



## Type specimens of vascular plants in the herbarium of the National Institute of Biological Resources (KB) of the Republic of Korea

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### Abstract

The article provides information on type specimens of 33 species (94 sheets) of vascular plants, kept in the herbarium of the National Institute of Biological Resources (KB) of the Republic of Korea. Most of the type specimens in KB were donated by the Herbaria of Ajou University (AJOU), Chonbuk National University (JNU), Chungbuk National University (CBU), Hallym University (HHU), Korea Plant Research Institute (KPRI), Seoul National University (SNU), and others in recent years. For all specimens, the type category is indicated. There were 15 sheets for holotypes, 57 sheets for isotypes, and 22 sheets for paratypes. There were seven species of Pteridophytes, 22 species of Dicotyledons, and four species of Monocotyledons. The most represented genera in the 33 species are *Corydalis* (seven species) and *Isoetes* (four species). The type specimens examined in this article belong to the taxa described by Korean botanists, Byoung-Un Oh, Byoung-Yoon Lee, Byung-Yun Sun, Chong-Wook Park, Hong-Keun Choi, Young-Dong Kim, and others.

**Keywords:** Type specimens, Vascular plants, National Institute of Biological Resources, KB, Korea

### Introduction

The herbarium of the National Institute of Biological Resources (KB) is the largest national herbarium in Republic of Korea. Since its establishment and official opening in 2007, more than 700,000 specimens of vascular plants have been preserved at KB. Type specimens are the most important basis for taxonomic studies, and it is necessary to permanently preserve them in a secure environment. According to Recommendation 7A of the International Code of Nomenclature for algae, fungi, and plants (ICN, Turland *et al.* 2017), it is strongly recommended that the type material is deposited in a public herbarium with a policy of researcher access to the deposited material. KB has approximately 100 type specimens of vascular plants. Most of the type specimens in KB were donated by Ajou University (AJOU), Chonbuk National University (JNU), Chungbuk National University (CBU), Hallym University (HHU), Korea Plant Research Institute (KPRI), Seoul National University (SNU), and others. The specimens were relocated from the above-mentioned universities and institutes to KB, however some of the information about the donated specimens in KB is still unknown. Therefore, information and images (Fig. 1) about the type materials preserved at KB are presented in this article.

We recorded information of type specimens housed in KB, such as families, scientific names, the kind of type specimens, collection site, date, collectors, and citation of the protologue. The family names of Pteridophytes are arranged following Smith *et al.* (2006) and Angiosperms are arranged following the Cronquist (1981) like herbarium (KB) system, while genus and scientific names are arranged in alphabetical order. The information of the specimens' collection site, date, and collectors are inscribed in accordance with the labels and are provided in as much detail as possible. The herbarium abbreviation is used with reference to Index Herbariorum (<http://sweetgum.nybg.org/>).

In total there were 94 sheets for the 33 species. There were 15 sheets for holotypes, 57 sheets for isotypes, and 22 sheets for paratypes. There were four families, four genera, and seven species of Pteridophytes; 14 families, 16 genera, and 22 species of Dicotyledons; and three families, three genera, and four species of Monocotyledons. The most well represented families and genera in the specimens are Fumariaceae *Corydalis* (seven species) and Isoetaceae *Isoetes* (four species). Categorized by countries, there were 28 species from Korea, two species from Cambodia, two species from Myanmar, and one species from Laos. The majority of the type collections were made by Korean botanists, such

as Byoung-Un Oh, Byoung-Yoon Lee, Byung-Yun Sun, Chong-Wook Park, Hong-Keun Choi, Young-Dong Kim, and others.

The type specimens of Yong-No Lee, the author of the “*Flora of Korea (1996)*”, are housed in KB, and the material included more than 20 sheets of his type specimens. However he did not accurately indicate information of the holotype in his protologue. There is no way that we can determine the type of the specimens, i.e., whether they are holotypes or syntypes. Consequently, we excluded information on his type specimens in this article; we will report on these type specimens in a later article. Two invalidly published names, *Carex brevispicula* G.H.Nam & G.Y.Chung and *Trichophorum dioicum* J.Jung & H.-K.Choi are presented in Appendix 1; the type specimens are kept in KB.



**FIGURE 1.** Type specimens in the herbarium of National Institute of Biological Resources (KB).

1. *Huperzia jejuensis* B.-Y.Sun & J.Lim (NIBRVP473716), 2. *Isoetes coreana* Y.H.Chung & H.-K.Choi (NIBRVP720426), 3. *Isoetes hallasanensis* H.-K.Choi, C.Kim & J.Jung (NIBRVP720434), 4. *Isoetes jejuensis* H.-K.Choi, C.Kim & J.Jung (NIBRVP720437), 5. *Isoetes laosensis* C.Kim & H.-K.Choi (NIBRVP720427), 6. *Mankyua chejuense* B.-Y.Sun, M.H.Kim & C.H.Kim (NIBRVP601881), 7. *Phegopteris koreana* B.-Y.Sun & C.H.Kim (NIBRVP601888), 8. *Clematis calcicola* J.S.Kim (NIBRVP218724), 9. *Eranthis pungdoensis* B.U.Oh (NIBRVP358231), 10. *Corydalis alata* B.U.Oh & W.R.Lee (NIBRVP358245), 11. *Corydalis albipetala* B.U.Oh (NIBRVP358250), 12. *Corydalis grandicalyx* B.U.Oh & Y.S.Kim (NIBRVP358607).





FIGURE 1. (Continued)

13. *Corydalis humilis* B.U.Oh & Y.S.Kim (NIBRVP358253), 14. *Corydalis maculata* B.U.Oh & Y.S.Kim (NIBRVP358606), 15. *Corydalis misandra* B.U.Oh (NIBRVP358236), 16. *Corydalis namdoensis* B.U.Oh & J.G.Kim (NIBRVP358604), 17. *Begonia myanmarica* C.I.Peng & Y.D.Kim (NIBRVP655700), 18. *Rorippa apetala* Y.Y.Kim & B.U.Oh (NIBRVP358228), 19. *Lysimachia quelpaertensis* K.-H.Tae & J.S.Lee (NIBRVP290858), 20. *Chrysosplenium aureobracteatum* Y.I.Kim & Y.D.Kim (NIBRVP655697), 21. *Sonerila bokorense* S.H.Cho & Y.D.Kim (NIBRVP655696), 22. *Cissus erecta* S.H.Cho & Y.D.Kim (NIBRVP655698), 23. *Impatiens vokorenensis* S.H.Cho & B.Y.Kim (NIBRVP655699), 24. *Angelica reflexa* B.Y.Lee (NIBRVP298527).





FIGURE 1. (Continued)

25. *Sium ternifolium* B.Y.Lee & S.C.Ko (NIBRVP358609), 26. *Melampyrum koreanum* K.-J.Kim & S.-M.Yun (NIBRVP358608), 27. *Orobanchefilicicola* Nakai ex J.O.Hyun, Y.S.Lim & H.C.Shin, 28. *Zabelia densipila* M.-P.Hong, Y.-C.Kim & B.Y.Lee (NIBRVP353208), 29. *Aster pseudoglehnii* Y.S.Lim, J.O.Hyun & H.Shin, 30. *Zostera geojeensis* H.Shin, K.H.Cho & Y.S.Oh (NIBRVP720424), 31. *Polygonatum infundiflorum* Y.S.Kim, B.U.Oh & C.G.Jang (NIBRVP358235), 32. *Calanthe rubra* S.H.Oh, H.J.Suh & C.-W.Park (NIBRVP647408), 33–34. *Calanthe insularis* S.H.Oh, H.J.Suh & C.-W.Park (NIBRVP647413), 35. *Carex brevispicula* G.H.Nam & G.Y.Chung (NIBRVP291950), 36. *Trichophorum dioicum* J.Jung & H.-K.Choi (NIBRVP631358).

## Lycopodiaceae

1. *Huperzia jejuensis* B.-Y.Sun & J.Lim, Korean J. Pl. Taxon. 45: 18, 2015.

Holotype: Korea, Jeju-do, Jeju-si, Haean-dong, Mt. Halla, 8 Aug. 2010, J.Lim, S.S.Choi and N.R.Yun 50803 (NIBRVP473716).

Isotype: Korea, Jeju-do, Jeju-si, Haean-dong, Mt. Halla, 8 Aug. 2010, J.Lim 50803 (NIBRVP473716), 5 sheets.

**Note.** The number of collectors differs between the label of the holotype specimen (J.Lim, S.S.Choi and N.R.Yun) and the protologue (C.H.Kim, J.Lim, S.S.Choi and N.R.Yun). We recorded label information of the holotype specimen. According to Art. 9.2 ICN (Turland *et al.* 2018), a correction is needed on the holotype citation.

## Isoetaceae

### 2. *Isoetes coreana* Y.H.Chung & H.-K.Choi, Korean J. Pl. Taxon. 16: 2, 1986.

Holotype: Korea, Gangwon, Hwacheon-gun, Hanam-myeon, Nonmi-ri, 1 Aug. 1984, *H.K.Choi & S.M.Lee 58000* (NIBRVP720426).

**Note.** This specimen was transferred to KB from SNU. The isotypes are preserved at SNU and KNHU. The names of the collectors differ between the labels of the holotype specimen (H.-K.Choi & S.M.Lee) and the protologue (Y.H.Chung & H.-K.Choi). We recorded label information of the holotype specimen. According to Art. 9.2 ICN (Turland *et al.* 2018), a correction is needed on the holotype citation.

### 3. *Isoetes hallasanensis* H.-K.Choi, C.Kim & J.Jung, J. Pl. Biol. 51: 357, 2008.

Holotype: Korea, Jeju, Seoguipo city, Saigdal-dong, 1100-wetland, 13 Jul. 2006, *H.K.Choi 20061380* (NIBRVP720434).

Isotype: Korea, Seoguipo city, Saigdal-dong, 1100-wetland, 13 Jul. 2006, *H.K.Choi 20061380* (NIBRVP720433)

Paratype: Korea, Jeju, Seoguipo city, Saigdal-dong, 1100-wetland, 3 May 2007, *C.K.Kim, H.R.Na & S.Cho 200784* (NIBRVP720435);  
*C.K.Kim & H.R.Na 200798* (NIBRVP720436).

**Note.** These specimens were transferred to KB from AJOU. Choi *et al.* (2008) recorded the paratypes of two specimens (3 May 2007, *C.Kim 200784*, AJOU; 30 Aug. 2007, *C.Kim 200798*, AJOU) in the protologue, but the two specimens have errors in the collection date and collectors. We recorded the label information of the paratype specimens.

### 4. *Isoetes jejuensis* H.-K.Choi, C.Kim & J.Jung, J. Pl. Biol. 51: 356, 2008.

Holotype: Korea, Jeju, Namjeju-gun, Seongsan-eup, Samdal-ri, Galmae-pond, 5 Aug. 2000, *J.D.Jung 2000157* (NIBRVP720437).

Isotype: Korea, Jeju, Namjeju-gun, Seongsan-eup, Samdal-ri, Galmae-pond, 5 Aug. 2000, *J.D.Jung 2000157* (NIBRVP720438).

**Note.** These specimens were transferred to KB from AJOU.

### 5. *Isoetes laosiensis* C.Kim & H.-K.Choi, Amer. Fern J. 100: 48, 2010.

Holotype: Laos, Small pond near Ban Kiat Nagang village, Mt. Phou Asha, 24 Jul. 2007, *B.Y.Sun & S.S.Shoi 2039-5* (NIBRVP720427).

Isotype: Laos, Small pond near Ban Kiat Nagang village, Mt. Phou Asha, 24 Jul. 2007, *B.Y.Sun & S.S.Shoi 2039-1* (NIBRVP720432); *B.Y.Sun & S.S.Shoi 2039-2* (NIBRVP720428); *B.Y.Sun & S.S.Shoi 2039-3* (NIBRVP720429); *B.Y.Sun & S.S.Shoi 2039-4* (NIBRVP720430);  
*B.Y.Sun & S.S.Shoi 2039-5* (NIBRVP720431).

**Note.** These specimens were transferred to KB from AJOU. There is a discrepancy in the collection number of the holotype specimen in the protologue (Kim *et al.* 2010). The collection number of the holotype is “2039-5” on page 48, and “2039-1” on page 50. The label on the holotype sheet is “2039-1”. Thus according to Art. 9.2 ICN (Turland *et al.* 2018), a correction is needed on the holotype citation.

## Ophioglossaceae

### 6. *Mankyua chejuense* B.-Y.Sun, M.H.Kim & C.H.Kim, Taxon 50: 1020, 2001.

Holotype: Cheju Province: Pukcheju-gun, Kujoa-up, Myosan-bong (hill), 80 m alt., swampy area, 5 Jan. 1998, *M.H.Kim 1800* (NIBRVP601881).

Isotype: Cheju Province: Pukcheju-gun, Kujoa-up, Myosan-bong (hill), 80 m alt., swampy area, 5 Jan. 1998, *M.H.Kim 1800* (NIBRVP601882, NIBRVP601887).

Paratype: Cheju Province: Pukcheju-gun, Kujoa-up, Myosan-bong (hill), 80 m alt., swampy area, 24 Oct. 1996, *M.H.Kim 1400* (NIBRVP601883); 10 Jun. 2000, *M.H.Kim 2533* (NIBRVP601884-601886).

**Note.** These specimens were transferred to KB from JNU.

### **Thelypteridaceae**

#### **7. *Phegopteris koreana* B.-Y.Sun & C.H.Kim, Novon 14: 440, 2004.**

Holotype: Korea, Jeollanam-do prov., Mt. Baek-yang (formerly Baek-am), Under the edge of deciduous forest, partially shaded, 13 Oct. 2001, *B.Y.Sun & C.H.Kim 434* (NIBRVP601888).

Isotype: Korea, Jeollanam-do prov., Mt. Baek-yang (formerly Baek-am), Under the edge of deciduous forest, partially shaded, 13 Oct. 2001, *B.Y.Sun & C.H.Kim 434* (NIBRVP601889-601892), 4 sheets.

**Note.** These specimens were transferred to KB from JNU.

### **Ranunculaceae**

#### **8. *Clematis calcicola* J.S.Kim, Korean J. Pl. Taxon. 39: 1, 2009.**

Holotype: Korea, Gangwon-do, Samcheok-si, Mt. Deokhang, limestone cliffs, 14 May 2004, *J.S.Kim 2204* (NIBRVP218724).

**Note.** The isotype is preserved at KNU.

#### **9. *Eranthis pungdoensis* B.U.Oh, Korean J. Pl. Taxon. 39: 86, 2009.**

Isotype: Korea, Gyeonggi-do, Ansan-si, Pung-do, 16 Mar. 2007, *B.U.Oh 2007001* (NIBRVP358229, NIBRVP358230, NIBRVP358231).

Paratype: Korea, Gyeonggi-do, Ansan-si, Pung-do, 24 Mar. 1996, *B.U.Oh et al. 960324-001* (NIBRVP358232, NIBRVP358233).

**Note.** These specimens were transferred to KB from CBU. The holotype and the rest of the isotypes, and the paratypes are preserved at KH.

### **Fumariaceae**

#### **10. *Corydalis alata* B.U.Oh & W.R.Lee, Korean J. Pl. Taxon. 40: 79, 2010.**

Isotype: Korea, Gyeongsangbuk-do, Pohang-si, Buk-gu, Jukjang-myeon, Sangok-ri, Naeyeonsan, 16 Apr. 2009, *B.U.Oh et al. Pohang (Naeyeonsan)-090416-002* (NIBRVP358245); *B.U.Oh et al. Pohang (Naeyeonsan)-090416-021* (NIBRVP358249); *B.U.Oh et al. Pohang (Naeyeonsan)-090416-022* (NIBRVP358246); *B.U.Oh et al. Pohang (Naeyeonsan)-090416-024* (NIBRVP358248); *B.U.Oh et al. Pohang (Naeyeonsan)-090416-025* (NIBRVP358247).

**Note.** These specimens were transferred to KB from CBU. The holotype, the rest of isotypes, and the paratypes are preserved at KH.

#### **11. *Corydalis albipetala* B.U.Oh, Korean J. Pl. Taxon. 26: 213, 1996.**

Isotype: Korea, Gangwon-do, Pyeongchang-gun, Mt. Odae-san, around Woljeongsa, 25 Apr. 1989, *B.U.Oh et al. 1989006* (NIBRVP358251); *B.U.Oh et al. 1989007* (NIBRVP358252); *B.U.Oh et al. 1989010* (NIBRVP358250).

**Note.** These specimens were transferred to KB from CBU. The holotype and the rest of the isotypes are preserved at KH.



**12. *Corydalis grandicalyx* B.U.Oh & Y.S.Kim**, Korean J. Pl. Taxon. 17: 21, 1987.

Isotype: Korea, Gangwon-do, Pyeongchang-gun, Mt. Odae-san, 10 Apr. 1986, *B.U.Oh et al. 1986015* (NIBRVP358607).

**Note.** This specimen was transferred to KB from CBU. The holotype and the rest of the isotypes are preserved at KH.

**13. *Corydalis humilis* B.U.Oh & Y.S.Kim**, Korean J. Pl. Taxon. 17: 24, 1987.

Isotype: Korea, Gyeonggi-do, Gapyeong-gun, Mt. Hyeondeung-san (Mt. Unaksan), 22 Apr. 1986, *B.U.Oh et al. 1986008* (NIBRVP358253); *B.U.Oh et al. 1986010* (NIBRVP358254); *B.U.Oh et al. 1986012* (NIBRVP358603).

**Note.** These specimens were transferred to KB from CBU. The holotype and the rest of the isotypes are preserved at KH.

**14. *Corydalis maculata* B.U.Oh & Y.S.Kim**, Korean J. Pl. Taxon. 17: 21, 1987.

Isotype: Korea, Gyeonggi-do, Namyangju-gun, Cheonmasan, 2 May 1986, *B.U.Oh 1986002* (NIBRVP358606).

**Note.** This specimen was transferred to KB from CBU. The holotype and the rest of the isotypes are preserved at KH.

**15. *Corydalis misandra* B.U.Oh**, Korean J. Pl. Taxon. 36: 138, 2006.

Isotype: Korea, Gyeonggi-do, Gwangju-si, Namhansanseong, 9 Apr. 2005, *B.U.Oh 2005002* (NIBRVP358237); *B.U.Oh 2005003* (NIBRVP358238); *B.U.Oh 2005014* (NIBRVP358236).

Paratype: Korea, Gyeonggi-do, Namyangju-si, Cheonmasan, 22 Apr. 2006, *H.J.Choi 060422-007* (NIBRVP358240); *H.J.Choi 060422-009* (NIBRVP358242); *H.J.Choi 060422-008* (NIBRVP358243); Pocheon-si, Jijangbong, 22 Apr. 2006, *H.J.Choi 060422-013* (NIBRVP358241); Yangpyeong-gun, Nojeokbong, 9 Apr. 2005, *B.U.Oh 050409-001* (NIBRVP358239); Gangwon-do, Hwacheon-gun, Gwangdeoksan, 9 Apr. 2005, *H.J.Choi 050409-006* (NIBRVP358244).

**Note.** These specimens were transferred to KB from CBU. The rest of the isotypes and the paratypes are preserved at KH.

**16. *Corydalis namdoensis* B.U.Oh & J.G.Kim**, Korean J. Pl. Taxon. 34: 266, 2004.

Isotype: Korea, Kyongsangbuk-do, Kunwi-gun, Mt. Seonam-san, 13 Apr. 2002, *B.U.Oh et al. 2002005* (NIBRVP358604); *B.U.Oh et al. 2002006* (NIBRVP358605).

**Note.** This specimen was transferred to KB from CBU. The holotype, the rest of the isotypes, and the paratypes are preserved at KH.

## **Begoniaceae**

**17. *Begonia myanmarica* C.I.Peng & Y.D.Kim**, Bot. Stud. 58-21: 2, 2017.

Isotype: Myanmar, Sagaing Region, Alangdaw Kathapa National Park, 20 Mar. 2016, *C.I.Peng 23566* (NIBRVP655700).

**Note.** The holotype is preserved at RAF, and the other isotype specimen is preserved at HAST.

## Brassicaceae

**18. *Rorippa apetala* Y.Y.Kim & B.U.Oh**, Korean J. Pl. Taxon. 40: 84, 2010.

Isotype: Korea, Gangwon-do, Wonju-si, Jijeong-myeon, Anchang-ri, Seomgang, 2 Jun. 2009, *B.U.Oh & Y.Y.Kim Wonju (Seomgang)-090602-002* (NIBRVP358227); *B.U.Oh & Y.Y.Kim Wonju (Seomgang)-090602-003* (NIBRVP358228).

Paratype: Korea, Gangwon-do, Wonju-si, Jijeong-myeon, Anchang-ri, Seomgang, 1 Jul. 2008, *B.U.Oh & Y.Y.Kim Wonju (Seomgang)-080701-002* (NIBRVP358224), 3 sheets; *B.U.Oh & Y.Y.Kim Wonju (Seomgang)-080701-003* (NIBRVP358225), 2 sheets; *B.U.Oh & Y.Y.Kim Wonju (Seomgang)-080701-004* (NIBRVP358226).

**Note.** These specimens were transferred to KB from CBU. The holotype, the rest of the isotypes, and the paratypes are preserved at KH.

## Primulaceae

**19. *Lysimachia quelpaertensis* K.-H.Tae & J.S.Lee**, Korean J. Pl. Taxon. 40: 109, 2010.

Holotype: Korea, Jeju, Seogwipo-si, Sanghyo-dong, Donnaeko Valley, 4 Jul. 2009, *K.H.Tae & S.H.Hwang JMY2009-00001* (NIBRVP290858).

Isotype: Korea, Jeju, Seogwipo-si, Sanghyo-dong, Donnaeko Valley, 4 Jul. 2009, *K.H.Tae & S.H.Hwang JMY2009-00002* (NIBRVP290859).

## Saxifragaceae

**20. *Chrysosplenium aureobracteatum* Y.I.Kim & Y.D.Kim**, Novon 23: 432, 2015.

Isotype: Korea, Gangwon-do, Hwacheon-gun, Sanae-myeon, Gwangdeok-ri, Mt. Gwangdeok, near Gwangdeok valley stream, 16 Apr. 2009, *KYI-2009013* (NIBRVP655697).

**Note.** The holotype and the other isotype are preserved at HHU.

## Melastomataceae

**21. *Sonerila bokorensis* S.H.Cho & Y.D.Kim**, Phytotaxa 222: 295, 2015.

Isotype: Cambodia, Krong Kampot, Phnum Bokor National Park, near Bokor Hill Station, 20 Oct. 2010, *S.H.Cho, J.H.Lee, C.Phourin & Y.D.Kim CB-1730* (NIBRVP655696).

**Note.** The holotype is preserved at HHU.

## Vitaceae

**22. *Cissus erecta* S.H.Cho & Y.D.Kim**, Phytotaxa 260: 291, 2016.

Holotype: Myanmar, Mandalay, Mt. Popa, Popa Mountain Park, 23 Jul. 2015, *S.H.Cho, J.H.Lee, D.H.Kang & Y.D.Kim MM-5057* (NIBRVP655698).

**Note.** The isotypes are preserved at HHU, K, and RAF.

## Balsaminaceae

**23. *Impatiens bokorensis* S.H.Cho & B.Y.Kim**, Phytokey 77: 34, 2017.



Isotype (?): Cambodia, Krong Kampot, Phnum Bokor National Park, 16 Nov. 2015, *S.H.Cho, B.Y.Kim, H.S.Park & C.Phourin CB-3432* (NIBRVP655699).

**Note.** The holotype is preserved at HHU, and the rest of the isotypes are preserved at KRIB and RUPP. The specimen (NIBRVP655699) in KB was known as the isotype of this taxa, but the collection date was different from that of the holotype. Thus, we consider that this specimen (NIBRVP655699) is neither the isotype nor any other nomenclatural types. It is regarded as type material of *I. bokorensis*.

## Apiaceae

### 24. *Angelica reflexa* B.Y.Lee, J. Pl. Res. 2: 245, 2013.

Holotype: Korea, Gangwon-do, Inje-gun, Seohwa-myeon, Seohwa-ri, Mt. Daeam, 19 Sep. 2009, *B.Y.Lee 090919-11* (NIBRVP298527), 3 sheets.

Isotype: Korea, Gangwon-do, Inje-gun, Seohwa-myeon, Seohwa-ri, Mt. Daeam, 19 Sep. 2009, *B.Y.Lee 090919* (NIBRVP298528), 3 sheets; *B.Y.Lee 090919* (NIBRVP298529), 2 sheets; *B.Y.Lee 090919* (NIBRVP354309), 4 sheets.

Paratype: Korea, Gangwon-do, Inje-gun, Seohwa-myeon, Seohwa-ri, Mt. Daeam, 23 Oct. 2009, *B.Y.Lee 091023* (NIBRVP354215), 2 sheets; 6 Aug. 2011, *B.Y.Lee 110806* (NIBRVP354311), 3 sheets; Pyeongchang-gun, Daegwallyeong-myeon, Seonja valley, 25 Sep. 2011, *B.Y.Lee 110925* (NIBRVP354314), 2 sheets.

**Note.** One sheet (NIBRVP354309) of the isotypes has a date error; “19 Sep. 2011” should be replaced with “19 Sep. 2009”.

### 25. *Sium ternifolium* B.Y.Lee & S.C.Ko, Korean J. Pl. Taxon. 39: 130, 2009.

Isotype: Gangwon Prov., Mt. Chiak-san, Guryong-sa ~ Seryeom-pokpo, 20 Aug. 2009, *S.C.Ko 064186* (NIBRVP358609).

**Note.** The holotype is preserved at HNHM, and isotypes are preserved at HNHM and KH.

## Scrophulariaceae

### 26. *Melampyrum koreanum* K.-J.Kim & S.-M.Yun, Phytotaxa 42: 48, 2012.

Isotype: Gyeongsangnam-do, Tongyeong-si, Hansan-myeon, Somaemuldo, 17 Oct. 2008, *S.M.Yun 2008-1561* (NIBRVP358608).

**Note.** The holotype is preserved at KUS, and the rest of the isotypes are preserved at KUS and MO. The name of the collector on the label of the isotype specimen (S.M.Yun) differs from that in the protologue (K.-J.Kim & S.M.Yun). We recorded the information of the isotype specimen.

## Orobanchaceae

### 27. *Orobanche filicicola* Nakai ex J.O.Hyun, Y.S.Lim & H.Shin, Novon 13: 64, 2003.

Isotype: Korea, Chunnam: ca. 1 km N of the Office of National Parks Authority at Mt. Baikyang, along roadside, running parallel with the Hwangryong River, Changsung-Gun, 4 Jun. 1999, *J.O.Hyun 1999*.

**Note.** This specimen was transferred to KB from AJOU. The holotype and the other isotype specimens are preserved at SNU.

## Linnaeaceae

### 28. *Zabelia densipila* M.-P.Hong, Y.-C.Kim & B.Y.Lee, J. Sp. Res. 1: 1, 2012.

Holotype: Korea, Gangwon-do, Yeongwol-gun, Yeongwol-eup, Geoun-ri, Gilungol, Dong river, 18 Apr. 2009, *M.P.Hong & Y.C.Kim 2K9-00181* (NIBRVP353208).

Isotype: Korea, Gangwon-do, Yeongwol-gun, Yeongwol-eup, Geoun-ri, Gilungol, Dong river, 18 Apr. 2009, *M.P.Hong & Y.C.Kim 2K9-00181* (NIBRVP353207).

Paratype: Korea, Gangwon-do, Pyeongchang-gun, Pyeongchang-eup, Dasu-ri, 20 Sep. 2009, *Y.C.Kim VP-KOBG-2K9-0195* (NIBRVP353204); *Y.C.Kim VP-KOBG-2K9-0196* (NIBRVP353205).

**Note.** The specimen (NIBRVP353206) in KB was labeled as the “paratype” of *Z. densipila*. However, this specimen is not the paratype, because the information of the specimen was not recorded in the protologue. It is regarded as type material of *Z. densipila*.

## Asteraceae

**29. *Aster pseudoglehnii* Y.S.Lim, J.O.Hyun & H.Shin**, J. Pl. Biol. 48: 479, 2005.

Isotype: Korea, Kyungbuk, Ulleung Island, near a road along the foot of mountain, ca. 300 m NE of Seokmundong, Namyang-ri, Seomyeon, 5 Oct. 2002, *Y.S.Lim 2002002*.

**Note.** This specimens was transferred to KB from AJOU. The holotype and the rest of the isotypes are preserved at SNU.

## Zosteraceae

**30. *Zostera geojeensis* H.Shin, K.H.Cho & Y.S.Oh**, Algae 17: 71, 2002.

Holotype: Korea, Gyeongnam, Geoje City, Nambu-myun, Dadae port, 9 Jun. 1997, *H.Shin, K.H.Cho & Y.S.Oh 97054* (NIBRVP720424).

Isotype: Korea, Gyeongnam, Geoje City, Nambu-myun, Dadae port, 9 Jun. 1997, *H.Shin, K.H.Cho & Y.S.Oh 97054* (NIBRVP720425).

**Note.** These specimens were transferred to KB from AJOU. The rest of the isotypes are preserved at SNU.

## Liliaceae

**31. *Polygonatum infundiflorum* Y.S.Kim, B.U.Oh & C.G.Jang**, Korean J. Pl. Taxon. 28: 210, 1998.

Isotype: Korea, Prov. Kyonggi-do, Ahansan-shi, Is. Pungdo, 11 May 1996, *B.U.Oh et al. 96004* (NIBRVP358235); *B.U.Oh et al. 96011* (NIBRVP358234).

**Note.** This specimen was transferred to KB from CBU. The holotype and the rest of the isotypes are preserved at KH.

## Orchidaceae

**32. *Calanthe insularis* S.H.Oh, H.J.Suh & C.-W.Park**, Phytotaxa 218: 69, 2015.

Holotype: Korea, Jeollanam-do, Sinan-gun, Heuksan-myeon, Is. Gageo, 18 May 2013, *H.J.Suh 5580* (NIBRVP647413), 3 sheets.

**Note.** The isotypes are preserved at BH and TUT.

**33. *Calanthe rubra* S.H.Oh, H.J.Suh & C.-W.Park**, Phytotaxa 218: 75, 2015.

Holotype: Korea, Jeollanam-do, Sinan-gun, Heuksan-myeon, Is. Gageo, 18 May 2013, *H.J.Suh 5499* (NIBRVP647408).

## Appendix 1. Type specimens of invalidly published names in the National Institute of Biological Resources (KB)

### Cyperaceae

***Carex brevispicula* G.H.Nam & G.Y.Chung**, Ph.D. thesis, Andong Nat. Univ. 109, 2017.

Holotype: Korea, Jeollabuk-do, Jinan-gun, Seongsu-myeon, Jwapo-ri, Pungbyeollaengcheon, 13 May 2011, *G.H.Nam Carex201\_1* (NIBRVP291950).

Isotype: Korea, Jeollabuk-do, Jinan-gun, Seongsu-myeon, Jwapo-ri, Pungbyeollaengcheon, 13 May 2011, *G.H.Nam Carex201\_2* (NIBRVP619368), *G.H.Nam Carex201\_3* (NIBRVP619369).

**Note.** This scientific name was published in a thesis submitted to university; therefore, the name is an invalidly published name according to Art. 30.9 of the ICN (Turland *et al.* 2018). It is necessary to publish this name legitimately.

***Trichophorum dioicum* J.Jung & H.-K.Choi**, Novon 20: 289, 2010. [nom. superfl.]

Holotype: Korea, Gangwon-do, Jeonseon-gun, ca. 10 km SW of Jeonseon-eup, Elev. 320 m, Limestone cliff area at Donggang riverside, 17 Apr. 2008, *J.D.Jung 804020* (NIBRVP631358).

Isotype: Korea, Gangwon-do, Jeonseon-gun, ca. 10 km SW of Jeonseon-eup, Elev. 320 m, Limestone cliff area at Donggang riverside, 17 Apr. 2008, *J.D.Jung 804020* (NIBRVP631355).

Paratype: Korea, Gangwon-do, Jeonseon-gun, Limestone cliff area at Donggang riverside, 17 Apr. 2008, *J.D.Jung 0804015-1* (NIBRVP631365); 17 Apr. 2008, *J.D.Jung 0804016* (NIBRVP631379); 27 Jun. 2008, *J.D.Jung 0806046* (NIBRVP631373); 27 Jun. 2008, *J.D.Jung 0806045-1* (NIBRVP631377); Gangwon-do, Jeonseon, 5 Apr. 2006, *Y.N.Lee s.n.* (NIBRVP187061, NIBRVP187062, NIBRVP187063).

**Note.** These specimens were transferred to KB from AJOU, and KPRI. This scientific name is a superfluous name of *Trichophorum polygamum* D.C.Son & K.S.Chang (Son *et al.* 2017, 2019). Three specimens (NIBRVP187061, NIBRVP187062, NIBRVP187063) of KPRI might be the original materials of *Neoscirpus dioicus* Y.N.Lee & Y.C.Oh., however the labels of those specimens do not accurately match the protologue (Lee & Oh 2006) for collectors, and sites.

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