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Floristic study of Aphaedo Island in Shinan-gun, Jeollanam-do, Korea

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ABSTRACT: We investigated vascular plants of Aphaedo Island in Shinan-gun, Jeollanam-do, Korea. By referring to voucher specimens collected over the course of 28 days from May of 2011 to March of 2016, a total of 451 taxa were identified and grouped into 102 families, 294 genera, 413 species, 6 subspecies, 30 varieties, and 2 forms, of which 9 taxa were classified as endangered or rare, including *Albizia kalkora*, *Salomonia oblongifolia*, and *Centranthera cochinchinensis* var. *lutea*. A total of 59 taxa were identified as regional indicator plants. Six taxa were endemic to Korea, including *Hepatica insularis*, *Indigofera koreana*, and *Lespedeza maritima*. Three taxa (*Rumex acetosella*, *Aster pilosus*, and *Hypochaeris radicata*) among 52 naturalized taxa were ecosystem-disturbing plants as designated by the Ministry of the Environment. The results of preceding floristic research before and after the inauguration of the Aphaedaegyo (bridge) were used to analyze changes in the number of naturalized species on Aphaedo Island.

Keywords: Aphaedo Island, flora, endangered and rare plants, floristic regional indicator plants, endemic plants, naturalized plants

Aphaedo Island is located in the southwest end of Korea. It belongs to Aphae-eup in Shinan-gun in Jeollanam-do. Aphaedo Island is adjacent to Muan-gun on the east, Amtaedo Island on the west, Mokpo-si on the south, and Jido Island on the north. Aphaedo Island is connected to Mokpo-si through the Aphaedaegyo Bridge. It is also connected with Muan-gun through the Kimdaejungdaegyo Bridge. Aphaedo Island is the main island of Aphae-eup consisting of 60 uninhabited islands and 8 inhabited islands, including Garando Island, Goyido Island, and Maehwado Island. The area of Aphaedo Island is 48.87 km^2, and the coastline reaches 81.9 km (Shinan-gun Office, 2016). Aphaedo Island is a mountainous area formed by Holmaesan Mountain (or Inmaesan Mountain, elev. 138.2 m) to the north of the island and Songgongsan Mountain (elev. 234.1 m) which is the highest peak of the western end. The center and the southeast of the island are flat while its outskirts are hilly areas of about 100 m in elevation. The entire island is surrounded by tidal-flats. Its coastline has a lot of bays and capes. However, its coastline is monotonous due to reclamation and paddy fields. It is said that the name (Aphae, 押海 in Chinese character) of this island is derived from the shape of the island spreading on three sides, pressing (押) the sea (海) (National Geographic Information Institute, 2010).

Shinan-gun, including Aphaedo Island, has an average annual temperature of 14.4°C as of 2015. Its average temperatures in January (the coldest month) and in August (the hottest month) are 2.5°C and 25.9°C, respectively, with a difference of 23.4°C. It has a temperate oceanic climate (Shinan-gun Office, 2016). Aphaedo Island belongs to the south coast subdistrict of the floristic region of the Korean peninsula (Lee and Yim, 2002). A total of 154 taxa (134 species, 18 varieties, and 2 forms) of 61 families and 124 genera were recorded at Aphaedo Island in floristic studies for 32 islands (distributed in the West and South Coast of Korea) conducted from June 2003 to October 2003 by Park (2004). Jeong et al. (2011) have reported 103 taxa from Aphaedo Island based on voucher specimens obtained from 11 islands in Shinan-gun in 2003 and 2010 (the list of plants growing in the region was counted as 102 taxa). Nam et al. (2012) have surveyed the flora of three islands (Aphaedo Island, Bigeumdo Island, Dochodo Island) belonging to Shinan-gun from May to September 2010 and reported 379

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taxa from Aphaedo Island (the list of plants growing in the region was counted as 380 taxa). Hwang et al. (2013) have surveyed 15 islands in Shinan-gun from September 2004 to September 2010 and reported 287 taxa from Aphaedo Island. Kim (2008) has also reported 68 taxa of naturalized plants from Aphaedo Island in an ecological study on vegetation distribution of coastal islands.

The objective of the present study was to update vascular plant flora of Aphaedo Island and determine the distribution of major plants such as endangered species, rare plants, endemic plants of the Korean Peninsula, and regional indicator species representing the south coast subdistrict flora. Another purpose of this study was to understand changes of flora in comparison with previous studies. The island was connected to the main land by Aphaedaegyo in 2008. After that, Shinan-gun Office was moved in 2011 and Kimdaejungdaegyo was opened in 2013. In 2018 there will be an inauguration of the Saecheonnyeondaegyo Bridge connecting Aphaedo Island and Amtaedo Island. This study was conducted to obtain basic data on the conservation and management of Aphaedo Island's biological resources, which are under high development pressure as the island is Shinan-gun's administrative and transportation center.

Materials and Methods

A field survey was conducted for a total of 28 days from May 2011 to March 2016 to examine the flora of Aphaedo Island. The scope of the survey covered vascular plants that appeared all over the area of Aphaedo Island, encompassing 10 administrative districts: Songgong-ri and Daecheon-ri, including Songgongsan Mountain, the highest peak (234.1 m) in the island; Dongseo-ri and Bunmae-ri (plains district through which Route 2 passes); Sinsang-ri (where Shinan-gun Office and Aphaedaegyo is located); Janggam-ri; Hakgyo-ri (including town office); Bongryong-ri (with Kimdaejungdaegyo connecting to mainland); Garyong-ri and Sinyong-ri (composed of hilly areas and farmlands of Holmaesan Mountain) (Fig. 1, Table 1). We collected samples in various plant growth environments such as coast, mountains, villages, farmland, and roads in the survey area on foot. In this process, individuals with reproductive organs such as flower, fruit, and sporangium were collected and prepared as dried specimens. Location, habitat, and identification of specimens were entered into the National Biological Resources Input System of the National Institute of Biological Resources (NIBR) in Korea. Voucher specimens were deposited at the herbarium of NIBR (KB).

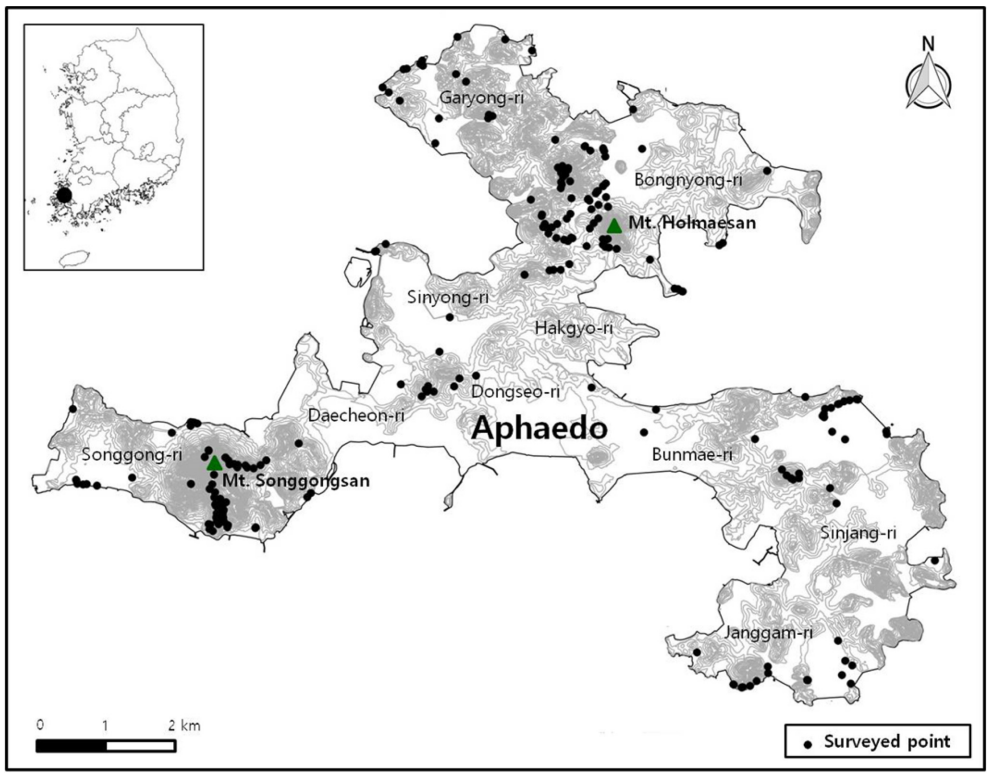

Fig. 1. Map of the investigated area (Aphaedo Island).

Identification and classification of these collected plants were performed with reference to Lee (1996a, 1996b), Lee (2003), Lee (2006), Park (2009), Park et al. (2008, 2011), and Hoshino and Masaki (2011). Scientific and common names were based on National List of Species of Korea (National Institute of Biological Resources, 2017) and Synonymic List of Vascular Plants in Korea (Korea National Arboretum and The Plant Taxonomic Society of Korea, 2007). The list of identified plants was arranged according to the Genera of Vascular Plants of Korea (Park, 2007). All plant names in list were based on voucher specimens. Taxa below the genus were arranged in alphabetical order. If there were several collections of voucher specimens for the same taxon, the first sampled specimen was presented. These investigated plants were reviewed in detail by the Red Data Book of Endangered Vascular Plants in Korea (National Institute of Biological Resources, 2012), Rare Plants Data Book in Korea (Korea National Arboretum, 2008), regional indicator species (National Institute of Environmental Research, 2012), endemic plants of Korean Peninsula (Chung et al., 2017), and the list of naturalized plants (Bang, 2014) presented in the Ministry of Environment's "1st Alien Species Management Plan".

Table 1. Investigation timeline and location in Aphaedo Island.

Date	Locality in Aphaedo Island
30 May 2011	Garyong-ri, Songgong-ri, Daecheon-ri, Bunmae-ri, Sinjang-ri, Hakgyo-ri
29 Aug 2011	Songgong-ri, Daecheon-ri, Sinjang-ri
5–6 May 2012	Garyong-ri, Bongnyong-ri, Bunmae-ri, Hakgyo-ri, Songgong-ri, Daecheon-ri, Janggam-ri
23–24 May 2012	Garyong-ri, Songgong-ri, Daecheon-ri, Bongnyong-ri
9 Jul 2012	Bongnyong-ri, Sinyong-ri, Garyong-ri
20 Aug 2012	Janggam-ri, Sinyong-ri, Dongseo-ri, Sinjang-ri, Songgong-ri, Daecheon-ri, Bunmae-ri, Hakgyo-ri
22 Aug 2012	Songgong-ri
24–25 Sep 2012	Garyong-ri, Bongnyong-ri, Sinyong-ri, Daecheon-ri, Songgong-ri, Bunmae-ri, Janggam-ri
4–5 Oct 2012	Sinjang-ri, Janggam-ri, Garyong-ri, Songgong-ri, Daecheon-ri, Bunmae-ri
15 Mar 2013	Songgong-ri
9 Jul 2013	Garyong-ri, Bongnyong-ri, Songgong-ri, Sinyong-ri, Hakgyo-ri
9 Nov 2013	Songgong-ri
22 May 2014	Bunmae-ri, Songgong-ri
3 Jul 2014	Songgong-ri
11 Aug 2014	Bongnyong-ri, Garyong-ri, Daecheon-ri, Songgong-ri
14 Oct 2014	Daecheon-ri, Songgong-ri, Sinjang-ri
12 Aug 2015	Bunmae-ri
26–27 Aug 2015	Songgong-ri, Daecheon-ri, Dongseo-ri, Garyong-ri
12 Sep 2015	Songgong-ri
22–23 Sep 2015	Garyong-ri, Bongnyong-ri
21 Oct 2015	Daecheon-ri, Garyong-ri
21 Mar 2016	Bunmae-ri, Hakgyo-ri, Sinyong-ri, Bongnyong-ri, Garyong-ri, Songgong-ri

Results and Discussion

List of vascular plants

A total of 451 taxa (413 species, 6 subspecies, 30 varieties, and 2 forms) in 102 families 294 genera of vascular plants growing on Aphaedo Island were identified, including 13 species of ferns (in 10 families 11 genera), 7 species of gymnosperms (in 2 families 4 genera), and 431 taxa (393 species, 6 subspecies, 30 varieties, and 2 forms) of angiosperms in 90 families 279 genera (Table 2, Appendix 1). This is equivalent to 10.1% of 4,455 taxa of the Korean Peninsula (National Institute of Biological Resources, 2017), 35.5% of 1,271 taxa of vascular plants distributed in the southern coastal district of Korea (Oh et al., 2004), and 32.7% of 1,379 species of vascular plants known to be distributed in southwestern islands in Korea (Oh et al., 2010). A total of 586 taxa (species and infra-specific taxa) have been reported from Aphaedo Island, including 154 taxa by Park (2004), 68 taxa by Kim (2008), 102 taxa by Jeong et al. (2011), 383 taxa by Nam et al. (2012), and 287 taxa by Hwang et al. (2013). Compared to previous studies, 119 taxa were newly identified in this study. Thus, a total of 705 taxa (635 species, 8 subspecies, 58 varieties, and 4 varieties) in 117 families 390 genera of vascular plants have been reported in Aphaedo Island so far, including

Table 2. Number of vascular plants in Aphaedo Island.

Taxa	Fam.	Gen.	Sp.	Subsp.	Var.	F.	Total
Pteridophyta	10	11	13	-	-	-	13
Gymnospermae	2	4	7	-	-	-	7
Angiospermae	90	279	393	6	30	2	431
Dicotyledon	74	200	276	4	19	1	300
Monocotyledon	16	79	117	2	11	1	131
Total	102	294	413	6	30	2	451

the 119 taxa identified in the current study. Among them, cultivated plants were 25 taxa (species and infra-specific taxa), including *Ginkgo biloba* L., *Castanea crenata* Siebold & Zucc. and *Lagerstroemia indica* L. etc.. Excluding cultivated plants reported in this study and previous studies, 680 taxa (611 species, 8 subspecies, 57 varieties, and 4 varieties) belonging to 110 families 373 genera of vascular plants are found to be native to Aphaedo Island (Appendix 1).

Among vascular plants identified in this study, evergreen broad-leaved trees were 11 taxa: *Quercus salicina* Blume, *Camellia japonica* L., *C. sasanqua* Thunb., *Eurya japonica* Thunb., *Vaccinium bracteatum* Thunb., *Euonymus japonicus* Thunb., *Ilex crenata* Thunb., *Fatsia japonica* (Thunb.) Decne. & Planch., *Hedera rhombea* (Miq.) Bean, *Vitex rotundifolia* L. f., and *Ligustrum japonicum* Thunb.. Among these taxa, *Camellia japonica*, *Hedera rhombea*, and evergreen fern species *Dicranopteris linearis* (Burm. f.) Underw., *Pteris multifida* Poir., and *Cyrtomium falcatum* (L. f.) C. Presl. are southern plants that are expected to grow in population size and range expansion to the north due to temperature increase caused by global climate change. These are taxa that are designated and managed by the Ministry of Environment as national climate change index species (Lee et al., 2010). In addition, halophytes growing on salt fields and sea shores including mud flats, sand dunes, and rocks (Na and Hyun, 2015) were classified into 41 taxa (species and infraspecific taxa) in 18 families 32 genera (Table 3). This corresponds to 9.1% of plants distributed on Aphaedo Island. Among these, 15 taxa such as *Salsola komarovii* Iljin, *Suaeda japonica* Makino, and *Polygonum fusco-ochreatum* Kom. are newly reported species in this study. *Suaeda glauca* (Bunge) Bunge, *Suaeda australis* (R. Br.) Moq., *Suaeda maritima* (L.) Dumort., and *Salicornia europaea* L. are known as representative halophyte species of Chenopodiaceae. They were found in tidal flats, salt fields, and around the marina in Garyong-ri and Sinjang-ri.

Endangered and rare plants

The following nine taxa are classified as Threatened (critically endangered [CR], endangered [EN], vulnerable [VU]) and near threatened (NT) category in the Red Data Book of Endangered Vascular Plants in Korea (National Institute of Biological Resources, 2012) and the Rare Plants Data Book in Korea (Korea National Arboretum, 2008): *Albizia calcareous* (Roxb.) Prain, *Wisteria japonica* Siebold & Zucc., *Salomonia oblongifolia* DC., *Bupleurum falcatum* L., *Centranthera cochinchinensis* (Lour.) Merr. var. *lutea* (H. Hara) H. Hara, *Utricularia bifida* L., *Hololeion maximowiczii* Kitam.,

Table 3. List of halophytes in Aphaedo Island.

Family	Taxa
Dryopteridaceae	*Cyrtomium falcatum* (L. f.) C. Presl 도깨비고비[a]
Pinaceae	*Pinus thunbergii* Parl. 곰솔
Chenopodiaceae	*Atriplex gmelinii* C. A. Mey. 가는갯능쟁이
	Chenopodium glaucum L. 취명아주
	Salicornia europaea L. 퉁퉁마디
	Salsola komarovii Iljin 수송나물[a]
	Suaeda australis (R. Br.) Moq. 방석나물
	Suaeda glauca (Bunge) Bunge 나문재
	Suaeda japonica Makino 칠면초[a]
	Suaeda maritima (L.) Dumort. 해홍나물
Caryophyllaceae	*Spergularia marina* (L.) Griseb. 갯개미자리
Polygonaceae	*Polygonum fusco-ochreatum* Kom. 큰옥매듭풀[a]
Primulaceae	*Lysimachia mauritiana* Lam. 갯까치수염
Rosaceae	*Rosa rugosa* Thunb. 해당화
	Rosa wichuraiana Crép. ex Déségl. 돌가시나무
Fabaceae	*Lathyrus japonicus* Willd. 갯완두[a]
Apiaceae	*Cnidium japonicum* Miq. 갯사상자
	Glehnia littoralis F. Schmidt ex Miq. 갯방풍[a]
Convolvulaceae	*Calystegia soldanella* (L.) Roem. & Schult. 갯메꽃[a]
Verbenaceae	*Vitex rotundifolia* L. f. 순비기나무
Labiatae	*Scutellaria strigillosa* Hemsl. 참골무꽃[a]
Asteraceae	*Artemisia capillaris* Thunb. 사철쑥
	Aster hispidus Thunb. 갯쑥부쟁이
	Aster tripolium L. 갯개미취[a]
Juncaginaceae	*Triglochin maritimum* L. 지채
Juncaceae	*Juncus setchuensis* Buchenau var. *effusoides* Buchenau 푸른갯골풀
Cyperaceae	*Bolboschoenus planiculmis* (F. Schmidt) T. V. Egorova 새섬매자기
	Carex kobomugi Ohwi 통보리사초[a]
	Carex scabrifolia Steud. 천일사초
	Eleocharis kamtschatica (C. A. Mey.) Kom. 올방개아재비
	Fimbristylis longispica Steud. 큰하늘지기
	Fimbristylis sieboldii Miq. Ex Franch. & Sav. 갯하늘지기
Poaceae	*Calamagrostis epigeios* (L.) Roth 산조풀[a]
	Ischaemum anthephoroides (Steud.) Miq. 갯쇠보리[a]
	Ischaemum crassipes (Steud.) Thell. 쇠보리
	Phragmites communis Trin. 갈대
	Polypogon monspeliensis (L.) Desf. 갯쇠돌피
	Setaria viridis (L.) P. Beauv. var. *pachystachys* (Franch. & Sav.) Makino & Nemoto 갯강아지풀
	Zoysia macrostachya Franch. & Sav. 왕잔디[a]
	Zoysia sinica Hance 갯잔디
Typhaceae	*Typha laxmannii* Lepech. 꼬마부들[a]

[a]Newly identified taxa in this study.

Table 4. List of endangered or rare plants in Aphaedo Island.

Family	Taxa	Criteria[a]	
		NIBR[b]	KNA[c]
Fabaceae	*Albizia kalkora* (Roxb.) Prain 왕자귀나무	VU	EN
	Wisteria japonica Siebold & Zucc. 애기등	-	VU
Polygalaceae	*Salomonia oblongifolia* DC. 병아리다리	VU	CR
Apiaceae	*Bupleurum falcatum* L. 시호	-	VU
Scrophulariaceae	*Centranthera cochinchinensis* (Lour.) Merr. var. *lutea* (H. Hara) H. Hara 성주풀	EN	VU
Lentibulariaceae	*Utricularia bifida* L. 땅귀개	-	VU
Asteraceae	*Hololeion maximowiczii* Kitam. 께묵	NT	EN
Orchidaceae	*Bletilla striata* (Thunb.) Rchb. f. 자란	-	VU
	Pogonia japonica Rchb. f. 큰방울새란	NT	VU

[a]CR, critically endangered; EN, endangered; VU, vulnerable; NT, near threatened. [b]Red data book of endangered vascular plants in Korea (National Institute of Biological Resources, 2012). [c]Rare plants data book in Korea (Korean National Arboretum, 2008).

Fig. 2. Some remarkable plants in Aphaedo Island. **A.** *Albizia kalkora* (Roxb.) Prain. **B.** *Wisteria japonica* Siebold & Zucc. **C.** *Salomonia oblongifolia* DC. **D.** *Centranthera cochinchinensis* (Lour.) Merr. var. *lutea* (H. Hara) H. Hara. **E.** *Utricularia bifida* L. **F.** *Utricularia racemosa* Wall. ex Walp. **G.** *Hololeion maximowiczii* Kitam. **H.** *Scleria caricina* (R. Br.) Benth. **I.** *Pogonia japonica* Rchb. f.

Bletilla striata (Thunb.) Rchb. f., and *Pogonia japonica* Rchb. f. (Table 4). *Juniperus chinensis* L. belongs to VU in the Red List category. However, it is excluded from the list as it is a planted species.

Albizia kalkora (Fig. 2A) was growing in foothills of Garyong-ri coast and in hills near Bunmae-ri ranch as reported in previous studies (Park, 2004; Jeong et al., 2011; Nam et al., 2012; Hwang et al., 2013). In addition, it has been found in

uninhabited islands such as Songgongsan Mountain, Godongseom Island, Dolseom Island, Odo Island, Jeongjudo Island, and Haeduseom Island which belongs to Aphaedo Island (Hwang, 2017). *Wisteria japonica* (Fig. 2B) was observed in Hakgyo-ri Holmaesan Mountain area. *Salomonia oblongifolia* (Fig. 2C) was growing on the eastern slope of Bokryong-ri opposite to Holmaesan Mountain. *Bupleurum falcatum* was growing together in the native area of *Albizia kalkora* in Bunmae-ri. *Centranthera cochinchinensis* (Fig. 2D), *Utricularia bifida* (Fig. 2E), *Hololeon maximowiczii* (Fig. 2G), and *Pogonia japonica* (Fig. 2I) were distributed on the southern slope of Songgongsan Mountain bordering Songgong-ri and Daecheon-ri. In this slope, regional indicator species and a variety of mountain wetland plants have been identified, including V grade species *Utricularia racemosa* Wall. ex Walp. (Fig. 2F) and IV grade species such as *Scleria caricina* (R. Br.) Benth. (Fig. 2H), *Scleria rugosa* R. Br., *Rhynchospora chinensis* Nees & Meyen, *Scleria parvula* Steud., *Parnassia palustris* L. var. *multiseta* Ledeb., *Habenaria linearifolia* Maxim., and so on. However, they were close to low-lying trails, causing concern about degradation of native habitat and disturbance of the ecosystem due to influx of invasive plants. There are also private forests and forests owned by families of same clan. Therefore, the possibility of habitat damage due to anthropogenic activity such as mountain clearing and installation of facilities cannot be excluded. In 2007, a bonsai park was constructed on the southern side of Songgongsan Mounatain, damaging much of the wetlands. However, in the upper area of the park, a wetland ecological garden was created and a part of it was preserved. In the future, it is necessary to conduct a detailed survey on wetlands distributed throughout Songgongsan Mountain and prepare conservation plans including designation of wetland protection areas.

Regional indicator plants

A total of 59 species and infraspecific taxa were confirmed as regional indicator species distributed in Aphaedo Island, including four grade V taxa [*Albizia calcora* (Roxb.) Prain, *Wisteria japonica* Siebold & Zucc., *Utricularia bifida* L., *Utricularia racemosa* Wall. ex Walp.], six taxa in grade IV [including *Polygonum fusco-ochreatum* Kom., *Salomonia oblongifolia* DC., *Centranthera cochinchinensis* (Lour.) Merr. var. *lutea* (H. Hara), and H. Hara etc], 19 taxa in grade III [including *Trichosanthes kirilowii* Maxim. var. *japonica* (Miq.) Kitam., *Cynanchum nipponicum* Matsum., *Bletilla striata* (Thunb.) Rchb. f. etc.], four taxa in grade II, and 26 taxa in grade I. These taxa represent 13.1% of vascular plants identified on Aphaedo Island. A total of 24 taxa, including *Polygonum fusco-ochreatum*, *Trichosanthes kirilowii*, and *Cynanchum nipponicum*, are newly recorded regional indicator species (Table 5).

The majority of these regional indicator species in grade V and IV are endangered and rare plants of the Red Data Book of Endangered Vascular Plants in Korea (Table 4). *Albizia calcora* (Fig. 2A) is restricted to the western coast while *Wisteria japonica* (Fig. 2B) distributes relatively broad in the south coast and coastal areas in Jeollabuk-do. Both species are not currently protected by law. They are exposed to development threats because they are growing in the vicinity of villages (National Institute of Biological Resources, 2012). *Polygonum fusco-ochreatum*, a halophyte reported in the western coast of south Chungcheong-do, was observed around the native habitat of *Albizia kalkora* on the coast of Garyong-ri. *Cladium chinense* Nees and *Scleria caricina* (R. Br.) Benth. (Fig. 2H) are restricted to the southern coastal regions and islands in Korea, respectively. In this study, they were found in the south coast of Songgongsan Mountain and wetlands of south slopes, respectively.

Endemic plants

The following endemic plants in the Korean Peninsula were identified in the survey area: *Hepatica insularis* Nakai, *Indigofera koreana* Ohwi, *Lespedeza maritima* Nakai, *Forsythia koreana* (Rdhder) Nakai, *Paulownia coreana* Uyeki, and *Weigela subsessilis* (Nakai) L. H. Bailey. This is equivalent to 1.6% of 360 species (including infraspecific taxa) of Korean endemic plants (Chung et al., 2017) (Table 6). *Hepatica insularis* was discovered in southern slope of Songgongsan Mountain while *Indigofera koreana* Ohwi was growing in the forests of Bunmae-ri and near Geumsansa Temple in Garyong-ri. *Lespedeza maritima* was distributed at the mountain foot of the north side of the Bokryong-ri Horae reservoir while *Forsythia koreana* (planted) was collected in the forests and farms near Horae reservoir. *Paulownia coreana* and *Weigela subsessilis* not previously reported on Aphaedo Island flora were observed in Bunmae-ri Moknaru and Songgongsan Mounatain north slopes, respectively.

Naturalized plants and invasive species

A total of 52 species and infraspecific taxa (in 16 families 40 genera) examined in this study are naturalized plants. This is equivalent to 11.5% of total vascular plants in Aphaedo Island. Among these, invasive (i.e., ecosystem disturbing) plant species include *Rumex acetosella* L., *Aster pilosus* Willd., *Hypochaeris radicata* L., *Solidago altissima* L., *Paspalum distichum* L., and *P. distichum* L. var. *indutum* Shinners (Table 7). A total of 334 taxa of naturalized plants listed in the 1st alien species management program of the Ministry of

Table 5. List of regional indicator plants in Aphaedo Island.

Grade	Taxa	No. of taxa
V	*Albizia kalkora* (Roxb.) Prain 왕자귀나무	4
	Wisteria japonica Siebold & Zucc. 애기등	
	Utricularia bifida L. 땅귀개	
	Utricularia racemosa Wall. ex Walp. 이삭귀개	
IV	*Platycladus orientalis* (L.) Franco 측백나무(식재)[a]	6
	Polygonum fusco-ochreatum Kom. 큰옥매듭풀[a]	
	Salomonia oblongifolia DC. 병아리다리	
	Centranthera cochinchinensis (Lour.) Merr. var. *lutea* (H. Hara) H. Hara 성주풀	
	Cladium chinense Nees 층층고랭이	
	Scleria caricina (R. Br.) Benth. 애기개올미	
III	*Botrychium virginianum* (L.) Sw. 늦고사리삼[a]	19
	Juniperus chinensis L. 향나무(식재)[a]	
	Quercus salicina Blume 참가시나무[a]	
	Idesia polycarpa Maxim. 이나무[a]	
	Trichosanthes kirilowii Maxim. var. *japonica* (Miq.) Kitam. 노랑하늘타리[a]	
	Vaccinium bracteatum Thunb. 모새나무	
	Vigna vexillata (L.) A. Rich. var. *tsusimensis* Matsum. 돌동부[a]	
	Ilex crenata Thunb. 꽝꽝나무[a]	
	Melia azedarach L. 멀구슬나무	
	Poncirus trifoliata (L.) Raf. 탱자나무(식재)	
	Fatsia japonica (Thunb.) Decne. & Planch. 팔손이[a]	
	Centella asiatica (L.) Urb. 병풀[a]	
	Glehnia littoralis F. Schmidt ex Miq. 갯방풍[a]	
	Cynanchum nipponicum Matsum. 덩굴박주가리[a]	
	Callicarpa mollis Siebold & Zucc. 새비나무	
	Verbena officinalis L. 마편초	
	Polypogon monspeliensis (L.) Desf. 갯쇠돌피	
	Aletris spicata (Thunb.) Franch. 쥐꼬리풀	
	Bletilla striata (Thunb.) Rchb. f. 자란	
II	*Caltha palustris* L. 동의나물	4
	Caryopteris incana (Thunb. ex Houtt.) Miq. 층꽃나무	
	Ottelia alismoides (L.) Pers. 물질경이	
	Epipactis thunbergii A. Gray 닭의난초	
I	*Dicranopteris linearis* (Burm. f.) Underw. 발풀고사리	26
	Lygodium japonicum (Thunb.) Sw. 실고사리	
	Pteris multifida Poir. 봉의꼬리[a]	
	Thelypteris glanduligera (Kunze) Ching 사다리고사리[a]	
	Dryopteris erythrosora (D. C. Eaton) Kuntze 홍지네고사리	
	Chloranthus fortunei (A. Gray) Sloms 옥녀꽃대	
	Semiaquilegia adoxoides (DC.) Makino 개구리발톱	

Table 5. Continued.

Grade	Taxa	No. of taxa
I	*Camellia japonica* L. 동백나무	26
	Eurya japonica Thunb. 사스레피나무	
	Grewia parviflora Bunge 장구밥나무[a]	
	Vaccinium oldhamii Miq. 정금나무	
	Lysimachia mauritiana Lam. 갯까치수염	
	Rubus hirsutus Thunb. 장딸기[a]	
	Euonymus japonicus Thunb. 사철나무	
	Mallotus japonicus (L. f.) Müll. Arg. 예덕나무	
	Euscaphis japonica (Thunb.) Kanitz 말오줌때	
	Hedera rhombea (Miq.) Bean 송악[a]	
	Calystegia soldanella (L.) Roem. & Schult. 갯메꽃[a]	
	Lithospermum zollingeri A. DC. 반디지치	
	Vitex rotundifolia L. f. 순비기나무	
	Scutellaria strigillosa Hemsl. 참골무꽃[a]	
	Ligustrum japonicum Thunb. 광나무[a]	
	Potamogeton cristatus Regel & Maack 가는가래[a]	
	Carex kobomugi Ohwi 통보리사초[a]	
	Ischaemum anthephoroides (Steud.) Miq. 갯쇠보리[a]	
	Sorghum nitidum (Vahl) Pers. 수수새	

[a]Newly identified taxa in this study.

Table 6. List of plants endemic to Korea found in Aphaedo Island.

Family	Taxa
Ranunculaceae	*Hepatica insularis* Nakai 새끼노루귀
Fabaceae	*Indigofera koreana* Ohwi 좀땅비싸리
	Lespedeza maritima Nakai 해변싸리
Oleaceae	*Forsythia koreana* (Rdhder) Nakai 개나리(식재)
Scrophulariaceae	*Paulownia coreana* Uyeki 오동나무
Diervillaceae	*Weigela subsessilis* (Nakai) L. H. Bailey 병꽃나무

Environment (Bang, 2014) are divided into four categories based on risk level: ecosystem risk, ecosystem risk concern, harmless to ecosystem, and unclassified. According to the risk level, naturalized plants of Aphaedo Island are classified as follows. Ecosystem risk species includs all six invasive species listed above. Ecosystem risk concern species were *Phytolacca americana* L., *Plantago lanceolata* L., and *Aster subulatus* Michx.. Thirteen species were included in harmless to ecosystem category while 29 species were classified in the unclassified category. On the other hand, *Indigofera bungeana* Walp. not inlcuded in the list of the Ministry of Environment is a plant introduced from China for landslide prevention as well as greening purpose. It was included in the list of naturalized plants of this study.

Naturalized plants (species and infraspecific taxa) surveyed in Aphaedo Island since 2003 include 11 taxa by Park (2004), 67 taxa (a total of 68 taxa are presented, of which *Veronica polita* Fr. subsp. *lilacina* (H. Hara ex T. Yamaz.) T. Yamaz. are excluded here because they are native plants) by Kim (2008), 16 taxa by Hwang et al. (2013), 10 taxa by Jeong et al. (2011), and 55 taxa by Nam et al. (2012). The total number of naturalized plants reported in Aphaedo Island reached a total

of 22 families, 77 genera, 100 taxa (species and infraspecific taxa), including 12 newly confirmed ones in this study such as *Malva neglecta* Wallr., *Aster pilosus*, and *Briza minor* L. etc. (Tables 7, 8). This corresponds to 14.7% of 680 taxa (excluding cultivated plants) of vascular plants distributed on Aphaedo Island to date. The percentage of naturalized plants (naturalization rate) in Aphaedo Island is higher than that of Imjado Island (5.5%) (Hong et al., 2011), Dochodo Island (8.9%) (Nam et al., 2012), and Bigeumdo Island (9.6%) (Nam et al., 2012). In addition, this is higher than the average naturalization rate (7.66%) of plants in inhabited island of Jeollanam-do and the naturalization rate of plants on islands in the Yellow Sea (8.39%) (Kim et al., 2017). The naturalization rate of plants on inhabited islands has a

Table 7. List of naturalized plants in Aphaedo Island.

Family	Taxa	D[a]	Study[b]					
			1	2	3	4	5	6
Saururaceae	*Houttuynia cordata* Thunb. 약모밀	4				O		
Phytolaccaceae	*Phytolacca americana* L. 미국자리공	2		O	O	O	O	O
Chenopodiaceae	Atriplex hastata L. 창명아주	4				O		
	Chenopodium album L. 흰명아주	4		O		O		
	Chenopodium ficifolium Sm. 좀명아주	4			O	O	O	O
	Chenopodium glaucum L. 취명아주	4		O				O
Amaranthaceae	*Amaranthus lividus* L. 개비름	3						O
	Amaranthus viridis L. 청비름	3		O		O		
Caryophyllaceae	*Cerastium glomeratum* Thuill. 양점나도나물	4		O		O		O
	Spergula arvensis L. 들개미자리	3			O		O	O
	Spergularia rubra J. Presl & C. Presl 유럽개미자리	3		O		O		
Polygonaceae	*Fallopia convolvulus* (L.) Á. Löve 나도닭의덩굴	4		O				
	Rumex acetosella L. 애기수영[c]	1		O	O		O	O
	Rumex crispus L. 소리쟁이	4	O	O	O	O	O	O
	Rumex nipponicus Franch. & Sav. 좀소리쟁이	4						O
	Rumex obtusifolius L. 돌소리쟁이	2		O		O		
Malvaceae	*Abutilon theophrasti* Medik. 어저귀	3		O				
	Malva neglecta Wallr. 난쟁이아욱	4						O
	Malva sylvestris L. var. *mauritiana* (L.) Boiss. 당아욱	3		O				
Brassicaceae	*Brassica juncea* (L.) Czern. 갓	4		O		O	O	O
	Lepidium apetalum Willd. 다닥냉이	4		O				O
	Lepidium virginicum L. 콩다닥냉이	4		O	O	O	O	O
	Thlaspi arvense L. 말냉이	4		O				
Rosaceae	*Potentilla supina* L. 개소시랑개비	3		O				
Fabaceae	*Amorpha fruticosa* L. 족제비싸리	2		O				
	Indigofera bungeana Walp. 큰낭아초	-						O
	Medicago lupulina L. 잔개자리	4		O		O		
	Medicago polymorpha L. 개자리	4				O		O
	Melilotus suaveolens Ledeb. 전동싸리	3		O				
	Robinia pseudoacacia L. 아까시나무	4	O	O		O		O
	Trifolium repens L. 토끼풀	4	O	O		O		O
	Vicia villosa Roth 벳지	3				O		O

Table 7. Continued.

Family	Taxa	D[a]	Study[b]					
			1	2	3	4	5	6
Onagraceae	*Oenothera biennis* L. 달맞이꽃	3	O	O		O		O
	Oenothera glazioviana Micheli 큰달맞이꽃	3						O
Euphorbiaceae	*Euphorbia supina* Raf. 애기땅빈대	4		O		O	O	O
Oxalidaceae	*Oxalis articulata* Sabigny 덩이괭이밥	3		O				
Solanaceae	*Datura tatula* L. 독말풀	4		O				
	Physalis angulata L. 땅꽈리	4				O		
Convolvulaceae	*Cuscuta pentagona* Engelm. 미국실새삼	4						O
	Ipomoea hederacea Jacq. 미국나팔꽃	4		O		O		
	Ipomoea hederacea Jacq. var. *integriuscula* A. Gray 둥근잎미국나팔꽃	4				O		
	Ipomoea purpurea (L.) Roth 둥근잎나팔꽃	4				O		O
	Quamoclit coccinea Moench 둥근잎유홍초	3					O	
Boraginaceae	*Symphytum officinale* L. 컴프리	4				O		
Plantaginaceae	*Plantago lanceolata* L. 창질경이	2	O	O		O		O
Scrophulariaceae	*Veronica arvensis* L. 선개불알풀	4				O		O
	Veronica persica Poir. 큰개불알풀	4		O		O	O	O
Asteraceae	*Ambrosia artemisiifolia* L. 돼지풀[c]	1	O	O		O		
	Aster pilosus Willd. 미국쑥부쟁이[c]	1						O
	Aster subulatus Michx. 비짜루국화	2				O		O
	Aster subulatus Michx. var. *sandwicensis* A. G. Jones 큰비짜루국화	2		O		O		
	Bidens frondosa L. 미국가막사리	2				O	O	
	Bidens pilosa L. 울산도깨비바늘	4						O
	Carduus crispus L. 지느러미엉겅퀴	4				O		
	Chrysanthemum leucanthemum L. 불란서국화	4				O		
	Conyza bonariensis (L.) Cronquist 실망초	4		O				O
	Conyza canadensis (L.) Cronquist 망초	4		O				O
	Conyza sumatrensis (Retz.) E. Walker 큰망초	4		O		O		
	Coreopsis lanceolata L. 큰금계국	3	O	O		O		O
	Coreopsis tinctoria Nutt. 기생초	3		O				
	Cosmos bipinnatus Cav. 코스모스	3	O	O				
	Cosmos sulphureus Cav. 노랑코스모스	3		O				
	Crassocephalum crepidioides (Benth.) S. Moore 주홍서나물	3	O					O
	Erechtites hieraciifolia (L.) Raf. ex DC. 붉은서나물	3		O				O
	Erigeron annuus (L.) Pers. 개망초	4	O	O	O	O	O	O
	Galinsoga parviflora Cav. 별꽃아재비	4		O				
	Gamochaeta calviceps (Fernald) Cabrera 선풀솜나물	4				O		
	Helianthus tuberosus L. 뚱딴지	3		O				
	Hypochaeris radicata L. 서양금혼초[c]	1				O		O
	Lactuca scariola L. 가시상추[c]	1		O		O		
	Rudbeckia hirta L. var. *pulcherrima* Farw. 원추천인국	4		O				

Table 7. Continued.

Family	Taxa	D[a]	Study[b]					
			1	2	3	4	5	6
	Senecio vulgaris L. 개쑥갓	4		O	O	O	O	O
	Solidago altissima L. 양미역취[c]	1		O				O
	Solidago gigantea Aiton subsp. *serotina* (Aiton) McNeill 미국미역취	4						O
	Sonchus asper (L.) Hill 큰방가지똥	3		O		O		O
	Sonchus oleraceus L. 방가지똥	3		O	O	O	O	O
	Tagetes minuta L. 만수국아재비	2		O				
	Taraxacum laevigatum (Willd.) DC. 붉은씨서양민들레	4		O				
	Taraxacum officinale F. H. Wigg. 서양민들레	4		O				O
	Xanthium canadense Mill. 큰도꼬마리	4		O				
	Xanthium strumarium L. 도꼬마리	4		O				
Commelinaceae	*Tradescantia ohiensis* Raf. 자주달개비	3		O				
Poaceae	*Alopecurus japonicus* Steud. 털뚝새풀	4						O
	Avena fatua L. 메귀리	4		O		O		O
	Briza minor L. 방울새풀	3						O
	Bromus rigidus Roth 긴까락빕새귀리	4						O
	Bromus unioloides Kunth 큰이삭풀	3		O		O		O
	Dactylis glomerata L. 오리새	4		O		O		O
	Eragrostis curvula (Schrad.) Nees 능수참새그령	4		O				
	Festuca arundinacea Schreb. 큰김의털	2		O		O		
	Festuca myuros L. 들묵새	4		O		O		
	Leptochloa malabarica (L.) Veldkamp 갯드렁새	4		O		O		
	Lolium multiflorum Lam. 쥐보리	4		O	O	O	O	O
	Lolium perenne L. 호밀풀	4		O		O		
	Panicum dichotomiflorum Michx. 미국개기장	4		O		O		
	Paspalum distichum L. 물참새피[c]	1		O		O		O
	Paspalum distichum L. var. *indutum* Shinners 털물참새피[c]	1		O		O		O
	Poa pratensis L. 왕포아풀	4		O		O	O	
Iridaceae	*Iris pseudoacorus* L. 노랑꽃창포	4				O		
	Sisyrinchium angustifolium Mill. 등심붓꽃	3	O					O
	Total		11	67	10	55	16	52

[a)]D, degree of ecological risk (Bang, 2014). [b)]1, Park (2004); 2, Kim (2008); 3, Jeong et al. (2011); 4, Nam et al. (2012); 5, Hwang et al. (2013); 6, This study. [c]Ecosystem disturbing plants (National Institute of Environmental Research, 2012).

significant positive correlation with the size of the island (Kim et al., 2017). The naturalization rate of plants on Aphaedo Island is high compared to the naturalization rate of plants on Daebudo Island (12.9%) (Lim et al., 2014) which is adjacent to the metropolitan area and under accelerated development.

Aphaedaegyo is a bridge connecting Aphaedo Island and Mokpo City. It was started in 2000 and completed in 2008. Naturalized plants of Aphaedo Island were increased by a factor of 1.4 compared to that at the beginning period of the bridge construction (11 taxa) and 9 times just before the onset (69 taxa) (Table 8). On the other hand, most of invasive plants identified in this survey were found in the vicinity of Sinjang-ri, the place where it was connected with the Aphaedaegyo. *Aster pilosus*, *Hypochaeris radicata*, and *Solidago altissima*

Table 8. Change in number of naturalized plants in Aphaedo Island.

Survey year	Taxa			
	Total (ratio, %)[a]	Newly identified	Re-identified	Cumulative total
2003 (Park, 2004)	11 (7.1)	-	-	11
2006–2007 (Kim, 2008)	67 (+)	58	9	69
2007–2010 (Hwang et al., 2013)	16 (5.6)	4	12	73
2010 (Jeong et al., 2011)	10 (9.8)	-	10	73
2011 (Nam et al., 2012)	55 (14.4)	15	40	88
2011–2016 (this study)	52 (11.5)	12	40	100
2003–2016 (total)	100 (14.2)			

+, all naturalized plants surveyed.
[a]Naturalized plants ratio in each study.

were frequently observed near the marina and Route 2. *Paspalum distichum* and *P. distichum* var. *indutum* were found near the reservoir (Ohoje) located in the northwest of the Aphaedaegyo and in a nearby waterway. On the other hand, *Rumex acetosella* and *Hypochaeris radicata* were distributed sporadically along the southern slope of Songgongsan Mountain where rare plants such as *Utricularia bifida*, *Centranthera cochinchinensis*, and *Pogonia japonica* were found.

Once the Saecheonnyeondaegyo is open in 2018 and Amtaedo Island, Jaeundo Island, Palgeumdo Island, and Anjwado Island are connected to Aphaedo Island, it is expected that naturalized plants of Aphaedo Island will rapidly flow into these areas. Island areas are vulnerable to external influx and environmental changes due to limited habitat space (Kim et al., 2017). From this perspective, it is necessary to closely monitor the naturalized plants on these islands.

Conflict of Interest

Authors declare that there is no conflict of interest.

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Literature Cited

Bang, S. W. 2014. A Study for Mid to Long-term Management of Alien Species. Ministry of Environment, Sejong, 295 pp. (in Korean)

Chung, G. Y., K. S. Chang, J.-M. Chung, H. J. Choi, W.-K. Paik and J.-O. Hyun. 2017. A checklist of endemic plants on the Korean Peninsula. Korean Journal of Plant Taxonomy 47: 264–288. (in Korean)

Hong, H.-H., H.-D. Son, S. In and H.-T. Im. 2011. Floristic study of Inmja-do (Isl.). Korean Journal of Plant Taxonomy 41: 429–439. (in Korean)

Hoshino, T. and T. Masaki. 2011. Illustrated Sedges of Japan. Heibonsha, Tokyo, 778 pp.

Hwang, H.-R. 2017. Distribution characteristics and status of the *Albizia kalkora* (Roxb.) Prain in Mokpo. MS thesis, Chonnam University, Gwangju, 64 pp. (in Korean)

Hwang, H.-S., J.-C. Yang, S.-H. Oh, Y.-M. Lee and K.-S. Chang. 2013. A study on the flora of 15 islands in the western sea of Jeollanamdo Province, Korea. Journal of Asia-Pacific Biodiversity 6: 281–310.

Jeong, J. H., C. M. Jang, K. H. Kim, Y. J. Oh and W. K. Paik. 2011. Flora of Sinan-gun (Sinan, Jeollanam-do, Korea). Korean Journal of Nature Conservation 5: 107–134. (in Korean)

Kim, H.-H., D.-B. Kim, C.-H. Jeon, C.-S. Kim and W.-S. Kong. 2017. Island-biogeographical characteristics of naturalized plant in Jeollanamdo islands. Journal of Environmental Impact Assessment 26: 272–289. (in Korean)

Kim, H. S. 2008. Ecological studies on the changes of distribution of plants in coastal islands: a case of the Abhaedo, Shinangun. Journal of Korean Island 20: 79–88. (in Korean)

Korea National Arboretum. 2008. Rare Plants Data Book in Korea. Geobook Publishing Co., Pocheon, 332 pp. (in Korean).

Korea National Arboretum and The Plant Taxonomic Society of Korea. 2007. A Synonymic List of Vascular Plants in Korea. Korea National Arboretum, Pocheon, 534 pp. (in Korean)

Lee, B.-Y., G.-H. Nam, J.-H. Yun, G. Y. Cho, J. S. Lee, J.-H. Kim, T. S. Park, K. Kim and K. Oh. 2010. Biological indicators to monitor responses against climate change in Korea. Korean Journal of Plant Taxonomy 40: 202–207.

Lee, T. B. 2003. Coloured Flora of Korea. Vol. I, II. Hyangmunsa, Seoul, Vol. 1, 914 pp, Vol. II, 910 pp. (in Korean)

Lee, W. T. 1996a. Lineamenta Florae Koreae. Academy Press, Seoul, 1688 pp. (in Korean)

Lee, W. T. 1996b. Standard Illustrations of Korean plants. Academy Press, Seoul, 624 pp. (in Korean)

Lee, W. T. and Y. J. Yim. 2002. Plant Geography with Special Reference to Korea. Kangwon National University Press, Chuncheon, 412 pp. (in Korean)

Lee, Y. N. 2006. New flora of Korea. Vol. I, II. Gyohaksa, Seoul, Vol. 1, 975 pp, Vol. 2, 885 pp. (in Korean)

Lim, Y., K.-P. Yoo, The Korean Society of Plant Parataxonomists and J.-O. Hyun. 2014. Floristic study of Daebudo Island. Korean Journal of Plant Resources 27: 447–476. (in Korean)

Na, H. R. and J.-O. Hyun. 2015. A checklist of halophyte species in Korea. *In* 2015 International Symposium on Plant Sciences & Annual Conference of the Korean Society of Plant Biologists. Korean Society of Plant Biologists, Seoul. P. 217.

Nam, C.-H., S.-H. Park, S.-Y. Jung, S. H. Oh, J.-O. Hyun, H. J. Kwon and K. S. Chang. 2012. The vascular plants of Sinan-gun Jellanam-do Korea: Aphae-do (Is.), Bigeum-do (Is.) and Docho-do Island. Journal of Korea Nature 5: 65–87.

National Geographic Information Institute. 2010. The Origin of Korean Geographical Names: Jeonnam and Jeju. National Geographic Information Institute, Suwon. Pp. 695–721. (in Korean)

National Institute of Biological Resources. 2012. Red Data Book of Endangered Vascular Plants in Korea. National Institute of Biological Resources, Incheon, 167 pp. (in Korean)

National Institute of Biological Resources. 2017. National List of Species of Korea, 2016. Retrieved Mar. 1, 2018, available from http://www.kbr.go.kr.

National Institute of Environmental Research. 2012. A Guide to the 4th National Natural Environment Research. National Institute of Environmental Research, Incheon. Pp. 173–226. (in Korean).

Oh, B. U., D. G. Jo, B. Y. Sun, B. H. Choi, J. H. Pak, H. T. Im, C. S. Chang, W. K. Paik, G. Y. Chung, K. R. Park, J. H. Kim and C. G. Jang. 2004. Distribution Maps of Vascular Plants of Korean Peninsula, I. South-Coast Province. Korea National Arboretum, Pocheon, 692 pp. (in Korean)

Oh, B. U., D. G. Jo, S. C. Ko, B. H. Choi, W. K. Paik, G. Y. Chung, Y. M. Lee and C. G. Jang. 2010. 300 Target Plants Adaptable to Climate Change in the Korean Peninsula. Korea National Arboretum, Pocheon, 492 pp. (in Korean)

Park, C.-W. 2007. The Genera of Vascular Plants of Korea. Flora of Korea Editorial Committee. Academy Publishing Co., Seoul, 1482 pp.

Park, S. H. 2009. New Illustrations and Photographs of Naturalized Plants of Korea. Ilchokak, Seoul, 575 pp. (in Korean)

Park, S. H., Y. M. Lee, S. Y. Jeong, G. S. Jang, W. C. Kang, S. S. Jeong, S. H. Oh and J. C. Yang. 2011. Illustrated Grasses of Korea. Revised and enlarged edition. Korea National Arboretum, Pocheon, 600 pp. (in Korean)

Park, S. H., Y. M. Lee, J. C. Yang, D. K. Jo, G. H. Lee, C. S. Chang, H. J. Lee, H. J. Choi, S. S. Jeong and J. H. Lee. 2008. Illustrated Pteridophyta of Korea. Korea National Arboretum, Pocheon, 547 pp. (in Korean)

Park, Y. K. 2004. Flora of islands in west and south regions of Korea. MS thesis, Honam University, Gwangju, 121 pp. (in Korean)

Shinan-gun Office. 2016. Shinan Statistical Year Book. Vol. 56, II. Land and Climate. Shinan-gun Office, Shinan. Pp. 47–58. (in Korean)

압해도(전라남도 신안군)의 식물상

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적 요: 전라남도 신안군에 위치한 압해도의 관속식물상을 조사하고 분포가 확인된 주요 식물에 대해 논의하였다. 2011년 5월부터 2016년 3월까지 총 28일간 현지조사를 통해 확보된 표본에 근거하여 식물목록을 작성한 결과, 압해도에 분포하는 관속식물은 102과 294속에 속하는 413종 6아종 30변종 2품종 등 총 451분류군으로 정리되었다. 이 중에서 멸종위기 및 희귀식물은 왕자귀나무, 병아리다리, 성주풀 등 9분류군이 확인되었다. 식물구계학적 특정식물은 V등급 4분류군, IV등급 6분류군, III등급 19분류군, II등급 4분류군, I등급 26분류군 등 총 59분류군이 조사되었다. 특산식물은 새끼노루귀, 좀땅비싸리, 해변싸리 등 6분류군이 확인되었다. 귀화식물은 생태계교란식물인 애기수영, 미국쑥부쟁이, 서양금혼초 등을 포함하여 총 52분류군으로 나타났다. 압해대교 개통 전후에 수행된 선행연구 비교를 통하여 압해도의 귀화식물 변화를 분석하였다.

주요어: 압해도, 식물상, 멸종위기 및 희귀식물, 식물구계학적 특정식물, 특산식물, 귀화식물

Appendix 1. The list of vascular plants of Aphaedo Island.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
	Ophioglossaceae 고사리삼과						
1	*Botrychium virginianum* (L.) Sw. 늦고사리삼 KP256149						O
	Osmundaceae 고비과						
2	*Osmunda japonica* Thunb. 고비 KP255588	O					O
	Gleicheniaceae 발풀고사리과						
3	*Dicranopteris linearis* (Burm. f.) Underw. 발풀고사리 NP582539				O	O	O
	Schizaeaceae 실고사리과						
4	*Lygodium japonicum* (Thunb.) Sw. 실고사리 KP255667				O	O	O
	Pteridaceae 봉의꼬리과						
5	*Pteris multifida* Poir. 봉의꼬리 KP256151						O
	Dennstaedtiaceae 잔고사리과						
6	*Pteridium aquilinum* (L.) Kuhn var. *latiusculum* (Desv.) Underw. ex A. Heller 고사리 KN373336	O			O	O	O
	Aspleniaceae 꼬리고사리과						
7	*Asplenium incisum* Thunb. 꼬리고사리 KP256153			O		O	O
	Athyriaceae 개고사리과						
8	*Deparia japonica* (Thunb.) M. Kato 진고사리 KP256155						O
	Thelypteridaceae 처녀고사리과						
9	*Thelypteris glanduligera* (Kunze) Ching 사다리고사리 KP256161						O
10	*Thelypteris palustris* (Salisb.) Schott 처녀고사리 KP256248						O
	Dryopteridaceae 관중과						
11	*Arachniodes aristata* (G. Forst.) Tindale 가는쇠고사리				O		
12	*Cyrtomium falcatum* (L. f.) C. Presl 도깨비고비 NP582525						O
13	*Dryopteris bissetiana* (Baker) C. Chr. 산족제비고사리					O	
14	*Dryopteris chinensis* (Baker) Koidz. 가는잎족제비고사리			O		O	
15	*Dryopteris erythrosora* (D. C. Eaton) Kuntze 홍지네고사리 KP256150				O		O
16	*Dryopteris lacera* (Thunb.) Kuntze 비늘고사리 KP256154						O
17	*Dryopteris pacifica* (Nakai) Tagawa 큰족제비고사리			O		O	
	Ginkgoaceae 은행나무과						
18	*Ginkgo biloba* L. 은행나무				◎		
19	*Sciadopitys verticillata* (Thunb.) Siebold & Zucc. 금송					◎	
	Pinaceae 소나무과						
20	*Pinus densiflora* Siebold & Zucc. 소나무 NP582538	O			O		O
21	*Pinus rigida* Mill. 리기다소나무	◎					
22	*Pinus thunbergii* Parl. 곰솔 KP255379	O			O		O
	Cupressaceae 측백나무과						
23	*Chamaecyparis obtusa* (Siebold & Zucc.) Endl. 편백 KP255507	◎					◎
24	*Chamaecyparis pisifera* (Siebold & Zucc.) Endl. 화백 NP582553						◎
25	*Cryptomeria japonica* (Thunb. ex L. f.) D. Don 삼나무	O					
26	*Juniperus chinensis* L. 향나무 NP582555						◎

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
27	*Juniperus rigida* Siebold & Zucc. 노간주나무 KP255412	O		O		O	O
28	*Platycladus orientalis* (L.) Franco 측백나무 NP582552						◎
	Lauraceae 녹나무과						
29	*Lindera glauca* (Siebold & Zucc.) Blume 감태나무			O		O	
30	*Lindera obtusiloba* Blume 생강나무	O					
31	*Neolitsea sericea* (Blume) Koidz. 참식나무				O		
	Chloranthaceae 홀아비꽃대과						
32	*Chloranthus fortunei* (A. Gray) Sloms 옥녀꽃대 KP255426					O	O
33	*Chloranthus japonicus* Siebold 홀아비꽃대	O		O		O	
	Saururaceae 삼백초과						
34	*Houttuynia cordata* Thunb. 약모밀				O		
	Ranunculaceae 미나리아재비과						
35	*Caltha palustris* L. 동의나물 KP217375				O	O	O
36	*Clematis brachyura* Maxim. 외대으아리				O		
37	*Clematis terniflora* DC. 참으아리					O	
38	*Clematis terniflora* DC. var. *mandshurica* (Rupr.) Ohwi 으아리				O		
39	*Hepatica insularis* Nakai 새끼노루귀 KP289427					O	O
40	*Pulsatilla cernua* (Thunb.) Bercht. & J. Presl var. *koreana* (Yabe ex Nakai) Y. N. Lee 할미꽃	O					
41	*Ranunculus cantoniensis* DC. 털개구리미나리				O		
42	*Ranunculus chinensis* Bunge 젓가락나물 KP255573						O
43	*Ranunculus extorris* Hance 개구리갓				O		
44	*Ranunculus japonicus* Thunb. 미나리아재비 KP255639						O
45	*Ranunculus sceleratus* L. 개구리자리 KP255347				O		O
46	*Semiaquilegia adoxoides* (DC.) Makino 개구리발톱 KP255453					O	O
	Menispermaceae 새모래덩굴과						
47	*Cocculus trilobus* (Thunb.) DC. 댕댕이덩굴 KP255688	O		O	O	O	O
	Platanaceae 버즘나무과						
48	*Platanus occidentalis* L. 양버즘나무				◎		
	Celtidaceae 팽나무과						
49	*Celtis sinensis* Pers. 팽나무	O			O		
	Cannabinaceae 삼과						
50	*Humulus japonicus* Siebold & Zucc. 환삼덩굴 KP256144				O		O
	Moraceae 뽕나무과						
51	*Broussonetia kazinoki* Siebold 애기닥나무 KP256277						O
52	*Cudrania tricuspidata* (Carriére) Bureau ex Lavallée 꾸지뽕나무			O		O	
53	*Ficus carica* L. 무화과나무				◎		
54	*Morus alba* L. 뽕나무 KP255357						O
	Urticaceae 쐐기풀과						
55	*Boehmeria nivea* (L.) Gaudich. 모시풀				O		

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
56	*Boehmeria tricuspis* (Hance) Makino 거북꼬리 KP256280						O
	Juglandaceae 가래나무과						
57	*Platycarya strobilacea* Siebold & Zucc. 굴피나무 KP255364	O		O	O	O	O
	Fagaceae 너도밤나무과						
58	*Castanea crenata* Siebold & Zucc. 밤나무			◎		◎	
59	*Quercus acutissima* Carruth. 상수리나무	O					
60	*Quercus aliena* Blume 갈참나무 KP255361			O	O	O	O
61	*Quercus dentata* Thunb. 떡갈나무 KP255469	O		O		O	O
62	*Quercus mongolica* Fisch. ex Ledeb. 신갈나무	O					
63	*Quercus myrsinifolia* Blume 가시나무				O		
64	*Quercus salicina* Blume 참가시나무 NP582549						O
65	*Quercus serrata* Murray 졸참나무 KP217370	O		O	O	O	O
66	*Quercus variabilis* Blume 굴참나무	O		O		O	
	Betulaceae 자작나무과						
67	*Alnus firma* Siebold & Zucc. 사방오리 KP255373	◎			◎	◎	◎
68	*Alnus hirsuta* Turcz. ex Rupr. 물오리나무 NP582545	O					O
69	*Alnus japonica* (Thunb.) Steud. 오리나무			O	O	O	
70	*Carpinus heterophylla* Fischer var. *thunvergii* Blume 개암나무	O					
71	*Carpinus turczaninowii* Hance 소사나무 KP255456			O	O	O	O
	Phytolaccaceae 자리공과						
72	*Phytolacca americana* L. 미국자리공 KP255656		O	O	O	O	O
	Chenopodiaceae 명아주과						
73	*Atriplex gmelinii* C. A. Mey. 가는갯능쟁이 KN373425				O		O
74	*Atriplex hastata* L. 창명아주				O		
75	*Chenopodium album* L. 흰명아주		O		O		
76	*Chenopodium album* L. var. *centrorubrum* Makino 명아주				O		
77	*Chenopodium album* L. var. *stenophyllum* Makino 가는명아주				O		
78	*Chenopodium ficifolium* Sm. 좀명아주 KP256199			O	O	O	O
79	*Chenopodium glaucum* L. 취명아주 KP255554		O				O
80	*Kochia scoparia* (L.) Schrad. 댑싸리 KP255670				◎		◎
81	*Kochia scoparia* (L.) Schrad. var. *littorea* Makino 갯댑싸리				O		
82	*Salicornia europaea* L. 퉁퉁마디 KP256218				O		O
83	*Salsola komarovii* Iljin 수송나물 KP255684						O
84	*Suaeda australis* (R. Br.) Moq. 방석나물 KP256209				O		O
85	*Suaeda glauca* (Bunge) Bunge 나문재 KP255722				O		O
86	*Suaeda japonica* Makino 칠면초 KP256112						O
87	*Suaeda maritima* (L.) Dumort. 해홍나물 KP256088				O		O
	Amaranthaceae 비름과						
88	*Achyranthes fauriei* H. Lèv. & Vaniot 털쇠무릎				O		

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
89	*Achyranthes japonica* (Miq.) Nakai 쇠무릎 KP256091	O					O
90	*Amaranthus lividus* L. 개비름 KP255662						O
91	*Amaranthus viridis* L. 청비름		O		O		
	Portulacaceae 쇠비름과						
92	*Portulaca oleracea* L. 쇠비름 KN373186						O
	Molluginaceae 석류풀과						
93	*Mollugo pentaphylla* L. 석류풀 KP255751						O
	Caryophyllaceae 석죽과						
94	*Cerastium glomeratum* Thuill. 양점나도나물 KP318927		O		O		O
95	*Cerastium holosteoides* Fr. var. *hallaisanense* (Nakai) M. Mizush. 점나도나물 KP255408						O
96	*Dianthus chinensis* L. 패랭이꽃	O					
97	*Sagina japonica* (Sw.) Ohwi 개미자리 KP255560				O		O
98	*Sagina maxima* A. Gray 큰개미자리				O		
99	*Silene aprica* Turcz. ex Fisch. & C. A. Mey. var. *oldhamiana* (Miq.) C. Y. Wu 갯장구채	O					
100	*Silene firma* Siebold & Zucc. 장구채	O					
101	*Spergula arvensis* L. 들개미자리 KP217372			O		O	O
102	*Spergularia marina* (L.) Griseb. 갯개미자리 KP217355			O	O	O	O
103	*Spergularia rubra* J. Presl & C. Presl 유럽개미자리		O		O		
104	*Stellaria aquatica* (L.) Scop. 쇠별꽃 KP256156				O		O
105	*Stellaria media* (L.) Vill. 별꽃 KP255611			O	O	O	O
	Polygonaceae 마디풀과						
106	*Fallopia convolvulus* (L.) Á. Löve 나도닭의덩굴		O				
107	*Polygonum aviculare* L. 마디풀 KP256108				O	O	O
108	*Polygonum fusco-ochreatum* Kom. 큰옥매듭풀 KP319812						O
109	*Polygonum japonicum* Meisn. 흰꽃여뀌 KP255712						O
110	*Polygonum lapathifolium* L. 흰여뀌 KP255663				O	O	O
111	*Polygonum longisetum* Bruijn 개여뀌 KP256100	O			O		O
112	*Polygonum perfoliatum* L. 며느리배꼽 KP256145				O		O
113	*Polygonum polyneuron* Franch. & Sav. 갯마디풀				O		
114	*Polygonum sagittatum* L. var. *sieboldii* (Meisn.) Maxim 미꾸리낚시 KP256120					O	O
115	*Polygonum thunbergii* Siebold & Zucc. 고마리 KP256137						O
116	*Rumex acetosa* L. 수영 KP217358						O
117	*Rumex acetosella* L. 애기수영 KP255513		O	O		O	O
118	*Rumex conglomeratus* Murray 묵밭소리쟁이 KP255520						O
119	*Rumex crispus* L. 소리쟁이 KP290394	O	O	O	O	O	O
120	*Rumex japonicus* Houtt. 참소리쟁이 KP255695				O		O
121	*Rumex nipponicus* Franch. & Sav. 좀소리쟁이 KP290422						O
122	*Rumex obtusifolius* L. 돌소리쟁이		O		O		
	Plumbaginaceae 갯질경이과						

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
123	*Limonium tetragonum* (Thunb.) Bullock 갯길경 KP255703					O	O
	Theaceae 차나무과						
124	*Camellia japonica* L. 동백나무 NP582533	O				O	O
125	*Camellia sasanqua* Thunb. 애기동백 NP582548						◎
126	*Eurya japonica* Thunb. 사스레피나무 KP217371	O		O	O	O	O
	Guttiferae 물레나물과						
127	*Hypericum erectum* Thunb. 고추나물 KP255740	O			O	O	O
128	*Hypericum japonicum* Thunb. 애기고추나물 KP256119				O	O	O
129	*Hypericum laxum* (Blume) Koidz. 좀고추나물 KP255763	O			O		O
	Tiliaceae 피나무과						
130	*Corchoropsis tomentosa* (Thunb.) Makino 수까치깨 KP256162	O					O
131	*Grewia parviflora* Bunge 장구밥나무 KP255680						O
	Sterculiaceae 벽오동과						
132	*Firmiana simplex* (L.) W. Wight 벽오동				◎		
	Malvaceae 아욱과						
133	*Abutilon theophrasti* Medik. 어저귀		O				
134	*Malva neglecta* Wallr. 난쟁이아욱 NP582529						O
135	*Malva sylvestris* L. var. *mauritiana* (L.) Boiss. 당아욱		O				
	Flacourtiaceae 산유자나무과						
136	*Idesia polycarpa* Maxim. 이나무 KP255626						O
	Violaceae 제비꽃과						
137	*Viola acuminata* Ledeb. 졸방제비꽃 KP255535					O	O
138	*Viola albida* Palib. var. *chaerophylloides* (Regel) F. Maek. 남산제비꽃	O				O	
139	*Viola grypoceras* A. Gray 낚시제비꽃 KP255447			O		O	O
140	*Viola japonica* Langsd. ex Ging. 왜제비꽃 NP582536					O	O
141	*Viola lactiflora* Nakai 흰젖제비꽃 KP319810			O			O
142	*Viola mandshurica* W. Becker 제비꽃 KP255370	O			O	O	O
143	*Viola patrinii* DC. ex Ging. 흰제비꽃					O	
144	*Viola rossii* Hemsl. 고깔제비꽃					O	
145	*Viola yedoensis* Makino 호제비꽃				O		
	Cucurbitaceae 박과						
146	*Actinostemma lobatum* Maxim. 뚜껑덩굴				O		
147	*Trichosanthes kirilowii* Maxim. var. *japonica* (Miq.) Kitam. 노랑하늘타리 KP255761						O
	Salicaceae 버드나무과						
148	*Populus* × tomentiglandulosa T. B. Lee 은사시나무	◎			◎		
149	*Salix koreensis* Andersson 버드나무 KP217379				O		O
	Brassicaceae 십자화과						
150	*Arabis glabra* (L.) Bernh. 장대나물					O	
151	*Brassica juncea* (L.) Czern. 갓 KP255342		O		O	O	O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
152	*Capsella bursa-pastoris* (L.) Medik. 냉이 KP255341				O	O	O
153	*Cardamine fallax* (O. E. Schulz) Nakai 좁쌀냉이 NP582559					O	O
154	*Cardamine flexuosa* With. 황새냉이 KP255430			O	O	O	O
155	*Cardamine impatiens* L. 싸리냉이 KP255406						O
156	*Lepidium apetalum* Willd. 다닥냉이 KP255544		O				O
157	*Lepidium virginicum* L. 콩다닥냉이 KP290396		O	O	O	O	O
158	*Rorippa indica* (L.) Hiern 개갓냉이 KP255387				O		O
159	*Rorippa palustris* (L.) Besser 속속이풀 KP255606				O		O
160	*Thlaspi arvense* L. 말냉이		O				
	Ericaceae 진달래과						
161	*Rhododendron mucronulatum* Turcz. 진달래 NP582523	O		O	O	O	O
162	*Rhododendron yedoense* Maxim. ex Regel for. *poukhanense* (H. Lév.) M. Sugim. 산철쭉 KP255365			O	O	O	O
163	*Vaccinium bracteatum* Thunb. 모새나무 KP255637	O			O	O	O
164	*Vaccinium oldhamii* Miq. 정금나무 KP217365	O		O	O	O	O
	Pyrolaceae 노루발과						
165	*Pyrola japonica* Klenze ex Alef. 노루발 NP582550	O			O	O	O
	Ebenaceae 감나무과						
166	*Diospyros kaki* Thunb. 감나무	◎					
	Styracaceae 때죽나무과						
167	*Styrax japonicus* Siebold & Zucc. 때죽나무 KP255557						O
	Symplocaceae 노린재나무과						
168	*Symplocos sawafutagi* Nagam. 노린재나무 KP255514	O				O	O
169	*Symplocos tanakana* Nakai 검노린재 KP217364				O	O	O
	Primulaceae 앵초과						
170	*Androsace filiformis* Retz. 애기봄맞이 KP256133						O
171	*Lysimachia barystachys* Bunge 까치수염					O	
172	*Lysimachia clethroides* Duby 큰까치수염 KP255632	O		O		O	O
173	*Lysimachia japonica* Thunb. 좀가지풀 KP255533				O		O
174	*Lysimachia mauritiana* Lam. 갯까치수염 KP255701				O		O
	Crassulaceae 돌나물과						
175	*Sedum bulbiferum* Makino 말똥비름				O		
176	*Sedum oryzifolium* Makino 땅채송화			O		O	
	Parnassiaceae 물매화과						
177	*Parnassia palustris* L. var. *multiseta* Ledeb. 물매화 KP255770	O			O		O
	Rosaceae 장미과						
178	*Agrimonia pilosa* Ledeb. 짚신나물 KP255738						O
179	*Aria alnifolia* (Siebold & Zucc.) Decne. 팥배나무 KP255432			O	O	O	O
180	*Duchesnea chrysantha* (Zoll. & Moritzi) Miq. 뱀딸기				O	O	
181	*Geum japonicum* Thunb. 뱀무	O					

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
182	*Potentilla chinensis* Ser. 딱지꽃				O		
183	*Potentilla discolor* Bunge 솜양지꽃 KP217369	O		O	O	O	O
184	*Potentilla fragarioides* L. 양지꽃 NP582541					O	O
185	*Potentilla freyniana* Bornm. 세잎양지꽃 KP255380					O	O
186	*Potentilla supina* L. 개소시랑개비		O				
187	*Pourthiaea villosa* (Thunb.) Decne. 윤노리나무					O	
188	*Prunus jamasakura* Siebold ex Koidz. 벚나무 KP255423						O
189	*Prunus mume* (Siebold) Siebold & Zucc. 매실나무 NP582534						◎
190	*Prunus sargentii* Rehder 산벚나무 KP255455	O					O
191	*Prunus serrulata* Lindl. var. *pubescens* (Makino) Nakai 잔털벚나무			O	O	O	
192	*Pyrus calleryana* Decne. var. *fauriei* (C. K. Schneid.) Rehder 콩배나무 KP255378				O	O	O
193	*Pyrus pyrifolia* (Burm. f.) Nakai 돌배나무 KP255559						O
194	*Rosa multiflora* Thunb. 찔레나무 KP255360	O		O	O	O	O
195	*Rosa rugosa* Thunb. 해당화 KP255584	O					O
196	*Rosa wichuraiana* Crép. ex Déségl. 돌가시나무 KP256121	O		O	O	O	O
197	*Rubus hirsutus* Thunb. 장딸기 KP255445						O
198	*Rubus parvifolius* L. 멍석딸기 KP255367	O		O	O	O	O
199	*Sanguisorba officinalis* L. 오이풀 KP255731	O			O	O	O
	Fabaceae 콩과						
200	*Aeschynomene indica* L. 자귀풀 KP255706				O	O	O
201	*Albizia kalkora* (Roxb.) Prain 왕자귀나무 KP255759	O		O	O	O	O
202	*Albizzia julibrissin* Durazz. 자귀나무 KP256206			O	O	O	O
203	*Amorpha fruticosa* L. 족제비싸리 KP255622		O				
204	*Amphicarpaea bracteata* (L.) Fernald subsp. *edgeworthii* (Benth.) H. Ohashi 새콩 KP256159						O
205	*Chamaecrista nomame* (Siebold) H. Ohashi 차풀 KP256111					O	O
206	*Dunbaria villosa* (Thunb.) Makino 여우팥 KP255739				O	O	O
207	*Glycine soja* Siebold & Zucc. 돌콩				O	O	
208	*Indigofera bungeana* Walp. 큰낭아초 KN373182						O
209	*Indigofera kirilowii* Maxim. ex Palib. 땅비싸리	O			O		
210	*Indigofera koreana* Ohwi 좀땅비싸리 KP217362			O	O	O	O
211	*Kummerowia stipulacea* (Maxim.) Makino 둥근매듭풀 KP255696				O		O
212	*Kummerowia striata* (Thunb.) Schindl. 매듭풀 KP255692	O			O		O
213	*Lathyrus japonicus* Willd. 갯완두 KP255578						O
214	*Lespedeza bicolor* Turcz. 싸리 KP255687				O	O	O
215	*Lespedeza cuneata* (Dum. Cours.) G. Don. 비수리 KP255698	O			O	O	O
216	*Lespedeza cyrtobotrya* Miq. 참싸리 KP255635	O					O
217	*Lespedeza maritima* Nakai 해변싸리 KP255631	O					O
218	*Lespedeza maximowiczii* C. K. Schneid. 조록싸리 KP255707	O		O		O	O
219	*Lespedeza maximowiczii* C. K. Schneider var. *tomentella* Nakai 털조록싸리 KP291304						O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
220	*Lespedeza pilosa* (Thunb.) Siebold & Zucc. 괭이싸리	O			O	O	
221	*Lespedeza tomentosa* (Thunb.) Siebold ex Maxim. 개싸리				O		
222	*Lespedeza virgata* (Thunb.) DC. 좀싸리 KP255668				O	O	O
223	*Lotus corniculatus* L. var. *japonicus* Regel 벌노랑이 KP217359				O		O
224	*Medicago lupulina* L. 잔개자리		O		O		
225	*Medicago polymorpha* L. 개자리 KP255348				O		O
226	*Melilotus suaveolens* Ledeb. 전동싸리		O				
227	*Pueraria lobata* (Willd.) Ohwi 칡				O		
228	*Rhynchosia volubilis* Lour. 여우콩					O	
229	*Robinia pseudoacacia* L. 아까시나무 KP255366	O	O		O		O
230	*Sophora flavescens* Aiton 고삼	O		O	O	O	
231	*Trifolium repens* L. 토끼풀 KP255356	O	O		O		O
232	*Vicia amoena* Fisch. 갈퀴나물					O	
233	*Vicia angustifolia* L. ex Reichard 가는살갈퀴 KP255340						O
234	*Vicia angustifolia* L. ex Reichard var. *segetilis* (Thuill) W. D. J. Koch 살갈퀴				O	O	
235	*Vicia cracca* L. 등갈퀴나물 KP255375						O
236	*Vicia hirsuta* (L.) Gray 새완두 KP255515						O
237	*Vicia tetrasperma* (L.) Schreb. 얼치기완두 KP255344				O	O	O
238	*Vicia unijuga* A. Braun 나비나물					O	
239	*Vicia villosa* Roth 벳지 KP255569				O		O
240	*Vigna angularis* (Willd.) Ohwi & H. Ohashi var. *nipponensis* (Ohwi) Ohwi & H. Ohashi 새팥 KP256129				O		O
241	*Vigna vexillata* (L.) A. Rich. var. *tsusimensis* Matsum. 돌동부 KP256233						O
242	*Wisteria japonica* Siebold & Zucc. 애기등 KP255762				O		O
	Elaeagnaceae 보리수나무과						
243	*Elaeagnus umbellata* Thunb. 보리수나무 KP255382	O			O	O	O
	Haloragaceae 개미탑과						
244	*Haloragis micrantha* (Thunb.) R. Br. ex Siebold & Zucc. 개미탑 KP255425	O			O	O	O
	Lythraceae 부처꽃과						
245	*Lagerstroemia indica* L. 배롱나무 NP582556						◎
246	*Rotala indica* (Willd.) Koehne 마디꽃				O		
	Trapaceae 마름과						
247	*Trapa japonica* Flerow 마름 KP255650				O		O
	Onagraceae 바늘꽃과						
248	*Epilobium pyrricholophum* Franch. & Sav. 바늘꽃					O	
249	*Ludwigia epilobioides* Maxim. 여뀌바늘				O		
250	*Oenothera biennis* L. 달맞이꽃 KP255664	O	O		O		O
251	*Oenothera glazioviana* Micheli 큰달맞이꽃 KP255694						O
	Cornaceae 층층나무과						
252	*Cornus officinalis* Siebold & Zucc. 산수유 NP582542						◎

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
	Santalaceae 단향과						
253	*Thesium chinense* Turcz. 제비꿀 KP255524	O			O	O	O
	Celastraceae 노박덩굴과						
254	*Celastrus orbiculatus* Thunb. 노박덩굴 KP255528	O		O		O	O
255	*Euonymus japonicus* Thunb. 사철나무 KP255349	O		O		O	O
256	*Euonymus sachalinensis* (F. Schmidt) Maxim. 회나무					O	
257	*Tripterygium regelii* Sprague & Takeda 미역줄나무					O	
	Aquifoliaceae 감탕나무과						
258	*Ilex crenata* Thunb. 꽝꽝나무 KP290404						O
	Euphorbiaceae 대극과						
259	*Acalypha australis* L. 깨풀 KP255676				O		O
260	*Euphorbia esula* L. 흰대극				O		
261	*Euphorbia helioscopia* L. 등대풀 KP255561						O
262	*Euphorbia sieboldiana* C. Morren & Decne. 개감수 KP255512	O					O
263	*Euphorbia supina* Raf. 애기땅빈대 KP256229		O		O	O	O
264	*Mallotus japonicus* (L. f.) Müll. Arg. 예덕나무 KP255633	O		O	O	O	O
265	*Phyllanthus ussuriensis* Rupr. & Maxim. 여우주머니 KP256163				O		O
	Vitaceae 포도과						
266	*Ampelopsis brevipedunculata* (Maxim.) Trautv. 개머루 KP255657			O	O	O	O
267	*Parthenocissus tricuspidata* (Siebold & Zucc.) Planch. 담쟁이덩굴	O			O		
268	*Vitis amurensis* Rupr. 왕머루				O		
269	*Vitis ficifolia* Bunge var. *sinuata* (Regel) H. Hara 까마귀머루 KP255682	O		O	O	O	O
270	*Vitis flexuosa* Thunb. 새머루 KP255689	O		O		O	O
	Polygalaceae 원지과						
271	*Polygala japonica* Houtt. 애기풀 KP255424	O			O	O	O
272	*Salomonia oblongifolia* DC. 병아리다리 KP319784				O	O	O
	Staphyleaceae 고추나무과						
273	*Euscaphis japonica* (Thunb.) Kanitz 말오줌때 KP255381	O		O	O	O	O
274	*Staphylea bumalda* DC. 고추나무 KP255744						O
	Anacardiaceae 옻나무과						
275	*Rhus javanica* L. 붉나무 KP255730	O					O
276	*Toxicodendron sylvestre* (Siebold & Zucc.) Kuntze 산검양옻나무 KP255562			O	O	O	O
277	*Toxicodendron trichocarpum* (Miq.) Kuntze 개옻나무 KP255386	O					O
	Meliaceae 멀구슬나무과						
278	*Melia azedarach* L. 멀구슬나무 KP255567	O			O	O	O
	Rutaceae 운향과						
279	*Orixa japonica* Thunb. 상산			O		O	
280	*Poncirus trifoliata* (L.) Raf. 탱자나무 KP255437	◎					◎
281	*Zanthoxylum planispinum* Siebold & Zucc. 개산초					O	

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
282	*Zanthoxylum schinifolium* Siebold & Zucc. 산초나무 KP255720	O			O		O
	Oxalidaceae 괭이밥과						
283	*Oxalis articulata* Sabigny 덩이괭이밥		O				
284	*Oxalis corniculata* L. 괭이밥 KP255338	O		O	O	O	O
285	*Oxalis stricta* L. 선괭이밥				O		
	Balsaminaceae 봉선화과						
286	*Impatiens noli-tangere* L. 노랑물봉선	O					
	Araliaceae 두릅나무과						
287	*Aralia elata* (Miq.) Seem. 두릅나무				O		
288	*Fatsia japonica* (Thunb.) Decne. & Planch. 팔손이 NP582527						O
289	*Hedera rhombea* (Miq.) Bean 송악 NP582557						O
	Apiaceae 미나리과						
290	*Bupleurum falcatum* L. 시호 KP255764	O			O		O
291	*Caucalis scabra* (DC.) Makino 개사상자				O		
292	*Centella asiatica* (L.) Urb. 병풀 KP217374						O
293	*Cnidium japonicum* Miq. 갯사상자 KP255725				O		O
294	*Glehnia littoralis* F. Schmidt ex Miq. 갯방풍 KP290414						O
295	*Hydrocotyle maritima* Honda 선피막이 KP290387			O	O	O	O
296	*Hydrocotyle ramiflora* Maxim. 큰피막이 KP255665	O			O		O
297	*Hydrocotyle sibthorpioides* Lam. 피막이				O	O	
298	*Oenanthe javanica* (Blume) DC. 미나리				O		
299	*Peucedanum terebinthaceum* (Fisch. ex Trevir.) Fisch. ex Turcz. 기름나물 KP256171	O			O	O	O
300	*Sium ninsi* L. 감자개발나물 KP255773				O	O	O
301	*Sium suave* Walter 개발나물 KP256172				O		O
302	*Torilis japonica* (Houtt.) DC. 사상자 KP255359			O	O	O	O
	Loganiaceae 마전과						
303	*Mitrasacme pygmaea* R. Br. 큰벼룩아재비 KP319777				O	O	O
	Gentianaceae 용담과						
304	*Gentiana squarrosa* Ledeb. 구슬붕이				O		
305	*Gentiana zollingeri* Fawc. 큰구슬붕이 KP255454						O
	Apocynaceae 협죽도과						
306	*Apocynum lancifolium* Russanov 개정향풀					O	
307	*Trachelospermum asiaticum* (Siebold & Zucc.) Nakai 마삭줄			O		O	
	Asclepiadaceae 박주가리과						
308	*Cynanchum nipponicum* Matsum. 덩굴박주가리 KP366308						O
309	*Cynanchum paniculatum* (Bunge) Kitag. 산해박 KP290408	O		O		O	O
310	*Metaplexis japonica* (Thunb.) Makino 박주가리 KP255708	O			O		O
	Solanaceae 가지과						
311	*Datura tatula* L. 독말풀		O				

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
312	*Lycium chinense* Mill. 구기자나무				◎		
313	*Physalis angulata* L. 땅꽈리				O		
314	*Solanum lyratum* Thunb. 배풍등				O		
315	*Solanum nigrum* L. 까마중 KP319804						O
	Convolvulaceae 메꽃과						
316	*Calystegia hederacea* Wall. 애기메꽃				O		
317	*Calystegia sepium* (L.) R. Br. var. *japonica* Makino 메꽃 KP255558						O
318	*Calystegia soldanella* (L.) Roem. & Schult. 갯메꽃 KP255579						O
319	*Cuscuta pentagona* Engelm. 미국실새삼 KP255709						O
320	*Ipomoea hederacea* Jacq. 미국나팔꽃		O		O		
321	*Ipomoea hederacea* Jacq. var. *integriuscula* A. Gray 둥근잎미국나팔꽃				O		
322	*Ipomoea purpurea* (L.) Roth 둥근잎나팔꽃 KP256205				O		O
323	*Pharbitis nil* (L.) Choisy 나팔꽃 KP256272						O
324	*Quamoclit coccinea* Moench 둥근잎유홍초					O	
	Polemoniaceae 꽃고비과						
325	*Phlox subulata* L. 지면패랭이꽃 NP582551						◎
	Boraginaceae 지치과						
326	*Bothriospermum secundum* Maxim. 참꽃받이			O		O	
327	*Bothriospermum tenellum* (Hornem.) Fisch. & C. A. Mey. 꽃받이 KP255351				O		O
328	*Lithospermum zollingeri* A. DC. 반디지치 KP255435					O	O
329	*Symphytum officinale* L. 컴프리				O		
330	*Trigonotis peduncularis* (Trevis.) Benth. ex Baker & S. Moore 꽃마리 KP318946				O		O
	Verbenaceae 마편초과						
331	*Callicarpa japonica* Thunb. 작살나무 KP255618			O		O	
332	*Callicarpa mollis* Siebold & Zucc. 새비나무 KP291299					O	O
333	*Caryopteris incana* (Thunb. ex Houtt.) Miq. 층꽃나무 KP256134	O			O		O
334	*Verbena officinalis* L. 마편초 KP234674				O		O
335	*Vitex rotundifolia* L. f. 순비기나무 KP256177				O		O
	Labiatae 꿀풀과						
336	*Ajuga decumbens* Thunb. 금창초 KP255451						O
337	*Clinopodium chinense* (Benth.) Kuntze 층층이꽃				O		
338	*Clinopodium gracile* (Benth.) Matsum. var. *multicaule* (Maxim.) Ohwi 탑꽃 KP255737						O
339	*Isodon inflexus* (Thunb.) Kudô 산박하 KP255733	O			O	O	O
340	*Lamium amplexicaule* L. 광대나물 KP255399				O	O	O
341	*Leonurus japonicus* Houtt. 익모초 KP256141				O		O
342	*Lycopus lucidus* Turcz. ex Benth. 쉽싸리					O	
343	*Lycopus maackianus* (Maxim. ex Herder) Makino 애기쉽싸리				O	O	
344	*Mentha arvensis* L. var. *piperascens* Malinv. ex Holmes 박하 KP255753						O
345	*Mosla chinensis* Maxim. 가는잎산들깨 KP256241					O	O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
346	*Mosla dianthera* (Buch.-Ham. ex Roxb.) Maxim. 쥐깨풀 KP256174						O
347	*Mosla japonica* (Benth. ex Oliv.) Maxim. 산들깨					O	
348	*Mosla punctulata* (J. F. Gmel.) Nakai 들깨풀 KP256240					O	O
349	*Nepeta cataria* L. 개박하	O					
350	*Prunella asiatica* Nakai 꿀풀 KP255527	O		O	O	O	O
351	*Salvia japonica* Thunb. 둥근배암차즈기			O		O	
352	*Salvia plebeia* R. Br. 배암차즈기 KP217363				O		O
353	*Scutellaria fauriei* H. Lév. & Vaniot 그늘골무꽃					O	
354	*Scutellaria indica* L. 골무꽃 KP255428	O		O	O	O	O
355	*Scutellaria strigillosa* Hemsl. 참골무꽃 KP255517						O
	Callitrichaceae 별이끼과						
356	*Callitriche palustris* L. 물별이끼				O		
	Plantaginaceae 질경이과						
357	*Plantago asiatica* L. 질경이			O	O	O	
358	*Plantago lanceolata* L. 창질경이 KP255363	O	O		O		O
359	*Plantago major* L. for. *yezomariima* (Koidz.) Ohwi 갯질경이				O		
	Oleaceae 물푸레나무과						
360	*Forsythia koreana* (Rdhder) Nakai 개나리 NP582537	◎					◎
361	*Fraxinus rhynchophylla* Hance 물푸레나무					O	
362	*Ligustrum japonicum* Thunb. 광나무 KP255433						O
363	*Ligustrum obtusifolium* Siebold & Zucc. 쥐똥나무 KP255460			O	O	O	O
	Scrophulariaceae 현삼과						
364	*Centranthera cochinchinensis* (Lour.) Merr. var. *lutea* (H. Hara) H. Hara 성주풀 KP255771					O	O
365	*Dopatrium junceum* (Roxb.) Buch.-Ham. ex Benth. 등에풀				O		
366	*Lindernia procumbens* (Krock.) Borbás 밭뚝외풀				O		
367	*Mazus pumilus* (Burm. f.) Steenis 주름잎 KP255384				O		O
368	*Melampyrum roseum* Maxim. 꽃며느리밥풀 KP255774				O	O	O
369	*Paulownia coreana* Uyeki 오동나무 KP255355						O
370	*Pseudolysimachion linariifolium* (Pall. ex Link) Holub 꼬리풀 KP256132					O	O
371	*Siphonostegia chinensis* Benth. 절국대 KP234676				O		O
372	*Veronica arvensis* L. 선개불알풀 KP255352				O		O
373	*Veronica persica* Poir. 큰개불알풀 KP255339		O		O	O	O
374	*Veronica polita* Fr. subsp. *lilacina* (H. Hara ex T. Yamaz.) T. Yamaz. 개불알풀		O				
	Acanthaceae 쥐꼬리망초과						
375	*Justicia procumbens* L. 쥐꼬리망초 KP256164				O		O
	Lentibulariaceae 통발과						
376	*Utricularia bifida* L. 땅귀개 KP256122				O	O	O
377	*Utricularia japonica* Makino 통발				O		
378	*Utricularia pilosa* (Makino) Makino 들통발					O	

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
379	*Utricularia racemosa* Wall. ex Walp. 이삭귀개 KP255768				O	O	O
380	*Utricularia tenuicaulis* Miki 참통발 KP319796						O
	Campanulaceae 초롱꽃과						
381	*Adenophora polyantha* Nakai 수원잔대					O	
382	*Adenophora remotiflora* (Siebold & Zucc.) Miq. 모시대					O	
383	*Adenophora stricta* Miq. 당잔대 KP320395						O
384	*Adenophora triphylla* (Thunb.) A. DC. var. *japonica* (Regel) H. Hara 잔대	O			O		
385	*Adenophora verticillata* Fisch. 층층잔대 KP255735					O	O
386	*Lobelia chinensis* Lour. 수염가래꽃 KP319794				O		O
387	*Platycodon grandiflorum* (Jacq.) A. DC. 도라지 KP255700	O			O	O	O
	Rubiaceae 꼭두선이과						
388	*Asperula odorata* L. 선갈퀴				O		
389	*Galium pogonanthum* Franch. & Sav. 산갈퀴 KP255516						O
390	*Galium spurium* L. var. *echinospermum* (Wallr.) Hayek 갈퀴덩굴 KP255343				O		O
391	*Galium verum* L. var. *asiaticum* Nakai 솔나물 KP255747	O		O	O	O	O
392	*Paederia scandens* (Lour.) Merr. 계요등 KP234675	O			O	O	O
393	*Paederia scandens* (Lour.) Merr. var. *angustifolia* (Nakai) T. B. Lee 좁은잎계요등				O		
394	*Rubia cordifolia* L. var. *pratensis* Maxim. 갈퀴꼭두선이 KP256143				O		O
	Diervillaceae 병꽃나무과						
395	*Weigela subsessilis* (Nakai) L. H. Bailey 병꽃나무 KP255446						O
	Caprifoliaceae 인동과						
396	*Lonicera japonica* Thunb. 인동 KP255568	O		O	O	O	O
	Viburnaceae 산분꽃나무과						
397	*Viburnum dilatatum* Thunb. 가막살나무	O					
398	*Viburnum erosum* Thunb. 덜꿩나무 KP255420			O		O	O
	Valerianaceae 마타리과						
399	*Patrinia scabiosifolia* Fisch. ex Trevir. 마타리 KP255702				O	O	O
400	*Patrinia villosa* (Thunb.) Juss. 뚝갈 KP256130	O			O	O	O
	Asteraceae 국화과						
401	*Ambrosia artemisiifolia* L. 돼지풀	O	O		O		
402	*Artemisia annua* L. 개똥쑥				O		
403	*Artemisia capillaris* Thunb. 사철쑥 KP255727				O		O
404	*Artemisia feddei* H. Lèv. & Vaniot 뺑쑥				O		
405	*Artemisia japonica* Thunb. 제비쑥 KP256131	O		O	O	O	O
406	*Artemisia keiskeana* Miq. 맑은대쑥 KP291292	O			O	O	O
407	*Artemisia princeps* Pamp. 쑥 KP256093	O			O	O	O
408	*Aster meyendorffii* (Regel & Maack) Voss 개쑥부쟁이 KP256142						O
409	*Aster hispidus* Thunb. 갯쑥부쟁이 KP256089				O		O
410	*Aster pilosus* Willd. 미국쑥부쟁이 KP256187						O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
411	*Aster scaber* Thunb. 참취 KP256109	O			O	O	O
412	*Aster subulatus* Michx. 비짜루국화 KP256101				O		O
413	*Aster subulatus* Michx. var. *sandwicensis* A. G. Jones 큰비짜루국화		O		O		
414	*Aster tripolium* L. 갯개미취 KP256208						O
415	*Aster yomena* (Kitam.) Honda 쑥부쟁이 KP255754	O					O
416	*Atractylodes ovata* (Thunb.) DC. 삽주 KP256247	O				O	O
417	*Bidens bipinnata* L. 도깨비바늘 KP256178				O		O
418	*Bidens frondosa* L. 미국가막사리				O	O	
419	*Bidens pilosa* L. 울산도깨비바늘 KP256140						O
420	*Breea segeta* (Bunge) Kitam. 조뱅이 KP255596				O		O
421	*Carduus crispus* L. 지느러미엉겅퀴				O		
422	*Carpesium abrotanoides* L. 담배풀					O	
423	*Carpesium cernuum* L. 좀담배풀				O	O	
424	*Carpesium divaricatum* Siebold & Zucc. 긴담배풀 KP255748						O
425	*Centipeda minima* (L.) A. Braun & Asch. 중대가리풀 KP319783				O		O
426	*Chrysanthemum leucanthemum* L. 불란서국화				O		
427	*Cirsium japonicum* (Thunb.) Fisch. ex DC. 엉겅퀴 KP255634	O			O		O
428	*Conyza bonariensis* (L.) Cronquist 실망초 KP255724		O				O
429	*Conyza canadensis* (L.) Cronquist 망초 KP255719		O				O
430	*Conyza sumatrensis* (Retz.) E. Walker 큰망초		O		O		
431	*Coreopsis lanceolata* L. 큰금계국 KP255508	O	O		O		O
432	*Coreopsis tinctoria* Nutt. 기생초		O				
433	*Cosmos bipinnatus* Cav. 코스모스	O	O				
434	*Cosmos sulphureus* Cav. 노랑코스모스		O				
435	*Crassocephalum crepidioides* (Benth.) S. Moore 주홍서나물 KP256148	O					O
436	*Dendranthema boreale* (Makino) Ling ex Kitam. 산국 KP291302						O
437	*Dendranthema indicum* (L.) Des Moul. 감국	O					
438	*Dendranthema zawadskii* (Herbich) Tzvelev var. *latilobum* (Maxim.) Kitam. 구절초	O					
439	*Eclipta prostrata* (L.) L. 한련초 KP255671				O		O
440	*Erechtites hieraciifolia* (L.) Raf. ex DC. 붉은서나물 KP256181		O				O
441	*Erigeron annuus* (L.) Pers. 개망초 KP255629	O	O	O	O	O	O
442	*Euchiton japonicus* (Thunb.) Holub 풀솜나물 KP255385	O		O	O	O	O
443	*Eupatorium japonicum* Thunb. 등골나물	O					
444	*Eupatorium lindleyanum* DC. 골등골나물 KP319826				O	O	O
445	*Eupatorium makinoi* T. Kawahara & Yahara var. *oppositifolium* T. Kawahara & Yahara 벌등골나물 KP255721	O			O		O
446	*Eupatorium tripartitum* (Makino) Murata & H. Koyama 향등골나물 KP319755				O		O
447	*Galinsoga parviflora* Cav. 별꽃아재비		O				
448	*Gamochaeta calviceps* (Fernald) Cabrera 선풀솜나물				O		

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
449	*Helianthus tuberosus* L. 뚱딴지		O				
450	*Hemistepta lyrata* Bunge 지칭개 KP255608				O		O
451	*Hieracium umbellatum* L. 조밥나물 KP255693						O
452	*Hololeion maximowiczii* Kitam. 께묵 KP256176					O	O
453	*Hypochaeris radicata* L. 서양금혼초 KP255729				O		O
454	*Ixeridium dentatum* (Thunb.) Tzvelev 씀바귀 KP255444			O	O	O	O
455	*Ixeris chinensis* (Thunb.) Kitag. subsp. *strigosa* (H. Lèv. & Vaniot) Kitam. 선씀바귀				O		
456	*Ixeris debilis* (Thunb.) A. Gray 벋음씀바귀 KP255371				O		O
457	*Lactuca indica* L. var. *laciniata* H. Hara 왕고들빼기 KP255691				O		O
458	*Lactuca scariola* L. 가시상추		O		O		
459	*Petasites japonicus* (Siebold & Zucc.) Maxim. 머위 NP582546					O	O
460	*Pseudognaphalium affine* (D. Don) Anderb. 떡쑥 KP255574			O	O	O	O
461	*Pseudognaphalium hypoleucum* (DC.) Hilliard & B. L. Burtt 금떡쑥				O		
462	*Rudbeckia hirta* L. var. *pulcherrima* Farw. 원추천인국		O				
463	*Saussurea japonica* (Thunb.) DC. 큰각시취				O		
464	*Saussurea pulchella* (Fisch.) Fisch. ex Colla 각시취					O	
465	*Saussurea seoulensis* Nakai 분취	O					
466	*Senecio vulgaris* L. 개쑥갓 KP255552		O	O	O	O	O
467	*Serratula coronata* L. subsp. *insularis* (Iljin) Kitam. 산비장이 KP256255					O	O
468	*Sigesbeckia glabrescens* Makino 진득찰 KP255672						O
469	*Sigesbeckia pubescens* (Makino) Makino 털진득찰 KP256227				O		O
470	*Solidago altissima* L. 양미역취 KP256207		O				O
471	*Solidago gigantea* Aiton subsp. *serotina* (Aiton) McNeill 미국미역취 KP255681						O
472	*Solidago virgaurea* L. subsp. *asiatica* Kitam. ex Hara 미역취 KP291290	O				O	O
473	*Sonchus asper* (L.) Hill 큰방가지똥 KP318911		O		O		O
474	*Sonchus brachyotus* DC. 사데풀 KP256102				O		O
475	*Sonchus oleraceus* L. 방가지똥 KP255407		O	O	O	O	O
476	*Syneilesis palmata* (Thunb.) Maxim. 우산나물	O					
477	*Tagetes minuta* L. 만수국아재비		O				
478	*Taraxacum laevigatum* (Willd.) DC. 붉은씨서양민들레		O				
479	*Taraxacum officinale* F. H. Wigg. 서양민들레 KP255354		O				O
480	*Taraxacum platycarpum* Dahlst. 민들레 KP255545				O		O
481	*Tephroseris kirilowii* (Turcz. ex DC.) Holub 솜방망이 KP255443					O	O
482	*Tephroseris pseudosonchus* (Vaniot) C. Jeffrey & Y. L. Chen 물솜방망이				O		
483	*Xanthium canadense* Mill. 큰도꼬마리		O				
484	*Xanthium strumarium* L. 도꼬마리		O				
485	*Youngia japonica* (L.) DC. 뽀리뱅이 KP255353			O	O	O	O
	Alismataceae 택사과						
486	*Alisma canaliculatum* A. Braun & Bouchè 택사 KP290402						O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
	Hydrocharitaceae 자라풀과						
487	*Hydrilla verticillata* (L. f.) Royle 검정말				O		
488	*Ottelia alismoides* (L.) Pers. 물질경이 KP319840				O		O
	Juncaginaceae 지채과						
489	*Triglochin maritimum* L. 지채 KP255587				O		O
	Potamogetonaceae 가래과						
490	*Potamogeton crispus* L. 말즘 KP255593				O		O
491	*Potamogeton cristatus* Regel & Maack 가는가래 KP319795						O
492	*Potamogeton distinctus* A. Benn. 가래 KP366313						O
493	*Potamogeton pusillus* L. 실말				O		
	Ruppiaceae 줄말과						
494	*Ruppia maritima* L. 줄말				O		
	Najadaceae 나자스말과						
495	*Najas graminea* Delile 나자스말				O		
496	*Najas marina* L. 민나자스말				O		
	Araceae 천남성과						
497	*Pinellia ternata* (Thunb.) Breitenb. 반하				O	O	
	Lemnaceae 개구리밥과						
498	*Lemna perpusilla* Torr. 좀개구리밥 NP582540				O		O
	Commelinaceae 닭의장풀과						
499	*Commelina communis* L. 닭의장풀 KP255647	O					O
500	*Murdannia keisak* (Hassk.) Hand.-Mazz. 사마귀풀 KN373330				O		O
501	*Tradescantia ohiensis* Raf. 자주달개비		O				
	Eriocaulaceae 곡정초과						
502	*Eriocaulon hondoense* Satake 큰개수염 KP256168					O	O
503	*Eriocaulon miquelianum* Körn. 개수염 KP256261				O	O	O
	Juncaceae 골풀과						
504	*Juncus diastrophanthus* Buchenau 별날개골풀 KP256260						O
505	*Juncus effusus* L. var. *decipiens* Buchenau 골풀 KP256286				O		O
506	*Juncus gracillimus* (Buchenau) V. I. Krecz. & Gontsch. 물골풀			O		O	
507	*Juncus krameri* Franch. & Sav. 비녀골풀					O	
508	*Juncus leschenaultii* Gay ex Laharpe 참비녀골풀 KP256311						O
509	*Juncus setchuensis* Buchenau var. *effusoides* Buchenau 푸른갯골풀 KP256312			O	O	O	O
510	*Juncus wallichianus* Laharpe 눈비녀골풀 KP290400					O	O
511	*Luzula capitata* (Miq.) Miq. 꿩의밥 NP582531			O	O	O	O
	Cyperaceae 사초과						
512	*Bolboschoenus maritimus* (L.) Palla 매자기			O			
513	*Bolboschoenus planiculmis* (F.Schmidt) T. V. Egorova 새섬매자기 KP217357				O	O	O
514	*Bulbostylis densa* (Wall.) Hand.-Mazz. 꽃하늘지기				O	O	

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
515	*Carex appendiculata* (Trautv. & C. A. Mey.) Kük. 뚝사초 KP256307						O
516	*Carex breviculmis* R. Br. 청사초				O		
517	*Carex brownii* Tuck. 흰꼬리사초 KP256300						O
518	*Carex ciliatomarginata* Nakai 털대사초					O	
519	*Carex conica* Boott 애기사초				O		
520	*Carex fernaldiana* H. Lèv. & Vaniot 실사초	O					
521	*Carex humilis* Leyss. 산거울	O					
522	*Carex kobomugi* Ohwi 통보리사초 KP290415						O
523	*Carex lanceolata* Boott 그늘사초 KP256299	O			O	O	O
524	*Carex laticeps* C. B. Clarke 갯보리사초					O	
525	*Carex leucochlora* Bunge 이삼사초					O	
526	*Carex maculata* Boott 무늬사초					O	
527	*Carex maximowiczii* Miq. 왕비늘사초 KP256285			O	O	O	O
528	*Carex mitrata* var. *aristata* Ohwi 겨락겨사초					O	
529	*Carex nervata* Franch. & Sav. 양지사초				O		
530	*Carex phacota* Spreng. 비늘사초				O		
531	*Carex polyschoena* H. Lèv. & Vaniot 가지청사초				O	O	
532	*Carex sabynensis* Less. ex Kunth 실청사초					O	
533	*Carex scabrifolia* Steud. 천일사초 KP217356				O		O
534	*Carex siderosticta* Hance 대사초 KP255448						O
535	*Carex tristachya* Thunb. 반들사초				O	O	
536	*Carex tristachya* Thunb. var. *pocilliformis* (Boott) Kük. 애기반들사초			O		O	
537	*Cladium chinense* Nees 층층고랭이 KP319550				O	O	O
538	*Cyperus difformis* L. 알방동산이 KP256330				O	O	O
539	*Cyperus globosus* Forssk. 드렁방동산이				O	O	
540	*Cyperus haspan* L. 모기방동산이 KP319750				O	O	O
541	*Cyperus iria* L. 참방동산이 KP256228				O	O	O
542	*Cyperus microiria* Steud. 금방동산이 KP256219				O	O	O
543	*Cyperus nipponicus* Franch. & Sav. 푸른방동산이				O		
544	*Cyperus sanguinolentus* Vahl 방동산이대가리 KP366310	O					O
545	*Cyperus tenuispica* Steud. 우산방동산이 KP256332					O	O
546	*Eleocharis kamtschatica* (C. A. Mey.) Kom. 올방개아재비 KP256296				O		O
547	*Eleocharis tetraquetra* Nees 네모골					O	
548	*Eleocharis wichurae* Boeck. 좀네모골 KP319543				O	O	O
549	*Fimbristylis autumnalis* (L.) Roem. & Schult. 애기하늘지기				O	O	
550	*Fimbristylis complanata* (Retz.) Link var. *exaltata* (T. Koyama) Y. C. Tang ex S. R. Zhang & T. Koyama 어른지기 KP256322						O
551	*Fimbristylis cymosa* R. Br. 바다지기				O		
552	*Fimbristylis dichotoma* (L.) Vahl 하늘지기 KP366601				O	O	O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
553	*Fimbristylis littoralis* Gaudich. 바람하늘지기				O	O	
554	*Fimbristylis longispica* Steud. 큰하늘지기 KP256313				O		O
555	*Fimbristylis pierotii* Miq. 들하늘지기			O		O	
556	*Fimbristylis sieboldii* Miq. Ex Franch. & Sav. 갯하늘지기 KP256315				O	O	O
557	*Fimbristylis squarrosa* Vahl var. *esquarrosa* Makino 암하늘지기					O	
558	*Fimbristylis tomentosa* Vahl 털하늘지기				O		
559	*Fimbristylis tristachya* R. Br. var. *subbispicata* (Nees & Meyen) T. Koyama 꼴하늘지기 KP256325				O	O	O
560	*Kyllinga brevifolia* Rottb. 파대가리 KP256331					O	O
561	*Rhynchospora chinensis* Nees & Meyen 고양이수염 KP256167				O	O	O
562	*Rhynchospora faberi* C. B. Clarke 골풀아재비 KP256256				O	O	O
563	*Rhynchospora fauriei* Franch. 큰고양이수염					O	
564	*Rhynchospora fujiiana* Makino 좀고양이수염 KP290390				O		O
565	*Rhynchospora rubra* (Lour.) Makino 붉은골풀아재비 KP319536						O
566	*Schoenoplectiella hotarui* (Ohwi) J. Jung & H.-K. Choi 좀올챙이골 KP319757				O		O
567	*Schoenoplectiella juncoides* (Roxb.) Lye 올챙이고랭이				O	O	
568	*Scirpus mitsukurianus* Makino 솔방울골					O	
569	*Scirpus wichurai* Boeck. var. *asiaticus* (Beetle) T. Koyama ex Ohwi 방울고랭이 KP255772						O
570	*Scleria caricina* (R. Br.) Benth. 애기개올미 KP366305				O	O	O
571	*Scleria parvula* Steud. 너도고랭이 KP256268				O	O	O
572	*Scleria rugosa* R. Br. 가시개올미 KP366306				O	O	O
	Poaceae 화본과						
573	*Agropyron ciliare* (Trin.) Franch. 속털개밀 KP318909			O	O	O	O
574	*Agropyron tsukushiense* (Honda) Ohwi var. *transiens* (Hack.) Ohwi 개밀 KP256306				O		O
575	*Agrostis clavata* Trin. var. *nukabo* Ohwi 겨이삭			O	O	O	
576	*Alopecurus aepualis* Sobol. 둑새풀 KP255345						O
577	*Alopecurus japonicus* Steud. 털뚝새풀 KP256333						O
578	*Arthraxon hispidus* (Thunb.) Makino 조개풀 KP256251				O		O
579	*Arundinella hirta* (Thunb.) Tanaka 새 KP256237	O			O	O	O
580	*Arundinella hirta* (Thunb.) Tanaka var. *ciliata* (Thunb.) Koidz. 털새 KP319773				O	O	O
581	*Arundinella hirta* (Thunb.) Tanaka var. *hondana* Koidz. 이삭털새				O		
582	*Avena fatua* L. 메귀리 NP582544		O		O		O
583	*Beckmannia syzigachne* (Steud.) Fernald 개피 KP255640				O		O
584	*Briza minor* L. 방울새풀 KP255518						O
585	*Bromus japonicus* Thunb. 참새귀리 KP318928				O		O
586	*Bromus pauciflorus* (Thunb.) Hack. 꼬리새 KP256301						O
587	*Bromus rigidus* Roth 긴까락빕새귀리 KP256294						O
588	*Bromus unioloides* Kunth 큰이삭풀 KP318908		O		O		O
589	*Calamagrostis arundinacea* (L.) Roth 실새풀					O	
590	*Calamagrostis epigeios* (L.) Roth 산조풀 KP290417						O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
591	*Capillipedium assimile* (Steud.) A. Camus 나도기름새 KP256242					O	O
592	*Cymbopogon tortilis* (J. Presl) A. Camus subsp. *goeringii* (Steud.) T. Koyama 개솔새 KP256104				O	O	O
593	*Dactylis glomerata* L. 오리새 KP256289		O		O		O
594	*Digitaria sanguinalis* (L.) Scop. 바랭이 KP255661				O	O	O
595	*Dimeria ornithopoda* Trin. 잔디바랭이					O	
596	*Echinochloa crus-galli* (L.) P. Beauv. 돌피 KP255628				O		O
597	*Echinochloa crus-galli* (L.) P. Beauv. var. *echinata* (Willd.) Honda 물피 KP319837						O
598	*Echinochloa crus-galli* (L.) P. Beauv. var. *praticola* Ohwi 좀돌피					O	
599	*Echinochloa oryzoides* (Ard.) Fritsch 논피					O	
600	*Eleusine indica* (L.) Gaertn. 왕바랭이 KP255660						O
601	*Elymus dahuricus* Turcz. ex Griseb. 갯보리			O		O	
602	*Eragrostis curvula* (Schrad.) Nees 능수참새그령		O				
603	*Eragrostis pilosa* (L.) P. Beauv. 큰비노리				O		
604	*Eulalia speciosa* (Debeaux) Kuntze 개억새 KP320397					O	O
605	*Festuca arundinacea* Schreb. 큰김의털		O		O		
606	*Festuca myuros* L. 들묵새		O		O		
607	*Festuca ovina* L. 김의털 KP256231			O	O	O	O
608	*Festuca parvigluma* Steud. 김의털아재비				O		
609	*Festuca rubra* L. 왕김의털				O		
610	*Hemarthria compressa* (L. f.) R. Br. var. *japonica* (Hack.) Ohwi 쇠치기풀				O		
611	*Hierochloe odorata* (L.) P. Beauv. 향모				O		
612	*Hordeum vulgare* L. var. *hexastichon* (L.) Asch. 보리				◎		
613	*Imperata cylindrica* (L.) Raeusch. var. *koenigii* (Retz.) Benth. ex Pilg. 띠 KP256282	O		O	O	O	O
614	*Isachne globosa* (Thunb.) Kuntze 기장대풀 KP255638				O	O	O
615	*Ischaemum anthephoroides* (Steud.) Miq. 갯쇠보리 KP290413						O
616	*Ischaemum crassipes* (Steud.) Thell. 쇠보리 KP255646	O			O	O	O
617	*Koeleria cristata* Pers. 도랑이피			O	O	O	
618	*Leersia japonica* (Makino & Honda) Honda 나도겨풀				O		
619	*Leptochloa malabarica* (L.) Veldkamp 갯드렁새		O		O		
620	*Lolium multiflorum* Lam. 쥐보리 KP318929		O	O	O	O	O
621	*Lolium perenne* L. 호밀풀		O		O		
622	*Melica nutans* L. 왕쌀새					O	
623	*Miscanthus sacchariflorus* (Maxim.) Hack. 물억새	O					
624	*Miscanthus sinensis* Andersson 참억새 KP256097	O			O	O	O
625	*Miscanthus sinensis* Andersson for. *gracillimus* (Hitchc.) Ohwi 가는잎억새				O	O	
626	*Miscanthus sinensis* Andersson for. *purpurascens* (Andersson) Nakai 억새 KP256215	O				O	O
627	*Moliniopsis japonica* (Hack.) Hayata 진퍼리새				O	O	
628	*Muhlenbergia japonica* Steud. 쥐꼬리새 KP256317						O
629	*Oplismenus undulatifolius* (Ard.) Roem. & Schult. 주름조개풀 KP291297	O				O	O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
630	*Panicum bisulcatum* Thunb. 개기장 KP256250				O		O
631	*Panicum dichotomiflorum* Michx. 미국개기장		O		O		
632	*Parapholis incurva* (L.) C. E. Hubb. 회초리잔디 KP318923				O		O
633	*Paspalum distichum* L. 물참새피 KP320402		O		O		O
634	*Paspalum distichum* L. var. *indutum* Shinners 털물참새피 KP255645		O		O		O
635	*Paspalum thunbergii* Kunth ex Steud. 참새피 KP319838				O	O	O
636	*Pennisetum alopecuroides* (L.) Spreng. 수크령 KP256092						O
637	*Phacelurus latifolius* (Steud.) Ohwi 모새달				O		
638	*Phragmites communis* Trin. 갈대 KP256196	O			O		O
639	*Phyllostachys bambusoides* Siebold & Zucc. 왕대				O		
640	*Poa annua* L. 새포아풀 KP318930				O	O	O
641	*Poa nipponica* Koidz. 큰꾸러미풀				O		
642	*Poa pratensis* L. 왕포아풀		O		O	O	
643	*Poa sphondylodes* Trin. 포아풀 KP318905				O	O	O
644	*Polypogon fugax* Nees ex Steud. 쇠돌피 KP256303				O		O
645	*Polypogon monspeliensis* (L.) Desf. 갯쇠돌피 KP318907			O	O	O	O
646	*Pseudoraphis ukishiba* Ohwi 물잔디				O		
647	*Sacciolepis indica* (L.) Chase 좀물뚝새					O	
648	*Sacciolepis indica* (L.) Chase 물뚝새 var. *oryzetorum* (Makino) Ohwi KP256266				O		O
649	*Sasa borealis* (Hack.) Makino & Shibata 조릿대			O		O	
650	*Sasa japonica* (Siebold & Zucc. ex Steud.) Makino 이대				O		
651	*Schizachyrium brevifolium* (Sw.) Nees & Büse 쇠풀					O	
652	*Setaria* × pycnocoma (Steud.) Henrard ex Nakai 수강아지풀					O	
653	*Setaria faberi* R. A. W. Herrm. 가을강아지풀 KP255717				O		O
654	*Setaria glauca* (L.) P. Beauv. 금강아지풀 KP256094				O	O	O
655	*Setaria viridis* (L.) P. Beauv. 강아지풀 KP255690					O	O
656	*Setaria viridis* (L.) P. Beauv. var. *pachystachys* (Franch. & Sav.) Makino & Nemoto 갯강아지풀 KP319818						O
657	*Sorghum nitidum* (Vahl) Pers. 수수새 KP256246				O	O	O
658	*Spodiopogon sibiricus* Trin. 큰기름새 KP256334						O
659	*Sporobolus elongatus* R. Br. 쥐꼬리새풀 KP256234	O			O	O	O
660	*Themeda triandra* Forssk. subsp. *japonica* (Willd.) T. Koyama 솔새 KP255743	O			O	O	O
661	*Trisetum bifidum* (Thunb.) Ohwi 잠자리피				O		
662	*Zoysia japonica* Steud. 잔디	O			O		
663	*Zoysia macrostachya* Franch. & Sav. 왕잔디 KP290416						O
664	*Zoysia sinica* Hance 갯잔디 KP217360			O	O	O	O
	Typhaceae 부들과						
665	*Typha angustifolia* L. 애기부들 KP255654						O
666	*Typha laxmannii* Lepech. 꼬마부들 KP255655						O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
	Liliaceae 백합과						
667	*Aletris spicata* (Thunb.) Franch. 쥐꼬리풀 KP217366	O		O	O	O	O
668	*Allium macrostemon* Bunge 산달래 KP255577						O
669	*Allium monanthum* Maxim. 달래	O					
670	*Allium sacculiferum* Maxim. 참산부추 KP256243						O
671	*Allium thunbergii* G. Don 산부추 KP256113					O	O
672	*Disporum smilacinum* A. Gray 애기나리 KP255440	O				O	O
673	*Hemerocallis fulva* (L.) L. 원추리	◎					
674	*Hemerocallis minor* Mill. 애기원추리					O	
675	*Hemerocallis thunbergii* Baker 노랑원추리 KP290423				O		O
676	*Lilium amabile* Palib. 털중나리					O	
677	*Lilium tsingtauense* Gilg 하늘말나리 KP255538					O	O
678	*Liriope platyphylla* F. T. Wang & T. Tang 맥문동 KP289426					O	O
679	*Polygonatum cryptanthum* H. Lèv. & Vaniot 목포용둥굴레 KP255539				O		O
680	*Polygonatum falcatum* A. Gray 진황정					O	
681	*Polygonatum inflatum* Kom. 퉁둥굴레 KP255452						O
682	*Polygonatum involucratum* (Franch. & Sav.) Maxim. 용둥굴레 KP255436	O				O	O
683	*Polygonatum lasianthum* Maxim. 죽대 KP255537					O	O
684	*Polygonatum odoratum* (Mill.) Druce var. *pluriflorum* (Miq.) Ohwi 둥굴레	O					
685	*Scilla scilloides* (Lindl.) Druce 무릇 KP255732	O			O		O
	Iridaceae 붓꽃과						
686	*Iris ensata* Thunb. var. *spontanea* (Makino) Nakai 꽃창포			O	O	O	
687	*Iris pseudoacorus* L. 노랑꽃창포				O		
688	*Iris rossii* Baker 각시붓꽃 KP255372	O				O	O
689	*Iris sanguinea* Donn ex Hornem. 붓꽃	O					
690	*Sisyrinchium angustifolium* Mill. 등심붓꽃 KP255597	O					O
	Smilacaceae 청미래덩굴과						
691	*Smilax china* L. 청미래덩굴 KP255368	O		O	O	O	O
692	*Smilax nipponica* Miq. 선밀나물 KP255449					O	O
	Dioscoreaceae 마과						
693	*Dioscorea oppositifolia* L. 마 KP255679				O		O
694	*Dioscorea quinqueloba* Thunb. 단풍마	O					
	Orchidaceae 난초과						
695	*Bletilla striata* (Thunb.) Rchb. f. 자란 KP217367	O			O		O
696	*Calanthe discolor* Lindl. 새우난초					O	
697	*Cephalanthera erecta* (Thunb.) Blume 은난초 KP319546						O
698	*Cephalanthera falcata* (Thunb.) Blume 금난초					O	
699	*Cymbidium goeringii* (Rchb. f.) Rchb. f. 보춘화 KP255429	O			O		O
700	*Epipactis thunbergii* A. Gray 닭의난초 KP255755	O				O	O

Appendix 1. Continued.

No.	Taxa and representative voucher specimen number (KP: KOSPVP0000-, KN: KONPVP0000-, NP: NIBRVP0000-)	Study					
		1	2	3	4	5	6
701	*Habenaria linearifolia* Maxim. 잠자리난초 KP255769				O	O	O
702	*Platanthera mandarinorum* Rchb. f. 산제비란				O		
703	*Pogonia japonica* Rchb. f. 큰방울새란 KP255526				O		O
704	*Pogonia minor* (Makino) Makino 방울새란				O		
705	*Spiranthes sinensis* (Pers.) Ames 타래난초 KP255563	O			O		O

1, Park (2004); 2, Kim (2008); 3, Jeong et al. (2011); 4, Nam et al. (2012); 5, Hwang et al. (2013); 6, This study; ◎, cultivated plants.