**Two new taxa of *Allium* (Alliaceae) from Korea:
A. koreanum H.J. Choi et B.U. Oh and *A. thunbergii* var.
teretifolium H.J. Choi et B.U. Oh**

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Here we described and illustrated two new taxa of *Allium* (Alliaceae) from southern part of Korea. One new species, *A. koreanum* H. J. Choi et B. U. Oh was clearly distinguished from *A. splendens* of sect. *Reticulato-bulbosa* by larger and stellately spreading pale pink perianth, apparently exsert filaments, and conical stigma as well as chromosome number. Another new variety, *A. thunbergii* var. *teretifolium* H.J. Choi et B.U. Oh was also easily distinguished from its relatives, var. *thunbergii* and var. *deltoides* by terete and hollow leaf blade. Keys to the two species of *Allium* sect. *Reticulato-bulbosa* and the three varieties of *A. thunbergii* (sect. *Sacculiferum*) in Korea were described.

Keywords: *Allium*, new species, *A. koreanum*, new variety, *A. thunbergii* var. *teretifolium*

The genus *Allium* L., which traditionally belongs to the tribe Allieae under the Liliaceae (Bentham & Hooker, 1883; Vvedenskii, 1935; Lawrence, 1951; Xu, 2000), but recent many authors generally have placed this genus in its own family Alliaceae (Dahlgren *et al.*, 1985; Takhtajin, 1997; Rahn, 1988). Over 700 species of this genus are widely distributed in N Hemisphere, especially in the temperate regions of Eurasia, and also growing in S Hemisphere such as Africa and Central and South America (Hutchinson, 1959; Ohwi,

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1984; Rahn, 1988; Takhtajin, 1997; Xu, 2000). Among these, about 21 taxa except cultivated ones have been known from Korea (Choi, 2004). Especially, in recent studies, *A. linearifolium* and *A. longistylum* were added as a new endemic and an unrecorded species respectively (Choi & Oh, 2003; Choi *et al.*, 2003).

In the present study, we described and illustrated two new taxa of *Allium* from southern part of Korea. One new species, *A. koreanum* H.J. Choi et B.U. Oh was obviously separated from *A. splendens* of sect. *Reticulato-bulbosa*, and another new variety, *A. thunbergii* var. *teretifolium* H.J. Choi et B.U. Oh was easily distinguished from its relatives, var. *thunbergii* and var. *deltoides*.

Allium koreanum H.J. Choi et B.U. Oh, sp. nov. (Figs. 1, 3)

Holotype: Korea. Jeollabuk-do, Jinan-gun, Maisan, Ammaibong, open slope of rocky area, 650~660m, 16 August 2002, 020077 (CBU).

Isotypes: 020078 to 020085 (CBU).

Paratypes: 0022896 (KWNU); 009100 (HNHM).

Herba bulbi tunicis reticulato-fibrosis. Bulbus ovoideus 7.7~12.7 mm diametro. Folia 3~8 linearia, solus 13.0~40.0 cm longa et 1.9~3.2 mm lata, petiolo 11.7~25.3 cm longo et vagina clausa membranacea. Scapus erectus 33.8~57.0 cm longus 1.3~2.3 mm diametro. Umbella floribus 20~120. Perianthii segmenta dilute rosea, ovata-elliptica, apice obtusa, 4.0~5.3 mm longa. Stamina filamenta 6.0~8.4 mm longa exserta. Ovarium roseum basi nectariis 3. Capsula 3.7~4.7 mm longa et 4.2~4.3 mm lata.

Herbs hermaphroditic. Rhizomes more or less erect, 2.5~10.0mm long. Bulbs usually paired, cylindrically ovoid, without bulblets, 7.7~12.7mm in diam.; tunics reticulate, light brown to grayish brown. Leaves 3~8; leaf sheaths exposed over ground, 12~25cm high, striped green; leaf blades curved, linear, flat, 13~40cm long, 1.9~3.2mm wide, solid and with 2-rowed vascular bundles in cross-section, sessile at base, acute in apex. Scapes terminal from bulbs, terete, erect before flowering, solid in cross-section, 34~57cm long, 1.3~2.3mm wide. Inflorescences umbel, hemiglobose, 16.9~36.4mm high, 20.3~37.7mm wide, without bulblets, 20~120 flowered; pedicels terete, equal in length, 5.9~11.0mm long,

Fig.1. *Allium koreanum*(020077, CBU).

1. Habit 2. Flower 3. Tepal and filament arrangement 4, 5. Cross-section shapes of leaf blade(Upside: Abaxial, VB: Vascular bundles) 6. Pistil 7. Capsule 8. Seed.

thinner than the scapes; bracts 5.1~6.8mm long. Flowers bisexual; perianths stellately spreading, pale pink, inner tepals longer than outer ones, ovately elliptical, obtuse at apex, 4.8~5.3mm long, 2.5~2.8mm wide; outer tepals ovately elliptical, obtuse at apex, 4.0~4.6mm long, 2.4~2.5mm wide; anthers 1.5~1.6mm long; filaments longer than the tepals, 6.0~8.4mm long, 1~4-toothed at base; ovary obovoid, pink, with hood-like projections at base, 2.0~2.2mm long, 1.8~1.9mm wide, locules 3, ovules 2 per locule; style 1, erect, terete, exsert; stigma conical. Capsules subglobose, 3.7~4.7mm long, 4.2~4.3mm wide. Seeds black, semi-ellipsoid, 4.0~4.3mm long, 2.0~2.1mm wide. Chromosome number $2n=16$.

Korean name: Dol-bu-chu (돌부추: Yu *et al.*, 1981a)

Flowering Jul. to Aug.

Distribution: Endemic to Korea.

Korea: Jeollabuk-do; Maisan, Minjujisan. Gyeongsangnam-do; Jaeaksan, Sinbulsan, Bulmosan.

A. koreanum had been misidentified as *A. splendens* of sect. *Reticulato-bulbosa* (Yu *et al.*, 1981a; Lee, 1996; Woo, 2000), but the former was clearly distinguished from *A. splendens* s.l. which was widely distributed in NE Asia by larger and stellately spreading pale pink perianth, apparently exsert filaments, and conical stigma. Especially, this new taxon proved to be diploid in chromosome number ($2n=2x=16$; Fig. 3-5), whereas *A. splendens* s.s. from N Korea was tetraploid ($2n=4x=32$; Choi, 2004). From these respects, we treated the new taxon as a distinct species in this work. In addition, the distribution range of *A. koreanum* was very limited. It was found only in the southern part of Korea. In habitats, this species occurred in open slope of rocky areas in a state of scattered or locally congregative population. In contrast, *A. splendens* s.l. was known from sunny forests, scrub and meadows of Mongolia, NE Russia, China, Japan and N Korea (Vvedenskii, 1935; Xu, 2000; Choi, 2004). Therefore, *A. koreanum* was thought to be endemic to Korea. The two species of *Allium* sect. *Reticulato-bulbosa* in Korea could be easily separated by the following key.

Key to the species of *Allium* sect. *Reticulato-bulbosa* in Korea

1. Perianths stellately spreading, pale pink, shorter than filaments; inner tepals 4.8~5.3mm long, 2.5~2.8mm wide; outer ones 4.0~4.6mm long, 2.4~2.5mm wide; anthers 1.5~1.6mm long; filaments 6.0~8.4mm long; ovary pink, 2.0~2.2mm long, 1.8~1.9mm wide; stigma conical; $2n=16$ *A. koreanum*
1. Perianths campanulate, reddish lilac, longer to slightly shorter than filaments; inner

tepals 4.3~4.6mm long, 1.7~1.9mm wide; outer ones 3.5~4.3mm long, 1.3~1.7mm wide; anthers 1.0~1.2mm long; filaments 4.3~4.9mm long; ovary green, 1.7~1.8mm long, 1.6~1.7mm wide; stigma capitate; $2n=32$ *A. splendens*

***Allium thunbergii* var. *teretifolium* H.J. Choi et B.U. Oh, var. nov. (Fig. 2)**

Holotype: Korea, Jeollabuk-do, Muju-gun, Deogyusan, Hyangjeokbong, slope of rocky area, 1,600~1,610m, 7 October 2002, 020068 (CBU).

Isotypes: 020086 to 020090 (CBU).

Paratypes: 0022801 (KWNU); Jeollabuk-do, Deogyusan, ?, s.n. (KNU); Jeollanam-do, Jirisan, 29 Sep. 1966, T.B. Lee & M.Y. Cho, s.n. (SNUA).

Bulbus ovoideus 6.0~10.7 mm diametro. Folia 2~5 linearia teretia fistulosa 17.7~45.5 cm longa et 1.2~3.1 mm lata, petiolo 4.5~13.8 cm longo, vagina clausa membranacea. Scapus erectus 15.7~38.7 cm longus, 1.0~2.1 mm diametro. Umbella floribus 8~43. Perianthii segmenta purpurea usque atro-purpurea, ovata-elliptica usque ovata, apice obtusa usque rotundata, 5.0~6.4 mm longa. Stamina filamenta 7.5~9.8 mm longa exserta. Ovarium viride, basi nectariis 3. Capsula 4.2~5.3 mm longa et 4.8~5.7 mm lata.

Herbs hermaphroditic. Rhizomes short, erect, 2.3~5.0mm long. Bulbs solitary to clustered, ovoid without bulblets, 6.0~10.7mm in diam.; tunics papery to subfibrous, blackish brown. Leaves 2~5; leaf sheaths buried under ground, 5~14cm high, striped; leaf blades ascending, linear, terete, 18~46cm long, 1.2~3.1mm wide, hollow in cross-section, sessile and pale green at base, tapered at apex. Scapes terminal from bulbs, terete, erect before flowering, solid in cross-section, 16~39cm long, 1.0~2.1mm wide. Inflorescences umbel, subglobose, 18.0~29.8mm high, 20.6~41.6mm wide, without bulblets, 8~43 flowered; pedicels terete, equal in length, 8.4~14.9mm long, thinner than the scapes; bracts 4.1~8.3mm long. Flowers bisexual; perianths campanulate, purple to dark purple, inner tepals longer than outer ones, ovately elliptical to oval, obtuse to rounded at apex, 5.9~6.4mm long, 3.4~3.8mm wide; outer tepals elliptical to oval, obtuse to rounded at apex, 5.0~5.8mm long, 2.5~3.0mm wide; anthers 1.6~1.8mm long; filaments longer than the tepals, 7.5~9.8mm long, entire or small 1-toothed at base; ovary obovoid, green, with hood-like projections at base, 3.3~3.7 mm long, 2.5~3.0mm wide, locules 3, ovules 2 per locule; style 1, erect, terete, exsert; stigma conical. Capsules obcordiform, trigonous, 4.2~5.3mm long, 4.8~5.7mm wide. Seeds black, semi-ellipsoid, 3.5~3.8mm long, 2.4~2.7mm wide. Chromosome number $2n=16$ (17).

Korean name: Dung-geun-san-bu-chu (둥근산부추)

Flowing Sep. to Oct.

Distribution: Endemic to Korea.

Korea: Jeollabuk-do; Deogyusan. Jeollanam-do; Jirisan.

A. thunbergii var. *teretifolium* had been recognized as *A. taquetii* of sect. *Sacculiferum* in Korea (Yu *et al.*, 1981a; Woo, 2000; Lee *et al.*, 2002). In this study, however, this new taxon proved to be more closely related with the *A. thunbergii* than *A. taquetii* by morphological characters such as the shape and the size of perianth. Moreover, it was easily distinguished from its relatives, var. *thunbergii* and var. *deltoides* by terete and hollow leaf blades. Thus, we treated this taxon as an additional variety of *A. thunbergii*, based on above mentioned characters and very restrictive distribution which was one of the important conditions in recognizing infraspecific taxon (Radford *et al.*, 1974). Besides, the phenomenon of aneuploidy which had been discussed as a driving force of the speciation of the genus *Allium* (Yu *et al.*, 1981b; Choi, 2004) was observed in this new variety. In biogeography, we regarded *A. thunbergii* var. *teretifolium* as a supplementary endemic taxon which was only known from the southern part of Korea. The three varieties of *A. thunbergii* in Korea could be easily separated by the following key.

Key to the varieties of *A. thunbergii* in Korea

1. Leaf blades flat, solid in cross-section var. *thunbergii*
1. Leaf blades angular or terete, hollow in cross-section.
 2. Leaf blades curved, angular var. *deltoides*
 2. Leaf blades ascending, terete var. *teretifolium*

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부추속(부추과)의 두 신분류군: 돌부추, 둥근산부추

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한국의 남부지방에서 발견된 부추속(부추과)의 새로운 두 분류군을 기재 및 도해하였다. 신종으로 처리된 돌부추(*A. koreanum* H.J. Choi et B.U. Oh)는 크기가 보다 크며, 별모양으로 완전히 벌어진 열은 분홍색의 화피, 현저하게 돌출된 화사, 그리고 원추형의 주두 및 염색체수 등의 특징으로 동북아시아에 널리 분포하는 돌부추절(sect. *Reticulato-bulbosa*)의 가는산부추(*A. splendens*)와 명확히 구분되었다. 또한 신변종으로 처리된 둥근산부추(*A. thunbergii* var. *teretifolium* H.J. Choi et B.U. Oh)는 원통형의 속이 비어있는 엽신 등의 특징으로 근연인 산부추(var. *thunbergii*) 및 세모산부추(var. *deltoides*)와 쉽게 구별되었다. 한국산 돌부추절의 두 종과 산부추(산부추절)의 세 변종에 대한 검색표를 제시하였다.

주요어: 부추속, 신종, 돌부추, 신변종, 둥근산부추

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