



## A new species of *Juncus* (Juncaceae): *J. baekdusanensis* M. Kim

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## 골풀속(골풀과)의 신종: 김의골풀(*Juncus baekdusanensis* M. Kim)

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**ABSTRACT:** A new species, *Juncus baekdusanensis* M. Kim (Juncaceae), has been named and described from Mt. Baekdu of the Korean peninsula. *Juncus baekdusanensis* shares several characters (terete leaf blades with leaf sheath auricles, between 1 and 2 flowered inflorescences, and 2 bracteoles) with its related species *J. tenuis* Willd. It is, however, distinct from *J. tenuis* which have 1-flowered inflorescences, green perianth, lanceolate perianth segments, acuminate perianth apices, small capsules, and lowland grassland habitats by having 2-flowered inflorescences, reddish green perianth, ovate perianth segments, acute perianth apices, large capsules, and highland swamp habitats.

**Keywords:** *Juncus baekdusanensis*, Juncaceae, Mt. Baekdu

**적 요:** 백두산에서 골풀속의 신종인 김의골풀(*Juncus baekdusanensis* M. Kim)을 새로이 발견하여 기재하였다. 김의골풀은 엽초를 가진 잎을 가지며 1-2개의 꽃으로 이루어진 화서를 가지고 있고 2개의 막질 소포를 가진 점에서 길골풀(*J. tenuis* Willd.)과 유사하다. 그러나 김의골풀은 2개의 꽃으로 이루어진 화서, 적녹색의 막질상 화피, 난형의 화피, 예두의 화피열편, 화피보다 커다란 삭과, 고지대의 늪지에서 자라는 특징이 있다. 반면에 길골풀은 1개의 꽃으로 이루어진 화서, 녹색의 강직한 화피, 장피침형의 화피, 점첨두의 화피열편, 화피보다 작은 삭과, 저지대의 초지에서 자라는 점에서 뚜렷하게 차이를 보인다.

**주요어:** 김의골풀, 골풀과, 백두산

The genus *Juncus* L. (Juncaceae) consists of approximately 240 species and is found in temperate and cold regions (Wu and Clemants, 2000).

The genus *Juncus* is characterized by laterally compressed or terete leaves, bisexual flowers, 6 perianth segments, and 3-locular capsules (Wu and Clemants, 2000; Oh and Lee, 2007). Eighteen taxa of *Juncus* are reported from Korea (Lee, 1980; Oh and Lee, 2007). Of 18 taxa, *J. effusus* L. and *J. krameri* Fr. et Sav. are a popular occurrence in Korea, while *J. maximowiczii* Buchen. and

*J. fauriei* Lev. & Vaniot are rather rare and sporadically distributed (Lee, 1980; Kim et al., 2012; Kim and Kim, 2013).

Mt. Baekdu (Baekdusan) is an active volcano and the highest mountain (2,744 m) on the Korean peninsula and in Manchuria (Lee, 1991; Lee et al., 2013). Mt. Baekdu contains about 1,500 species of vascular plants, of which 11 angiosperms are endemic (Kim, 2004).

In 2013, the authors first discovered *Juncus baekdusanensis* M. Kim on Mt. Baekdu. It forms a large population of two thousand organisms at 1,700 m altitude on Mt. Baekdu. The species shares several characters with its related taxa *J. tenuis* Willd., but it can be distinguished based on its 2-flowered inflorescences, reddish green perianth, ovate perianth segments, acute perianth apices, large capsules, and highland swamp habitats.

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*Juncus baekdusanensis* M. Kim sp. nov. (Figs. 1-3)

**Korean name:** Gim-ui-gol-pul 김의골풀

Plants perennial, tufted. Rhizome horizontal. Stems terete, 15-50 cm. Leaves basal and cauline, leaf sheath auricles 1.5-4.5 mm, leaf blade terete, 7-15 cm × 0.5-1 mm. Inflorescences terminal, 7-10 cm, 2-flowers in capitate clusters. Involucral bracts 1, leaflike, 1-5.5 cm. Bracteoles 2, ovate. Perianth segments 6, reddish green, ovate, 3.5-4.0 × 1.0-1.5 mm, margin white scarious, apex acute. Stamens 6, filaments 2-2.4 mm, anther ca. 0.5 mm. Ovary ca. 2 mm, style ca. 0.7 mm, stigma 3-branched. Capsule ovoid, 4.0-5.5 mm, longer than perianth. Fl. July, fr. August.

**Type Locality:** Mt. Baekdu.

**Holotype:** Mt. Baekdu. July 10, 2014. M. Kim 20140321. Herbarium of Chonbuk National University (JNU).

**Isotypes:** JNU, KH.

**Paratypes:** Mt. Baekdu. August 5, 2014. M. Kim 20140345-20140348 JNU.



**Fig. 1.** *Juncus baekdusanensis* M. Kim. A. Adult plant; B. Flowers; C. Stamens and pistil; D. Fruits; E. Seed.

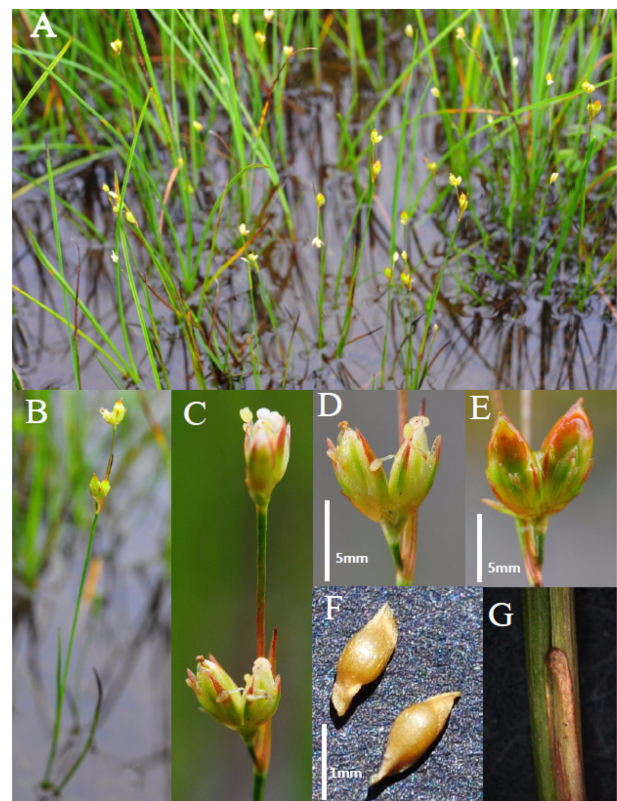
**Distribution:** Mt. Baekdu

**Etymology:** The specific epithet is derived from Mt. Baekdu (Baekdusan) where this new species is located. The Korean name, Gim-ui-gol-pul, comes from general Jwajin Kim who fought against the Japanese army in this area for Korean independence.

**Habitats:** The natural habitat of *Juncus baekdusanensis* M. Kim was found in the highland swamps on Mt. Baekdu. This species occurs in swamps dominated by *Rhynchospora alba*, *Andromeda polifolia*, *Oxycoccus microcarpus*, *Oxycoccus quadripetalus*, *Drosera rotundifolia*, *Scheuchzeria palustris*, *Parnassia palustris*, and *Lobelia sessilifolia*.

**Key to *Juncus baekdusanensis* and its related taxa.**

1. Inflorescences pseudolateral
  2. Stamens 3
    3. Perianth segments unequal ..... *J. effusus* 골풀
    3. Perianth segments equal ... *J. setchuensis* 푸른갯골풀
  2. Stamens 6 ..... *J. haenkei* 갯골풀
1. Inflorescences terminal
  4. Herbs annual ..... *J. bufonius* 애기골풀



**Fig. 2.** Photographs of *Juncus baekdusanensis* M. Kim at the natural habitat in Mt. Baekdu. A. Habitat; B. Adult plant; C. Inflorescence; D. Flowers; E. Fruits; F. Seeds; G. Leaf sheath.



Fig. 3. Holotype of *Juncus baekdusanensis* M. Kim.

Table 1. Comparison of morphological characters between *Juncus baekdusanensis* M. Kim and *J. tenuis* Willd.

Characters	<i>J. baekdusanensis</i>	<i>J. tenuis</i>
Habits	perennial	perennial
Habitat	swamps	grasslands
Plant height	15-50 cm	10-40 cm
Cauline leaf sheath	1.5-4.5 mm	2-4 cm
Cauline leaf blade shape	terete	terete
Cauline leaf blade length	7-15 cm	4-23 cm
Inflorescences	terminal	terminal
Involucral bract	1-5.5 cm	4-18 cm
Flowers in capitate cluster	2-flowers	1-flower
Bracteoles	2	2
Perianth segment color	reddish green	green
Perianth segment number	6	6
Perianth segment apex	acute	acuminate
Perianth segment shape	ovate	lanceolate
Perianth segment length	3.5-4.0 mm	3.0-3.5 mm
Perianth segment width	1.0-1.5 mm	0.7-1.0 mm
Stamens	6	6
Stigma	3-branched	3-branched
Capsule length	4.0-5.5 mm	2.0-2.5 mm
Capsule	longer than perianth	shorter than perianth
Seed length	1.2-1.4 mm	0.4-0.5 mm

- 4. Herbs perennial
- 5. 1- or 2-flowers in capitate clusters
- 6. 1-flower in capitate cluster, green perianth, lanceolate perianth segments, acuminate perianth apex, small capsule
- 7. Involucral bract longer than inflorescence  
..... *J. gracillimus* 물골풀
- 7. Involucral bract shorter than inflorescence  
..... *J. tenuis* 길골풀
- 6. 2-flowers in capitate cluster, reddish green perianth, ovate perianth segments, acute perianth apex, large capsule ..... *J. baekdusanensis* 김의골풀
- 5. Few to many flowers in capitate clusters
- 8. Leaf blade septate
- 9. Leaf blade incompletely septate, stem winged
- 10. Stamens 6, stems broadly winged  
..... *J. alatus* 날개골풀
- 10. Stamens 3, stems narrowly winged  
..... *J. diastrophanthus* 별날개골풀
- 9. Leaf blade completely septate, stem wingless
- 11. Stamens 6
- 12. Perianth segments dark brown  
..... *J. triceps* 설령골풀

- 12. Perianth segments green  
..... *J. krameri* 비녀골풀
- 11. Stamens 3
- 13. Capsule apex tapered into a short beak  
..... *J. wallichianus* 눈비녀골풀
- 13. Capsule apex acute or acuminate  
..... *J. papillosus* 청비녀골풀
- 8. Leaf blade not septate
- 14. Leaves all basal ..... *J. triglumis* 구름골풀
- 14. Leaves basal and cauline
- 15. Capsule 4.5-5 mm ... *J. maximowiczii* 실비녀골풀
- 15. Capsule 3.5-3.7 mm ..... *J. potaninii* 백두실골풀

By applying the IUCN Red List criteria (IUCN, 2011), *Juncus baekdusanensis* M. Kim will be evaluated as a category of Endangered (EN) species, because of its only one population of two thousand organisms found in Mt. Baekdu.

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