & Kerzhner, 1974 | * | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| Berytidae (1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Metatropis rufescens (Herrich-Schaeffer, 1835) | * | * | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Lygaeidae (31) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lygaeus equestris (Linnaeus, 1758) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Arocatus rufipes Stål, 1873 | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Nysius ericetorum (Schilling, 1829) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Nysius groenlandicus (Zetterstedt, 1838) | * | * | * | * | | | | | | | | | | | | | | | | | | | | | | Hol. |
| Nysius expressus Distant, 1883 | * | * | * | * | | | | | | | | | | | | | | | | | | | | | | Sib.+Man. |
| Kleidocerys resedae (Panzer, 1797) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Hol. |
| Cymus glandicolor Hahn, 1832 | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Cymus ausrescens Distant, 1883 | * | * | * | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Dimorphopterus japonicus (Hidaka, 1969) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Pachygrontha antennata (Uhler, 1860) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| Geocoris proteus Distant, 1883 | | | | | | | | | | | | | | | | | | | | | | | | | | | Man. |
| Iodina ferruginea Lindberg, 1927 | * | * | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Stygnocoris sabulosus (Schilling, 1829) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Hol. |
| Scolopostethus thomsoni Reuter, 1874 | * | * | * | * | | | | | | | | | | | | | | | | | | | | | | Hol. |
| Eremocoris plebejus (Fallén, 1807) | | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Drymus pilicornis (Mulsant & Rey, 1852) | * | | | | | | | | | | | | | | | | | | | | | | | | | | Pal. |
| Lamproplax membranae Distant, 1883 | * | * | | | | | | | | | | | | | | | | | | | | | | | | | 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 |
|----------------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|    |               |
| Trichodrymus panerosides Lindberg, 1927      | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.          |
| Gastrodes grossipes japonicus (Stål, 1874)    | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.          |
| Stigmatonotum rufipes (Motschulsky, 1866)    | *  | *  |    | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Kam.-Man.      |
| Pachybrachius luridus Hahn, 1826              | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Hol.           |
| Paraparomius lateralis (Scott, 1874)         | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Panaurus japonicus (Stål, 1874)              | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Sphragisticus neblosus (Fallén, 1807)        | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| **Pyrrhocorididae** (1)                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Sib.+Man.      |
| **Alydidae** (1)                             |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| Paraplesius unicolor Scott, 1874             | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| **Rhopalidae** (2)                           |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| Rhopalus maculatus (Fieber, 1836)            | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| Stictopleurus punctatonervosus (Goeze, 1778) | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| **Urostylididae** (1)                        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| Urostylis annulicornis Scott, 1874           | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| **Acanthosomatidae** (10)                    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Acanthosoma expansum Horváth, 1905           | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Acanthosoma spinicolle Jakovlev, 1880        | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.+NSIS      |
| Acanthosoma labiduroides Jakovlev, 1880      | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Acanthosoma denticaudum Jakovlev, 1880       | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Elasmostethus humeralis Jakovlev, 1883       | *  | *  |    | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Elasmostethus interstinctus (Linnaeus, 1758) | *  | *  |    | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| Elasmucha fieberi (Jakovlev, 1865)           | *  | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| Elasmucha amurensis Kerzhner, 1972           | *  | *  |    | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Elasmucha dorsalis (Jakovlev, 1876)          | *  | *  |    | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Sib.+Man.      |
| **Cydnidae** (4)                            |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| Microcorus nigrita (Fabricius, 1794)         | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Pal.           |
| Macroscythus japonensis Scott, 1874          | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Adomerus variegatus (Signoret, 1884)         | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| **Pentatomidae** (13)                        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Graphosoma ruhrolineatum (Westwood, 1837)    | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Man.           |
| Aelia fieberi Scott, 1874                    | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 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 |
|---------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| *Eysarcoris gibbosus* (Jakovlev, 1904) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | * | Man. |
| *Carbula abbreviata* (Motschusky, 1866) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Man. |
| *Palomena angulosa* (Motschusky, 1861) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Man. |
| *Carpocoris purpureipennis* (De Geer, 1773) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Pal. |
| *Dolycoris baccarum* (Linneus, 1758) | *  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Pal. |
| *Eurydema rugosa* (Motschusky, 1861) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Man. |
| *Pentatoma rufipes* (Linneus, 1758) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Pal. |
| *Pieromerus bidens* (Linneus, 1758) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Pal. |
| *Dinorhynchus dybowskii* Jakovlev, 1876 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Man. |
| *Arma castor* (Fabricius, 1794) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  * | Pal. |