千島列島チリンコタン島の維管束植物チェックリスト

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Hideki Takahashi[1], Vyacheslav Y. Barkalov[2], Sarah Gage[3], Birgit Semsrott[4], Marina Ilushko[2] and Yuri N. Zhuravlev[2] : **A preliminary checklist of the vascular plants of Chirinkotan, Kuril Islands**

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Chirinkotan, in the middle Kuril Islands, lies 29km west of Ekarma (Fig. 1), in the western zone ("inner zone" in the literature in Russian) of the Kuril Islands (Gorshkov 1970). It is roughly circular, about 2.5–3km across, with a 724m peak (Figs. 1, 2). The Chirinkotan volcano rises from the floor of the Kuril Basin and was newly formed in the Holocene, as was the more northern island Atlasova (Alaid) (Gorshkov 1970). The island is uninhabited, and appears to have no persistent bodies of fresh water. Many nests, for several species of seabirds, occur on cliffs and

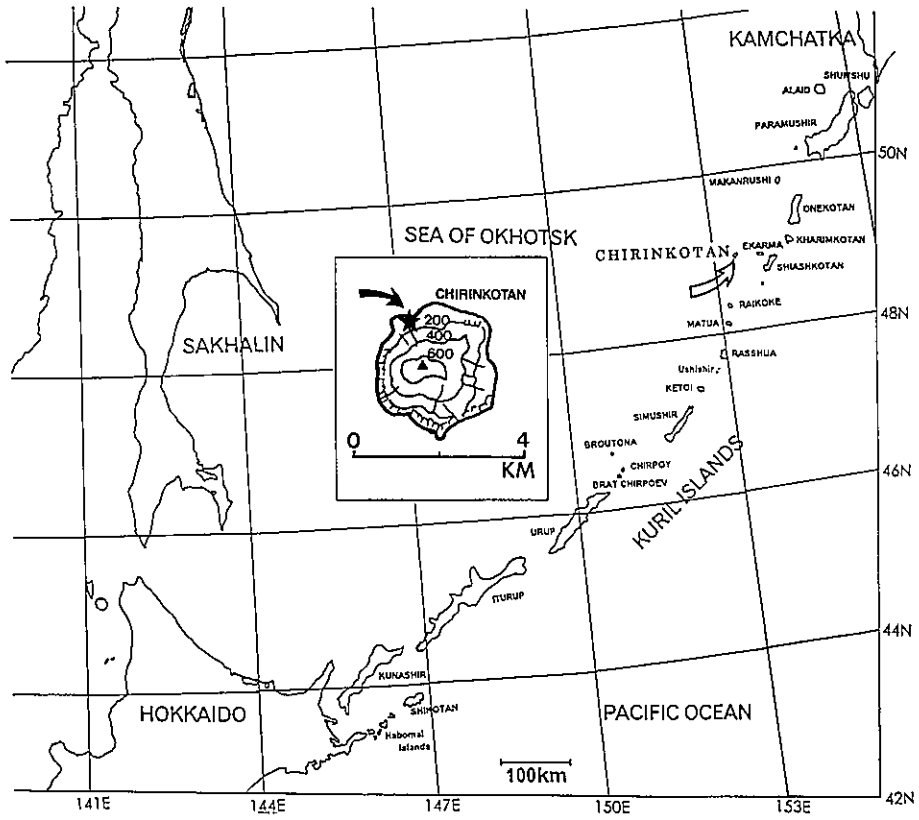

Fig. 1. Map showing the explored area on Chirinkotan in the Kuril Islands.

Fig. 2. Chirinkotan Island seen from the north.

slopes of the island.

Meteorological data for Chirinkotan is not available. However, a Japanese weather station collected information on the island of Kharimkotan, which lies about 75km east of Chirinkotan. In 1939–40, the monthly mean temperatures above 5℃ were 7.6℃ in July, 13.4℃ in August, 10.8℃ in September and 5.8℃ in October. The lowest monthly mean temperature was −3.6℃ in February. Annual total precipitation was about 960mm (Central Meteorological Observatory 1954).

Co-operative field work between Japan, Russia and the USA was performed on the island under the auspices of the International Kuril Island Project (IKIP). On August 10, 1996, five botanists from the three countries landed at a small inlet just east of Cape Ptichy, on the northwest corner of the island (48°59.30' N latitude, 153°28.28' E longitude). They collected vascular plants along the seacoast and up a small gully (Fig. 3), but could not reach high altitude because of the steep unstable slopes. They collected independently during the day, and later exchanged information to compile a plant list for the island.

Fig. 3. Gully on the northwest side of Chirinkotan.

We present here a preliminary, and the first, checklist of vascular plants for Chirinkotan. No flora has been published for Chirinkotan (Takahashi 1996), and to the best of our knowledge no botanists had collected there extensively prior to 1996. Only one Chirinkotan specimen (*Rhodiola rosea* L.; V. Kanayev s.n. in 1954) was found at VLA.

We list 15 families, 30 genera, and 34 species of seed plants. Dominant families are; Poaceae (8 spp.), Asteraceae (6 spp.), Brassicaceae (3 spp.) and Apiaceae (3 spp.). The other families contain less than three species. On average, each family includes 2 genera and 2.3 species.

Most species found on the island are common in the entire Kuril Islands. No pteridophytes were found. Other than *Salix kurilensis*, we found no woody plants on Chirinkotan, although *Pinus pumila*, *Alnus maximowiczii*, and *Betula ermanii* are common in the Kuril Islands. Of course we should have consideration for limited explored area and short collecting time on the island.

In our research site we did not find any wetland plant association, such as in bogs, marshes, or riparian areas. This was not surprising, given the steep slope and the lack of persistent fresh water. The ground nesting birds that inhabit the island appear to influence plant growth through the addition of guano and subsequent nitrogen enrichment of the soil. Nest building and other activities appear to cause significant soil disturbance. The effect of ground nesting birds on plant distribution in the Kuril Islands has yet to be investigated.

The list includes comments on the taxonomy and nomenclature of the species, and only important synonyms are cited. Specimens are deposited in the following herbaria: SAPT, Herbarium, Faculty of Agriculture, Hokkaido University, 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.

SALICACEAE

1. *Salix kurilensis* Koidz. in Bot. Mag. Tokyo **32**: 62 (1918).
Habitat. Gully.
Specimens. Takahashi 21605, 21620 (SAPT); Gage 2168 (WTU).
Distr. Okhotsk Sea region.
Note. Tatewaki (1957) recognized 21 *Salix* species in the Kurils including several endemic species. Since leaf size, shape of leaf base, and petiole length of *S. kurilensis* are extremely variable, this and its related species need revision.

POLYGONACEAE

1. *Oxyria digyna* (L.) Hill, Hort. Kew 158 (1769).
Habitat. Seashore.
Specimens. Takahashi 21591(SAPT); Zhuravlev and Ilushko 529 (VLA).
Distr. Cool regions of the Northern Hemisphere.

CARYOPHYLLACEAE

1. *Sagina maxima* A. Gray var. *crassicaulis* (S. Watson) H. Hara in Rhodora **41**: 391 (1939) —*S. crassicaulis* S. Watson—*S. maxima* A. Gray f. *crassicaulis* (S. Watson) M. Mizush.
Habitat. Bare places on seashore.
Specimens. Takahashi 21588 (SAPT); Zhuravlev and Ilushko 226 (VLA); Semsrott 248 (WTU).
Distr. Okhotsk Sea region, the Aleutians and western North America.
2. *Stellaria ruscifolia* Pall. ex Schltdl. in Mag. Ges. Nat. Freunde Berlin **7**: 194 (1816).
Habitat. Meadows and rocky seashore.
Specimens. Takahashi 21589, 21596 (plants sticky), 21601 (SAPT); Zhuravlev and Ilushko 238 (VLA); Semsrott 242 (WTU).
Distr. Okhotsk Sea region, the Aleutians and Alaska.

BRASSICACEAE

1.*Cardamine regeliana* Miq. in Ann. Mus. Bot. Lugd-Bat. **2**: 73 (1865-66) —*C. scutata* Thunb. subsp. *regeliana* (Miq.) H. Hara
Habitat. Meadows in gully.
Specimens. Takahashi 21617, 21619 (SAPT); Gage 2176 (WTU).
Distr. Eastern Asia and Okhotsk Sea region.
2. *Cochlearia officinalis* L., Sp. Pl. 647 (1753) —*C. officinalis* L. subsp. *oblongifolia* (DC.) Hultén —*C. oblongifolia* DC.
Habitat. On seashore.
Specimens. Takahashi 21583 (SAPT); Zhuravlev and Ilushko 166, 167 (VLA); Gage 2141, Semsrott 253 (WTU).
Distr. Cool regions of the Northern Hemisphere.
3. *Draba grandis* Langsd. in DC., Syst. Nat. **2**: 355 (1821) —*D. hyperborea* auct., non Desv.
Habitat. Rocky sea cliffs.
Specimens. Takahashi 21602 (SAPT); Zhuravlev and Ilushko 174 (VLA); Gage 2149 (WTU).
Distr. The Kurils, the Aleutians and western N. America.

CRASSULACEAE

1. *Rhodiola rosea* L., Sp. Pl. 1035 (1753) —*Sedum rosea* (L.) Scop.
Habitat. Seashore.
Specimens. Takahashi 21599 (SAPT); V. Kanayev s.n. in 1954, Zhuravlev and Ilushko 529 (VLA); Gage 2148, Semsrott 245 (WTU).
Distr. Cool regions of the Northern Hemisphere.
Note. *Rhodiola rosea* shows a wide variation in stem height, leaf shape and leaf size (Ohba 1982). It is a question whether *R. sachalinensis* Boriss. should be recognized as a distinct species.

SAXIFRAGACEAE

1. *Saxifraga bracteata* D. Don in Trans. Linn. Soc. **13**: 367 (1822).
Habitat. Seashore.
Specimens. Takahashi 21600, 21618 (SAPT); Zhuravlev and Ilushko 529 (VLA); Gage 2147, Semsrott 244 (WTU).
Distr. Okhotsk Sea region, the Aleutians, Chukot and Alaska.

GERANIACEAE

1. *Geranium erianthum* DC., Prodr. **1**: 641 (1824).
Habitat. Meadows in gully.
Specimens. Takahashi 21610 (SAPT); Zhuravlev and Ilushko 354 (VLA); Gage 2165 (WTU).
Distr. Eastern Siberia, Okhotsk Sea region, the Aleutians, Chukot and wetern N. America.

APIACEAE

1. *Coelopleurum gmelinii* (DC.) Ledeb. Fl. Ross. **2**: 361 (1844) —*C. lucidum* (L.) Fernald var.

gmelinii (DC.) H. Hara—*Angelica gmelinii* (DC.) Pimenov.
Habitat. Seashore.
Specimens. Takahashi 21586 (SAPT) ; Zhuravlev and Ilushko 126 (VLA) ; Gage 2144 (WTU).
Distr. Okhotsk Sea region, the Aleutians, Chukot and western N. America.
2. *Conioselinum chinense* (L.) Britton, Sterns et Poggenb. in Prelim. Cat. 22 (1888) —*C. kamtschaticum* auct., non Rupr.
Habitat. Seashore.
Specimens. Takahashi 21592 (SAPT) ; Gage 2146 (WTU).
Distr. Okhotsk Sea region, the Aleutians and N. America.
Note. We adopted *Conioselinum chinense* (L.) Britton, Sterns et Poggenb. instead of "*C. kamtschaticum* Rupr." which is commonly used in Japanese literature.
3. *Ligusticum hultenii* Fernald in Rhodora **32**: 7 (1930)—*L. scoticum* L. subsp. *hultenii* (Fernald) Calder et Taylor.
Habitat. Seashore.
Specimens. Takahashi 21597 (SAPT) ; Zhuravlev and Ilushko 130 (VLA) ; Gage 2143 (WTU).
Distr. Cool regions of the Northern Hemisphere.

SCROPHULARIACEAE
1. *Euphrasia mollis* Ledeb. ex Wettst., Monogr. Euphrasia 141, fig. 4, 205-210, table 125 (1896).
Habitat. Meadows in gully.
Specimens. Takahashi 21616 (SAPT) ; Zhuravlev and Ilushko 771 (VLA) ; Gage 2175 (WTU).
Distr. Okhotsk Sea region, the Aleutians and Alaska.

CAMPANULACEAE
1. *Campanula lasiocarpa* Cham. in Linnaea **4**: 39 (1829)—*C. lasiocarpa* Cham. subsp. *latisepala* (Hultén) Hultén.
Habitat. Meadows in gully.
Specimens. Takahashi 21621 (SAPT) ; Zhuravlev and Ilushko 188, 189 (VLA) ; Gage 2177 (WTU).
Distr. Okhotsk Sea region, the Aleutians, Chukot and western N. America.
Note. Hultén (1968) recognized subsp. *latisepala* (Hultén) Hultén for the plants in northern Japan and the Kurils, on the basis of sepal shape. However, this feature is highly variable in this region. This needs future clarification.

ASTERACEAE
1. *Anaphalis margaritacea* (L.) Benth. et Hook. f., Gen. Pl. **2**: 303 (1873).
Habitat. Seashore ; meadows in gully.
Specimens. Takahashi 21595 (SAPT) ; Zhuravlev and Ilushko 6 (VLA) ; Gage 2167 (WTU).
Distr. Temperate regions of eastern Asia, Okhotsk Sea region, the Aleutians and N. America.
2. *Artemisia unalaskensis* Rydb. in North Amer. Fl. **34**: 266 (1916).
Habitat. Seashore.
Specimens. Takahashi 21587 (SAPT) ; Zhuravlev and Ilushko 16 (VLA) ; Gage 2142 (WTU).
Distr. Okhotsk Sea region and the Aleutians.
3. *Cirsium kamtschaticum* Ledeb. ex DC., Prodr. 6: 644 (1837).
Habitat. Seashore ; meadows in gully.
Specimens. Takahashi 21594 (SAPT) ; Zhuravlev and Ilushko 46 (VLA) ; Gage 2166 (WTU).
Distr. Okhotsk Sea region and the western Aleutians.
4. *Dendranthema arcticum* (L.) Tzvelev in Fl. URSS **26**: 386 (1961) subsp. *arcticum*—*Chrysanthemum arcticum* L. —*Arctanthemum arcticum* (L.) Tzvelev.
Habitat. Seashore.
Specimens. Takahashi 21590 (SAPT) ; Zhuravlev and Ilushko 22 (VLA) ; Gage 2145, Semsrott 243 (WTU).
Distr. Cool regions of the Northern Hemisphere.
5. *Parasenecio auriculatus* (DC.) H. Koyama var. *kamtschaticus* (Maxim.) H. Koyama in Iwatsuki et al., Fl. Jap. **3b**: 50 (1995)—*Cacalia auriculata* DC. var. *kamtschatica* (Maxim.) Matsum. —*C. auriculata* DC. subsp. *kamtschatica* (Maxim.) Hultén—*C. kamtschatica* (Maxim.) Kudô.
Habitat. Meadows in gully.
Specimens. Takahashi 21613, 21626 (SAPT) ; Zhuravlev and Ilushko 40 (VLA).
Distr. Okhotsk Sea region and the western Aleutians.
6. *Solidago virgaurea* L., Sp. Pl. 880 (1753).
Habitat. Meadows in gully.
Specimens. Takahashi 21625 (SAPT) ; Zhuravlev and Ilushko 120 (VLA) ; Gage 2164 (WTU).
Distr. Temperate to cool regions of the Northern Hemisphere.

Note. This species has highly variable morphology, and its taxonomy and nomenclature are very complicated in eastern Asia. We recognize this species in the broad sense here. Quantitative morphological analysis is necessary.

LILIACEAE

1. *Maianthemum dilatatum* (Wood) A. Nelson et J. F. Macbr. in Bot. Gaz. **61**: 30 (1916).
Habitat. Meadows in gully.
Specimens. Takahashi 21611 (SAPT); Gage 2163 (WTU).
Distr. Eastern Asia, Okhotsk Sea region, the Aleutians and western N. America.

JUNCACEAE

1. *Juncus haenkei* E. Mey., Syn. Juncor. 10 (1822) —*J. balticus* Willd. subsp. *sitchensis* (Engelm.) Hultén—*J. arcticus* Willd. subsp. *sitchensis* Engelm.
Habitat. Seashore.
Specimens. Zhuravlev and Ilushko 399 (VLA); Semsrott 246 (WTU).
Distr. Eastern Asia, Okhotsk Sea region, the Aleutians, Chukot and Alaska.
2. *Luzula kjellmanniana* Miyabe et Kudô in Trans. Sapporo Nat. Hist. Soc. **5**: 38 (1913) — *L. multiflora* (Retz.) Lej. var. *kjellmanniana* (Miyabe et Kudô) G. Samuelsson—*L. sudetica* DC. var. *kjellmanniana* (Miyabe et Kudô) T. Shimizu.
Habitat. Meadows in gully.
Specimens. Takahashi 21606, 21623 (SAPT); Gage 2170 (WTU).
Distr. Okhotsk Sea region, the Aleutians, Chukot and Alaska.

POACEAE

1. *Calamagrostis langsdorffii* (Link) Trin., Diss. Bot. Gram. Unifl. 225, pl. 4, fig. 10 (1824) —*C. canadensis* (Michx.) Beauv. subsp. *langsdorffii* (Link) Hultén.
Habitat. Meadows in gully.
Specimens. Takahashi 21612 (SAPT); Gage 2162 (WTU).
Distr. Temperate to cool regions of the Northern Hemisphere.
2. *Calamagrostis urelytra* Hack. in Bot. Mag. Tokyo **12**: 28 (1897).
Habitat. Meadows in gully.
Specimens. Takahashi 21604, 21615 (SAPT); Zhuravlev and Ilushko 573 (VLA); Gage 2174 (WTU).
Distr. Eastern Siberia and Okhotsk Sea region.
Note. Above specimens have the following morphological features; leaf blades more or less scabrous above, panicles narrowly lanceolate, sometimes cylindric or narrowly ovate, and glumes 7–8 mm long. Based on these features, the specimens are somewhat intermediate between *Calamagrostis urelytra* and *C. sesquiflora* (Trin.) Tzvelev. This needs future clarification.
3. *Deschampsia beringensis* Hultén in Kungl. Sv. Vet. Akad. Handl., ser. 3, **5** (1): 107 (1927).
Habitat. Seashore.
Specimens. Takahashi 21598 (SAPT); Zhuravlev and Ilushko 579, 580 (VLA).
Distr. Okhotsk Sea region, the Aleutians and western N. America.
4. *Deschampsia paramushirensis* Honda in Journ. Fac. Sci. Univ. Tokyo (Bot.) **3** (1): 140 (1930).
Habitat. Seashore; meadows in gully.
Specimens. Takahashi 21603, 21608 (SAP); Zhuravlev and Ilushko 581 (VLA); Gage 2161, 2171 (WTU).
Distr. Okhotsk Sea region.
Note. Tsvelev (1984) recognized the above two species of *Deschampsia* as subspecies of *D. caespitosa* (L.) Beauv. Plants that are about 30 cm tall, having panicles about 10cm long, narrow, with strongly scabrous branches, and spiklets 5mm long are identified as *D. beringensis* here. On the other hand *D. paramushirensis* is recognized here as having the following characters; less than 20cm tall, panicles less than 10 cm long, lax, broad ovate, with less scabrous branches, and spiklets 4–4.5mm long. *D. caespitosa* s. l. is polymorphic in the Kurils, and needs taxonomic revision.
5. *Festuca rubra* L., Sp. Pl. 74 (1753).
Habitat. Meadows in gully.
Specimens. Takahashi 21609, 21622 (SAPT); Zhuravlev and Ilushko 586, 587 (VLA); Gage 2173 (WTU).
Distr. Temperate and cool regions of the Northern Hemisphere.
6. *Leymus mollis* (Trin.) Pilger in Bot. Yahrb. **74**: 6 (1945) —*Elymus arenarius* L. subsp. *mol-*

lis (Trin.) Hultén—*Elymus mollis* Trin. —*Leymus mollis* (Trin.) H. Hara, nom. invalid.
Habitat. Seashore.
Specimens. Takahashi 21584(SAPT); Zhuravlev and Ilushko 614 (VLA); Gage 2140 (WTU).
Distr. Cool regions of eastern Asia, Okhotsk region, the Aleutians, Chukot and N. America.
7. *Poa macrocalyx* Trautv. et C. A. Mey. in Middendorf, Reis. 1 (2), Fl. Ochot. 103 (1856).
Habitat. Seashore; meadows in gully.
Specimens. Takahashi 21585, 21593, 21614, Kuwahara s.n. (SAPT); Zhuravlev and Ilushko 621, 630, 631 (VLA); Gage 2172, Semsrott 241, 247 (WTU).
Distr. Okhotsk Sea region, the Aleutians and Alaska.
Note. This species and its related taxa are polymorphic, therefore we recognize it in the broad sense here.
8. *Poa turneri* Scribn. in Bull. U. S. Dept. Agr., Div. Agrost. **8**: 5 (1897).
Habitat. Seashore.
Specimens. Zhuravlev and Ilushko 630, 631 (VLA).
Distr. The Kurils, the Aleutians and Alaska.
Note. Tsvelev (1984) regarded this species as a synonym of *Poa macrocalyx* Trautv. et C. A. Mey. The species distinction of *Poa turneri* Scribn. needs future clarification

CYPERACEAE
1. *Carex gmelinii* Hook. et Arn. in Bot. Beech. Voy. **3**: 118 (1832).
Habitat. Seashore.
Specimens. Zhuravlev and Ilushko 255 (VLA); Gage 2169 (WTU).
Distr. Cool regions of eastern Asia, Okhotsk Sea region, the Aleutians, Chukot and western N. America.
2. *Carex riishirensis* Franch. in Bull. Soc. Philom. Paris 8, Ser. **7**: 88 (1895) —*C. scita* Maxim. var. *riishirensis* (Franch.) Kük. —*C. scita* Maxim. var. *koraginensis* (Meinsh.) Kük.
Habitat. Meadows in gully.
Specimens. Takahashi 21607, 21624 (SAPT); Zhuravlev and Ilushko 259 (VLA).
Distr. Okhotsk Sea region.
Note. This species has been recognized as a variety under *Carex scita* Maxim. by several authors. There are taxonomic problems on the distinction between several varieties of *Carex scita* s. l. including *C. scabrinervia* Franch.

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1996年の国際千島列島調査（IKIP）のおりに、中部千島に位置する小島チリンコタンに上陸し，フロラ調査をおこなった。これまで本島の植物についての報告はなかった。今回，維管束植物として15科30属34種を記録した。大きい科としては，イネ科（8種），キク科（6種），アブラナ科（3種），セリ科（3種）が挙げられる。千島列島とその近隣地域の文献を主にして学名の整理をおこない，分類学上の問題についてもリスト中に指摘した。なお日本の多くの図鑑類では，カラフトニンジンには *Conioselinum kamtschaticum* Rupr. が使われているが，代わりに *Conioselinum chinense*（L.）Britton, Sterns et Poggenb. を正名として起用した。

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