

# Collaborative Exploration between NIAS Genebank and USDA ARS (U.S. Department of Agriculture, Agricultural Research Service) for the Collection of Genetic Resources of Fruit and Nut Species in Hokkaidō and the Northern Tōhoku Region

Hiroyuki IKETANI<sup>1)</sup>, Kim E. HUMMER<sup>2)</sup>, Joseph D. POSTMAN<sup>2)</sup>,  
Hiroyuki IMANISHI<sup>3)</sup> and Nobuko MASE<sup>1)</sup>

- 1) *Genetic Resources Laboratory, Research Support Center, National Institute of Fruit Tree Science, National Agriculture and Food Research Organization. 2-1 Fujimoto, Tsukuba 305-8615, Japan.*
- 2) *US Department of Agriculture, National Clonal Germplasm Repository. 33447 Peoria Road, Corvallis, Oregon 97333-2521, USA.*
- 3) *Center of Field Education and Research, Faculty of Bioresource Sciences, Akita Prefectural University. 6 Ogata, Ogata, Akita 010-0451, Japan.*

## Summary

From 7 to 25 September 2009, a collaborative exploration between NIAS Genebank and USDA ARS to collect genetic resources in Hokkaidō and the Northern Tōhoku region was performed. The investigated areas were mainly upper deciduous forest and subalpine conifer forest zones. The vegetation was mainly forests, but we also visited upland bogs and coastal vegetation to collect some particular plants. The expedition obtained 147 seed and plant samples representing 20 genera and 53 species. Collected genera were *Actinidia*, *Chaenomeles*, *Corylus*, *Crataegus*, *Empetrum*, *Gaultheria*, *Humulus*, *Fragaria*, *Lonicera*, *Lycium*, *Malus*, *Mentha*, *Prunella*, *Potentilla*, *Pyrus*, *Ribes*, *Rubus*, *Sorbus*, *Vaccinium* and *Vitis*.

Key words: genetic resources, fruit tree, nut, Hokkaidō, Tōhoku

## Introduction

Hokkaidō Island occupies a special position in the phytogeography of Japan. In the classification system of the world's floristic regions<sup>1)</sup>, Hokkaidō belongs to Sakhalin-Hokkaidō Province, while the other three main islands of Japan belong to Japanese-Korean Province. Both Provinces belong to the East Asiatic Region, Boreal Subkingdom, Holarctic Kingdom. Since Hokkaidō is the northernmost island of Japan and its climate is subarctic, it has many more plants in common with the Circumboreal Region (Northeastern Siberian Province, Okhotsk-Kamchatka Province, Canadian Province, etc.) than the other three islands. In addition, several of these plants are also distributed in the Northern Tōhoku region, mainly in the Ōu Mountains

and the Kitakami Mountains<sup>2)</sup>.

The participants from USDA, Kim E. Hummer (KEH), and Joseph D. Postman (JDP), had already explored Eastern Siberia and the Kurile Islands to collect fruit and nut genetic resources, and in 2003 they planned an expedition to Hokkaidō and offered to collaborate with NIAS Genebank. The first Joint Expedition was held in July 2004, mainly to collect *Fragaria*, *Lonicera*, *Ribes* and other small fruit genetic resources which bear mature fruits in this season.

In 2008, American members planned a second expedition to collect *Actinidia*, *Humulus*, *Malus*, *Pyrus*, *Rubus*, *Sorbus*, *Vaccinium* and so on, the fruits of which ripen later than July. A non-funded cooperative agreement between NIAS Genebank and USDA ARS was drawn up, in accordance with the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization.

## Methods

The main purpose of this exploration was to collect mature seeds of wild genetic resources, and so it was important to find their native habitats. However, it is difficult to obtain detailed location information from publications (scientific reports, flora, field guides, etc.), so we started by gathering such knowledge from primary information sources, mainly herbarium specimens and personal communications with local botanists.

Then we narrowed down candidate locations, selected several public forests and applied for permission to explore. For locations situated in special zones of national parks or quasi national parks, which are controlled by government regulations, we also applied for permission under those regulations. We also planned to collect from materials cultivated in botanical gardens and other facilities, since wild plants do not bear fruit every year.

For these purposes, Japanese members, Hiroyuki Iketani (HIk), Hiroyuki Imanishi (HIIm) and Nobuko Mase (NM), carried out preliminary field investigations in August 2008 (HIk), June 2009 (HIk and NM) and August 2009 (HIk and HIIm). We finally planned the itinerary (Table 1), and the main investigation was conducted by both American (KEH and JDP) and Japanese (HIk and HIIm) members from 8 to 25 September 2009.

## Results and Discussion

A total of 147 accessions of genetic resources representing 20 genera and 53 species were collected (Table 2), of which 29 were plant samples (living plants or cuttings) and 124 were seed samples. These samples were divided between the NIAS Genebank and USDA ARS collaborators. The Japanese portion was deposited in the Genebank of NIAS, and the US portion was deposited in the US/NPGS.

Particularly interesting plants are outlined below.

1) *Crataegus chlorosarca* (including *C. jozana*)

This species is listed in the National Red List of endangered plants<sup>3)</sup> as “vulnerable” (= high risk of endangerment). It might have been a common species in the lowland swamps of Hokkaidō before reclamation began in the mid 19th century, but this habitat has greatly decreased and it is now difficult to find this species. Our investigation location, a national forest in Nanporo-chō, was originally a natural forest. It remains as a windbreak forest, although the

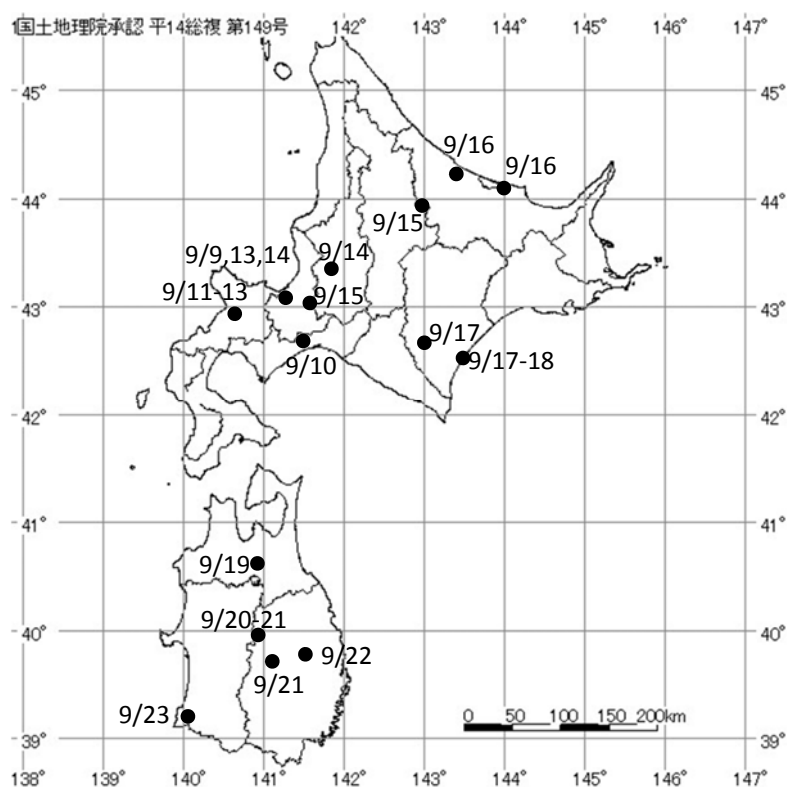


Fig. 1. Collection sites of genetic resources. The map was made with KenMap<sup>13)</sup>.

Table 1. Itinerary of the main investigation from 8 to 23 September 2009.

Date	Principal locality	Main purpose
2009/9/8	Arrival at Sapporo (All members)	
2009/9/9	Botanical Gardens, Hokkaido University (AM), Hokkaido Agricultural Research Center (PM)	Cultivated plants (originally collected in Hokkaidō)
2009/9/10	Tomakomai University Forest of Hokkaido University	
2009/9/11	Move to Niseko-chō (AM), around the foot of Mt. Nisekoannupuri (PM)	<i>Vaccinium</i> and other alpine plants
2009/9/12	North foot of Mt. Konbudake (AM), Shinsennuma Bog, Niimitōge Pass (PM)	<i>Rubus vernus</i> and other alpine plants
2009/9/13	Private gardens in Kucchan-chō (AM), Sapporo-shi	Cultivated plants (originally collected in Hokkaidō)
2009/9/14	Forest and Forest Products Research Institute (AM), Hokkaido Forestry Research Institute (PM)	Cultivated plants (originally collected in Hokkaidō)
2009/9/15	Nanporo-chō (AM), Ukishima Shitsugen Bog (PM)	<i>Crataegus</i> , <i>Vaccinium</i>
2009/9/16	Monbetsu-shi (AM), Lake Saromako (PM)	<i>Vaccinium</i> , <i>Malus</i>
2009/9/17	East foot of Hidaka Mountains (AM), seashore of the Pacific Ocean (PM)	<i>Mentha</i>
2009/9/18	Hidaka-shichō (AM), move to Sapporo	
2009/9/19	Move to Aomori (KEH, JDP and Hik), north foot of Hakkōda Mountains	<i>Rubus vernus</i>
2009/9/20	East foot of Mt. Ōdake (AM), Mt. Hachimantai (PM)	<i>Vaccinium</i> , <i>Prunella</i>
2009/9/21	East foot of Mt. Hachimantai (AM), Morioka-shi (PM)	<i>Sorbus</i> , <i>Prunella</i>
2009/9/22	Kitakami Mountains	<i>Malus</i> , <i>Pyrus</i>
2009/9/23	Mt. Chōkaisen, move to Tsukuba	<i>Rubus vernus</i> , <i>Vaccinium</i>
2009/9/24	NIFTS and NIAS at Tsukuba	
2009/9/25	Return to U.S. (KEH and JDP)	

surrounding area has been developed as agricultural land. As a result, the forest has become a refuge for native rare plants and has retained species richness, while other windbreaks, typically secondary forest, have not done so.

#### 2) *Lycium chinense*

We found a small population near the seashore in Minatomachi, Rankoshi-chō. This plant is common in human areas except for Hokkaidō, where it is very rare. It is found only in the southern area where Japanese people had already settled before the mid 19th century, so it is thought to have been introduced from Honshū.

#### 3) *Malus baccata* var. *mandshurica*

Unlike its distribution in the upper mountainous zone (1,000 - 2,000 m asl.) in Central Honshū<sup>4)</sup>, in Hokkaidō it appears in coastal sand dune forests, especially in the Okhotsk Sea area<sup>5)</sup>. In other areas we found only a few individuals through preliminary field investigations and this forest type may have decreased, so we chose to visit Lake Saromako where a large population was found.

#### 4) *Rubus vernus*

This is an endemic species distributed from Central Honshū and the Northern region, mainly on the Sea of Japan side. In Hokkaidō it is very rare and found only in the southern area. However, since it grows in upper mountainous and subalpine zones, it is native unlike *Lycium chinense*. The northern limit is Mt. Shakotandake<sup>6)</sup>. We investigated a small population on Nimitōge Pass in the Niseko Mountains.

#### 5) *Sorbus x kawashiroi*

This is a natural hybrid between *Sorbus alnifolia* and *S. commixta* originally discovered in the Okhotsk area<sup>7)</sup>. We collected samples from a cultivated tree in the Botanical Gardens of Hokkaidō University that had perhaps been propagated from an original individual.

#### 6) *Pyrus ussuriensis*

This formerly ambiguous species was recently proved to be truly native to the Kitakami Mountains<sup>8)</sup> in Iwate Prefecture, however, the extant populations are very small<sup>9)</sup>. It was listed in the National Red List of endangered plants<sup>3)</sup> as “critically endangered” (= extremely high risk of extinction). Most recently, the majority of individuals were proved to be introgressed with *Pyrus pyrifolia*<sup>10)</sup>. Therefore we selected several trees having the true native genetic structure from the data in reference 10 and collected from them.

### Future prospects

Through the two collaborative explorations we were able to collect many native wild fruit tree genetic resources from Hokkaidō. We will evaluate the characteristics of the collected germplasms in parallel with maintaining and propagating them. These will be valuable materials for evolutionary biology, ecology, and physiology studies, as well as horticulture and breeding.

### Acknowledgements

We would like to thank Dr. H. Nakai of Sapporo city, Mr. H. Igarashi of Chitose city, Mr. Y. Ueno of Shiroishi city, Mr. Y. Horii of Daisen city, Mr. N. Numakunai of Fukushima city, Dr. T. Azuma of the Botanical Gardens of the Graduate School of Agriculture, Hokkaidō University,

Dr. Y. Ito of the National Agricultural Research Center for the Hokkaidō Region, Mr. I. Ikeda of Niseko town, owners of two private gardens in Kucchan town, Dr. T. Kawahara of the Hokkaidō Research Center, Forestry and Forest Product Research Institute, Dr. Y. Wakita of the Hokkaidō Forestry Research Institute, Hokkaidō Research Organization, Mr. M. Takahashi of the Central Agricultural Experiment Station, Hokkaidō Research Organization and Dr. M. Suzuki of Iwate Prefectural Museum, for providing information on the native habitats or guiding and permitting us to collect in their institutions. We are grateful to the curators of the herbarium of the Botanical Gardens of the Graduate School of Agriculture, Hokkaidō University for assisting us with our investigation of plant specimens. We are also grateful to District Forest Offices of the Hokkaidō Regional Forest Office, Forestry Agency, MAFF, to the Departments of the Environment of Hokkaidō and Akita Prefectural Governments, to the Tōhoku Regional Environment Office of the Ministry of Environment, and to the Tomakomai Research Forest of Field Science Center for Northern Biosphere, Hokkaidō University, for permission to investigate and collect plant materials.

### Endnote

In this report, we adopted the ALA-LC Romanization Tables<sup>11)</sup> for the transcription of Japanese proper names, except for the names of several bodies.

### References

- 1) Takhtajan A. (translated by Crovello T. J.) (1986) Floristic regions of the world. University of California Press, Berkeley.
- 2) Ohashi H. (1987) Floristic regions in the Tōhoku District of Japan. *Journal of Japanese Botany* 62: 119-126 (in Japanese with English summary).
- 3) Ministry of the Environment, Government of Japan (2007) The updated Japanese red lists on mammals, brackish-water/freshwater fishes, insects, shellfish, and plants I and II. <http://www.env.go.jp/en/headline/headline.php?serial=503>.
- 4) Iketani H. (2004) Rediscovery of *Malus baccata* var. *mandshurica* at Nikko and the reexamination of its taxonomy. *Bunrui* 4: 125-136 (in Japanese).
- 5) Ishimaru K., T. Komatsu and Y. Takeda (1997) Phytosociological study of *Malus baccata* var. *mandshurica* forest on coastal sand dunes in eastern Hokkaidō. *Vegetation Science* 14: 37-45 (in Japanese with English summary).
- 6) Hinoma A. (2008) Distribution maps of vascular plants in Hokkaidō, Japan. <http://www.hinoma.com/maps/index.shtml>.
- 7) Ito K. (1968) Observations on Northern Japanese plants (8). *Journal of Geobotany* 16: 104-106.
- 8) Iketani H. and H. Ohashi (2003) Taxonomy and distribution of Japanese populations of *Pyrus ussuriensis* Maxim. (Rosaceae). *Journal of Japanese Botany* 78: 119-134.
- 9) Iketani H., N. Mase and Y. Sato (2006) Exploration and collection of *Pyrus* and *Malus* genetic resources in Northern Tōhoku region. *Annual Report on Exploration and Introduction of Plant Genetic Resources* 22: 13-21 (in Japanese).
- 10) Iketani H., T. Yamamoto, H. Katayama, C. Uematsu, N. Mase and Y. Sato (2010) Introgression

- between native and prehistorically naturalized (archaeophytic) wild pear (*Pyrus* spp.) populations in Northern Tōhoku, Northeast Japan. Conservation Genetics 11: 115-126.
- 11) The American Library Association (1997) Library of Congress Romanization tables.  
<http://www.loc.gov/catdir/cpsol/roman.html>.
- 12) Yonekura K. and T. Kajita (2004-) BJ Plants - Index of Japanese names and Scientific names.  
[http://bean.bio.chiba-u.jp/bgplants/ylist\\_main.html](http://bean.bio.chiba-u.jp/bgplants/ylist_main.html).
- 13) Kamada, T. (2009) KenMap ver. 8.32. <http://www5b.biglobe.ne.jp/~t-kamada/CBuilder/kenmap.htm>.

## 和文摘要

農業生物資源研究所ジーンバンクと米国農務省研究局との共同事業として、2009年9月7日から25日まで、北海道及び北東北地域の果樹遺伝資源の探索を行った。調査地域の植生は、上部温帯から亜寒帯針葉樹林帯にあたる。主として森林地帯で調査を行ったが、立地条件の特殊な種の探索のため、高山湿原や海岸周辺部も巡った。

この結果、以下の20属53種について計147点を収集した：マタタビ属、ボケ属、ハシバミ属、サンザシ属、ガンコウラン属、アカモノ属、カラハナソウ属、イチゴ属、ウグイスカグラ属、クコ属、リンゴ属、ハッカ属、ウツボグサ属、キジムシロ属、ナシ属、スグリ属、キイチゴ属、ナナカマド属、スノキ属、ブドウ属である。

Table 2. List of collected genetic resources.

Collection number	JP number in NIAS genebank	Accession number in USDA-ARS	Collection Date	Sample Type	Taxon <sup>1)</sup>	Japanese Plant Name <sup>2)</sup>	Latitude	Longitude	Elev. (m)	Prefecture	Municipality	Locality
JPN-2009-001	237682	CLON 60	2009/9/9	plant	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominougusukagura	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-002	237683	CCRA 210	2009/9/9	seed, plant	<i>Crataegus chlorosarca</i> Maxim.	Kuromisanzashi	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-003	237684	CVAC 1836	2009/9/9	seed	<i>Vaccinium japonicum</i> Miq.	Akushiba	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-004	237685	CVAC 1837	2009/9/9	seed	<i>Vaccinium smallii</i> A. Gray	Ōbasunoki	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-005	237686	CVAC 1838	2009/9/9	seed	<i>Vaccinium oldhamii</i> Miq.	Natsuhaze	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-006	237687	CSOR 303	2009/9/9	plant	<i>Sorbus</i> × <i>kawashiroi</i> Koji Ito ex Murata	Kawashironanakamado	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-007	237688	CHUM 1593	2009/9/9	plant	<i>Humulus lupulus</i> var. <i>cordifolius</i> (Miq.) Maxim.	Karahanasō	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-008	237689	CFRA 2015	2009/9/9	seed	<i>Fragaria vesca</i> L.	Ezohebiichigo	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-009	237690	Ames 30306 CPRN 1	2009/9/9	seed	<i>Prunella vulgaris</i> L. subsp. <i>asiatica</i> (Nakai) H. Hara	Tateyamautsubogusa	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-010	237691	CPOT 17	2009/9/9	plant	<i>Potentilla sprengeliana</i> Lehm. = <i>P. fragarioides</i> L.	Kijimushiro	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-011	237692	CSOR 304	2009/9/9	seed	<i>Sorbus matsumurana</i> (Makino) Koehne	Urajironanakamado	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-012	237693	CVAC 1839	2009/9/9	seed	<i>Vaccinium ovalifolium</i> Sm.	Kurousugo	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-013	237694	CSOR 305	2009/9/9	seed	<i>Sorbus sambucifolia</i> (Cham. et Schldt.) Roemer	Takanenanakamado	43-03-55	141-20-39	15	Hokkaidō	Sapporo-shi	Botanical Gardens, Hokkaidō University. Cultivated.
JPN-2009-014	237695	CVAC 1840	2009/9/9	seed	<i>Vaccinium oldhamii</i> Miq.	Natsuhaze	43-00-25	141-25-40	60	Hokkaidō	Sapporo-shi	National Agricultural Research Center for Hokkaidō Region
JPN-2009-015	237696	CVAC 1841	2009/9/9	seed	<i>Vaccinium hirtum</i> Thunb.	Usunoki	43-00-25	141-25-40	60	Hokkaidō	Sapporo-shi	National Agricultural Research Center for Hokkaidō Region
JPN-2009-016	237697	CVAC 1842	2009/9/9	seed	<i>Vaccinium japonicum</i> Miq.	Akushiba	43-00-25	141-25-40	60	Hokkaidō	Sapporo-shi	National Agricultural Research Center for Hokkaidō Region
JPN-2009-017	237698	CVAC 1843	2009/9/9	seed	<i>Vaccinium yakushimense</i> Makino	Akushibamodoki	43-00-25	141-25-40	60	Hokkaidō	Sapporo-shi	National Agricultural Research Center for Hokkaidō Region. Cultivated.
JPN-2009-018	237699	CRIB 1619	2009/9/9	seed	<i>Ribes ambiguum</i> Maxim.	Yashabishaku	43-00-25	141-25-40	60	Hokkaidō	Sapporo-shi	National Agricultural Research Center for Hokkaidō Region. Cultivated.
JPN-2009-019	237700	CRUB 2549	2009/9/9	seed	<i>Rubus crataegifolius</i> Bunge	Kumaichigo	43-00-25	141-25-40	60	Hokkaidō	Sapporo-shi	National Agricultural Research Center for Hokkaidō Region
JPN-2009-020	237701	CACT 276	2009/9/10	seed	<i>Actinidia arguta</i> (Siebold et Zucc.) Planch. ex Miq.	Sarunashi	42-42-49	141-34-11	30	Hokkaidō	Tomakomai-shi	Tomakomai Research Forest, Hokkaidō University

Table 2 (continued).

Collection number	JP number in NIAS genebank	Accession number in USDA-ARS	Collection Date	Sample type	Taxon <sup>1)</sup>	Japanese plant Name <sup>2)</sup>	Latitude	Longitude	Elev. (m)	Prefecture	Municipality	Locality
JPN-2009-021	237702	CACT 277	2009/9/10	seed	<i>Actinidia polygama</i> (Siebold et Zucc.) Planch. ex Maxim.	Matatabi	42-42-49	141-34-17	30	Hokkaidō	Tomakomai-shi	Tomakomai Research Forest, Hokkaidō University
JPN-2009-022	237703		2009/9/10	plant	<i>Potentilla sprengeliana</i> Lehm. = <i>P. fragariooides</i> L.	Kijimushiro	42-42-49	141-34-19	30	Hokkaidō	Tomakomai-shi	Tomakomai Research Forest, Hokkaidō University
JPN-2009-023	237704	CRUB 2550	2009/9/10	seed	<i>Rubus crataegifolius</i> Bunge	Kumaichigo	42-42-01	141-34-22	80	Hokkaidō	Tomakomai-shi	Tomakomai Research Forest, Hokkaidō University
JPN-2009-024	237705	CRUB 2551	2009/9/10	seed	<i>Rubus parvifolius</i> L.	Nawashirochigo	42-42-03	141-34-23	80	Hokkaidō	Tomakomai-shi	Tomakomai Research Forest, Hokkaidō University
JPN-2009-025	237706	CRUB 2552	2009/9/10	seed	<i>Rubus hybrid?</i> <i>parvifolius</i> x <i>idaeus?</i> <i>Rubus hybrid</i>		42-41-21	141-35-24	65	Hokkaidō	Tomakomai-shi	Tomakomai Research Forest, Hokkaidō University
JPN-2009-026	237707	CRUB 2553	2009/9/10	seed	<i>Rubus idaeus</i> L. subsp. <i>melanolasius</i> Focke	Ezoichigo	42-40-59	141-35-29	40	Hokkaidō	Tomakomai-shi	Tomakomai Research Forest, Hokkaidō University
JPN-2009-028	237708		2009/8/21	seed	<i>Rubus mesogeus</i> Focke	Kuroichigo				Hokkaidō	Sapporo-shi	seed collected by Dr. Y. Ito
JPN-2009-029	237709		2009/8/21	seed	<i>Rubus mesogeus</i> Focke	Kuroichigo				Hokkaidō	Sapporo-shi	seed collected by Dr. Y. Ito
JPN-2009-030	237710	CLON 61	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō	Tomakomai-shi	seed collected by Dr. Y. Ito
JPN-2009-031	237711	CLON 62	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō	Tomakomai-shi	seed collected by Dr. Y. Ito
JPN-2009-032	237712	CLON 63	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō	Tomakomai-shi	seed collected by Dr. Y. Ito
JPN-2009-033	237713	CLON 64	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō	Tomakomai-shi	seed collected by Dr. Y. Ito
JPN-2009-034	237714	CLON 65	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō	Tomakomai-shi	seed collected by Dr. Y. Ito
JPN-2009-035	237715	CLON 66	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō	Tomakomai-shi	seed collected by Dr. Y. Ito
JPN-2009-036	237716	CLON 67	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-037	237717	CLON 68	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-038	237718	CLON 69	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-039	237719	CLON 70	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-040	237720	CLON 71	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-041	237721	CLON 72	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito



Table 2 (continued).

Collection number	JP number in NIAS genebank	Accession number in USDA-ARS	Collection Date	Sample type	Taxon <sup>1)</sup>	Japanese plant Name <sup>2)</sup>	Latitude	Longitude	Elev. (m)	Prefecture	Municipality	Locality
JPN-2009-042	237722	CLON 73	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-043	237723	CLON 74	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-044	237724	CLON 75	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-045	237725	CLON 76	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-046	237726	CLON 77	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-047	237727	CLON 78	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-048	237728	CLON 79	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-049	237729	CLON 80	2009/7/22	seed	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten var. <i>emphylocalyx</i> (Maxim.) Nakai	Kurominouguisukagura				Hokkaidō		seed collected by Dr. Y. Ito
JPN-2009-050	237730	CSOR 306	2009/9/11	seed	<i>Sorbus commixta</i> Hedl.	Nanakamado	42-50-51	140-38-38	410	Hokkaidō	Niseko-chō	foot of Niseko Moiwai ski area
JPN-2009-051	237731	CVAC 1844	2009/9/11	seed	<i>Vaccinium smallii</i> A. Gray	Ōbasunoki	42-53-40	140-40-02	580	Hokkaidō	Kucchan-chō	near Kagaminuma Bog
JPN-2009-052	237732	CVAC 1845	2009/9/11	seed, plant	<i>Vaccinium oxycoccos</i> L.	Tsurukokemomo	42-53-40	140-40-08	580	Hokkaidō	Kucchan-chō	Kagaminuma Bog
JPN-2009-053	237733	CRUB 2556	2009/9/11	plant	<i>Rubus chamaemorus</i> L.	Horomuichigo	42-53-40	140-40-08	580	Hokkaidō	Kucchan-chō	Kagaminuma Bog
JPN-2009-054	237734	Ames 30307 CPRN 2	2009/9/11	seed	<i>Prunella vulgaris</i> L. subsp. <i>asiatica</i> (Nakai) H. Hara	Utsubogusa	42-53-40	140-40-08	580	Hokkaidō	Kucchan-chō	Kagaminuma Bog
JPN-2009-055	237735	CFRA 2016	2009/9/11	plant	<i>Fragaria iinumae</i> Makino	Nōgōichigo	42-52-40	140-38-33	795	Hokkaidō	The border between Rankoshi-chō and Kucchan-chō	west foot of Mt. Nisekoannupuri
JPN-2009-056	237736	CEMP 9	2009/9/11	seed	<i>Empetrum nigrum</i> L. var. <i>japonicum</i> K. Koch	Gankōran	42-52-40	140-38-33	795	Hokkaidō	The border between Rankoshi-chō and Kucchan-chō	west foot of Mt. Nisekoannupuri
JPN-2009-057	237737	CVAC 1846	2009/9/11	seed	<i>Vaccinium hirtum</i> Thunb.	Usunoki	42-52-40	140-38-33	795	Hokkaidō	The border between Rankoshi-chō and Kucchan-chō	west foot of Mt. Nisekoannupuri
JPN-2009-058	237738	CGAU 40	2009/9/11	seed	<i>Gaultheria miqueliana</i> Takeda	Shiratamanoki	42-52-40	140-38-33	795	Hokkaidō	The border between Rankoshi-chō and Kucchan-chō	west foot of Mt. Nisekoannupuri

Table 2 (continued).

Collection number	JP number in NIAS genebank	Accession number in USDA-ARS	Collection Date	Sample type	Taxon <sup>1)</sup>	Japanese plant Name <sup>2)</sup>	Latitude	Longitude	Elev. (m)	Prefecture	Municipality	Locality
JPN-2009-059	237739	CFRA 2017	2009/9/11	seed	<i>Fragaria iinumae</i> Makino	Nōgōichigo	42-51-08	140-38-26	450	Hokkaidō	Niseko-chō	near Niseko ski area
JPN-2009-060	237740	CRUB 2557	2009/9/11	seed	<i>Rubus idaeus</i> L. subsp. <i>melanolasius</i> Focke	Ezoichigo	42-51-07	140-38-26	450	Hokkaidō	Niseko-chō	near Niseko ski area
JPN-2009-062	237741	CFRA 2018	2009/9/12	plant	<i>Fragaria iinumae</i> Makino	Nōgōichigo	42-44-14	140-39-27	500	Hokkaidō	Niseko-chō	north foot of Mt. Konbudake
JPN-2009-063	237742	CFRA 2019	2009/9/12	seed, plant	<i>Fragaria vesca</i> L.	Ezohebiichigo	42-44-14	140-39-27	500	Hokkaidō	Niseko-chō	north foot of Mt. Konbudake
JPN-2009-064	237743	CFRA 2020	2009/9/12	plant	<i>Fragaria hybrid (inumae x vesca?)</i>		42-44-14	140-39-27	500	Hokkaidō	Niseko-chō	north foot of Mt. Konbudake
JPN-2009-065	237744	CFRA 2021	2009/9/12	plant	<i>Fragaria hybrid (inumae x vesca?)</i>		42-44-14	140-39-27	500	Hokkaidō	Niseko-chō	north foot of Mt. Konbudake
JPN-2009-066	237745	CACT 278	2009/9/12	seed	<i>Actinidia arguta</i> (Siebold et Zucc.) Planch. ex Miq.	Sarunashi	42-44-08	140-39-31	510	Hokkaidō	Niseko-chō	north foot of Mt. Konbudake
JPN-2009-067	237746	CRUB 2558	2009/9/12	seed	<i>Rubus idaeus</i> L. subsp. <i>melanolasius</i> Focke	Ezoichigo	42-43-18	140-39-13	570	Hokkaidō	Niseko-chō	Kurokawa
JPN-2009-068	237747	CRUB 2559	2009/9/12	plant	<i>Rubus pseudojaponicus</i> Koidz.	Himegoyōichigo	42-43-18	140-39-13	570	Hokkaidō	Niseko-chō	Kurokawa
JPN-2009-069	237748	CRIB 1620	2009/9/12	plant	<i>Ribes japonicum</i> Maxim.	Komagatakesuguri	42-44-13	140-37-28	355	Hokkaidō	Niseko-chō	Inufurebetsu River
JPN-2009-070	237749	CVIT 11 GVIT 1702	2009/9/12	seed	<i>Vitis coignetiae</i> Pulliat ex Planch.	Yamabudō	42-44-13	140-37-28	355	Hokkaidō	Niseko-chō	Inufurebetsu River
JPN-2009-071	237750	CVAC 1847	2009/9/12	seed	<i>Vaccinium hirtum</i> Thunb.	Usunoki	42-54-24	140-35-24	765	Hokkaidō	Kyōwa-chō	near Shinsennuma Bog
JPN-2009-072	237751	CSOR 307	2009/9/12	seed	<i>Sorbus commixta</i> Hedl.	Nanakamado	42-54-24	140-35-24	765	Hokkaidō	Kyōwa-chō	near Shinsennuma Bog
JPN-2009-073	237752	CCOR 922	2009/9/12	seed	<i>Corylus sieboldiana</i> Blume	Tsunohashibami	42-54-24	140-35-24	765	Hokkaidō	Kyōwa-chō	near Shinsennuma Bog
JPN-2009-074	237753	CFRA 2022	2009/9/12	plant	<i>Fragaria iinumae</i> Makino	Nōgōichigo	42-54-07	140-35-19	770	Hokkaidō	Kyōwa-chō	near Shinsennuma Bog
JPN-2009-075	237754	CVAC 1848	2009/9/12	seed	<i>Vaccinium smallii</i> A. Gray	Ōbasunoki	42-54-07	140-35-19	770	Hokkaidō	Kyōwa-chō	near Shinsennuma Bog
JPN-2009-076	237755	CRUB 2560	2009/9/12	plant	<i>Rubus vernus</i> Focke	Benibanaichigo	42-53-49	140-32-55	745	Hokkaidō	The border between Kyōwa-chō and Rankoshi-chō	Nimitōge Pass
JPN-2009-077	237756	CLYC 2	2009/9/12	plant	<i>Lycium chinense</i> Mill.	Kuko	42-52-47	140-21-58	12	Hokkaidō	Rankoshi-cho	near seashore, Minatomachi
JPN-2009-078	237757	CFRA 2023	2009/8/26	seed	<i>Fragaria iinumae</i> Makino	Nōgōichigo	42-53-44	140-44-56	170	Hokkaidō	Kucchan-chō	collected by Mr. Ikeda
JPN-2009-079	237758	CVAC 1849	2009/8/26	seed	<i>Vaccinium praestans</i> Lamb.	Iwatsutsuji	42-53-44	140-44-56	170	Hokkaidō	Kucchan-chō	collected by Mr. Ikeda
JPN-2009-080	237759	CVAC 1850	2009/9/13	seed	<i>Vaccinium praestans</i> Lamb.	Iwatsutsuji	42-52-47	140-46-39	215	Hokkaidō	kucchan-chō	in a private garden. Cultivated.
JPN-2009-081	237760	CVAC 1851	2009/9/13	seed, plant	<i>Vaccinium uliginosum</i> L.	Kuromamenoki	42-52-47	140-46-39	215	Hokkaidō	kucchan-chō	in a private garden. Cultivated.
JPN-2009-082	237761	CVAC 1852	2009/9/13	seed	<i>Vaccinium vitis-idaea</i> L.	Kokemomo	42-52-47	140-46-39	215	Hokkaidō	kucchan-chō	in a private garden. Cultivated.
JPN-2009-083	237762	CVAC 1853	2009/9/13	seed	<i>Vaccinium oxycoccos</i> L.	Tsurukokemomo	42-52-47	140-46-39	215	Hokkaidō	kucchan-chō	in a private garden. Cultivated.
JPN-2009-084	237763	CSOR 308	2009/9/13	seed	<i>Sorbus sambucifolia</i> (Cham. et Schltld.) Roemer	Takanenanakamado	42-52-47	140-46-39	215	Hokkaidō	kucchan-chō	in a private garden. Cultivated.
JPN-2009-085	237764	CRUB 2561	2009/9/13	seed	<i>Rubus parvifolius</i> L.	Nawashiroichigo	43-03-00	141-13-12	250	Hokkaidō	Sapporo-shi	along Miyagi-sawa River
JPN-2009-086	237765	CVIT 12 GVIT 1703	2009/9/13	seed	<i>Vitis coignetiae</i> Pulliat ex Planch.	Yamabudō	43-03-00	141-13-12	250	Hokkaidō	Sapporo-shi	along Miyagi-sawa River
JPN-2009-087	237766	CLON 81	2009/9/14	plant	<i>Lonicera caerulea</i> L. subsp. <i>edulis</i> (Regel) Hulten	Keyonomi	42-59-52	141-23-31	135	Hokkaidō	Sapporo-shi	Forest & Forest Products Research Inst. Cultivated.
JPN-2009-088	237767	CRIB 1621	2009/9/14	seed	<i>Ribes sachalinense</i> (F. Schmidt) Nakai	Togasuguri	42-59-52	141-23-31	135	Hokkaidō	Sapporo-shi	Forest & Forest Products Research Inst. Cultivated.

Table 2 (continued).

Collection number	JP number in NIAS genebank	Accession number in USDA-ARS	Collection Date	Sample type	Taxon <sup>1)</sup>	Japanese plant Name <sup>2)</sup>	Latitude	Longitude	Elev. (m)	Prefecture	Municipality	Locality
JPN-2009-089	237768	CCRA 211	2009/9/14	seed	<i>Crataegus chlorosarca</i> Maxim.	Kuromisanzashi	42-59-52	141-23-31	135	Hokkaidō	Sapporo-shi	Forest & Forest Products Research Inst. Cultivated.
JPN-2009-091	237769	CCHA 24	2009/9/14	seed	<i>Chaenomeles speciosa</i> (Sweet) Nakai	Boke	42-59-52	141-23-31	135	Hokkaidō	Sapporo-shi	Forest & Forest Products Research Inst. Cultivated.
JPN-2009-092	237770	CACT 279	2009/9/14	seed	<i>Actinidia polygama</i> (Siebold et Zucc.) Planch. ex Maxim.	Matatabi	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-093	237771	CVAC 1854	2009/9/14	seed	<i>Vaccinium smallii</i> A. Gray	Sunoki	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-094	237772	CVAC 1855	2009/9/14	seed	<i>Vaccinium vitis-idaea</i> L.	Kokemomo	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-095	237773	CSOR 309	2009/9/14	seed	<i>Sorbus sambucifolia</i> (Cham. et Schltdl.) Roemer	Takanenanakamado	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-096	237774	CRIB 1622	2009/9/14	seed	<i>Ribes latifolium</i> Jancz.	Ezouguri	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-097	237775	CRUB 2562	2009/9/14	seed	<i>Rubus mesogeus</i> Focke	Kuroichigo	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-098	237776	CCOR 923	2009/9/14	seed	<i>Corylus sieboldiana</i> Blume	Tsunohashibami	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-099	237777	CLYC 3	2009/9/14	seed	<i>Lycium chinense</i> Mill.	Kuko	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-100	237778	CACT 280	2009/9/14	seed	<i>Actinidia arguta</i> (Siebold et Zucc.) Planch. ex Miq.	Sarunashi	43-17-28	141-51-17	40	Hokkaidō	Bibai-shi	Hokkaidō Forest Research Institute. Cultivated.
JPN-2009-101	237779	CCRA 212	2009/9/15	seed	<i>Crataegus chlorosarca</i> Maxim.	Kuromisanzashi	43-03-18	141-37-16	8	Hokkaidō	Nanporo-chō	Nanporo National Forest
JPN-2009-102	237780	CHUM 1594	2009/9/15	seed, plant	<i>Humulus lupulus</i> L. var. <i>cordifolius</i> (Miq.) Maxim. ex Franch et Sav.	Karahanasō	43-03-18	141-37-16	8	Hokkaidō	Nanporo-chō	Nanporo National Forest
JPN-2009-103	237781	CMAL 147 GMAL 4837	2009/9/15	seed	<i>Malus sieboldii</i> (Regel) Rehder = <i>M. toringo</i> (Siebold) de Vriese	Zumi	43-03-18	141-37-16	8	Hokkaidō	Nanporo-chō	Nanporo National Forest
JPN-2009-104	237782	CVIT 13 GVIT 1704	2009/9/15	seed	<i>Vitis coignetiae</i> Pulliat ex Planch.	Yamabudō	43-03-18	141-37-16	8	Hokkaidō	Nanporo-chō	Nanporo National Forest
JPN-2009-105	237783	CVAC 1856	2009/9/15	seed	<i>Vaccinium praestans</i> Lamb.	Iwatsutsuji	43-55-47	142-58-38	835	Hokkaidō	Kamikawa-chō	near Ukishima-shitsugen Bog
JPN-2009-106	237784	CVAC 1857	2009/9/15	seed	<i>Vaccinium oxycoccos</i> L.	Tsurukokemomo	43-55-56	142-57-54	865	Hokkaidō	Kamikawa-chō	Ukishima Shitsugen Bog
JPN-2009-107	237785	CVAC 1858	2009/9/15	seed	<i>Vaccinium hirtum</i> Thunb.	Usunoki	43-55-56	142-57-54	865	Hokkaidō	Kamikawa-chō	Ukishima Shitsugen Bog
JPN-2009-108	237786	CVAC 1859	2009/9/15	seed	<i>Vaccinium ovalifolium</i> Sm.	Kurousugo	43-55-56	142-57-54	865	Hokkaidō	Kamikawa-chō	Ukishima Shitsugen Bog
JPN-2009-109	237787	CVAC 1860	2009/9/15	seed	<i>Vaccinium smallii</i> A. Gray	Ōbasunoki	43-55-56	142-57-54	865	Hokkaidō	Kamikawa-chō	Ukishima Shitsugen Bog
JPN-2009-110	237788	CVAC 1861	2009/9/15	seed	<i>Vaccinium smallii</i> A. Gray	Ōbasunoki	43-55-56	142-57-54	865	Hokkaidō	Kamikawa-chō	Ukishima Shitsugen Bog
JPN-2009-111	237789	CVAC 1862	2009/9/16	seed	<i>Vaccinium vitis-idaea</i> L.	Kokemomo	44-13-23	143-23-04	95	Hokkaidō	Monbetsu-shi	near Shimararagi River
JPN-2009-112	237790	CVAC 1863	2009/9/16	seed	<i>Vaccinium smallii</i> A. Gray	Ōbasunoki	44-13-23	143-23-04	95	Hokkaidō	Monbetsu-shi	near Shimararagi River
JPN-2009-113	237791	CVAC 1864	2009/9/16	seed	<i>Vaccinium ovalifolium</i> Sm.	Kurousugo	44-13-23	143-23-04	95	Hokkaidō	Monbetsu-shi	near Shimararagi River
JPN-2009-114	237792	CVAC 1865	2009/9/16	seed	<i>Vaccinium hirtum</i> Thunb.	Usunoki	44-13-23	143-23-04	95	Hokkaidō	Monbetsu-shi	near Shimararagi River

Table 2 (continued).

Collection number	JP number in NIAS genebank	Accession number in USDA-ARS	Collection Date	Sample type	Taxon <sup>1)</sup>	Japanese plant Name <sup>2)</sup>	Latitude	Longitude	Elev. (m)	Prefecture	Municipality	Locality
JPN-2009-116	237793	CHUM 1595	2009/9/16	seed	<i>Humulus lupulus</i> L. var. <i>cordifolius</i> (Miq.) Maxim. ex Franch et Sav.	Karahanasō	44-11-35	143-36-48	15	Hokkaidō	Kamiyubetsu-chō	along RN238
JPN-2009-117	237794	CMAL 148 GMAL 4835	2009/9/16	seed	<i>Malus baccata</i> (L.) Borkh. var. <i>mandshurica</i> (Maxim.) C.K. Schneid.	Ezonokoringo	44-06-54	143-58-04	2	Hokkaidō	Kitami-shi	Lake Saromako
JPN-2009-118	237795	CHUM 1596	2009/9/17	seed	<i>Humulus lupulus</i> L. var. <i>cordifolius</i> (Miq.) Maxim. ex Franch et Sav.	Karahanasō	42-39-31	143-00-03	270	Hokkaidō	Obihiro-shi	Iwanai, near Iwanai River
JPN-2009-119	237796	CRUB 2563	2009/9/17	seed	<i>Rubus parvifolius</i> L.	Nawashirochigo	42-32-03	143-29-10	3	Hokkaidō	Taiki-chō	Bansei, by ocean
JPN-2009-120	237797	CMEN 719	2009/9/17	plant	<i>Mentha japonica</i> (Miq.) Makino	Himehakka	42-31-44	143-28-51	10	Hokkaidō	Taiki-chō	Bansei, by ocean
JPN-2009-121	237798	CACT 281	2009/9/17	seed	<i>Actinidia arguta</i> (Siebold et Zucc.) Planch. ex Miq.	Sarunashi	42-31-44	143-28-51	10	Hokkaidō	Taiki-chō	Bansei, by ocean
JPN-2009-122	237799	CFRA 2024	2009/9/17	plant	<i>Fragaria nipponica</i> Makino	Shirobananohebiichigo	42-36-51	143-32-40	5	Hokkaidō	Toyokoro-chō	by Yūdōnuma Bog
JPN-2009-124	237800	CRUB 2564	2009/9/18	seed	<i>Rubus parvifolius</i> L.	Nawashirochigo	42-23-22	143-22-13	18	Hokkaidō	Hiroo-chō	by ocean
JPN-2009-125	237801	CVIT 14 GVIT 1705	2009/9/19	seed	<i>Vitis coignetiae</i> Pulliat ex Planch.	Yamabudō	40-41-24	140-49-58	680	Aomori	Aomori-shi	Hakkōda Mountains
JPN-2009-126	237802	CMAL 149 GMAL 4838	2009/9/20	seed	<i>Malus sieboldii</i> (Regel) Rehder = <i>M. toringo</i> (Siebold) de Vriese	Zumi	40-42-07	140-55-30	540	Aomori	Aomori-shi	Tashirodaira, by Komagome River
JPN-2009-128	237803	Ames 30308 CPRN 3	2009/9/20	seed	<i>Prunella vulgaris</i> L. subsp. <i>asiatica</i> (Nakai) H. Hara	Utsubogusa	39-56-30	140-51-29	1410	Iwate	Hachimantai-shi	Tōshichi Onsen Spa
JPN-2009-129	237804	CVAC 1866	2009/9/20	seed	<i>Vaccinium smallii</i> A. Gray	Ōbasunoki	39-56-30	140-51-29	1410	Iwate	Hachimantai-shi	Tōshichi Onsen Spa
JPN-2009-130	237805	CSOR 310	2009/9/20	seed	<i>Sorbus commixta</i> Hedl.	Nanakamado	39-56-30	140-51-29	1410	Iwate	Hachimantai-shi	Tōshichi Onsen Spa
JPN-2009-131	237806	CFRA 2025	2009/9/20	plant	<i>Fragaria iinumae</i> Makino	Nōgōichigo	39-56-30	140-51-29	1410	Iwate	Hachimantai-shi	Tōshichi Onsen Spa
JPN-2009-132	237807	CRUB 2565	2009/9/20	seed	<i>Rubus vernus</i> Focke	Benibanaichigo	39-56-26	140-52-02	1320	Iwate	Hachimantai-shi	by Hōrainuma Bog
JPN-2009-133	237808	CVAC 1867	2009/9/20	seed	<i>Vaccinium smallii</i> A. Gray	Ōbasunoki	39-56-26	140-52-02	1320	Iwate	Hachimantai-shi	by Hōrainuma Bog
JPN-2009-134	237809	CRUB 2566	2009/9/20	seed, plant	<i>Rubus ikenoensis</i> H. Lev. et Vaniot	Goyōichigo	39-56-26	140-52-02	1320	Iwate	Hachimantai-shi	by Hōrainuma Bog
JPN-2009-135	237810	CVAC 1868	2009/9/20	plant	<i>Vaccinium yatabei</i> Makino		39-56-26	140-52-02	1320	Iwate	Hachimantai-shi	by Hōrainuma Bog
JPN-2009-136	237811	CMAL 150 GMAL 4839	2009/9/20	seed	<i>Malus sieboldii</i> (Regel) Rehder = <i>M. toringo</i> (Siebold) de Vriese	Zumi	39-55-29	140-57-53	630	Iwate	Hachimantai-shi	near Ōnuma Pond
JPN-2009-137	237812	CSOR 311	2009/9/21	seed	<i>Sorbus matsumurana</i> (Makino) Koehne	Urajironanakamado	39-57-15	140-53-09	1440	Iwate	Hachimantai-shi	Kuroyaji
JPN-2009-138	237813	CMAL 151 GMAL 4840	2009/9/21	seed	<i>Malus sieboldii</i> (Regel) Rehder = <i>M. toringo</i> (Siebold) de Vriese	Zumi	39-56-49	140-56-37	895	Iwate	Hachimantai-shi	by Gozaishonuma Bog
JPN-2009-139	237814	CFRA 2026	2009/9/21	plant	<i>Fragaria nipponica</i> Makino	Shirobananohebiichigo	39-56-54	140-56-30	895	Iwate	Hachimantai-shi	by Gozaishonuma Bog
JPN-2009-140	237815	CVAC 1869	2009/9/21	seed	<i>Vaccinium oxycoccos</i> L.	Tsurukokemomo	39-56-54	140-56-30	895	Iwate	Hachimantai-shi	Gozaishonuma Bog
JPN-2009-141	237816	CACT 282	2009/9/21	seed	<i>Actinidia arguta</i> (Siebold et Zucc.) Planch. ex Miq.	Sarunashi	39-55-11	140-58-28	465	Iwate	Hachimantai-shi	Matsuohachimantai Visitor Center. Purchased.
JPN-2009-142	237817	CCOR 924	2009/9/21	seed	<i>Corylus heterophylla</i> Fisch. ex Besser (possible hybrid with <i>C. sieboldiana</i> )	Hashibami	39-44-38	141-09-28	210	Iwate	Morioka-shi	east foot of Ōmoriyama
JPN-2009-143	237818	CCOR 925	2009/9/21	seed	<i>Corylus heterophylla</i> Fisch. ex Besser	Hashibami	39-44-38	141-09-28	210	Iwate	Morioka-shi	east foot of Ōmoriyama

Table 2 (continued).

Collection number	JP number in NIAS genebank	Accession number in USDA-ARS	Collection Date	Sample type	Taxon <sup>1)</sup>	Japanese plant Name <sup>2)</sup>	Latitude	Longitude	Elev. (m)	Prefecture	Municipality	Locality
JPN-2009-144	237819	CCOR 926	2009/9/21	seed	<i>Corylus sieboldiana</i> Blume	Tsunohashibami	39-44-38	141-09-28	210	Iwate	Morioka-shi	east foot of Ōmoriyama
JPN-2009-145	237820	CPYR 2937	2009/9/22	seed	<i>Pyrus aromatica</i> Kikuchi et Nakai = <i>P. ussuriensis</i> Maxim.	Michinokunashi	39-50-35	141-30-51	930	Iwate	Morioka-shi	Hayasaka Kōgen (high plateau)
JPN-2009-146	237821	CRUB 2567	2009/9/22	seed	<i>Rubus parvifolius</i> L.	Nawashiroichigo	39-50-35	141-30-51	930	Iwate	Morioka-shi	Hayasaka Kōgen (high plateau)
JPN-2009-147	237822	CRUB 2568	2009/9/22	plant	<i>Rubus palmatus</i> Thunb.	Momijiichigo	39-50-35	141-30-51	930	Iwate	Morioka-shi	Hayasaka Kōgen (high plateau)
JPN-2009-148	237823	CPYR 2938	2009/9/22	seed	<i>Pyrus aromatica</i> Kikuchi et Nakai = <i>P. ussuriensis</i> Maxim.	Michinokunashi	39-50-40	141-31-23	820	Iwate	Morioka-shi	Hayasaka Kōgen (high plateau)
JPN-2009-149	237824	CPYR 2939	2009/9/22	seed	<i>Pyrus aromatica</i> Kikuchi et Nakai = <i>P. ussuriensis</i> Maxim.	Michinokunashi	39-48-41	141-25-08	720	Iwate	Morioka-shi	Karumatsuzawa (upper stream)
JPN-2009-150	237825	CMAL 152 GMAL 4836	2009/9/22	seed	<i>Malus baccata</i> (L.) Borkh. var. <i>mandshurica</i> (Maxim.) C.K. Schneid.	Ezonokoringo	39-49-41	141-25-35	675	Iwate	Morioka-shi	Karumatsuzawa (upper stream)
JPN-2009-151	237826	CFRA 2027	2009/9/23	plant	<i>Fragaria iinumae</i> Makino	Nōgōichigo	39-07-53	140-04-07	1180	Akita	Yurihonjō-shi	Haraigawa
JPN-2009-152	237827	CVAC 1870	2009/9/23	seed	<i>Vaccinium ovalifolium</i> Sm.	Kurousugo	39-07-40	140-04-01	1200	Akita	Yurihonjō-shi	Haraigawa
JPN-2009-153	237828	CRUB 2569	2009/9/23	seed	<i>Rubus vernus</i> Focke	Benibanaichigo	39-07-40	140-04-01	1200	Akita	Yurihonjō-shi	Haraigawa

1) Names followed the list of scientific names in the NIAS genebank. Unlisted names followed "BG Plants - Index of Japanese names and scientific names". 12) When there is a more popular synonym, it is displayed after "=".

2) Japanese plant names were transcribed into single words, without using hyphenation or word division.



Photo 1. *Crataegus chlorosarca*. Nanporo-chō, Hokkaidō Pref.



Photo 2. *Lycium chinense*. Rankochi- chō, Hokkaidō Pref.



Photo 3. *Malus baccata* var. *mandshurica*. Saromachō, Hokkaidō Pref.



Photo 4. *Rubus vernus*. Mt. Chōkai-san, Yurihonjō-shi, Akita Pref.

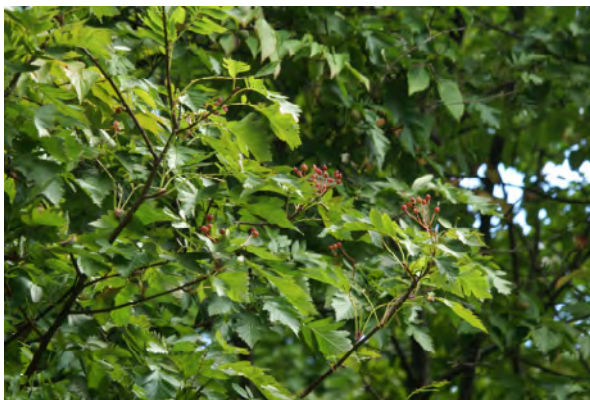


Photo 5. *Sorbus* × *kawashiroi*. Botanical Gardens of Hokkaidō University, Sapporo-shi, Hokkaidō Pref.



Photo 6. *Pyrus ussuriensis*. Morioka-shi, Iwate Pref.

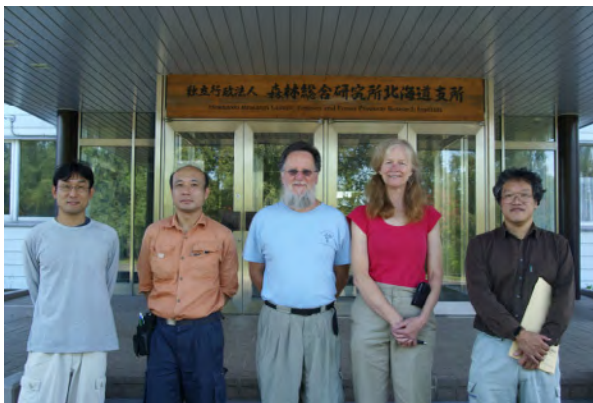


Photo 7. Members of the main investigation (From left, Drs. H. Imanishi, H. Iketani, J.D. Postman, K.E. Hummer) with Dr. T. Kawahara at Hokkaidō Research Center, FFPRI.