



## First record of *Ajuga nipponensis* Makino (Lamiaceae) from Korea

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### 한국산 조개나물속(꿀풀과)의 미기록 식물: 분홍꽃조개나물

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**ABSTRACT:** Five taxa of the genus *Ajuga* L. (Lamiaceae) were known previously in Korea which were mainly distributed in lowland and lower montane areas at 50-1000 m elevation. We report an unrecorded taxon of the genus *Ajuga* in Korea, namely *Ajuga nipponensis* Makino. This taxon was discovered at Is. Nok, Boryeong-si, in Chungcheongnam Province. *A. nipponensis* is found to be distributed along roadsides near villages of the island. *A. nipponensis* was distinguishable from other *Ajuga* in Korea by following combination of characters: Stems erect or procumbent, arranged in a dense cluster, corolla whitish-pale pink, 10-12 mm long. This taxon was named 'Bun-hong-kkot-jo-gae-na-mul' in Korean based on color of the corolla. The key to the genus *Ajuga* in Korea is also provided.

**Keywords:** Unrecorded, *Ajuga nipponensis* Makino, *Ajuga*, Lamiaceae

**적 요:** 한국의 조개나물속은 주로 해발 50-1000 m의 낮은 산지 또는 저지대에 분포하며 5분류군이 알려져 있다. 한국산 조개나물속의 미기록 식물로 *Ajuga nipponensis* Makino를 보고한다. 본 분류군은 충청남도 보령시 녹도의 마을 주변 길가에서 확인하였다. *A. nipponensis*는 직립하거나 기며, 줄기는 뿌리부터 여러 갈래로 나뉘며, 화통은 길이 10-12 mm, 연한 흰분홍색으로 한국산 조개나물속 다른 분류군들과 구분이 된다. 국명은 화통의 색깔을 고려하여, '분홍꽃조개나물'로 신칭하였다. 한국산 조개나물속 분류군에 대한 검색표를 제시하였다.

**주요어:** 미기록, 분홍꽃조개나물, 조개나물속, 꿀풀과

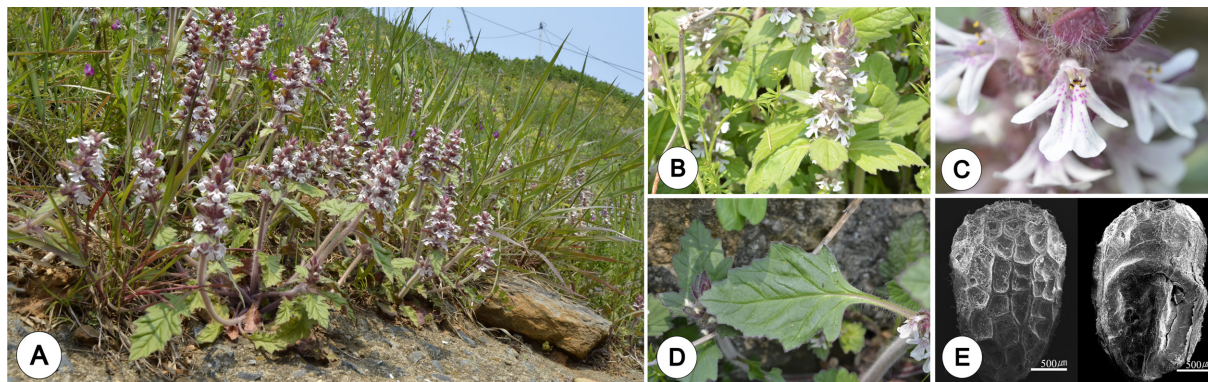
The family Lamiaceae is one of the largest Angiosperm families, comprising approximately 250 genera and more than 6,700 taxa distributed throughout the world, mostly in Mediterranean regions and Central Asia. In the flora of Korea, Lamiaceae are represented by a total of 65 taxa belonging to 26 genera (Suh et al., 2007).

The genus *Ajuga* L., herbaceous perennial plants, belong to Lamiaceae (Labiatae) and consist of approximately 50 taxa

distributed in regions of Eurasia (Li and Hedge, 1994). The genus can be distinguished from other Lamiaceae by the combination of reticulately sculptured mericarps, which separate late in development producing a prominent areole at the point of attachment (e.g. Fig. 1-E), and a persistent corolla base which often leaves a sheath around the mature mericarps (Harley et al., 2004).

Four taxa of *Ajuga* were recorded in Korea by Chung (1965), *Ajuga decumbens* Thunb. var. *decumbens* ('Geum-Chang-cho'), *A. multiflora* Bunge var. *multiflora* ('Jo-gae-na-mul'), *A. multiflora* Bunge f. *leucantha* T. B. Lee ('Huin-jo-gae-na-mul'), *A. spectabilis* Nakai ('Ja-ran-cho'). Additionally, the researchers

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**Fig. 1.** Photographs of *Ajuga nipponensis* Makino. A. Habitat; B. Inflorescences; C. Flowers; D. Leaf; E. Nutlet (left-dorsal view, right-ventral view).

(Lee, 1980; Lee, 1996; Lee, 2006) reported two taxa, *A. decumbens* Thunb. var. *rosa* Y. N. Lee ('Nae-jang-geum-Chang-cho'), and *A. multiflora* Bunge f. *rorea* Y. N. Lee ('Bulg-eun-jo-gae-na-mul'). However, *A. multiflora* f. *leucantha* T. B. Lee was described as an invalid name (Kim et al., 2005). Thus, a total of five taxa of *Ajuga* were recognized in Korea excluding invalidly published *A. multiflora* f. *leucantha* T. B. Lee. Although several infraspecific taxa of *A. multiflora* or *A. decumbens* were described by the earlier researchers, only three taxa at the species level (i.e., *A. decumbens*, *A. multiflora*, and *A. spectabilis*) were recognized in the genera of vascular plants of Korea (Suh et al., 2007). However, four taxa of the genus including *A. multiflora* were recognized at the national list of species of Korea (Lee et al., 2011). Because of uncertainty on species numbers and taxonomic delimitation of infraspecific levels, a detailed taxonomic investigation is urgently needed on the Korean *Ajuga* species.

With the exception of the above taxa, the second author of this paper has found an additional species, *A. nipponensis* Makino at the Is. Nok, Boryeong-si, in Chungcheongnam Province (N 36°16'12.26", E 126°15'55.81", alt. 14 m) in 2001.

This taxon was known to be distributed mainly in China, Japan, and Taiwan (Iwatsuki et al., 1995; Huang, 1998). *A. nipponensis* differs from other taxa of *Ajuga* by having prominent stem arranged in a dense cluster and villous; calyx ca. 4 mm long; corolla whitish-pale pink, (6-)10-12 mm long (Makino, 1909; Li and Hedge, 1994; Iwatsuki et al., 1995; Huang, 1998).

*A. nipponensis* was distributed along roadsides at village, together *Camellia japonica* L., *Duchesnea chrysantha* (Zoll. & Moritz) Miq., *Ilex crenata* Thunb., *Hedera rhombea* (Miq.) Bean, *Lamium amplexicaule* L., *Lilium lancifolium* Thunb., *Veronica persica* Poir., *Vicia amoena* Fisch. ex Ser.

The Korean name of *A. nipponensis* was given 'Bun-hong-kkot-Jo-gae-na-mul' based on color of corolla. Before more

detailed investigation on taxonomic delimitation of specific and infraspecific levels of the genus, we first reported four different species (*A. decumbens*, *A. spectabilis*, *A. multiflora*, and *A. nipponensis*) and two infraspecific taxa.

## Description

*Ajuga nipponensis* Makino, Bot. Mag. (Tokyo) 23: 67. 1909. Figs. 1-2.



**Fig. 2.** Voucher specimen of *Ajuga nipponensis* Makino in Korea.

**Korean name: Bun-hong-kkot-jo-gae-na-mul 분홍꽃조개나물**

**Herbs** perennial. **Rhizomes** short. **Stem** arranged in a dense cluster, erect or ascending, 16-35(-80) cm long, villous or pilose. **Leaves** cauline, abaxial purplish, adaxial green, petiole 1.0-4.1 cm long, narrowly winged, blades 2.1-7.5 × 1.2-4.5 cm, oblanceolate, lanceolate to elliptic, margin irregularly crenate to dentate, base cuneate, apex acute to obtuse, surface pilose; lower leaves occasionally absent at anthesis, upper leaves reduced to bracts. **Flowers** terminal verticillasters in many flowered or terminal spikes, bracts leaf-like, calyx 4-9 mm long, bilabiate, corolla whitish-pale pink, 10-12 mm long, upper lip ca. 1 mm long, lower lip ca. 3-5 mm long, 3-lobed. **Fruit** nutlets asymmetrical ovoid, ca. 2.3-2.6 mm long.

Flowering May to June; fruiting June to July

**Distribution:** China, Japan, Korea, Taiwan

**Examined specimens:** Is. Nok, Nokdo-ri, Ocheon-myeon, Boryeong-si, Chungcheongnam Province, Korea, 07 May 2013, Kim *et al.*, 7001-7012 (12 Sheets, KB); *ibid*, 08 Jul. 2013, Kim *et al.*-cultivated, 7013-7015 (3 Sheets, KB); *ibid*, 10 Jul. 2013, Kim *et al.*, 7016-7018 (3 Sheets, KB).

**Key to *Ajuga nipponensis* and related taxa in Korea.**

1. Plants prostrate; basal leaves in a rosette.
  2. Corolla purple or white
 

.....*A. decumbens* var. *decumbens* 금창초
  2. Corolla pink or pale red
 

.....*A. decumbens* var. *rosa* 내장금창초
1. Plants erect or ascending; leaves all cauline at anthesis.
  3. Stem arranged in a dense cluster
 

..... *A. nipponensis* 분홍꽃조개나물
  3. Stem nearly not arranged in a dense cluster.
    4. Plants glabrous; bracts not leaf-like
 

.....*A. spectabilis* 자란초
    4. Plants densely villous; bracts leaf-like
      5. Corolla purple or white
 

.....*A. multiflora* var. *multiflora* 조개나물
      5. Corolla pink or pale red
 

.....*A. multiflora* f. *rosea* 붉은조개나물

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