

## A recently introduced plantain species in Korea: *Plantago aristata* (Plantaginaceae)

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We reported that an alien species of Plantaginaceae, *Plantago aristata* Michx. from North America, grows at the Han-River estuary in Go-Yang City, Kyunggi Province. This species is easily distinguished from others in Korea by its linear leaves, cylindrical spikes with long linear bracts at base, and relatively large flowers of ca. 4–6 mm in diameter. We called the species as gin-po-ggot-jil-kyung-i as a local name. *Plantago aristata* is known to be very invasive and has been already introduced to Japan and China.

Key words: Introduced plant, Plantaginaceae, *Plantago aristata*, weed

The genus *Plantago* (Plantaginaceae) contains about 250 species worldwide (Mabberley, 1987). In Korea, five taxa including *P. asiatica* L., *P. major* L. var. *japonica* (Franch. & Sav.) Miyabe, *P. sibirica* Poir., *P. camtschatica* Cham. ex Link, and *P. depressa* Willd. are distributed as native plants (Kim, in press); most of these species are found disturbed places along roadside and in crop fields as weeds. In addition, *P. lanceolata* L. and *P. virginica* L. were introduced from Europe and North America, respectively. They have spread all over the country. In the United States, USDA treated the *P. lanceolata* with *P. aristata* Michx. as invasive weeds or noxious weeds (SWSS, 1998).

During a survey of Han River estuary, we found populations of *P. aristata*, a native plantain species of North America. The main objective of this paper is to report an establishment of *P. aristata* in Korea, which is presumably introduced from North America.

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## Materials and methods

Populations of *P. aristata* (Fig. 1) were first found in late June, 2004, at Han River estuary in Go-Yang City, Kyunggi Province, and its presence was re-confirmed in April, 2005 at the same site. The voucher specimens of *P. aristata* (D. U. Han 2-4; Fig. 2) from the above populations are deposited in Seoul National University Herbarium (SNU). For description of the species, we also observed other specimens of *P. aristata* collected from the United States by the first author.

## Description and comments

*Plantago aristata* Michx. Fl. Bor. Am. Vol. 1. 95, 1803.

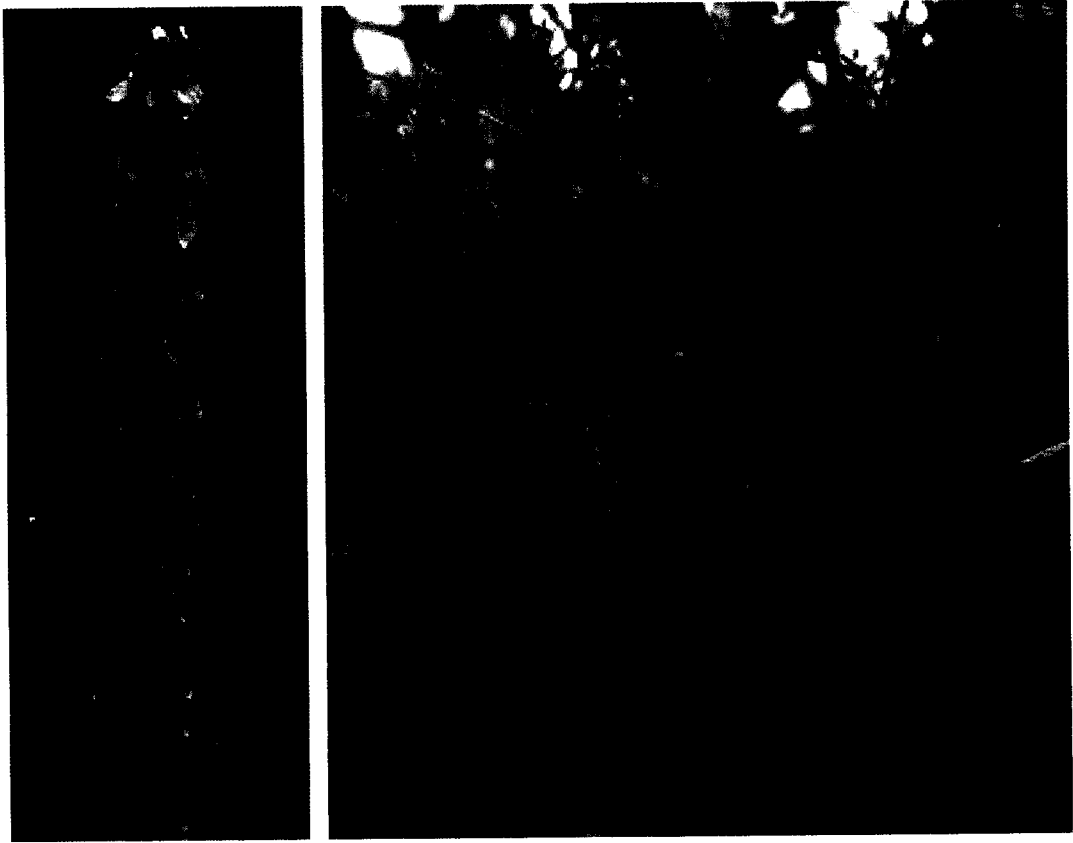
Korean name: Gin-Po-Ggot-Jil-Kyung-I (긴포꽃질경이)

Common names: bracted plantain; buckthorn

**Herbs** annual, rarely perennial, hermaphroditic, scapose, ca 25 cm tall. **Roots** taproot, elongate. **Scapes** ascending, rigid, pubescent with unicellular simple hairs ca. 1 mm long. **Leaves** linear, 9-20 cm long, 5-8 mm wide, more or less pubescent with unicellular simple hairs on both surfaces. **Inflorescences** spikes, cylindric, 10-15 cm long, 7-8 mm thick; bracts linear, lowest one ca. 3 cm long, progressively reduced upwards. **Flowers** bisexual; calyx 4 (2+2), narrowly oblong-ovate, rounded at apex; corolla lobes 4, white, red at base, ca. 2.5-3 mm long, suborbicular-ovate, spreading after anthesis; stamens 4; filaments less than 1 mm long; pistil 1; style ca 1 mm long, hairy. **Fruits** capsules, ca. 3.5 mm long, 1.5 mm wide. **Seeds** 2 per capsule, brown, elliptic, about 2.5 mm long, 1.3 mm wide.

**Distribution:** U. S. A. Native to Mississippi Valley from Illinois south to Texas, spread all over the United States; naturalized in Japan and China (Jiangsu and Shandong Provinces).

*Plantago aristata* was originally described from Illinois, U. S. A. by Michaux (1803) on the basis of its linear leaves, cylindrical spikes with long linear bracts at base, and relatively big flowers (Figs. 1, 2). The species is very invasive and spreads all over the United States; recently it is spread to Hawaiian Islands.



**Fig. 1.** *Plantago aristata* Michx. A, Inflorescence; B, Population established in Han-River estuary, Go-Yang City, Kyunggi Province, Korea. The arrow indicates its long linear bract, a characteristic feature of the species.

*Plantago aristata* was also introduced to some Asian countries including Japan and China. In Japan, the species is already established and listed as the established alien species (Ministry of the Environment, Japan, 2004). In China, it was first found in Qingdao, Shandong Province in 1929, becoming a widespread weed in Shandong Province and now also in Jiangsu Province (Zheng *et al.*, 1992; Xie *et al.*, 2001).

*Plantago aristata* has not been previously documented in Korea (Park, 1995, 2001; Park *et al.*, 2003; Bang, 2004). Currently, three populations of this species found only in a restricted area of Han River estuary in Korea, but it is highly likely that *P. aristata* would be spread to other areas rapidly. *Plantago aristata* can be distinguished from the other taxa of the genus in Korea as following:



**Fig. 2.** Voucher specimen of *Plantago aristata* Michx. collected from a population established at Han-River estuary, Go-Yang City, Kyunggi Province, Korea [D. U. Han 2 (SNU)].

1. Leaves lanceolate or linear
  2. Leaves lanceolate; bracts less than 2 mm long; style ca. 1cm long  
 ..... 1. *P. lanceolata*
  2. Leaves linear; bracts linear, 2-2.5 cm long; style less than 2 mm long  
 .....2. *P. aristata*
1. Leaves elliptic, oblong or ovate
  3. Leaves widely elliptic to ovate, abruptly narrowed to petiole; seeds 4-12 per capsule
    4. Scapes 10-50 cm long; seeds 4-6(-10) per capsule, dark brown  
 ..... 3. *P. asiatica*
    4. Scapes 0.5-1 m long; seeds 8-12 per capsule; pale brown  
 .....4. *P. major*
  3. Leaves oblong, tapered gradually to petiole; seeds 2 or 4 per capsule
    5. Seeds 2 per capsule ..... 5. *P. virginica*
    5. Seeds 4 per capsule
      6. Petiole 4-7 cm long ..... 6. *P. sibirica*
      6. Petiole 1-2 cm long or absent
        7. Calyx 2-2.5 mm long ..... 7. *P. camtschatica*
        7. Calyx less than 2 mm long ..... 8. *P. depressa*

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## 미기록 귀화식물: *Plantago aristata* (Plantaginaceae)

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질경이과의 *Plantago aristata* Michx.(국명신칭: 긴포꽃질경이)가 경기도 고양시 한강하구에 자라고 있는 것으로 처음 확인되었다. 이 귀화식물은 선형인 잎(길이 9-20 cm, 폭 5-8 mm), 긴 선형의 포(길이 약 2.5 cm), 큰 흰꽃(직경 4-6 mm)으로 다른 한반도 질경이속 식물들과 구별된다. 북미 원산인 본 종은 인근 국가인 일본과 중국에도 유입되어 퍼져나가고 있는 것으로 보고되어 있다. 확증표본은 서울대학교 석엽표본관(SNU)에 소장하였다.

주요어: 긴포꽃질경이, 미기록 귀화식물, 잡초, 질경이과

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