Saussurea namhaedoana (Compositae), a new species from Namhaedo Island, Korea

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INTRODUCTION

Saussurea DC. (Compositae) is composed of approximately 380 species (Lipschitz, 1979), occurring mainly at high altitudes in Asia. While some species, such as S. maximowiczii Herd., S. grandifolia Maxim., and S. odontolepis Maxim., occur widely throughout northeastern Asia, others are very narrowly restricted to limited regions as a consequence of local geographical adaptations. Of 33 species of Saussurea in Korea (Im, 2017; Sun et al., 2021a, 2021b), three endemics and two unrecorded species have been reported over the last three decades. In contrast, the number of Saussurea species in Japan has increased significantly from 25 species (Kitamura et al., 1982) to 63 species (Kadota, 2017) during almost the same period, and Chinese Saussurea had increased from 264 species (Chen and Shih, 1999) to 289 species (Shih, 2011). Saussurea is one of the highly diversified and adaptable groups in Asteraceae, and further discovery of new Saussurea species in Korea is highly anticipated. Recently, in the course of studying Korean endemic plants, we discovered a new species of Saussurea endemic to Korea in the Namhaedo Island.

TAXONOMIC TREATMENT

Saussurea namhaedoana J. M. Chung & H. T. Im, sp. nov. (Figs. 1, 2).—TYPE: KOREA. Gyeongsangnam-do, Namhae-gun, Gohyeon-myeon, Mt. Mangunsan, Hwabangsa (temple), elev. 240 m, 17 Sep 2021, H. T. Im, sharing grayish or white hairs on the abaxial leaf surfaces. It, however, can be distinguished from its close relatives by having a distinct leaf shape, i.e., sagittate or hastate leaves. The phylogenetic relationship relative to congeners in East Asia is yet to be determined.

Keywords: Saussurea namhaedoana, Asteraceae, Namhae-bunchui, new species, Namhaedo Island, endemic species

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hastate, auriculate, cordate, margins undulate-lobulate, mucronate-toothed; median and upper cauline leaves gradually smaller upward, petiolate or sessile, blade narrow lanceolate to linear. **Heads** several in loosely corymbose synflorescence, 0.9–1.1 cm in diam.; peduncles 0.4–4.5 cm long; involucre tubular, 8–12 × 4–6 mm, gray-white cobwebby; phyllaries 5–7 seriate, light green on middle and upper part; outer phyllaries oval-lanceolate, apex mucronate or acute; middle phyllaries sage green, oblong or oblong-lanceolate; inner phyllaries linear. **Florets** pale purple; corolla tubular 8.5–10 mm long, wide part and narrow part same length, limb 5-lobed. **Cypselae** cylindrical, 4–5 mm long; pappus bristles 2-seriate; outer series 0.4–1.8 mm long; inner series grayish white, 8.5–9.5 mm long.

**Flowering:** September to October.

**Distribution:** Mountainous region of Namhaedo Island, Gyongsangnam-do, Korea.

**Specimens examined:** KOREA. Gyeongsangnam-do: Namhae-gun, Gohyeon-myeon, Mt. Geumsan, Bori-an (temple), elev. 630 m, 3 Nov 2021, H. T. Im & S. Y. Park (CNU); Namhae-gun, Gohyeon-myeon, Mt. Mangunsan, Hwabang-sa (temple), elev. 260 m, 25 Apr 2018, H. T. Im & S. Y. Park (CNU); Namhae-gun, Gohyeon-myeon, Mt. Mangunsan, Hwabang-sa (temple), elev. 260 m, 5 Aug 2012, H. T. Im & J. S. Im (CNU).

As a newly described species, *S. namhaedoana* can be distinguished from its congeneric species in Korea primarily by the leaf characteristics, i.e., hastate or sagittate, rarely cordate leaves with mucronate toothed to undulate-lobulate margins (Fig. 3). The radical or lower cauline leaves of *S. namhaedoana* are usually sagittate or hastate (Fig. 3A, B), while some are cordate (Fig. 3D). The young leaves of *S. namhaedoana* can be distinguished from its congeneric species in Korea primarily by the leaf characteristics, i.e., hastate or sagittate, rarely cordate leaves with mucronate toothed to undulate-lobulate margins (Fig. 3). The radical or lower cauline leaves of *S. namhaedoana* are usually sagittate or hastate (Fig. 3A, B), while some are cordate (Fig. 3D). The young leaves of *S. namhaedoana* are usually sagittate or hastate (Fig. 3A, B), while some are cordate (Fig. 3D). The young leaves of *S. namhaedoana* are usually sagittate or hastate (Fig. 3A, B), while some are cordate (Fig. 3D). The young leaves of *S. namhaedoana* are usually sagittate or hastate (Fig. 3A, B), while some are cordate (Fig. 3D).

### Table 1. Comparison of morphological characteristics and distribution pattern between newly described *Saussurea namhaedoana* and morphologically similar species, *S. albifolia*, *S. seoulensis*, *S. gracilis*, and *S. insularis*.

<table>
<thead>
<tr>
<th></th>
<th><em>S. albifolia</em></th>
<th><em>S. gracilis</em></th>
<th><em>S. seoulensis</em></th>
<th><em>S. insularis</em></th>
<th><em>S. namhaedoana</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stem</strong></td>
<td>Well-branched</td>
<td>Well-branched</td>
<td>Scape-like</td>
<td>Well-branched</td>
<td>Well-branched</td>
</tr>
<tr>
<td><strong>Inflorescence</strong></td>
<td>Corymbose</td>
<td>Corymbose</td>
<td>Racemous-corymbose</td>
<td>Corymbose</td>
<td>Corymbose</td>
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<tr>
<td><strong>Involucre</strong></td>
<td>Campanulate, 14–16 × 8–12 mm</td>
<td>Tubular, 12.5–16 × 5–9.5 mm</td>
<td>Campanulate, 14–15 × 15–17 mm</td>
<td>Tubular, 10–11 × 5–7 mm</td>
<td>Tubular, 8–12 × 4–6 mm</td>
</tr>
<tr>
<td><strong>Outer surface of phyllaries</strong></td>
<td>Dark purplish</td>
<td>Dark purplish</td>
<td>Sage green</td>
<td>Sage green</td>
<td>Sage green</td>
</tr>
<tr>
<td><strong>Leaf shape</strong></td>
<td>Cordate, triangular cordate</td>
<td>Ovate, narrowly triangular</td>
<td>Triangular ovate</td>
<td>Triangular ovate</td>
<td>Hastate, sagittate, rarely cordate</td>
</tr>
<tr>
<td><strong>Abaxial leaf surface</strong></td>
<td>White tomentose</td>
<td>White tomentose</td>
<td>Grayish cobwebby</td>
<td>Grayish cobwebby while young</td>
<td>Grayish cobwebby while young</td>
</tr>
<tr>
<td><strong>Distribution</strong></td>
<td>Endemic to high mountain region around the Baekdudaegan Area, Korea</td>
<td>Widely distribute to mountainous region in Korea and Japan (except Hokkaido)</td>
<td>Endemic to mountainous region of Central Korea</td>
<td>Restricted to mountainous region of Southern Korea and Tsushima (Japan)</td>
<td>Endemic to low mountain region of Namhae Island, Korea</td>
</tr>
</tbody>
</table>
namhaedoana have grayish cobwebby hairs especially on abaxial leaf surface (Fig. 1Da), gradually becoming smooth and hairless as they mature (Fig. 1Db). The number of capitula ranges from 3 to 13 in loose corymbs (Fig. 1A, E). It has tubular involucre, 8–12 × 4–6 mm in size with gray-white cobwebby, and the outer surface of phyllaries are light green on middle and upper parts with acuminate tips (Fig. 1F). The tubular florets are 8.5–10 mm long, with nearly equal length of wide and narrow parts of the corolla tube (Fig. 1C).

Saussurea namhaedoana can easily be propagated vegetatively owing to the presence of prostrate rhizomes (Fig. 2B).

Among the Korean species of Saussurea, S. albifolia M. J. Nam & H. T. Im, S. seoulensis Nakai, S. gracilis Maxim., and S. insularis Kitam. are morphologically similar to S. namhaedoana by having leaves with white hairy beneath and persistent radical leaves at the time of flowering. Major morphological differences between S. namhaedoana and four morphologically similar species are shown in Table 1. Saussurea namhaedoana is distinctive from S. albifolia and S. insularis because the adaxial leaf surface of S. albifolia and S. insularis is white tomentose, whereas that of S. namhaedoana is grayish cobwebby. Saussurea namhaedoana can easily be distinguished from S. seoulensis because the involucre of S. seoulensis is campanulate, while that of S. namhaedoana is tubular. Saussurea namhaedoana has hastate or sagittate, rarely cordate leaves, which can be distinguished from triangular ovate leafed S. insularis. The dichotomous key for the above five Saussurea species is presented below.

1. Abaxial leaf surface white tomentose.
   2. Involucre campanulate .............................. S. albifolia
   3. Involucre tubular ................................. S. gracilis
1. Abaxial leaf surface grayish cobwebby.
   3. Synflorescence racemose-corymbose, involucre campanulate .............................. S. seoulensis
   4. Leaves triangular ovate ........................... S. insularis
   4. Leaves hastate or sagittate, rarely cordate ................................. S. namhaedoana

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

LITERATURE CITED


남해분취, 취나물속의 일신종

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적요: 경상남도 남해도에서 발견된 취나물속의 신종을 남해분취(Saussurea namhaedoana)라 기재했다. 이 종은 우리나라 특산으로 근사염이 화기까지 숙존하며, 잎은 극형, 전형 또는 드롭게 심장형으로 잎 가장자리는 중엽 또는 큰 거처가 발달하고, 아랫면에 조략하는 회백색 거미줄 털이 밀생하며, 종포는 통형으로 회백색 거미줄 털로 덮여 있다. 자생 취나물속 식물 중에 잎 아랫면에 회백색 또는 회색 털이 밀생하는 종으로는 은분취(S. gracilis), 함백취(S. albifolia), 서울분취(S. seoulensis), 백운취(S. insularis)가 있으나, 극형, 전형의 잎 은 남해분취만의 특징이다.

주요어: Saussurea namhaedoana, 국화과, 남해도, 남해분취, 신종, 한국 고유종