

Aster chusanensis (Asteraceae), a New Species from Korea

Yongseok Lim¹, Jin-O Hyun², Young-Dong Kim³, and Hyunchur Shin^{1*}

¹Department of Biology, Soonchunhyang University, Asan, Chungnam 336-745, Korea

²Institute of Northeast Asian Plant, Gangnam-Gu, Seoul 135-757, Korea

³Department of Life Science, Hallym University, Chunchon, Kangwon 200-702, Korea

***Aster chusanensis* is described and illustrated, and compared with its most closely related species, *A. pseudoglehni* and *A. spathulifolius*. This new species differs markedly from the latter two by its unequal inner and outer phyllaries, pubescent stem, leaves, and corolla tube, and ray florets partly in two series.**

Keywords: *Aster chusanensis*, Asteraceae, new species, Ullung Island, Korea

The flora of Ullung Island, a volcanic island in the East Sea between the Korean Peninsula and Japan, was first investigated by Nakai (1919), who reported 372 species of native vascular plants. Since then, many Korean taxonomists have re-investigated the flora, and have described several new species, including *Adenophora erecta* (Lee et al., 1997), *Viola woosanensis* (Lee and Kim, 1998), and *Aster pseudoglehni* (Lim et al., 2003). During a recent revision of genus *Aster* on Ullung Island, we found an undescribed species similar to *A. pseudoglehni* (Lim et al., 2003) and *A. spathulifolius* Maxim.

Aster chusanensis Lim, Hyun, Kim, & Shin sp. nov.
TYPE: Korea. Kyungpook. Ullung Island. Along the ridge road between Sadong and Dodong, Ullung-Eup, Ullung-Gun, N37° 28 33.3, E130° 53 51.0, 5 Oct 2002, *Lim 2002029* (Holotype SNU; Isotypes AJOU, SNU). Figure 1.

A. pseudoglehni et *A. spathulifolius* similis, sed in phyllarium inaequalis et in caulis, foliorum et tube corollae pubescens differt.

Herb, perennial, apically branched, 25-80 cm tall. Rhizomes short. Stems erect, terete, slightly articulate tomentose and stipitate glandular, 3-4 mm diameter. Leaves simple, alternate, petiole winged, 2- to 5-cm-long rosette leaves 3.5-7.0 cm long, densely tomentose and stipitate glandular, blade elliptic, obovate or broadly ovate, 1.0-3.5 cm long, 1-2 cm wide, base attenuate, margins with 2-4 pairs of serrations, apex acute lower leaves usually withering before anthesis; median leaves, 5-16 cm long, petiole winged 1.5-5.0 cm long, blade ovate or elliptic, 5-11 cm long, 3-7 cm wide, both surfaces strigose, stipitate glandular,

base attenuate, margins with 6-10 pairs of mucronate serrations, apex acute, densely strigose; petioles of upper leaves less than 1.5 cm long, broadly winged or leaves sessile, blade obovate or elliptic, 2.0-6.5 cm long, 0.6-3.5 cm wide, both surfaces densely strigose or slightly tomentose and stipitate glandular, base cuneate or attenuate, margins with 2-7 pairs of serrulations, apex acute. Inflorescences corymbose. Peduncles densely tomentose and stipitate glandular, bracts lanceolate or ovate, 3-15 mm long, 0.3-8.0 mm wide, apex acute, both surface densely tomentose and stipitate glandular. Heads 10-50 per corymb, 2.5-3.0 cm across. Involucre campanulate, 6-7 mm long, 4 mm wide; phyllaries in 3 series, unequal in size; outer phyllaries narrowly ovate to ovate, green, 3.0-3.5 mm long, 1.0-1.5 mm wide, adaxial surface densely tomentose and stipitate glandular, margins scarious, median to lower portions purplish-red, apex acuminate, purplish-red; inner phyllaries green, oblanceolate, 5-6 mm long, 0.5-0.8 mm wide, apex acute, purplish-red, adaxial surface sparsely tomentose and stipitate glandular, margins scarious, later splitting and hairy. Ray florets 16-25, 13-15 mm long, in 2 series, ligules pink or pale purple, 8.5-11.0 mm long, 1.7-2.0 mm wide, 4-veined; tube green 2.0-2.5 mm long, 0.2-0.4 mm wide, lower portion clavellate, clavellate from median to upper portion, apex shortly 2-lobed. Disk florets 19-41, funnel-form, 6-8 mm long, lower portion of tube green, clavellate, 2.0-2.5 mm long, 0.2-0.4 mm wide, median to upper portion of tube clavellate, upper portion of tube yellow, campanulate, 2.5-3.5 mm, 1.0-1.5 mm wide, 5-lobed, lobes lanceolate or narrowly ovate, apex acute. Ovary oblanceolate or obovoid, 1.7-2.2 mm long, 0.3-0.6 mm wide, compressed, 3-ridged, pannose with hairs 0.2-0.3 mm long. Achenes obo-

*Corresponding author; fax +82-41-530-1256
e-mail shinhy@sch.ac.kr



Figure 1. *Aster chusanensis*. A, habit. B, leaf margin, abaxial surface. C, head. D, involucre (florets removed). E, disk floret. F, ray floret. G, outer phyllary. H, inner phyllary. I, pappus. Drawn from Lim 2002029 (Holotype, SNU).

void, 3.5-4.0 mm long, 1.5-1.8 mm wide, compressed, 3-ridged, pinnose with hairs 0.2-0.3 mm long. Pappus white, 4.0-4.5 mm long.

Paratypes. Korea. Kyungpook. Ullung Island. Seomyeon, Namseori, near Namseo old mound, N37° 28' 18.0", E130° 50' 15.5", 6 Oct 2002, *Lim 2002024*

(AJOU, SNU); Buk-myeon, Naridong, at the edge of a *Pinus thunbergii* forest, N37° 31' 52.3", E130° 51' 42.8", 6 Oct 2002, *Lim 2002042* (AJOU, SNU); Buk-myeon, Hyunpori, near the seaside, N37° 31' 41.9", E130° 50' 20.3", 6 Oct 2002, *Lim 2002055* (AJOU, SNU).

Etymology. The species epithet 'chusanensis' refers

Table 1. Comparison of morphological characters among *A. chusanensis* and related taxa.

	<i>A. ageratoides</i>	<i>A. pseudoglehni</i>	<i>A. chusanensis</i>	<i>A. spathulifolius</i>
Stem pubescence	glabrous or sparsely strigose	glabrous	tomentose	woolly
Leaf surface	sparsely strigose	glabrous	strigose	woolly
Number of pairs of teeth on median leaves	3-9	8-20	6-10	3-6
Diameter of heads	0.6-1.2 cm	ca. 1.5 cm	2.5-3 cm	2.5-5 cm
Arrangement of ray florets	1-seriate	1-seriate	2-seriate	2-seriate
Corolla tube pubescence	glabrous	glabrescent	clavellate	densely clavellate
Length of outer phyllaries	2-3 mm	1.6-2.5 mm	3-3.5 mm	10-11 mm
Length of inner phyllaries	4-5 mm	4-4.5 mm	5-6 mm	9-11 mm

to the local name of the site where *A. chusanensis* was first discovered, 'Chusan, Ullung Island, Korea'. All the collections from this site have been lost in a fire, and a specimen from another site is designated as the holotype.

Distribution: Ullung Island, Korea. Throughout Ullung Island; from sea level to ca. 250 m, but mainly near the seacoast.

Habitat: Margins of forests with *Pinus thunbergii*, *Acer okamotoanum*, *Campanula takesimensis*, *Dystaenia takesimensis*, and *Hedera rhombea*; and on roadsides with *A. pseudoglehni* and *A. spathulifolius*.

A. chusanensis was first collected on Chusan and considered to be a variant of *A. pseudoglehni* Lim et al. More exhaustive study, however, has now revealed that it differs significantly from sympatrically occurring *A. pseudoglehni* and *A. spathulifolius*. *A. chusanensis* appears more similar to *A. spathulifolius* in its overall appearance, except in the length of unequal outer and inner phyllaries. It differs from *A. pseudoglehni* in having a pubescent stem and leaves and broader heads (Table 1).

Although the taxonomy of *Aster* L. has been extensively discussed in several publications, there is no worldwide monograph of this genus (Ito, 1995). According to the floras of Japan (Ito, 1995), USSR (Tamamshyan, 1959), China (Ling et al., 1985), and Korea (Chung, 1991), *A. chusanensis* would be placed in section *Aster*, section *Ageration* Tamamshyan, section *Orthomeris* A. Gray and section *Euaster* Gray, respectively, on the basis of having flat achenes, the pappus shorter than the corolla, the inner phyllaries longer than the outer ones, the heads being 1 to 3 cm in diameter and arranged in compound corymbs, and more disk florets than ray florets.

Among the numerous taxa of the above sections, *A. ageratoides* Turcz. and *A. pseudoglehni* are most similar to *A. chusanensis* in having a similar number of

teeth pairs on their leaves, unequal phyllaries in two or three series, and strigose leaf margins. *A. chusanensis* clearly differs from those two species, however, in having pubescent stems, leaves, phyllaries, and corolla tubes, as well as ray florets partly in two series and longer phyllaries (Table 1).

Plants of *A. chusanensis* exhibit mixed features of *A. spathulifolius* and *A. pseudoglehni* in many characteristics, especially in the number of pairs of teeth, head diameter, and the arrangement of ray florets and phyllaries. The sympatric distribution of these three species also implies the possibility of a hybrid origin for the newest one. More extensive systematic studies that comprise both morphological and molecular characters will elucidate the evolutionary origin of *A. chusanensis*.

ACKNOWLEDGEMENT

This work was supported by grant no. R01-2004-000-10712-0 from the Basic Research Program of the Korea Science and Engineering Foundation.

Received June 3, 2005; accepted August 5, 2005.

LITERATURE CITED

- Chung GY (1991) A taxonomic study on genus *Aster* and its allied groups in Korea. Ph.D. Thesis. Korea University, Seoul
- Ito M (1995) Genus *Aster* L., In K Iwatsuki, T Yamazaki, DE Boufford, H Ohba, eds, Flora of Japan, Angiospermae, Dicotyledoneae, Sympetaleae, Vol IIIb. Kodansha, Tokyo, pp 59-73
- Lee S, Lee J, Kim S (1997) A new species of *Adenophora* (Campanulaceae) from Korea. J Plant Res 110: 77-80
- Lee YN, Kim J (1998) New taxa on Korean flora (6). Kor J Plant Taxon 28: 25-39

- Lim Y, Hyun JO, Shin H (2003) *Aster pseudoglehni* (Asteraceae), a new species from Korea. Jpn J Bot 78: 203-207
- Ling Y, Chen YL, Chu S (1985) Genus *Aster* L., In Y Ling, YL Chen, eds, Flora Republicae Popularis Sinicae 74: 133-254. Science Press, Beijing
- Nakai T (1919) Report on the Vegetation of Dagelet Island, Corea. The Government of Chosen, Seoul
- Tamamshyan SG (1959) Genus *Aster* L., In Shishkin BK, ed, Flora of USSR 25. Compositae, Leningrad, pp 80-116