

Floristic study of Jang-do (Isl.) in Korea

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We investigated the flora of Jang-do (Isl.), an island of the Heuksan archipelago, located in Heuksan-myeon, Shinan-gun, Jeollanam-do and discussed the remarkable plants found there. Thirteen-field trips (total 27 days) were completed from May of 2004 to May of 2013. As a result, we identified the distribution of 423 taxa in Jang-do (Isl.), comprising 104 families, 285 genera, 335 species, 78 varieties and 10 forms. There are a total of 95 taxa of floristic regional indicator plants. The floristic regional indicators are as follows; four taxa of level V such as *Impatiens furcillata*, four taxa of level IV such as *Hosta yingeri*, 14 taxa of level III such as *Ophioglossum vulgatum*, 5 taxa of level II, and 58 taxa of level I. In addition 10 red data plants, 2 vulnerable species (VU) including *Calanthe striata* for. *sieboldii*, and 4 least concern species (LC) like *Ardisia crenata*, 2 not evaluated species (NE) such as *Hosta yingeri*, were found in the investigated area. An unrecorded species, *Fragaria* (Rosaceae), was found in a forest of Jang-do (Isl.) for the first time in Korea.

Keywords: flora, floristics, Jang-do (Isl.)

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INTRODUCTION

As a part of Dadohaehaesang National Park, Jang-do (Isl.), Heuksan-myeon, Sinan-gun, Jeollanam-do (125° 21'E longitude, 34° 41'N latitude; 234 m alt.) is an inhabited island which is adjacent to Heuksan-do (Isl.). Jang-do (Isl.) consisting of Daejang-do (Isl.) and Sojang-do (Isl.). Sojang-do (Isl.) is narrow with a long ridge, and because of a steep gradient and scarcity of water, Sojang-do (Isl.) is currently uninhabited. Daejang-do's three sides are comprised of escarpment or bedrock cliffs except on the southwestern coast (Jjakjigol) since Daejang-do (Isl.) is surrounded by horseshoe-shaped ridge. Being surrounded by a ridge, the center of island has peat deposits which makes shelving. The lower part of peat deposits has a impermeable clay layer and it forms a mountain wetland. This wetland forms a mountainous stream which flows to the direction of southwest and then, connected to gravel seaside of Jjakjigol. As the only mountainous wetland that is situated in an island, this is an academically high-valued region with its' ecological environment and geological formation process. It was designated as a Ramsar wetland by the Ministry of Environment in 2005. After being used as rice paddy or pasture for over a half century, utilization of this wetland is currently prohibited. As a precedent investigation, Jang-do wetland ecosystem survey (Jeon and Kwon,

2004) reported 84 families, 209 genera, 294 species through two investigations of March and May.

MATERIALS AND METHODS

To grasp Jang-do's flora of vascular plants, we facilitated 13 field investigation of total 27 days, from May 2004 to May 2013 (Table 1). The wetland which is situated at the island's center and the east and the west ridge surrounding the wetland and the whole area of Jjakjigol valley, an intense investigation rock place (Fig. 1).

For the preciseness of the identification, subject of collections were limited to plant with reproductive organs like flowers, fruits, spore, etc. Collected specimens were dried using dehumidification paper under pressure and deposited in the herbarium of Chonnam National University (CNU) and National Institute of Biological Resources (NIBR) as dry specimen. We used illustrations of plant like Lee (1996), Lee (2003), Lee (2006), Park (1995; 2001), Tagawa (1959), Kitamura *et al.* (1982), Iwatsuki *et al.* (1992), Nagata (1989) etc, for identification purpose.

The list of investigated vascular plant was made in accordance with Engler's classification system. In family, genera and species were sorted by the alphabetical order. Scientific names were conformed to Korean Plant Names

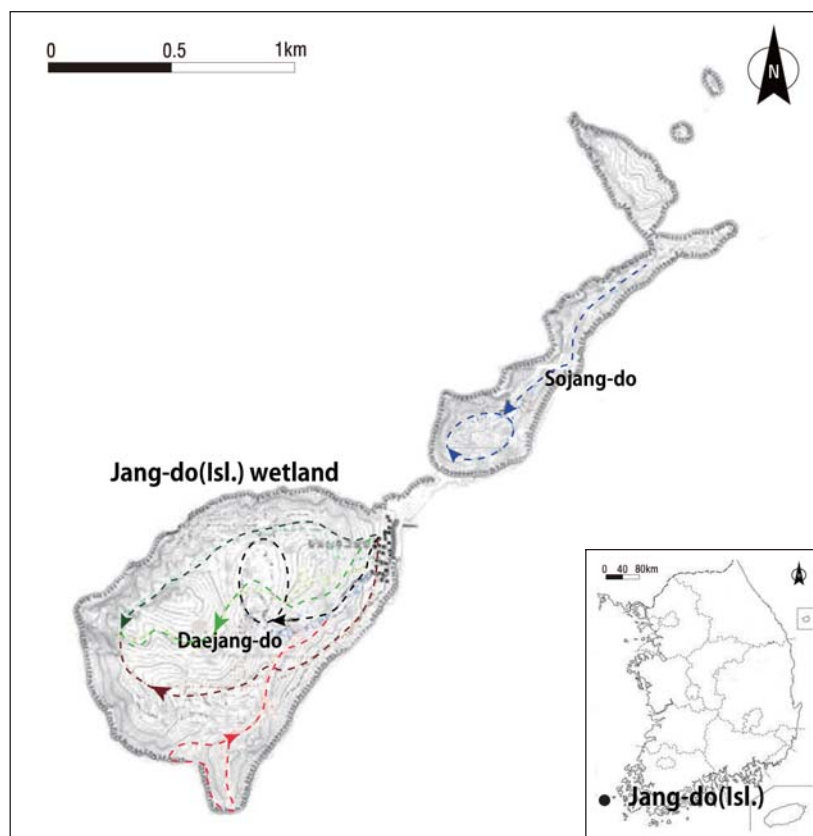


Fig. 1. Map of surveyed routes in Jang-do (Isl.).

Table 1. Surveyed dates and routes.

Date	Surveyed routes
2004. 5.2-5.3.	Jangdo dock -- Jangdo wetland -- west main ridge of Daejangdo
2006. 5.10-5.11.	Jangdo wetland -- east main girge -- Jangdo dock
8.9-8.10.	Jangdo wetland -- Jjakjigol beach of Daejangdo
2007. 5.5.-5.6.	Jangdo dock -- Jangdo wetland -- west main ridge of Daejangdo
7.20.-7.21.	Jangdo wetland -- west slope of west main ridge of Daejangdo
10.20.-10.21	Jangdo wetland -- Jjakjigol beach of Daejangdo
2010. 5.5.-5.6.	Jangdo dock -- Jangdo wetland
7.20.-7.21.	Jangdo dock -- Jangdo wetland
9.4.-9.5.	Jangdo wetland -- western face of Daejangdo -- Jangdo dock
10.20.-10.22.	Jangdo wetland -- eastern face of Daejangdo -- Jangdo dock
2012. 4.27.-4.28.	Jangdo wetland -- Jjakjigol beach of Daejangdo
6.11.-6.12.	Jangdo dock -- Sojangdo
2013. 5.12.-5.13.	Jangdo dock -- Jangdo wetland -- Jjakjigol beach of Daejangdo

Index which was published by Korea National Arboretum and Plant Taxonomic Society of Korea in 2007. Red data plants, floristic regional indicator plants and endangered plants, which should be protected by the wildlife protection law, were sorted by the red data book of endangered vascular plants in Korea (2012) and the investigation guide for the 4th. National Natural Environment Survey (2013). Plant geographical consideration has been done on the Jang-do's plants referred to a former study (Im, 1992).

RESULTS AND DISCUSSION

1. General view of Jang-do's flora

Based on plant specimens which were collected during this investigation period, a list of vascular plants that covers the entire investigation area has been made (Appendix 1). As a result, 423 taxa in Jang-do (Isl.), comprising 104 families, 285 genera, 335 species, 78 varieties and

Table 2. The number of vascular plants in Jang-do (Is).

Rank	Taxa				
	Fam.	Gen.	Sp.	Var.	For.
Pteridophyta	18	18	25	2	–
Gymnospermae	2	2	2	–	–
Angiospermae					
Dicotyledonae	74	205	234	54	7
Monocotyledonae	10	60	74	22	3
Total	104	285	335	78	10

10 forms, were identified at the Jang-do (Isl.) area (Table 2). The Jang-do (Isl.) area belongs to South coast province floristically and comes under warm-temperate evergreen broad-leaved forest zone. However, many parts of the area were replaced by secondary mixed forest which consists mainly of *Pinus* or sometimes contains additional *Quercus*. Evergreen broad-leaved forest which is mainly consisted of *Machilus* and *Castanopsis* is rather limited to the small area. The presence of mixed forest made up of evergreen broad-leaved tree and deciduous broad-leaved tree reveals that this area is undergoing succession after destruction of original vegetation. The vegetation of Jang-do area is composed of the wetland at the center, The Jjakjigol, the east ridge reaching from the dock to the Jjakjigol, the west ridge of the other side of the Jjakjigol.

1) Jang-do (Isl.) wetland

The mountainous wetland which is developed in Jang-do's center was transformed into the pasture after the long period of cultivation as a rice paddy had ended. Currently it is designated as a Ramsar wetland and it is prohibited from all forms of utilization. In here lies a grassland which is primarily formed by Poaceae (*Miscanthus sinensis*, *Avena fatua*, *Calamagrostis arundinacea*, *Poa hisauchi*, etc.), Cyperaceae (*Carex displata*, *Carex doniana*, *Cyperus nipponicus*, *Scripus juncoides*, etc.), Asteraceae (*Bidens radiata* var. *pinnatifida*, *Eclipta prostrata*, *Eupatorium lindleyanum*, *Artemisia japonica*, etc.), and *Juncus effusus* var. *dicipiens* (Juncaceae) and *Persicaria thunbergii* (Polygonaceae) which are also abundant. These plants are arable land weeds that are common around abandoned rice paddies. Although it seems that the entire wetland has plenty of water all year round, partial infiltration of *Salix koreensis* is enlarging the dry soil. *Salix koreensis* is a major component of every wetland that comprises of riparian forest. It is hard to discriminate that the increase of *Salix koreensis* is good or bad to the wetland vegetation because we can't speculate on the original vegetation of Jang-do (Isl.) wetland. The following plants which are expected to inhabit a natural wetland were unable to be found: *Habenaria radiata*, *Habenaria linearifolia*, *Drosera rotundifolia*,

Penthorum chinense, *Lysimachia vulgaris* var. *davurica*, *Utricularia racemosa*, *Utricularia vulgaris* var. *japonica*, *Lythrum anceps* and so on. Jang-do (Isl.) wetland maintains a geological structure as wetland as it has a vast and deep peat layer and a great volume of water, it seems that long-lasting human interference destroyed the wetland's original flora extremely.

2) Jjakjigol

Water flows from Jang-do (Isl.) wetland to the gravel seaside of Jjakjigo forming a mountainous stream. The Jjakjigol is covered with evergreen broad-leaved forest which pivots on the mountainous stream. The Jjakjigol forest is mainly composed of *Machilus thunbergii*, *Castanopsis cuspidata* and other evergreen broad-leaved trees, *Quercus acuta*, *Machilus japonica*, *Litsea japonica*, *Dendropanax trifidus*, *Actinodaphne lancifolia*, etc., grow abundantly. Since seedlings of evergreen broad-leaved tree thrive in the cool and damp forest floor and many evergreen vines like *Caesalpinia decapetala*, *Elaeagnus macrophylla*, *Stauntonia hexaphylla* are growing densely, the photoenvironment of forest bed is very poor. Thus an underlayer vegetation is composed of few species like *Ardisia crenata*, *Ardisia japonica*, *Prunus mume*, *Pyrola japonica*, *Trachelospermum asiaticum*, etc. The forest of Jjakjigol is considered as the closest to the original form of Jangdo's warm-temperate forest.

3) East ridge of the wetland

The lower part of this region has low naturalness since there is a mountain road that started from Jang-do (Isl.) dock to the east ridge. This area is covered with secondary forest which are composed of pure *Pinus* forest and mixed forest of *Pinus* and *Quercus*. Since there are arable lands and deserted lands scattered here and there, heliophilous plants like *Mallotus japonicus*, *Miscanthus sinensis*, *Celtis sinensis*, *Morus bombycis*, *Broussonetia kazinoki*, etc. are abundant and *Machilus thunbergii*, *Machilus thunbergii*, *Quercus acuta*, etc. are blended in it. Otherwise some remarkable plants like *Hosta yingeri*, *Saussurea polylepis*, *Pyrrosia lingua*, *Pyrrosia hastata* grow at a crack on a rock on the ridge. At the shore cliff that faces Jjakjigol, the colony formed by *Daphniphyllum teijsmanni*, *Eurya emarginata*, *Pittosporum tobira*, *Raphiolepis indica* var. *umbellata*, *Juniperus chinensis* var. *procumbens*, etc. maintains a good vegetation of warm-temperate forest.

4) West ridge of wetland

Rock faces or steep gradient of sea-facing bevel allowed lesser human interference to the west ridge of wetland. Evergreen broad-leaved forest comprised of *Machilus thunbergii*, *Machilus japonicus*, *Litsea japonica*, *Dendropanax trifidus*, *Lozoste lancifolia*, *Camellia japonica*, etc. is forming good warm-temperate vegetation in this

Table 3. The list of specially designated plants in Jang-do (Isl.) by the Ministry of Environment.

Grade	Taxa	Grade	Taxa
V	<i>Dryopteris fuscipes</i> C. Chr. 큰지네고사리 <i>Juniperus procumbens</i> (Siebold ex Endl.) Miq. 섬향나무 <i>Impatiens furcillata</i> Hemsl. 거제물봉선 <i>Calanthe striata</i> R. Br. ex Lindl. for <i>sieboldii</i> Decne. ex Rege 금새우난초		<i>Pyrrosia lingua</i> (Thunb.) Farw. 석위 <i>Pyrrosia hastata</i> (Thunb. ex Houtt.) Ching 세뿔석위 <i>Castanopsis cuspidata</i> var. <i>cuspidata</i> (Thunb. ex Murray) Schottky 모밀갓밥나무 <i>Castanopsis sieboldii</i> (Makino) Hatus. 구실갓밥나무 <i>Quercus acuta</i> for. <i>acuta</i> Thunb. ex Murray 붉가시나무 <i>Aphananthe aspera</i> (Thunb.) Planch. 푸조나무 <i>Celtis biondii</i> var. <i>heterophylla</i> (H. Lev.) Schneid 쪽나무 <i>Ulmus parvifolia</i> Jacq. 참느릅나무 <i>Ficus erecta</i> Thunb. 천선과나무 <i>Ficus oxyphylla</i> Miq. ex Zoll. 모람 <i>Silene aprica</i> var. <i>oldhamiana</i> (Miq.) C.Y. Wu 갯장구채 <i>Clematis patens</i> C. Morren & Decne. 큰꽃오아리 <i>Semiaquilegia adoxoides</i> (DC.) Makino 개구리발톱 <i>Sinomenium acutum</i> (Thunb.) Rehder & E.H. Wilson 방기 <i>Machilus thunbergii</i> Siebold & Zucc. 후박나무 <i>Neolitsea sericea</i> (Blume) Koidz. 참식나무 <i>Corydalis ambigua</i> Cham. & Schleht. 왜현호색 <i>Hylotelephium verticillatum</i> (L.) H. Ohba 세잎꿩의비름 <i>Pittosporum tobira</i> (Thunb.) W.T. Aiton 돈나무 <i>Rubus hirsutus</i> Thunb. 장딸기 <i>Caesalpinia decapetala</i> (Roth) Alston 실거리나무 <i>Dictamnus dasycarpus</i> Turcz. 백선 <i>Orixa japonica</i> Thunb. 상산 <i>Mallotus japonicus</i> (Thunb.) Muell. Arg. 예덕나무 <i>Euonymus japonicus</i> Thunb. 사철나무 <i>Euonymus fortunei</i> var. <i>radicans</i> (Miq.) Rehder 줄사철나무 <i>Euscaphis japonica</i> (Thunb.) Kanitz 말오줌때 <i>Cayratia japonica</i> (Thunb.) Gagnep. 거지덩굴 <i>Grewia biloba</i> Bunge 장구밥나무 <i>Camellia japonica</i> L. 동백나무 <i>Eurya japonica</i> Thunb. 사스레피나무 <i>Viola ovato-oblonga</i> (Miq.) Makino 긴잎제비꽃 <i>Elaeagnus macrophylla</i> Thunb. 보리밥나무 <i>Hedera rhombea</i> (Miq.) Bean 송악 <i>Peucedanum japonicum</i> Thunb. 갯기름나무 <i>Aucuba japonica</i> Thunb. 식나무 <i>Vaccinium oldhamii</i> Miq. 정금나무 <i>Ardisia japonica</i> (Thunb.) Blume 자금우 <i>Lysimachia mauritiana</i> Lam. 갯까치수염 <i>Chionanthus retusus</i> Lindl. & Paxton 이팝나무 <i>Ligustrum japonicum</i> var. <i>japonicum</i> Thunb. 광나무 <i>Calystegia soldanella</i> (L.) Roem. & Schultb. 갯메꽃 <i>Lithospermum zollingeri</i> A.DC. 반디지치 <i>Argusia sibirica</i> (L.) Dandy 모래지치 <i>Gynostemma pentaphylla</i> (Thunb.) Makino 돌외 <i>Ainsliaea apiculata</i> Sch. Bip. 줍떡취 <i>Aster spathulifolius</i> Maxim. 해국 <i>Carpesium glossophyllum</i> Maxim. 천일담배풀 <i>Arisaema ringens</i> (Thunb.) Schott 큰천남성 <i>Asparagus cochinchinensis</i> (Lour.) Merr. 천문동 <i>Ophiopogon jaburan</i> (Kunth) Lodd. 맥문아재비 <i>Polygonatum inflatum</i> Kom. 통동굴레
	IV		<i>Arachniodes aristata</i> (G. Forst.) Tindale 가는쇠고사리 <i>Pseudoraphis ukishiba</i> Ohwi 물잔디 <i>Carex blepharicarpa</i> var. <i>stenocarpa</i> Ohwi 여우꼬리사초 <i>Hosta yingeri</i> S.B. Jones 흑산도비비추
III	<i>Ophioglossum vulgatum</i> L. 나도고사리삼 <i>Stauntonia hexaphylla</i> (Thunb.) Decne. 멸꼴 <i>Kadsura japonica</i> (L.) Dunal 남오미자 <i>Litsea japonica</i> (Thunb.) Juss. 까마귀쪽나무 <i>Actinodaphne lancifolia</i> (Siebold & Zucc.) Meisn. 육박나무 <i>Machilus japonica</i> Siebold & Zucc. 센달나무 <i>Neolitsea aciculata</i> (Blume) Koidz. 새덕이 <i>Rhaphiolepis indica</i> var. <i>umbellata</i> (Thunb.) Ohashi 다정큼나무 <i>Zanthoxylum ailanthoides</i> Siebold & Zucc. 머귀나무 <i>Melia azedarach</i> L. 멀구슬나무 <i>Daphniphyllum teijsmannii</i> Kurz ex Teijsm. & Binn. 줄굴거리나무 <i>Ilex integra</i> Thunb. 감탕나무 <i>Eurya emarginata</i> (Thunb.) Makino 우묵사스레피 <i>Dendropanax trifidus</i> (Thunb.) Makino ex H. Hara 황칠나무 <i>Sanicula tuberculata</i> Maxim. 애기참반디 <i>Vaccinium bracteatum</i> Thunb. 모새나무 <i>Ardisia crenata</i> Sims 백량금 <i>Marsdenia tomentosa</i> Morren & Decne. 나도은조롱 <i>Callicarpa mollis</i> Siebold & Zucc. 새비나무 <i>Damnacanthus indicus</i> C.F. Gaertn. 호자나무 <i>Mitchella undulata</i> Siebold & Zucc. 호자덩굴 <i>Farfugium japonicum</i> (L.) Kitam. 털머위 <i>Phaenosperma globosa</i> Munro ex Benth. 산기장 <i>Aletris spicata</i> (Thunb.) Franch. 쥐꼬리풀	I	
	II		<i>Pseudostellaria coreana</i> (Nakai) Ohwi 참개별꽃 <i>Potentilla dickinsii</i> var. <i>dickinsii</i> Franch. & Sav. 돌양지꽃 <i>Caryopteris incana</i> (Thunb.) Miq. 층꽃나무 <i>Ligularia stenocephala</i> (Maxim.) Matsum. & Koidz. 곤달비 <i>Saussurea ussuriensis</i> Maxim. 구와취
	I		<i>Onychium japonicum</i> (Thunb.) Kunze 선바위고사리 <i>Pteris multifida</i> Poir. 봉의꼬리 <i>Cyclosorus acuminatus</i> (Houtt.) Nakai ex H. Ito 별고사리 <i>Dryopteris erythrosora</i> (D.C. Eaton) Kuntze 홍지네고사리 <i>Thelypteris glanduligera</i> var. <i>glanduligera</i> (Kunze) Ching 사다리고사리 <i>Lemmaphyllum microphyllum</i> C. Presl 콩짜개덩굴

area. *Impatiens furcillata*, *Arisaema ringens*, *Hosta yingeri*, *Calanthe striata* for. *sieboldii*, *Sanicula tuberculata*, etc. is growing abundantly here. It seems that *Neofinetia*

falcata, *Dendrobium moniliforme* can grow in the crack of well developed rock faces, but it was too dangerous for us to make certain of the plants there.

Table 4. The list of rare taxa in Jang-do (Isl.) designated by designated by NIBR.

Grade	Taxa	Grade	Taxa
VU	<i>Calanthe striata</i> R. Br. ex Lindl. for <i>sieboldii</i> Decne. ex Rege 금새우난초	LC	<i>Ardisia crenata</i> Sims 백량금
	<i>Impatiens furcillata</i> Hemsl. 거제물봉선		<i>Chionanthus retusus</i> Lindl. & Paxton 이팝나무
	<i>Marsdenia tomentosa</i> Morren & Decne. 나도는조롱		<i>Cymbidium goeringii</i> (Rchb.f.) Rchb.f. 보춘화
	<i>Saussurea polylepis</i> Nakai 홍도서덜취	NE	<i>Pseudoraphis ukishiba</i> Ohwi 물잔디
			<i>Hosta yingeri</i> S.B. Jones 흑산도비비추
			<i>Juniperus procumbens</i> (Siebold ex Endl.) Miq. 섬항나무

Table 5. The list of naturalized taxa in Jang-do (Isl.) designated by the Ministry of Environment.

Family	Taxa	Family	Taxa
Caryophyllaceae	<i>Cerastium glomeratum</i> Thuill. 유럽점나도나물	Gramineae	<i>Vulpia myuros</i> var. <i>myuros</i> (L.) C. Gmelin 들목새
Compositae	<i>Erigeron annuus</i> (L.) Pers. 개망초		<i>Lolium multiflorum</i> var. <i>multiflorum</i> Lam. 쥐보리
	<i>Conyza canadensis</i> (L.) Cronquist 망초		<i>Lolium perenne</i> L. 호밀풀
	<i>Sonchus asper</i> (L.) Hill 큰방가지뚥	Iridaceae	<i>Tritonia crocosmaeflora</i> Lemoine 애기범부채
	<i>Sonchus oleraceus</i> L. 방가지뚥	Phytolaccaceae	<i>Phytolacca americana</i> L. 미국자리공
Cruciferae	<i>Brassica juncea</i> var. <i>juncea</i> (L.) Czern. 갓	Polygonaceae	<i>Rumex crispus</i> L. 소리쟁이
Gramineae	<i>Avena fatua</i> L. 메귀리		<i>Veronica arvensis</i> L. 선개불알풀
	<i>Dactylis glomerata</i> L. 오리새	Scrophulariaceae	<i>Veronica persica</i> Poir. 큰개불알풀

2. Important Plants in Jang-do (Isl.)

1) Floristic regional indicators

Table 3 is showing floristic regional indicators designated by Ministry of Environment which were identified during this investigation. A total of 95 specially designated plants were identified in the entire area (Table 3). There are 4 taxa in grade V including *Impatiens furcillata*, 4 taxa in grade IV including *Hosta yingeri*, etc., 24 taxa in grade III including *Ophioglossum vulgatum*, etc., 5 taxa in grade II including *Pseudostellaria coreana*, etc. and 58 taxa in grade I including *Onychium japonicum* and so on.

2) Red data plants

This investigation identified 10 red data plants in Korea designated by the National Institute of Biological Resources (NIBR). These are 4 vulnerable species (VU) including *Calanthe striata* for. *sieboldii*, etc. and 4 least concern species (LC) including *Ardisia crenata*, etc., 2 not evaluated species (NE) including *Hosta yingeri* etc. (Table 4).

3) Naturalized plants

We found 16 naturalized plant taxa in Jang-do (Isl.) including *Tritonia crocosmaeflora* etc. (Table 5).

4) Remarkable plants

(1) *Dryopteris fuscipes* C. Chr. (큰지네고사리)

[Dryopteridaceae]

It is a grade V of floristic regional indicators designated by the Ministry of Environment and distributes on Jeju-do (Isl.), Jeollanam-do and Gyeongsangnam-do (Oh *et al.*, 2004; 2005). This evergreen fern has clustered

leaves from a short and thick rhizome. Leaves are ovate-elliptic or deltoid-ovate of odd-bipinnate and a petiole base is covered with a dense reddish brown scale with 1 cm long and the scale gets smaller and more prone to falling as it ascends upper part of petiole. Leaflets are long oval shape with dull edge and pocket shaped small scales are on rachis. Sorus with reniform indusium are hang in one line (rarely 2-3 line) close to midrib. It is a typical warm-temperate indicator species and in Jang-do (Isl.), it grows on evergreen broad-leaved forest bed at the upper part of Jjakjigol.

(2) *Impatiens furcillata* Hemsl (거제물봉선)

[Balsaminaceae]

This herbaceous plant is grade V of floristic regional indicator plants designated by the Ministry of Environment and vulnerable species (VU) designated by the NIBR. It distributes scarcely at Gangjin-gun, Jangheung-gun and Wando of Jeollanam-do, Geojae-gun of Gyeongsangnam-do and Busan, the southern coastal area of Korea (Oh *et al.*, 2004; 2005). It was found on the west ridge which is facing the ocean under shady and humid condition. It grows with *Arisaema ringens* under evergreen broad-leaved forest which is comprised of *Machilus thunbergii*, *Machilus japonica*, *Litsea japonica*, *Dendropanax trifidus*, *Actinodaphne lancifolia*. Jang-do's population corresponds to the western frontier of distribution and although *Impatiens furcillata* is native in Korea, it suggests that its' origin can be found from China and, by extension, Himalaya like the other species of *Impatiens*. Also, it can be plant geographical evidence that the distribution of *Impatiens furcillata* is the upper part of the warm-temperature zone (Fig. 2-A).



Fig. 2. Two remarkable plants in Jang-do (Isl.). A. *Impatiens furcillata*. B. Flowers of *Hosta yingeri*. B2. Fruits of *Hosta yingeri*.

(3) *Hosta yingeri* S. B. Jones (흑산도비비추) [Liliaceae]

This herbaceous plant is grade IV of floristic regional indicator plants designated by the Ministry of Environment and not evaluated species (NE) designated by the NIBR. It distributes at Heuksan-do (Isl.) and Gageo-do (Isl.), Shinan-gun of Jeollanam-do. With its' thick and gloss leaves and branched inflorescence with many flowers, it is a distinctive species that can be distinguishable from other *Hosta* with ease and has very high ornamen-

tal value (Fig. 2-B). It inhabits between exposed rocks of west and east ridge, and forest bed of Jjakjigol.

(4) *Fragaria* sp. [Rosaceae]

The plant that belongs to *Fragaria* was found at the evergreen broad-leaved forest edge of Jjakjigol. Whereas Korean *Fragaria*, *F. nipponica* and *F. yezoensis* have 5 sepals and petals each but *Fragaria* of Jang-do (Isl.) has 7 to 8 sepals and petals each. This is a characteristic that

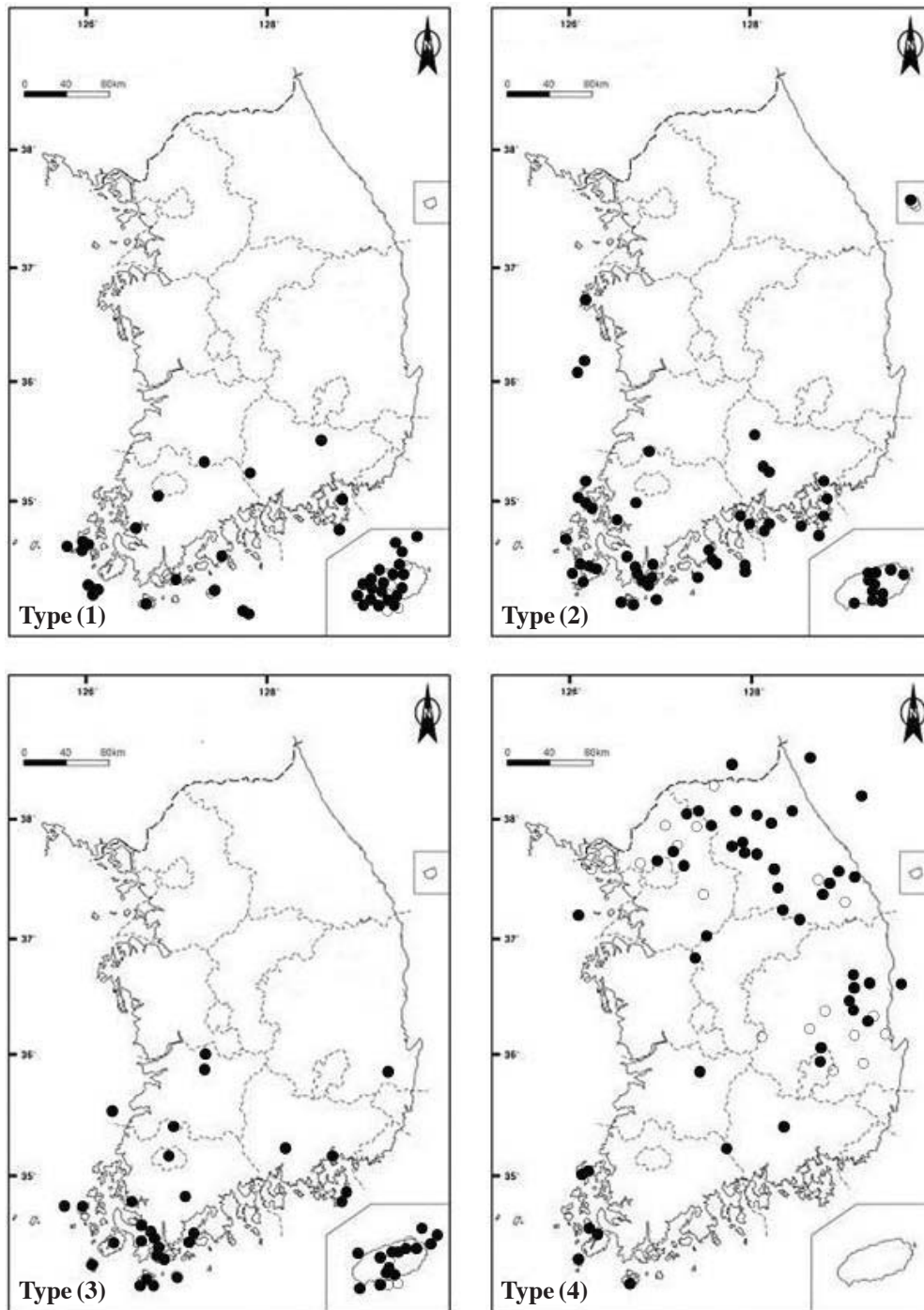


Fig. 3. National distribution of some Jang-do (Isl.) plants. Type (1). *Arachniodes aristata*. Type (2). *Ilex integra*. Type (3). *Dendropanax morbiferus*. Type (4). *Saussurea ussuriensis*, ● Literature, ○ Specimen.

is observed with some Japanese *Fragaria* and a more accurate comparison is in progress.

3. Floristic aspect of Jang-do (Isl.)

Jang-do (Isl.) is located at the center of Korea and

China on the Yellow Sea and it has many plants that spans over China, Korea and Japan. It also has many southern types of plants that has tropical or subtropical origin because of the warm current flows from the South China Sea. Jang-do (Isl.) also has northern types of plants and additionally has native plants which derive from

Northeast Asia's warm-temperate zone. The flora of Jang-do (Isl.) is very important to grasp plant distribution of Korea. Based on plant distribution of surrounding countries including Korea (Im, 1992), the plant distribution characteristics of Jang-do (Isl.) can be categorized as below.

1) Plants with tropical or subtropical origin (type 1)

As typical southern plants distribute mainly at the Philippines or Southeast Asia, type 1 plant settled already at the tertiary or spread under circumstance of warm current. *Stephania japonica*, *Machilus thunbergii*, *Caesalpinia decapetala*, *Zanthoxylum ailanthoides*, *Eurya japonica*, *Ardisia crenata*, *Lysimachia mauritiana*, *Lophatherum gracile*, *Aletris spicata*, *Calanthe striata* R. Br. ex Lindl for. *sieboldii*, etc. are in Jang-do (Isl.). Evergreen ferns like *Onychium japonicum*, *Pteris multifida*, *Arachniodes aristata* (Fig. 3, type 1), *Pyrrosia lingua*, etc., belongs to this type.

2) Plants that proceeded to the east from the Himalaya (type 2)

Type 2 is the plant that originated in the Himalaya passed southeastern China, Jeju-do (Isl.) and spread to Japan and has a relatively large distribution area. There are plants that spread to cold region like *Quercus acuta*, but the rest like *Castanopsis cuspidata*, *Kadsura japonica*, *Ilex integra* (Fig. 3, type 2), *Eurya emarginata* grows limited in warm-temperate or temperate regions.

3) Plants that derived from the warm-temperate region of Northeast Asia (type 3)

Type 3 is the plants which is derived from Jeju-do (Isl.), Taiwan, Japan by geographical variation and isolation and is native to this region. Although some species of type 3 extend their distribution to inland or central region of Korea along the coast like *Rubus hirsutus*, *Ainsliaea apiculata*, *Aster sphathulifolius*, *Cirsium japonicum* var. *maackii*, many others only distribute limitedly at warm climate region of the south coast like *Stauntonia hexaphylla*, *Litsea japonica*, *Machilus japonica*, *Machilus japonica*, *Daphniphyllum teijsmannii*, *Dendropanax trifidus* (Fig. 3, type 3), *Marsdenia tomentosa*, *Callicarpa mollis*, *Aerides japonicum*.

4) Plants that moved to the south from the continent

Type 4 is the plants that spread to Korea from northeastern China and Amur along with coldness during the Ice Age. It went through Tsushima and spread to Japan. Among the Jang-do (Isl.) plants *Schisandra chinensis*, *Lespedeza maximowiczii*, *Rhododendron mucronulatum*, *Chionanthus retusus*, *Caryopteris incana* are typical northern plant which moved to the south along with glacial and widely distributed in Northeast Asia. *Ranunculus chinensis*, *Thalictrum filamentosum* var. *tenerum*, *Menispermum dauricum*, *Parnassia palustris*, *Anthriscus sylvestris*, *Gentiana scabra*, *Cynanchum paniculatum*, *Argusia sibirica*, *Sambucus williamsii* var. *coreana*, *Bidens radiata* var. *pinnatifida*, *Dendranthema boreale*, *Leibnitzia anandria*, *Saussurea ussuriensis* (Fig. 3, type 4), *Spodiopogon sibiricus*, *Carex dispalata*, *Carex japonica*, *Carex thunbergii* var. *appendiculata*, *Kyllinga brevifolia*, *Arisaema amurense*, *Commelina communis*, *Allium macrostemon*, *Hemerocallis minor*, *Corydalis*, *Sedum*, etc. belong to type 4. Otherwise *Mitchella undulata* took a slightly different way by passing Kamchatka, the Kuril Islands, Japan and finally to Korea. In Korea, it's Korean distribution is restricted to Ulleung-do (Isl.) and Jeju-do (Isl.).

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Appendix 1. A list of vascular plants collected from Jang-do (Isl.).

Scientific name	Korean name	*Voucher specimen
Selaginellaceae	부처손과	
<i>Selaginella involvens</i> (Sw.) Spring	바위손	E080005
Equisetaceae	속새과	
<i>Equisetum arvense</i> L.	쇠뜨기	A100421
Ophioglossaceae	고사리삼과	
<i>Botrychium ternatum</i> (Thunb.) Sw.	고사리삼	D073011
<i>Ophioglossum vulgatum</i> L.	나도고사리삼	C063374
Osmundaceae	고비과	
<i>Osmunda japonica</i> Thunb.	고비	B130021a,b
Pteridaceae	고사리과	
<i>Onychium japonicum</i> (Thunb.) Kunze	선바위고사리	F70165
<i>Pteris multifida</i> Poir.	봉의꼬리	D073043
Davalliaceae	넉줄고사리과	
<i>Davallia mariesii</i> T. Moore ex Baker	넉줄고사리	A100402
Aspidiaceae	면마과	
<i>Arachniodes aristata</i> (G. Forst.) Tindale	가는쇠고사리	F70190
<i>Cyclosorus acuminatus</i> (Houtt.) Nakai ex H.Ito	별고사리	D073022
<i>Cyrtomium devexiscapulae</i> (Koidz.) Ching	긴잎도깨비쇠고비	D072917
<i>Cyrtomium falcatum</i> (L.f.) C. Presl	도깨비쇠고비	C063488
<i>Dryopteris bissetiana</i> (Baker) C. Chr.	산죽제비고사리	D072722
<i>Dryopteris chinensis</i> (Baker) Koidz.	가는잎죽제비고사리	A100443
<i>Dryopteris erythrosora</i> (D.C. Eaton) Kuntze	홍지네고사리	C063477
<i>Dryopteris fuscipes</i> C. Chr.	큰지네고사리	D072817
<i>Dryopteris lacera</i> (Thunb.) O. Kuntze	비늘고사리	C063564
<i>Dryopteris uniformis</i> (Makino) Makino	곰비늘고사리	B130022
<i>Dryopteris pacifica</i> (Nakai) Tagawa	큰죽제비고사리	D072798
<i>Dryopteris sacrosancta</i> Koidz.	애기죽제비고사리	F123284
<i>Macrothelypteris oligophlebia</i> var. <i>elegans</i> (Baker) Ching (Koidz.) Ching	각시고사리	C063579a,b
<i>Thelypteris glanduligera</i> var. <i>glanduligera</i> (Kunze) Ching	사다리고사리	D072951
Aspleniaceae	꼬리고사리과	
<i>Asplenium incisum</i> Thunb.	꼬리고사리	F70166
Polypodiaceae	고란초과	
<i>Lemmaphyllum microphyllum</i> C. Presl	콩짜개덩굴	C063669
<i>Lepisorus thunbergianus</i> (Kaulf.) Ching	일엽초	B130023
<i>Pyrrosia lingua</i> (Thunb.) Farw.	석위	D072923
<i>Pyrrosia hastata</i> (Thunb. ex Houtt.) Ching	새빨석위	D072853
Pinaceae	소나무과	
<i>Pinus densiflora</i> Siebold & Zucc.	소나무	A100153
Cupressaceae	측백나무과	
<i>Juniperus procumbens</i> (Siebold ex Endl.) Miq.	섬향나무	C063481
Salicaceae	버드나무과	
<i>Salix koreensis</i> Andersson	버드나무	E080009
Betulaceae	자작나무과	
<i>Carpinus turczaninowii</i> Hance	소사나무	D072636
<i>Corylus sieboldiana</i> var. <i>sieboldiana</i> Blume	참개암나무	A100465
Fagaceae	참나무과	
<i>Castanopsis cuspidata</i> var. <i>cuspidata</i> (Thunb. ex Murray) Schottky	모밀잣밤나무	F70145
<i>Castanopsis sieboldii</i> (Makino) Hatus.	구실잣밤나무	C063645
<i>Quercus acuta</i> for. <i>acuta</i> Thunb. ex Murray	붉가시나무	D072687
<i>Quercus aliena</i> Blume	갈참나무	A100342
<i>Quercus dentata</i> Thunb. ex Murray	떡갈나무	A100335
<i>Quercus serrata</i> Thunb. ex Murray	줄참나무	A100329
Ulmaceae	느릅나무과	
<i>Aphananthe aspera</i> (Thunb.) Planch.	푸조나무	D072749
<i>Celtis biondii</i> var. <i>heterophylla</i> (H. Lev.) Schneid	폭나무	C063792
<i>Celtis sinensis</i> Pers.	팽나무	C063530
<i>Ulmus parvifolia</i> Jacq.	참느릅나무	A100433
Moraceae	뽕나무과	
<i>Broussonetia kazinoki</i> Siebold	닥나무	C063363
<i>Ficus erecta</i> Thunb.	천선과나무	C063468
<i>Ficus oxyphylla</i> Miq. ex Zoll.	모람	D072794
<i>Morus bombycis</i> var. <i>bombycis</i> Koidz.	산뽕나무	C063331

Appendix 1. Continued.

Scientific name	Korean name	*Voucher specimen
Cannabinaceae	삼과	
<i>Humulus japonicus</i> Siebold & Zucc.	환삼덩굴	A100193
Urticaceae	췌기풀과	
<i>Boehmeria nivea</i> (L.) Gaudich.	모시풀	D073019
<i>Boehmeria platanifolia</i> Franch. & Sav.	개모시풀	A100402
<i>Boehmeria spicata</i> (Thunb.) Thunb.	좁개잎나무	A100296
<i>Pilea mongolica</i> Wedd.	모시물통이	A100307
Santalaceae	단향과	
<i>Thesium chinense</i> Turcz.	제비꽃	A100321
Polygonaceae	마디풀과	
<i>Persicaria longisetata</i> (Bruijn) Kitag.	개여뀌	A100424
<i>Persicaria filiformis</i> (Thunb.) Nakai ex Mori	이삭여뀌	A100396
<i>Persicaria hydropiper</i> var. <i>hydropiper</i> (L.) Spach	여뀌	D073029
<i>Persicaria japonica</i> (Meisn.) H. Gross ex Nakai	흰꽃여뀌	D073027
<i>Persicaria posumbu</i> var. <i>laxiflora</i> (Meisn.) Hara	장대여뀌	A100752
<i>Persicaria senticosa</i> var. <i>senticosa</i> (Meisn.) H. Gross ex Nakai	며느리밑씻개	A100298
<i>Persicaria thunbergii</i> (Siebold & Zucc.) H. Gross ex Nakai	고마리	A100307
<i>Polygonum aviculare</i> L.	마디풀	G120012
<i>Rumex crispus</i> L.	소리쟁이	F70121
Chenopodiaceae	명아주과	
<i>Chenopodium bryoniaefolium</i> Bunge	청명아주	C063558
Amaranthaceae	비름과	
<i>Achyranthes japonica</i> (Miq.) Nakai	쇠무릎	A100486
Phytolacaceae	자리공과	
<i>Phytolaca americana</i> L.	미국자리공	C063479
Caryophyllaceae	석죽과	
<i>Cerastium glomeratum</i> Thuill.	유럽접나도나물	H70228
<i>Cerastium holosteoides</i> var. <i>hallaisanense</i> (Nakai) Mizush.	접나도나물	A100847
<i>Dianthus chinensis</i> var. <i>chinensis</i> L.	패랭이꽃	A100853
<i>Silene aprica</i> var. <i>oldhamiana</i> (Miq.) C.Y. Wu	갯장구채	D072918
<i>Pseudostellaria coreana</i> (Nakai) Ohwi	참개별꽃	A100854
<i>Pseudostellaria heterophylla</i> (Miq.) Pax ex Pax & Hoffm.	개별꽃	D072812
<i>Pseudostellaria palibiniana</i> (Takeda) Ohwi	큰개별꽃	E080001
<i>Sagina japonica</i> (Sw.) Ohwi	개미자리	H70230
<i>Stellaria alsine</i> var. <i>undulata</i> (Thunb.) Ohwi	벼룩나물	A100306
<i>Stellaria aquarica</i> Scop.	쇠별꽃	D072845
<i>Stellaria media</i> Villas	별꽃	H120001
Ranunculaceae	미나리아재비과	
<i>Clematis apiifolia</i> DC.	사위질빵	A100837
<i>Clematis terniflora</i> var. <i>mandshurica</i> (Rupr.) Ohwi	으아리	D073085
<i>Clematis patens</i> C. Morren & Decne.	큰꽃으아리	040323, C063673
<i>Clematis terniflora</i> DC.	참으아리	C063400
<i>Ranunculus chinensis</i> Bunge	젓가락나물	A100731
<i>Ranunculus japonicus</i> Thunb.	미나리아재비	A100715
<i>Semiaquilegia adoxoides</i> (DC.) Makino	개구리발톱	G120016
<i>Thalictrum actaeifolium</i> var. <i>brevistylum</i> Nakai	은평의다리	A100365
<i>Thalictrum tuberiferum</i> Maxim.	산평의다리	C063321a,b
Lardizabalaceae	으름덩굴과	
<i>Akebia quinata</i> (Thunb.) Decne.	으름덩굴	A100289
<i>Stauntonia hexaphylla</i> (Thunb.) Decne.	멀풀	D072871
Menispermaceae	망기과	
<i>Cocculus trilobus</i> (Thunb.) DC.	맹맹이덩굴	D072971
<i>Menispermum dauricum</i> DC.	새모래덩굴	F70132
<i>Sinomenium acutum</i> (Thunb.) Rehder & E.H. Wilson	망기	D072772
Magnoliaceae	목련과	
<i>Kadsura japonica</i> (L.) Dunal	남오미자	D072782
<i>Schizandra chinensis</i> (Turcz.) Baill.	오미자	D073114
Lauraceae	녹나무과	
<i>Lindera glauca</i> var. <i>glauca</i> (Siebold & Zucc.) Blume	감태나무	A100285
<i>Lindera obtusiloba</i> var. <i>obtusiloba</i> Blume	생강나무	F120018
<i>Litsea japonica</i> (Thunb.) Juss.	까마귀쪽나무	D072831
<i>Lozoste lancifolia</i> (Siebold & Zucc.) Meisn.	육박나무	A100141

Appendix 1. Continued.

Scientific name	Korean name	*Voucher specimen
<i>Machilus japonicus</i> Siebold & Zucc.	센달나무	D072804
<i>Machilus thunbergii</i> Siebold & Zucc.	후박나무	C063442
<i>Neolitsea aciculata</i> (Blume) Koidz.	새덕이	A100192
<i>Neolitsea sericea</i> (Blume) Koidz.	참식나무	C063533
Fumariaceae	현호색과	
<i>Corydalis ambigua</i> Cham. & Schleht.	왜현호색	B040206
<i>Corydalis remota</i> Fisch. ex Maxim.	현호색	H70253
<i>Corydalis speciosa</i> Max.	산괴불주머니	C063346
<i>Corydalis turtschaninovii</i> Besser	조선현호색	B130007
Cruciferae	십자화과	
<i>Arabis glabra</i> Bernth.	장대나물	B130028
<i>Bertoroella maximowiczii</i> (Palibin) O.E. Schulz	장대냉이	D072678
<i>Brassica juncea</i> var. <i>juncea</i> (L.) Czern.	갓	H70239
<i>Capsella burapastoris</i> (L.) L.W. Medicus	냉이	H120003
<i>Cardamine flexuosa</i> With.	황새냉이	E080014
<i>Cardamine impatiens</i> L.	싸리냉이	E080016
<i>Draba nemorosa</i> for. <i>nemorosa</i> L.	꽃다지	E080016
Crassulaceae	돌나물과	
<i>Orostachys japonicus</i> (Maxim.) A. Berger	바위솔	A100730
<i>Sedum aizoon</i> L.	가는기린초	D072807
<i>Sedum kantschaticum</i> Fisch. & Mey.	기린초	F70209
<i>Sedum satmentosum</i> Bunge	돌나물	A100735
<i>Hylotelephium verticillatum</i> (L.) H. Ohba	세잎핑의비름	D072837
Saxifragaceae	범의귀과	
<i>Chrysosplenium grayanum</i> Maxim.	팽이눈	A100739
<i>Parnassia palustris</i> L.	물매화	A100852
Pittosporaceae	돈나무과	
<i>Pittosporum tobira</i> (Thunb.) W.T. Aiton	돈나무	D072718
Rosaceae	장미과	
<i>Agrimonia pilosa</i> Ledeb.	질신나물	C063752
<i>Duchesnea chrysantha</i> (Zoll. et Morr.) Miq.	뱀딸기	B130002
<i>Fragaria</i> sp.	new to Korea	F120002
<i>Potentilla chinensis</i> var. <i>chinensis</i> Ser.	딱지꽃	G120019
<i>Potentilla dickinsii</i> var. <i>dickinsii</i> Franch. & Sav.	돌양지꽃	A100146
<i>Potentilla fragarioidea</i> var. <i>major</i> Maxim	양지꽃	E080011
<i>Pourthiaea villosa</i> var. <i>villosa</i> (Thunb.) Decne.	윤노리나무	A100850
<i>Prunus serrulata</i> var. <i>spontanea</i> (Maxim.) E.H. Wilson	벚나무	D072885
<i>Prunus verecunda</i> var. <i>verecunda</i> (Koidz.) Koehne	개벚나무	A100287
<i>Rspiolepis indica</i> var. <i>umbellata</i> (L.) Lindl. (Thunb.) Ohashi	다정큼나무	D072788
<i>Rosa multiflora</i> var. <i>multiflora</i> Thunb.	절레꽃	B130029
<i>Rosa wichuraiana</i> Crep. ex Franch. & Sav.	돌가시나무	F70207
<i>Rubus coreanus</i> Miq.	복분자딸기	D072741
<i>Rubus hirsutus</i> Thub.	장딸기	E080002
<i>Rubus parvifolius</i> for. <i>parvifolius</i> L.	멍석딸기	C063360
<i>Sanguisorba officinalis</i> L.	오이풀	A100826
<i>Sorbus alnifolia</i> (Siebold & Zucc.) K. Koch	팔배나무	D072914
<i>Stephanandra incisa</i> var. <i>incisa</i> (Thunb.) Zabel	국수나무	A100320
Leguminoase	콩과	
<i>Albizia julibrissin</i> Duraz.	자귀나무	A100329
<i>Caesalpinia decapetala</i> (Roth) Alston	실거리나무	C063497
<i>Chamaecrista nomame</i> (Siebold) H. Ohashi	차풀	A100335
<i>Desmodium podocarpum</i> var. <i>oxyphyllum</i> (DC.) H. Ohashi	도둑놈의갈고리	A100756
<i>Glycine soja</i> Siebold & Zucc.	돌콩	D073028
<i>Indigofera koreana</i> Ohwi	민땅비싸리	D072932
<i>Kummerowia striata</i> (Thunb. ex Murray) Schindl.	매듭풀	A100724
<i>Lathyrus japonica</i> Willd.	갯완두	D073763
<i>Lespedeza bicolor</i> Turcz.	싸리	C063746
<i>Lespedeza cuneata</i> G. Don	비수리	A100296
<i>Lespedeza maximowiczii</i> C.K. Schneid.	조록싸리	A100753
<i>Pueraria lobata</i> (Willd.) Ohwi	췌	G120019
<i>Rhynchosia volubilis</i> Lour.	여우콩	C063539
<i>Sophora flavescens</i> Solander ex Aiton	고삼	A100708

Appendix 1. Continued.

Scientific name	Korean name	*Voucher specimen
<i>Vicia angustifolia</i> var. <i>segetilis</i> (Thuill.) K. Koch.	살갈퀴	E080007
<i>Vicia hirsuta</i> (L.) Gray	새완두	A100319
<i>Vicia tetrasperma</i> (L.) Schreb.	얼치기완두	A100306
Geraniaceae	퀴손이풀과	
<i>Geranium thunbergii</i> Siebold & Zucc.	이질풀	A100287
Oxalidaceae	괘이밥과	
<i>Oxalis corniculata</i> L.	괘이밥	E080011
Rutaceae	운향과	
<i>Dictamnus dasycarpus</i> Turcz.	백선	A100584
<i>Orixa japonica</i> Thunb.	상산	A100369
<i>Zanthoxylum ailanthoides</i> Siebold & Zucc.	머귀나무	D072733
<i>Zanthoxylum piperatum</i> (L.) DC.	초피나무	C063517
<i>Zanthoxylum schinifolium</i> Siebold & Zucc.	산초나무	D073017
Meliaceae	멀구슬나무과	
<i>Melia azedarach</i> L.	멀구슬나무	A100589
Euphorbiaceae	대극과	
<i>Daphniphyllum teijsmanni</i> Kurz ex Teijsm. & Binn.	좁글거리나무	D072702
<i>Euphorbia helioscopia</i> L.	등대풀	E080008
<i>Mallotus japonicus</i> (Thunb.) Muell. Arg.	예덕나무	D072674
Anacardizaceae	웃나무과	
<i>Rhus javanica</i> L.	붉나무	A100372
<i>Rhus trichocarpa</i> Miq.	개웃나무	A100573
<i>Rhus verniciflua</i> Stokes	웃나무	A100357
Aquifoliaceae	감탕나무과	
<i>Ilex integra</i> Thunb.	감탕나무	D072728
Celastraceae	노박덩굴과	
<i>Celastrus orbiculatus</i> Thunb.	노박덩굴	A100305
<i>Euonymus alatus</i> for. <i>ciliatodentatus</i> (Franch. & Sav.) Hiyama	회잎나무	A100534
<i>Euonymus fortunei</i> var. <i>radicans</i> (Miq.) Rehder	졸사철나무	G120021
<i>Euonymus hamiltonianus</i> var. <i>hamiltonianus</i> Wall.	참빗살나무	A100356
<i>Euonymus japonicus</i> Thunb.	사철나무	F70205
Staphyleaceae	고추나무과	
<i>Euscaphis japonica</i> (Thunb.) Kanitz	말오줌때	D072948
Aceraceae	단풍나무과	
<i>Acer pictum</i> subsp. <i>mono</i> (Maxim.) Ohashi	고로쇠나무	D072864
Balsaminaceae	봉선화과	
<i>Impatiens kojensis</i> Y.N. Lee	거제물봉선	D072761
<i>Impatiens textori</i> var. <i>textori</i> Miquel	물봉선	A100784
Rhamnaceae	갈매나무과	
<i>Rhamnus davurica</i> Pall.	갈매나무	A100225
<i>Rhamnus koraiensis</i> C.K. Schneid.	털갈매나무	D072876
<i>Rhamnus yoshinoi</i> Makino	짹자래나무	F70211
<i>Rhamnus yoshinoi</i> var. <i>mandshurica</i> T. Lee	만주짹자래나무	C062671
Vitaceae	포도과	
<i>Ampelopsis brevipedunculata</i> (Maxim.) Trautv.	개머루	C063556
<i>Cayratia japonica</i> (Thunb.) Gagnep.	거지덩굴	B130013
<i>Parthenocissus tricuspidata</i> (Siebold & Zucc.) Planch.	담쟁이덩굴	A100548
<i>Vitis flexuosa</i> Thunb.	새머루	A100537
<i>Vitis thunbergii</i> var. <i>sinuata</i> (Regel) H. Hara	까마귀머루	C063562
Tiliaceae	피나무과	
<i>Grewia parviflora</i> Bunge	장구참나무	C063528
Actinidiaceae	다래나무과	
<i>Actinidia arguta</i> var. <i>arguta</i> (Siebold & Zucc.) Planch. ex Miq.	다래	B130017
Theaceae	차나무과	
<i>Camellia japonica</i> L.	동백나무	B130018
<i>Eurya emarginata</i> (Thunb.) Makino	우목사스레피	C063505
<i>Eurya japonica</i> Thunb.	사스레피나무	D072780
Guttiferae	물레나무과	
<i>Hypericum erectum</i> Thunb.	고추나무	A100752
Violaceae	제비꽃과	
<i>Viola albida</i> var. <i>chaerophylloides</i> (Regel) F. Maek. ex Hara	남산제비꽃	E080021
<i>Viola grypceras</i> A. Gray	남시제비꽃	E080019

Appendix 1. Continued.

Scientific name	Korean name	*Voucher specimen
<i>Viola japonica</i> Langsd. ex Ging.	왜제비꽃	C063677
<i>Viola mandshurica</i> W. Becker	제비꽃	E080022
<i>Viola ovato-oblonga</i> (Miq.) Makino	긴잎제비꽃	A100304
<i>Viola patrinii</i> DC. ex Ging.	흰제비꽃	D072928
<i>Viola rossii</i> Hemsl.	고깔제비꽃	E080020
<i>Viola yedoensis</i> Makino	호제비꽃	A100315
Elaeagnaceae	보리수나무과	
<i>Elaeagnus macrophylla</i> Thunb.	보리밥나무	D073079
<i>Elaeagnus umbellata</i> Thunb.	보리수나무	A100717
Alangiaceae	박취나무과	
<i>Alangium platanifolium</i> var. <i>trilobum</i> (Miq.) Ohwi	박취나무	D072848
Araliaceae	두릅나무과	
<i>Aralia elata</i> (Miq.) Seem.	두릅나무	A100372
<i>Dendropanax trifidus</i> (Thunb.) Makino ex H. Hara	황칠나무	G120021
<i>Hedera rhombea</i> (Miq.) Bean	송악	B130045
Umbeliferae	산형과	
<i>Angelica grosseserrata</i> Maxim.	신감채	A100535
<i>Anthriscus sylvestris</i> (L.) Hoffm.	전호	C063340
<i>Peucedanum japonicum</i> Thunb.	갯기름나물	C064359
<i>Peucedanum terebinthaceum</i> (Fisch.) Fisch. ex DC.	기름나물	slide
<i>Sanicula chinensis</i> Bunge	참반디	D073119a,b
<i>Sanicula tuberculata</i> Maxim.	애기참반디	E080004
<i>Torilis scabra</i> (Thunb.) DC.	개사상자	H70254
Cornaceae	층층나무과	
<i>Aucuba japonica</i> Thunb.	식나무	D072834
<i>Cornus kousa</i> F. Buerger ex Miquel	산딸나무	A100337
Pyrolaceae	노루발과	
<i>Chimaphila japonica</i> Miq.	매화노루발	A100345
<i>Pyrola japonica</i> Klenze ex Alef.	노루발	F70156
Ericaceae	진달래과	
<i>Rhododendron mucronulatum</i> var. <i>mucronulatum</i> Turcz.	진달래	B130030
<i>Vaccinium bracteatum</i> Thunb.	모새나무	D072762
<i>Vaccinium oldhami</i> Miq.	정금나무	A100763
Myrsinaceae	자금우과	
<i>Ardisia crenata</i> Sims	백량금	D072766
<i>Ardisia japonica</i> (Thunb.) Blume	자금우	D072977
Primulaceae	앵초과	
<i>Lysimachia clethroides</i> Duby	큰까치수염	A100714
<i>Lysimachia mauritiana</i> Lam.	갯까치수염	C063453
Symplocaceae	노린재나무과	
<i>Symplocos tanakana</i> Nakai	검노린재나무	A100574
Styracaceae	매죽나무과	
<i>Styrax japonica</i> Siebold & Zucc.	매죽나무	D063412
Oleaceae	물푸레나무과	
<i>Chionanthus retusus</i> Lindl. & Paxton	이팝나무	A100568
<i>Fraxinus sieboldiana</i> Blume	쇠물푸레나무	B130031
<i>Ligustrum japonicum</i> var. <i>japonicum</i> Thunb.	광나무	D072725
<i>Ligustrum obtusifolium</i> Siebold & Zucc.	취퐁나무	F70152
Gentianaceae	용담과	
<i>Gentiana scabra</i> for. <i>scabra</i> Bunge	용담	G120022
<i>Gentiana zollingeri</i> for. <i>zollingeri</i> Faw.	큰구슬봉이	B130001
Apocynaceae	협죽도과	
<i>Trachelospermum asiaticum</i> var. <i>asiaticum</i> (Siebold & Zucc.) Nakai	마삭줄	D072670
Asclepiadaceae	박주가리과	
<i>Cynanchum paniculatum</i> (Bunge) Kitag.	산해박	D072686
<i>Cynanchum wilfordii</i> (Maxim.) Hemsl.	큰조롱	D072800
<i>Marsdenia tomentosa</i> Morren & Decaisne	나도은조롱	D072765
<i>Metaplexis japonica</i> (Thunb.) Makino	박주가리	A100754
Convolvulaceae	메꽃과	
<i>Calystegia soldanella</i> (L.) Roem. & Schultb.	갯메꽃	G70175
<i>Cuscuta australis</i> R. Br.	실새삼	A100549

Appendix 1. Continued.

Scientific name	Korean name	*Voucher specimen
Borraginaceae		
<i>Argusia sibirica</i> (L.) Dandy	지치과 모래지치	D072902
<i>Bothriospermum tenellum</i> (Hornem.) Fisch. & C.A. Mey.	꽃받이	H70237
<i>Lithospermum zollingeri</i> A. DC.	반디지치	E080017
<i>Trigonotis peduncularis</i> (Trevir.) Benth. ex Hemsl.	꽃마리	D072851
Verbenaceae		
<i>Callicarpa japonica</i> Thunb.	마편초과 작살나무	F70135
<i>Callicarpa mollis</i> Siebold & Zucc.	새비나무	G120023
<i>Caryopteris incana</i> (Thunb.) Miq.	층꽃나무	A100803
<i>Clerodendron trichotomum</i> Thunb.	누리장나무	A100754
Labiatae		
<i>Ajuga decumbens</i> Thunb.	꿀풀과 금창초	G120027
<i>Elsholtzia splendens</i> Nakai	꽃향유	A100720
<i>Isodon inflexus</i> (Thunb.) Kudo	산박하	D073074
<i>Lamium amplexicaule</i> L.	광대나물	A100368
<i>Leonurus japonicus</i> Houtt.	익모초	A100733
<i>Lycopus ramosissimus</i> (Makino) Makino	개췌싸리	C063590
<i>Mosla dianthera</i> (Buch.-Ham. ex Roxb.) ex Maxim.	취깨풀	A100792
<i>Prunella vulgaris</i> var. <i>lilacina</i> Nakai	꿀풀	F120020
<i>Scutellaria indica</i> L.	골무꽃	A100532
Solanaceae		
<i>Physalis alkekengi</i> var. <i>franchet</i> (Mast.) Hort	가지과 파리	D073126
<i>Solanum lyratum</i> Thunb. ex Murray	배풍등	A100538
<i>Solanum nigrum</i> var. <i>nigrum</i> L.	까마중	D072960
Scrophulariaceae		
<i>Melampyrum roseum</i> var. <i>japonicum</i> Fr. & Sav.	현삼과 수염머느리밥풀	A100818
<i>Phtheirospermum japonicum</i> (Thunb.) Kanitz	나도송이풀	G120023
<i>Veronica arvensis</i> L.	선개불알풀	A100319
<i>Veronica persica</i> Poir.	큰개불알풀	E080010
Acanthaceae		
<i>Justicia procumbens</i> L.	취꼬리망초과 취꼬리망초	A100226
Phrymaceae		
<i>Phryma leptostachya</i> var. <i>asiatica</i> Hara	파리풀과 파리풀	A100529
Plantaginaceae		
<i>Plantago asiatica</i> L.	질경이과 질경이	F70131
Rubiaceae		
<i>Damnacanthus indicus</i> C.F. Gaertn.	꼭두선이과 호자나무	F70193
<i>Galium gracilens</i> (A. Gray) Makino	좁네잎갈퀴	A100354
<i>Galium spurium</i> var. <i>echinospermon</i> (Wallr.) Hayek	갈퀴덩굴	B130027
<i>Galium verum</i> var. <i>asiaticum</i> Nakai	솔나무	A100751
<i>Mitchella undulata</i> Siebold & Zucc.	호자덩굴	F70198
<i>Paederia scandens</i> var. <i>scandens</i> (Lour.) Merr.	계요등	C063498
<i>Rubia cordifolia</i> var. <i>pratensis</i> Maxim.	갈퀴꼭두선이	B130026
Caprifoliaceae		
<i>Lonicera japonica</i> Thunb.	인동과 인동덩굴	F70203
<i>Sambucus sieboldiana</i> var. <i>miquelii</i> (Nakai) Hara	딱총나무	E080003
<i>Viburnum carlesii</i> Hemsl.	분꽃나무	C063631
<i>Viburnum erosum</i> Thunb.	덜꿩나무	C063670
Valerianaceae		
<i>Patrinia scabiosaefolia</i> Fisch. ex Trevir.	마타리과 마타리	A100775
<i>Patrinia villosa</i> (Thunb.) Juss.	뚝갈	A100768
Cucurbitaceae		
<i>Gynostemma pentaphylla</i> (Thunb.) Makino	박과 돌외	C063765
<i>Trichosanthes kirilowii</i> Max.	하늘타리	A100545
Campanulaceae		
<i>Adenophora triphyllum</i> var. <i>japonica</i> (Regel) H. Hara	초롱꽃과 잔대	D072993
<i>Codonopsis lanceolata</i> (Siebold & Zucc.) Trautv.	더덕	C064601
<i>Platycodon grandiflorum</i> (Jacq.) A. DC.	도라지	D072750
Compositae		
<i>Ainsliaea apiculata</i> Sch. Bip.	국화과 좁막취	A100227
<i>Artemisia capillaris</i> Thunb.	사철쭉	D073125
<i>Artemisia japonica</i> Thunb.	제비쭉	D073078

Appendix 1. Continued.

Scientific name	Korean name	*Voucher specimen
<i>Artemisia keiskeana</i> Miq.	맑은대쭉	A100763
<i>Artemisia princeps</i> Pamp	쭉	A100759
<i>Artemisia scoparia</i> Waldst. & Kitamura	비쭉	G120028
<i>Aster ageratoides</i> var. <i>ageratoides</i> Turcz.	까실쭉부쟁이	D073018
<i>Aster scaber</i> Thunb.	참취	C064528
<i>Aster sphathulifolius</i> Maxim.	해국	G70168
<i>Atractylodes ovata</i> (Thunb.) DC.	삼주	D072670
<i>Bidens bipinnata</i> L.	도깨비바늘	C063553
<i>Bidens radiata</i> var. <i>pinnatifida</i> (Turcz. ex DC.) Kitam.	구와가막사리	D073005
<i>Carpesium glossophyllum</i> Maxim.	천일담배풀	B130016
<i>Cirsium japonicum</i> var. <i>maackii</i> (Maxim.) Matsum.	엉겅퀴	C063526
<i>Conyza canadensis</i> (L.) Cronquist	망초	A100773
<i>Dendranthema boreale</i> (Makino) Ling ex Kitam.	산국	C063569
<i>Dendranthema zawadskii</i> var. <i>latilobum</i> (Maxim.) Kitam.	구절초	D073047
<i>Eclipta prostrata</i> L.	한련초	D072662
<i>Erigeron annuus</i> (L.) Pers.	개망초	F70125
<i>Eupatorium japonicum</i> Thunb. ex Murray	등골나물	A100739
<i>Eupatorium lindleyanum</i> DC.	골등골나물	D073053
<i>Farfugium japonicum</i> (L.) Kitam.	털머위	D073077
<i>Gnaphalium affine</i> D. Don	떡쭉	A100721
<i>Gnaphalium japonicum</i> Thunb.	풀솨나물	A100713
<i>Heteropappus meyenendorffii</i> (Regel & Maack) Kom. & Klob.-Alisova	개쭉부쟁이	A100756
<i>Hieracium umbellatum</i> L.	조밥나물	A100730
<i>Ixeridium dentatum</i> (Thunb. ex Mori) Tzvelev	쭉바귀	C063616
<i>Ixeridium dentatum</i> for. <i>albiflora</i> (Makino) H. Hara	흰쭉바귀	B130015
<i>Lactuca indica</i> var. <i>laciniata</i> (Kuntze) H. Hara	왕고들빼기	A100724
<i>Leibnitzia anandria</i> (L.) Nakai	솨나물	A100718
<i>Ligularia stenocephala</i> (Maxim.) Matsum. & Koidz.	근달비	C063576
<i>Petasites japonica</i> (Siebold & Zucc.) Maxim.	머위	H120005
<i>Saussurea ussuriensis</i> Maxim.	구와취	D072826
<i>Saussurea polylepis</i> Nakai	홍도서덜취	B130014
<i>Tephrosia kirilowii</i> (Turcz. ex DC.) Holub	솨방망이	A100744
<i>Solidago virg-aurea</i> subsp. <i>asiatica</i> var. <i>asiatica</i> Kitam. ex Hara	미역취	C063574
<i>Sonchus asper</i> (L.) Hill	큰방가지뚥	H70232
<i>Sonchus oleraceus</i> L.	방가지뚥	C063471
<i>Taraxacum coreanum</i> Nakai	흰민들레	H120006
<i>Taraxacum platycarpum</i> Dahlst.	민들레	E080017
<i>Crepidiastrum denticulatum</i> (Houtt.) Pak & Kawano	이고들빼기	D073087
<i>Youngia japonica</i> (L.) DC.	뽕리랭이	B130012
Gramineae		
<i>Agropyron tsukushiense</i> var. <i>transiens</i> (Hack.) Ohwi	벼과	G70172
<i>Alopecurus aequalis</i> Sobol.	개밀	A100553
<i>Arundinella hirta</i> (Thunb.) Koidz.	뚝새풀	D073037
<i>Avena fatua</i> L.	새	B130010
<i>Bromus japonicus</i> Thunb. ex Murray	메귀리	C063344
<i>Bromus pauciflorus</i> (Thunb.) Hack.	참새귀리	C063480
<i>Calamagrostis arundinacea</i> (L.) Roth	꼬리새	D073063
<i>Cymbopogon taitis</i> var. <i>geringil</i> (Steud.) Hand.-Mazz.	실새풀	D073056
<i>Dactylis glomerata</i> L.	개솔새	A100516
<i>Digitaria ciliaris</i> (Retz.) Koel.	오리새	A100530
<i>Echinochloa crusgalli</i> var. <i>crusgalli</i> (L.) P. Beauv.	바랭이	G120031
<i>Eleusine indica</i> (L.) Gaertner	들피	A100543
<i>Eragrostis ferruginea</i> (Thunb.) P. Beauv.	왕바랭이	A100528
<i>Fesituca ovina</i> var. <i>ovina</i> L.	그렁	D072693
<i>Fesituca parvigluma</i> Steud.	김의털	C063376
<i>Fesituca subulata</i> var. <i>japonica</i> Hack.	김의털아재비	A100293
<i>Ischaemum crassipes</i> (Steud.) Thell.	왕김의털아재비	C063508
<i>Lolium multiflorum</i> var. <i>multiflorum</i> Lam.	쇠보리	A100306
<i>Lolium perenne</i> L.	취보리	A100539
<i>Microstegium vimineum</i> var. <i>vimineum</i> (Trin.) A. Camus	호밀풀	C063595
<i>Miscanthus sinensis</i> var. <i>sinensis</i> Andersson	나도바랭이새	D072990
<i>Oplismenus undulatifolius</i> var. <i>undulatifolius</i> (Ard.) P. Beauv.	참억새	A100551
	주름조개풀	

Appendix 1. Continued.

Scientific name	Korean name	*Voucher specimen
<i>Pennisetum alopecuroides</i> var. <i>alopecuroides</i> (L.) Spreng.	수크령	C063555
<i>Phaneosperma globosa</i> Munro ex Benth.	산기장	C063470
<i>Phragmites communis</i> Trin.	갈대	A100739
<i>Poa acroleuca</i> Steud.	실포아풀	A100321
<i>Poa annus</i> L.	새포아풀	E080024
<i>Poa hisauchii</i> Honda	구내풀	A100347
<i>Poa sphondylodes</i> Trin.	포아풀	G70177
<i>Poa trivialis</i> L.	큰새포아풀	D072869
<i>Poa viridula</i> Palib.	청포아풀	B130005
<i>Pseudoraphis ukishiba</i> Ohwi	물잔디	C064459
<i>Sasa japonica</i> (Siebold & Zucc. ex Steud.) Makino	이대	A100721
<i>Setaria chondrache</i> (Steud.) Honda	조아재비	D073064
<i>Setaria glauca</i> (L.) P. Beauv.	금강아지풀	A100548
<i>Setaria viridis</i> var. <i>viridis</i> (L.) P. Beauv.	강아지풀	A100533
<i>Spodiopogon sibiricus</i> Trin.	큰기름새	D073045
<i>Themeda triandra</i> var. <i>japonica</i> (Willd.) Makino	솔새	D073038
<i>Vulpia myuros</i> var. <i>myuros</i> (L.) C.C. Gmelin	들목새	C063362
<i>Zoysia japonica</i> Steud.	잔디	A100351
Cyperaceae	사초과	
<i>Carex bootiana</i> Hook. & Arn.	밀사초	C063647
<i>Carex breviculmis</i> R. Br.	청사초	E080013
<i>Carex ciliatomarginata</i> Nakai	털대사초	A100206
<i>Carex dispalata</i> var. <i>dispalata</i> Boott	삿갓사초	A100214
<i>Carex doniana</i> Spreng.	흰사초	B130004
<i>Carex forficula</i> var. <i>forficula</i> Franch. & Sav.	산뚝사초	B040214
<i>Carex gibba</i> Wahlenb.	나도별사초	F70138
<i>Carex humilis</i> Leyss.	가는잎그늘사초	A100215
<i>Carex japonica</i> Thunb.	개찌버리사초	A100229
<i>Carex lanceolata</i> Boott	그늘사초	E080012
<i>Carex lenta</i> D. Don	줄사초	C063593
<i>Carex maximowiczii</i> var. <i>maximowiczii</i> Miq.	왕비늘사초	B130009
<i>Carex mitrata</i> var. <i>mitrata</i> Franch.	겨사초	B130011
<i>Carex phacota</i> Spreng.	비늘사초	G120007
<i>Carex polyschoena</i> H. Lev. & Vaniot	가지청사초	B130003
<i>Carex thunbergii</i> Steud.	뚝사초	A100228
<i>Carex tristachya</i> var. <i>tristachya</i> Thunb.	반들사초	A10052
<i>Carex sabynensis</i> Less.	실청사초	B130006
<i>Cyperus nipponicus</i> Franch. & Sav.	푸른방동사니	D072997
<i>Kyllingia brevifolia</i> (Rottb.) Hassk.	파대가리	C063486
<i>Rhynchospora fujiana</i> Makino	좁고양이수염	D073014
<i>Scripus juncooides</i> var. <i>hotarui</i> (Ohwi) Ohwi	올챙이고랭이	D073009
<i>Scirpus mucronatus</i> L.	좁은고랭이	C063571
Araceae	천남성과	
<i>Arisaema amurense</i> Maxim.	둥근잎천남성	C063646
<i>Arisaema ringens</i> (Thunb.) Schott	큰천남성	D072839
<i>Pinnelia ternata</i> (Thunb.) Breitenb.	반하	C063740
Commelinaceae	닭의장풀과	
<i>Commelina communis</i> L.	닭의장풀	A100701
Juncaceae	골풀과	
<i>Juncus effusus</i> var. <i>dicipiens</i> Buchenau	골풀	C063502
<i>Juncus leschenaultii</i> J. Gay	참비너골풀	A100203
<i>Luzula capitata</i> (Miq.) Miq.	평의밥	F120008
Liliaceae	백합과	
<i>Aletris spicata</i> (Thunb.) Franch.	취꼬리풀	A100573
<i>Allium macrostemon</i> Bunge	산달래	G70173
<i>Allium monanthum</i> Maxim.	달래	F120010
<i>Allium sacculiferum</i> Maxim.	참산부추	D073086
<i>Asparagus cochinchinensis</i> (Lour.) Merr.	천문동	D072688
<i>Asparagus schoberioides</i> Kunth	비짜루	C063510
<i>Disporum smilacinum</i> A. Gray	애기나리	C063662
<i>Disporum uniflorum</i> Baker	윤판나물	B130008
<i>Hemerocallis minor</i> Mill.	애기원추리	A100552

Appendix 1. Continued.

Scientific name	Korean name	*Voucher specimen
<i>Hosta yingeri</i> S.B. Jones	흑산도비비추	C063786
<i>Lilium lancifolium</i> Thunb.	참나리	C063514
<i>Lilium tsingtauense</i> Gilg	하늘말나리	A100378
<i>Liripe spicata</i> (Thunb.) Lour.	개맥문둥	D072708
<i>Ophiopogon jaburan</i> (Kunth) Lodd.	맥문아재비	D072829
<i>Polygonatum cryptanthum</i> H. Lev. & Vaniot	목포용동굴레	C063638
<i>Polygonatum odoratum</i> var. <i>pluriflorum</i> Ohwi	등굴레	B130047
<i>Polygonatum inflatum</i> Kom.	통등굴레	B130046
<i>Polygonatum involucratum</i> (Franch. & Sav.) Maxim.	용동굴레	B130041
<i>Scilla scilloides</i> (Lind.) Druce	무릇	D072745
<i>Smilax china</i> L.	청미래덩굴	C063623
<i>Smilax sieboldii</i> for. <i>sieboldii</i> Miq.	청가시덩굴	B130020
<i>Smilax sieboldii</i> var. <i>inermis</i> (Nakai) Hara	민청가시덩굴	D072893
<i>Tulipa edulis</i> (Miq.) Baker	산자고	H70250
Dioscoreaceae	마과	
<i>Dioscorea oppositifolia</i> L.	마	C063516
<i>Dioscorea tenuipes</i> Franch. & Sav.	각시마	D073032
Iridaceae	붓꽃과	
<i>Iris rossii</i> var. <i>rossii</i> Baker	각시붓꽃	A100287
<i>Tritonia crocosmaeflora</i> Lemoine	몬트부레치아	D072967
Orchidaceae	난과	
<i>Calanthe striata</i> for. <i>Sieboldii</i> R. Br. ex Lindl. Decne. ex Regel	금새우난초	E080018
<i>Cephalanthera erecta</i> (Thunb. ex Murray) Blume	은난초	C063649
<i>Cymbidium goeringii</i> (Rchb.f.) Rchb.f.	보춘화	E080006
<i>Liparis kumokiri</i> F. Maek	옥잠난초	D072692
<i>Platanthera mandarinorum</i> var. <i>brachycentron</i> Koidz.	짧은산제비난	F70197
<i>Spiranthes sinensis</i> (Pers.) Ames	타래난초	D07275

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