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Vascular Plants Collected on the Veslovskiy Peninsula, Kunashir Island in 2012

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Abstract During a field trip in 2012 to the Veslovskiy peninsula of Kunashir Island in the southern Kurils, 72 species in 24 families of vascular plants were collected. The floristic composition of Veslovskiy was compared with Notsuke of eastern Hokkaido. The general flora is similar between the two regions, except that forest vegetation is lacking in Veslovskiy. The relative dominance of the families; Rosaceae, Ranunculaceae, Ericaceae, and Violaceae in Notsuke can be explained by the presence of the forest vegetation. We could not confirm the forest vegetation in Veslovskiy. *Rhinanthus minor* and *Leontodon autumnalis*, which occur on Kunashir, are naturalized plants peculiar to Far Eastern Russia. They may become invaders on Hokkaido. *Cakile edentula*, on sandy beaches, has recently invaded the southern Kurils via seed dispersal through ocean currents from northern Hokkaido or Sakhalin.

Key words: flora, Kunashir, Notsuke, vascular plants, Veslovskiy

Introduction

The Veslovskiy peninsula is situated at the southern tip of Kunashir Island, and is separated from the Notsuke peninsula of eastern Hokkaido by a strait approximately 16 km wide (Fig. 1). As the general vegetation of the Veslovskiy peninsula appears similar to that of the Notsuke peninsula, it was natural to compare the plant species composition of the two regions.

Many studies of the vegetation and flora have been carried out by Japanese botanists on the Notsuke peninsula (Ito 1959, 1961, 1963a, 1963b, 1970; Hasegawa and Karino 1977; Hasegawa and Tsujii 1987). Ito (1959) recognized five plant communities; 1) sand beach community, 2) salt marsh community, 3) swamp community, 4) meadow community, and 5) forest community within the the Notsuke peninsula vegetation.

Ito (1961) carried out ecological studies on the salt marsh vegetation in Notsuke. He listed species of *Triglochin*, *Salicornia europaea*, *Puccinellia kurilensis*, *Carex ramenskii* and so on in characteristic salt marsh communities and showed the successional process of salt marsh communities schematically (Ito 1963b).

Ito (1963a) described the general vegetation of the Notsuke peninsula and listed 122 taxa found there. He especially commented on the presence of *Ranunculus reptans* L. and *Crataegus maximowiczii* C.K.Schneid. from a phytogeographic point of view. Ito (1970) studied the forest vegetation on the Notsuke peninsula and recognized three forest communities; 1) broad leaved forest community, 2) mixed forest community, and 3) needle leaved forest community. Recently, wither death of several species of trees was reported on Notsuke due to ground subsidence (Hasegawa and Karino 1977; Hasegawa and Tsujii 1987). The present condition and several problems in nature conservation in

the area have also been mentioned (Morita 2007, 2013).

Although many floristic and vegetational studies have been undertaken in Hokkaido on a regional scale, such studies on Kunashir Island are scarce. The present study on the regional flora of Kunashir will therefore provide basic biological information for the conservation of nature on the island.

Materials and Method

We surveyed the plants of Veslovskiy peninsula (Fig. 1), Kunashir Island on August 21, 2012. The Veslovskiy peninsula is about eight kilometers long by 0.2 to 1.6 km wide, and occupies an area of about 6.5 km². In comparison, the total land area of the Notsuke peninsula is roughly estimated to be about 28 km². The Veslovskiy peninsula is about one fourth the area of the Notsuke peninsula.

Four Japanese botanists collected vascular plants independently, which are summarized here in a preliminary list (see Appendix). Family and species names generally follow Murata and Yonekura (2012), and are ordered alphabetically in the list. All specimens are deposited in the Herbarium of the Hokkaido University Museum (SAPS). The comparable vascular plant list of Notsuke was compiled based on Ito (1963, 1970) and additionally Morita (2007, 2013).

Results and Discussion

We collected 72 species in 24 families of vascular plants on the Veslovskiy peninsula (see Appendix). As there are 211 species and 65 families reported for the Notsuke peninsula, the number of species on Veslovskiy is about one third that of Notsuke.

A comparison of the dominant families between the Notsuke peninsula, Hokkaido and the Veslovskiy peninsula of Kunashir (Table 1) shows the relative dominance of the families; Rosaceae, Ranunculaceae, Ericaceae, Violaceae and so on in Notsuke. This can be explained by the absence of the forest vegetation in Veslovskiy.

The Veslovskiy peninsula is composed of coastal sand dune (Fig. 2F), coastal meadows (Fig. 2D), salt lake (Lake Veslovskoe, Fig. 2A), salt marsh (Fig. 2B, C), several ponds (Fig. 2E), and disturbed wasteland, but forest vegetation was not found in our field examination. Trees such as *Abies sachalinensis*, *Picea jezoensis*, *Betula ermanii*, *Quercus crispula* which grow at Notsuke were not found in Veslovskiy. Similarly ten species of ferns and lycophytes recorded from Notsuke were not collected in Veslovskiy partly due to our limited time in the field in Veslovskiy. The findings indicate that the vegetation of the Veslovskiy peninsula is at an earlier stage of succession than on the Notsuke peninsula.

But recent decline in forest vegetation due to ground subsidence on Notsuke (Hasegawa and Karino 1977; Hasegawa and Tsujii 1987; Morita 2013) will bring about closer resemblance of the floras of the two regions.

Similar salt marsh vegetation is found at both Notsuke and Veslovskiy. This vegetation is characterized by *Salicornia europaea* (Fig. 2B), *Juncus gracillimus*, *Triglochin maritima* (Fig. 2C), *Puccinellia kurilensis*, and so on. Water plants such as *Utricularia japonica* and *Hippuris vulgaris*, were collected from fresh water ponds of Veslovskiy, but have not been recorded from Notsuke. Sea grasses, such as *Zostera*, were found at Veslovskiy, *Zostera marina* is one of the main components of the eco-system of the Bay of Notsuke.

Ranunculus reptans and *Crataegus maximowiczii* are regarded as important plants at Notsuke from a phytogeographic point of view (Ito 1963). *Ranunculus reptans* was collected on several islands in the Kurils, including Kunashir, but was not recorded at Veslovskiy. *Crataegus maximowiczii* has not been recorded from the Kurils (Barkalov 2009).

As there are many disturbed wastelands in the Veslovskiy peninsula, we found 16 naturalized species, including common worldwide naturalized plants such as *Achillea millefolium*, *Agrostis gigantea*, *Phleum pratense*, *Rumex acetosella*, and so on. Among them, *Rhinanthus minor* and *Leontodon autumnalis* are common

naturalized plants characteristic of the Russian Far East, including Sakhalin and the Kurils. These species have not substantially invaded in Hokkaido (Igarashi 2001), but are likely to be invaders on Hokkaido in the future.

On Veslovskiy, *Cakile edentula* (Fig. 2G) was found on coastal sandy beaches (cf. Fukuda et al. 2013). *Cakile edentula* has recently invaded the southern Kurils by seeds dispersed by ocean currents from northern Hokkaido or Sakhalin. *Cakile edentula* has not been found at Notsuke, but we anticipate its invasion because of recent records of its presence around Notsuke (Sukeno and Obata 2012).

Acknowledgements

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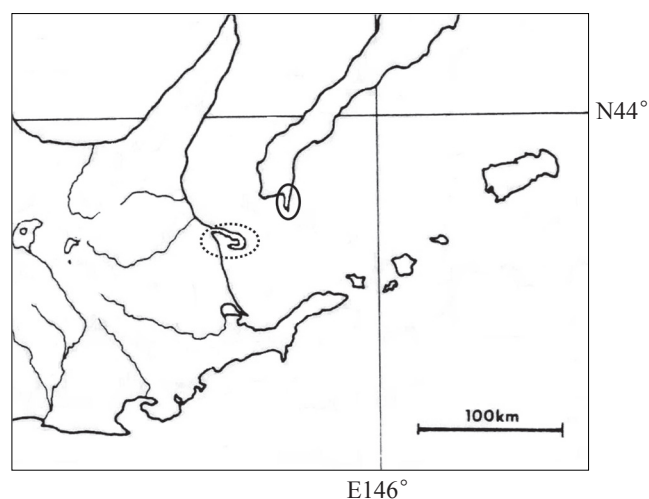


Figure 1. Location of study sites. Veslovskiy Peninsula (solid line) of Kunashir Island and Notsuke Peninsula (dotted line) of Hokkaido.

Table 1. A comparison of the dominant families between Notsuke of Hokkaido and Veslovskiy of Kunashir.

Rank	Notsuke	Rank	Veslovskiy
1	Asteraceae (21)	1	Asteraceae (14)
2	Poaceae (18)	2	Poaceae (13)
3	Rosaceae (17)	3	Caryophyllaceae (6)
4	Cyperaceae (12)	4	Cyperaceae (5)
5	Apiaceae (8)	5	Juncaceae (4)
	Ranunculaceae (8)	6	Amaranthaceae (3)
7	Ericaceae (7)		Apiaceae (3)
	Violaceae (7)		Polygonaceae (3)
9	Caryophyllaceae (6)		Zosteraceae (3)
	Juncaceae (6)	10	Lamiaceae (2)
11	Polygonaceae (5)		Plantaginaceae (2)
	Fabaceae (5)		Rosaceae (2)
	Plantaginaceae (5)		Rubiaceae (2)

The number of species in parentheses.

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 ITO, K. 1970. Ecological studies of the Notsukezaki sand spit, Prov. Nemuro, Hokkaido (2)- the forest communities. *Res. Bull. Hokkaido University For.* 27: 1–48 (with 4 plates). (In Japanese with English summary)
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 MURATA, J. AND YONEKURA, K. 2012. *An Enumeration of the Vascular Plants of Japan*. Tokyo: Hokuryu-kan. (In Japanese)
 SUKENO, M. AND OBATA, T. 2012. A distribution record of *Cakile edentula* from Hashirikotan of Bekkai-cho town, Hokkaido. *Hoppō-sansō* (29): 127–128. (In Japanese)

APPENDIX.

List of vascular plants on the Veslovskiy peninsula, Kunashir Island

AMARANTHACEAE

- Atriplex patens* (Litv.) Iljin [Hosoba-hama-akaza]
 H. Takahashi et al. 35258; Y. Kato 2012-141; T. Fukuda 2012-233.
Atriplex subcordata Kitag. [Hama-akaza]
 H. Takahashi et al. 35259; Y. Kato 2012-142; T. Fukuda 2012-226.
Salicornia europaea L. [Akkeshi-sō]
 H. Takahashi et al. 35262; H. Sato 01536, Y. Kato 2012-140; T. Fukuda 2012-225.

APIACEAE

- Bupleurum longiradiatum* Turcz. [Hotaru-saiko s.l.]
 H. Takahashi et al. 35254.
Cicuta virosa L. [Doku-zeri]
 T. Fukuda 2012-212.
Ligusticum scoticum L. [Maruba-tōki]
 T. Fukuda 2012-235.

ASPARAGACEAE

- Maianthemum dilatatum* (A.W.Wood) A.Nelson et J.F.Macbr. [Maizuru-sō]
 Y. Kato 2012-150.

ASTERACEAE

- Achillea alpina* L. subsp. *japonica* (Heimerl) Kitam. [Kitanokogirisō]
 H. Takahashie et al. 35252; Y. Kato 2012-162; T. Fukuda 2012-214.
Achillea millefolium L. [Seiyō-nokogiri-sō] Naturalized!
 H. Takahashi et al. 35237; T. Fukuda 2012-222.
Achillea ptarmica L. subsp. *macrocephala* (Rupr.) Heimerl var. *speciosa* (DC.) Herder [Ezo-nokogiri-sō]
 Y. Kato 2012-340.
Artemisia koidzumii Nakai [Hiroha-urajiro-yomogi]
 H. Takahashi et al. 35249.
Artemisia stelleriana Besser [Shiro-yomogi]
 T. Fukuda 2012-218.
Cirsium kamtschaticum Ledeb. ex DC. [Chishima-azami]

- H. Takahashi et al. 35248.
Gnaphalium uliginosum L. [Hime-chichiko-gusa] Naturalized!
 H. Takahashi et al. 35273.
Ixeris repens (L.) A.Gray [Hama-nigana]
 T. Fukuda 2012-219.
Leontodon autumnalis L. [Akino-tanpoopo-modoki] Naturalized!
 Y. Kato 2012-154.
Ligularia hodgsonii Hook.f. [Tōge-buki]
 H. Takahashi et al. 35253.
Matricaria matricarioides (Less.) Ced.Porter ex Britton [Koshikagiku] Naturalized!
 H. Takahashi et al. 35236; T. Fukuda 2012-223.
Senecio nemoralis L. [Kion]
 Y. Kato 2012-153.
Sonchus brachyotus DC. [Hachijyō-na]
 T. Fukuda 2012-221, 2012-238.
Tripleurospermum tetragonospermum (F.Schmidt) Poped. [Shikagiku]
 H. Takahashi et al. 35277; Y. Kato 2012-164; T. Fukuda 2012-220.

BRASSICACEAE

- Cakile edentula* (Bigelow) Hook. [Onihama-daikon] Naturalized!
 H. Takahashi et al. 35239, 35244, 35276; Y. Kato 2012-138; T. Fukuda 2012-237, 2012-241.

CAPRIFOLIACEAE

- Lonicera caerulea* L. subsp. *edulis* (Regel) Hultén var. *edulis* Regel [Keyonomi]
 H. Takahashi et al. 35250.

CARYOPHYLLACEAE

- Arenaria lateriflora* L. [Ōyama-husuma]
 Y. Kato 2012-139.
Dianthus superbus L. var. *superbus* [Ezo-kawara-nadeshiko]
 Y. Kato 2012-136.
Spergula arvensis L. var. *sativa* (Boenn.) Mert. et WDJ.Koch [Ō-tsumekusa] Naturalized!
 H. Takahashi et al. 35272.
Spergularia marina (L.) Griseb. [Ushio-tsumekusa]
 H. Takahashi et al. 35257; Y. Kato 2012-143; T. Fukuda 2012-230.
Stellaria graminea L. [Karafuto-hosoba-hakobe] Naturalized!
 Y. Kato 2012-144.
Stellaria humifusa Rottb. [Ezo-hakobe]
 H. Takahashi 35256; T. Fukuda 2012-215, 2012-234.

CORNACEAE

- Cornus suecica* L. [Ezo-gozen-tachibana]
 Y. Kato 2012-156.

CYPERACEAE

- Carex arenicola* F.Schmidt [Kuro-kawazu-suge]
 Y. Kato 2012-175, 2012-174.
Carex caryophyllea Latour. var. *microtricha* (Franch.) Kük. [Chasiba-suge]
 Y. Kato 2012-171, 2012-339.
Carex gmelinii Hook. et Arn. [Nemuro-suge]
 Y. Kato 2012-172; 2012-334; T. Fukuda 2012-213.
Carex lyngbyei Hornem. [Yarame-suge]
 T. Fukuda 2012-209.
Carex macrocephala Willd. ex Spreng. [Ezono-kōbō-mugi]
 Y. Kato 2012-173.

GERANIACEAE

- Geranium yesoense* Franch. et Sav. [Ezo-hūro]
 H. Takahashi et al. 35246; Y. Kato 2012-155.

HALORAGACEAE

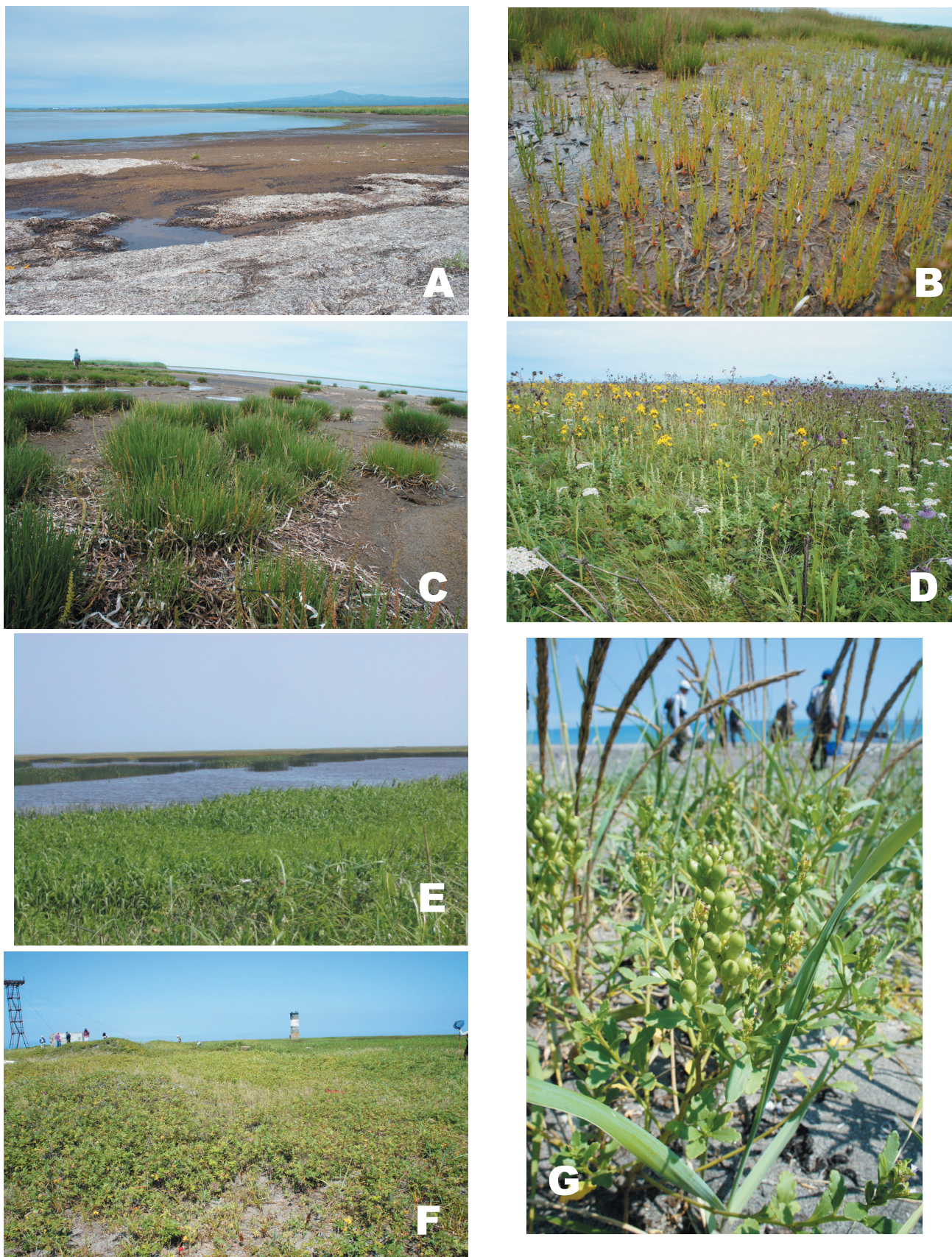


Figure 2. A. Lake-side of Veslovskoye. B. *Salicornia europaea* community. C. *Triglochin maritima* community. D. Meadows on coastal sand. E. Fresh water pond on the Veslovskiy peninsula. F. Meadow with *Rosa rugosa* scrubs at the edge of sandy beach. G. *Cakile edentula*, on sandy beaches, a new invader on the southern Kurils.

***Myriophyllum* sp.**

T. Fukuda 2012-207-a

Note: According to Barkalov (2009), it may be *M. spicatum* L. But in the present study, we hesitate to determine it because of its sterile stage.

JUNCACEAE

***Juncus bufonius* L.** [Hime-kōgai-zekishō] Naturalized!

H. Takahashi et al. 35274.

***Juncus covillei* Piper** [Sekishō-i]

Y. Kato 2012-169.

***Juncus decipiens* (Buchenau) Nakai** [Igusa]

Y. Kato 2012-149.

***Juncus gracillimus* (Buchenau) V.I.Krecz. et Gontsch.** [Doro-i]

H. Takahashi et al. 35261; Y. Kato 2012-332; T. Fukuda 2012-229.

JUNCAGINACEAE

Triglochin maritima L. [Marumino-shibana, Ō-shibana]

H. Takahashi et al. 35265; Y. Kato 2012-151, 152; H. Sato 01545; T. Fukuda 2012-224.

LAMIACEAE

Scutellaria strigillosa Hemsl. [Namiki-sō]

Y. Kato 2012-159.

Stachys aspera Michx. var. *baicalensis* (Fisch. ex Benth.) Maxim. [Ezo-inugoma]

Y. Kato 2012-160; T. Fukuda 2012-211.

LENTIBULARIACEAE

Utricularia japonica Makino. [Tanuki-mo]

H. Takahashi et al. 35267; T. Fukuda 2012-207b

OROBANCHACEAE

Rhinanthus minor L. [Okuezo-garagara] Naturalized!

H. Takahashi et al. 35275; Y. Kato 2012-148.

PLANTAGINACEAE

Hippuris vulgaris L. [Sugina-mo]

H. Takahashi et al. 35266; T. Fukuda 2012-210.

Plantago camtschatica Cham. ex Link [Ezo-ōbako]

Y. Kato 2012-161.

POACEAE

Agrostis clavata Trin. var. *clavata* [Yama-nukabo]

H. Sato 01547

Agrostis gigantea Roth [Konuka-gusa] Naturalized!

H. Takahashi et al. 35271.

Calamagrostis epigeios (L.) Roth [Yama-awa]

H. Takahashi et al. 35255, 35264; H. Sato 01554, 01555, 01556, 01557; T. Fukuda 2012-236.

Calamagrostis purpurea (Trin.) Trin. subsp. *langsдорffii* (Link) Tzvelev [Iwa-no-gariyasu]

H. Sato 01551, 01552, 01553.

Calamagrostis stricta (Timm) Koeler subsp. *inexpansa* (A.Gray) C.W.Greene [Chishima-gariyasu]

H. Sato 01540, 01541, 01542, 01543, 01544.

Elymus dahuricus Turcz. ex Griseb. [Hama-mugi]

Y. Kato 2012-147; H. Sato 01537, 01538, 01539.

Festuca ovina L. [Ushinoke-gusa]

Y. Kato 2012-145; H. Sato 01546.

Leymus mollis (Trin. ex Spreng.) Pilg. [Tenki-gusa, Hamanin'niku]

T. Fukuda 2012-240; H. Sato 01831, 01832.

Phleum pratense L. [Ō-awagaeri] Naturalized!

H. Takahashi et al. 35245; H. Sato 01548.

Poa annua L. [Suzumeno-katabira] Naturalized!

H. Takahashi et al. 35238.

Poa trivialis L. [Ō-suzumeno-katabira] Naturalized!

H. Sato 01549, 01550.

Puccinellia kurilensis (Takeda) Honda [Chishima-dojyōtsunagi]

H. Sato 01562, 01563, 01564, 01619, 01699, 01700.

Trisetum sibiricum Rupr. [Chishima-kanitsuri]

H. Takahashi 35251; H. Sato 01558, 01559, 01560, 01561.

POLYGONACEAE

Polygonum aviculare L. subsp. *neglectum* (Besser) Arcang. [Okumichiyangi] Naturalized!

H. Takahashi et al. 35235.

Polygonum polyneuron Franch. et Sav. [Akino-michiyangi] Naturalized!

H. Takahashi et al. 35243.

Rumex acetosella L. [Hime-suiba] Naturalized!

Y. Kato 2012-146.

PRIMULACEAE

Lysimachia maritima (L.) Galasso, Banfi et Soldano var. *obtusifolia* (Fernald) Yonek. [Umi-midori]

H. Takahashi et al. 35263; Y. Kato 2012-157, 2012-163; T. Fukuda 2012-228.

RANUNCULACEAE

Thalictrum minus L. var. *hypoleucum* (Siebold et Zucc.) Miq. [Aki-karamatsu]

H. Takahashi et al. 35247; Y. Kato 2012-137.

ROSACEAE

Potentilla anserina L. subsp. *pacifica* (Howell) Rousi [Ezo-tsuru-kinbai]

H. Takahashi 35260; Y. Kato 2012-166; T. Fukuda 2012-227, 2012-231.

Rosa rugosa Thunb. [Hama-nasu]

T. Fukuda 2012-232.

RUBIACEAE

Rubia jesoensis (Miq.) Miyabe et T.Miyake [Akane-mugura]

T. Fukuda 2012-216.

Galium verum L. subsp. *asiaticum* (Nakai) T.Yamaz. var. *trachycarpum* DC. [Ezono-kawara-matsuba]

Y. Kato 2012-158.

ZOSTERACEAE

Zostera asiatica Miki [Ō-amamo]

H. Takahashi et al. 35240.

Zostera japonica Asch. et Graebn. [Ko-amamo]

H. Takahashi et al. 35242; T. Fukuda 2012-205.

Zostera marina L. [Amamo]

H. Takahashi et al. 35241.

高橋英樹¹, 佐藤広行², 加藤ゆき恵³, 福田知子⁴: 2012年に国後島ケラムイ半島で採集された維管束植物

2012年の植物調査において、国後島ケラムイ半島で24科72種の維管束植物を採集し、その植物相を北海道東部の野付半島と比較した。塩湿地植生を持つ点で両地域は似ていたが、ケラムイ半島では森林植生が確認できなかった。この影響か、バラ科、キンポウゲ科、ツツジ科、スミレ科がケラムイ半島では少なかった。またケラムイ半島では淡水性の水草が比較的多く見られた。オクエゾガラガラ *Rhinanthus minor* やアキノタンポポモドキ *Leontodon autumnalis* など極東ロシアで典型的に見られる外来植物種がケラムイ半島のかく乱地で見られた。これらの種は近い将来北海道でも普通の外来種になっていくものと推定される。すでに他所で報告したが、北海道各地で見られるオニハマダイコン *Cakile edentula* が砂浜で見られた。これらは北北海道やサハリンに最近侵入した集団から、種子の海流散布により国後島に侵入したものと推定された。

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