**Sium ternifolium** (Apiaceae), a new species from Korea

Byoung-Yoon Lee and Sung-Chul Ko*

Division of Vascular Plants, National Institute of Biological Resources, Incheon 404-170, Korea
1Department of Biological Sciences, Hannam University, Daejeon 305-811, Korea

ABSTRACT: A new species of Apiaceae, *Sium ternifolium* from Mt. Chiak-san National Park, Gangwon-do province, Korea, is described and illustrated. This new species is closely related to *S. serra* (Fr. & Sav.) Kitag., having such characters as long acuminated apex of leaflets, 3-6 slender rays, but distinguished from the latter by its lower height, the absence of involucral bracts, and trifoliolate leaves.

Keywords: Apiaceae, Umbelliferae, Sium, *Sium ternifolium*, new species

In the genus *Sium* L. belonging to the tribe Oenanthe Dumort. of the family Apiaceae (Hardway et al., 2004), about 14 recognized species often live in moist to wet areas (Pimenov and Leonov, 1993). Among them, a couple of species have been reported in Korea, *S. suave* Walter and *S. ninsi* L. (Lee, 1980; Lee, 2007). The latter is considered an ancestor of *S. sisarum* L. that was widely cultivated once for its tuberous roots rich in carbohydrates (Spallik and Downie, 2006). *S. suave* is distinguished from *S. ninsi* by the presence of stout rays, seven to eleven leaflets, and broader leaflets (Ohwi, 1965). In addition to these two species, an unknown species of *Sium* was found from Mt. Chiak-san National Park, Gangwon-do Province, Korea. This new one can easily be distinguished from other related Korean taxa by the presence of only tri-foliolate leaflets and the absence of involucral bracts. In general appearance, this one is rather similar to a Japanese species, *S. serra* (Fr. & Sav.) Kitag., but quite different in numbers of leaflets. The new species, from Korea, is here described and illustrated. (Fig. 1, Fig. 2)

*Author for correspondence: kscaaa@hannam.ac.kr

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**Taxonomic Treatment**

*Sium ternifolium* B.Y. Lee & S.C. Ko, sp. nov. Type: KOREA. Gangwon-do Province, Wonju-si city, understory in the forests of *Carpinus kawafiora* and *Betula chinensis*, near stream, alt. 480–495 m, 20 Aug. 2009, S.C. Ko 064185 (holotype: HNHM; isotypes: HNHM, 2 sheets; KB, 2 sheets; NH, 1 sheet). Fig. 1.

Herbae perennae, cætæae, glabrae, raro ramosus, 20–50 cm altus; folia totus ternatus, petiolis glabris 10 cm. longis, vaginantes; foliolis sessilis, longiacuminatus, serrulatus; umbellæ paucæ, pedunculus elongatus, radii 3–6, subaequalis, involucræ bracteæ nullum, involucellum bracteolis 2–3 brevissimis ornatum, pedicelli pleurumque brevioribus, tenuibus, 0.5–2 cm. longis. Herbs perennial, glabrous; roots fibrous at first node, and branched and thickened at second node; stems erect, rarely branched, 20–50 cm high; all leaves ternately tri-foliolate, rarely simple at the low stem, radical leaves sheathing the stem, leaflets ovate, acuminate, lower cauline leaves petiolate, petiole
5-11 cm long, sheathing the stem, margin membranaceous, the leaflets sessile, long acuminate, minutely serrulate, terminal leaflet ovate to broad-lanceolate, lateral leaflets smaller than the terminal one, subequal at its base, the upper leaves small, short-petiolate, leaflets lanceolate; umbels few, delicate, irregular, lateral and terminal, the involucral bract none (rarely present, filiform when present), rays 3-6 (rarely 2), very slender, 0.5-2 cm long, subequal, involucral bracteoles 2-3, filiform, 1 mm
Fig. 2. Drawings of *Stium ternifolium* B.Y.Lee & S.C.Ko: a, habit; b, flower; c, petal; d, sepals; e, stamen; f, fruits; g, stem.
Table 1. Diagnostic characters among Korean species of Sium and close relatives.

<table>
<thead>
<tr>
<th>Characters</th>
<th>S. suave</th>
<th>S. nissi</th>
<th>S. serra</th>
<th>S. ternifolium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem height</td>
<td>60-120 cm</td>
<td>30-80 cm</td>
<td>60-80 cm</td>
<td>20-50 cm</td>
</tr>
<tr>
<td>Stem branch</td>
<td>branched</td>
<td>branched</td>
<td>branched</td>
<td>rarely branched</td>
</tr>
<tr>
<td>Leaf dissection (lower cauline)</td>
<td>pinnate</td>
<td>pinnate</td>
<td>pinnate</td>
<td>ternate</td>
</tr>
<tr>
<td>Leaf dissection (upper cauline)</td>
<td>pinnate</td>
<td>ternate</td>
<td>ternate</td>
<td>ternate</td>
</tr>
<tr>
<td>Apex of leaflet</td>
<td>acuminate</td>
<td>acuminate</td>
<td>long acuminate</td>
<td>long acuminate</td>
</tr>
<tr>
<td>Involutural bracts</td>
<td>several</td>
<td>several</td>
<td>single</td>
<td>none</td>
</tr>
<tr>
<td>Rays</td>
<td>stout</td>
<td>slender</td>
<td>slender</td>
<td>slender</td>
</tr>
<tr>
<td>Number of rays</td>
<td>7-12</td>
<td>about 10</td>
<td>2-6</td>
<td>2-6</td>
</tr>
<tr>
<td>Involutural bractlets</td>
<td>several, deflexed</td>
<td>several, deflexed</td>
<td>several, deflexed</td>
<td>several, non-deflexed</td>
</tr>
</tbody>
</table>

long, much shorter than pedicels, not deflexed in flowering, the pedicels 2-5 (rarely single), very slender; calyx teeth elongated, persistent in fruiting, petals white, outer ones emarginate and incurved at apex; stamens 5, versatile, 2-locular; ovary half-inferior, 2-locular; styles elongated, 1.5 times longer than conical staminalodium; fruits ovoid, 2-3 mm long, glabrous, mericarps laterally compressed, ribs 5, obtuse, thick, 3 on the dorsal, 2 at the lateral, vitiae numerous; seeds nearly orbicular in cross section, with a nearly flat face. Fl. Aug.

Korean name: 쌍일개발나물 (Sc-ip-gae-bal-na-mul)

Distribution: Korea (Mt. Chiak-san, Gangwon-do Province), endemic

Sium ternifolium is considered endemic to Korea, compared with Japanese and Chinese species within the genus Sium. So far, about 70 individuals of Sium ternifolium have been found in the shady and wet areas on Mt. Chiak-san, Gangwon-do Province, growing along with Opismenum undulatofolis (Ard.) Roem. & Schult., Galium dahuricum Turcz., Viola diamentica Nakai, Clematis apiopfolia DC., Staphylea bumalda DC., Morus bombycis Koidz., Fraxinus mandshurica Rupr., Carpinus laxiflora (Siebold & Zucc.) Blume, and Betula chinensis Maxim.

S. ternifolium is similar to S. serra in characters such as long acuminate apex of leaflets, numbers of very slender rays (3-6), but distinguished by characters such as trifoliate leaflets, stem height less than 50 cm long, non-branched stems, and even sequences of nuclear ribosomal DNA regions (B. Lee et al., unpub. data).

S. serra occurs in Japan and China, but treatment of the species is quite different by authors in the two countries. In Japanese flora, the species has been treated as a member of Sium L. since Kitagawa transferred the species from Pimpinella to Sium (Kitagawa, 1941; Ohwi, 1965; Ohba, 1999). However, Chinese authors who do not follow Kitagawa's transfer still retain the species as a member of the genus Pimpinella, treating it as P. serra Fr. & Sav. (Pu, 1985; Pu and Watson, 2005). From the herbarium specimens of Chinese P. serra (PE00744575, PE00744576) loaned from the Beijing Botanical Garden (PE), we found that this one is strikingly similar to Korean S. ternifolium by the presence of all trifoliate leaves, long acuminate leaflet apex, but different from Japanese S. serra. Although just a couple of specimen sheets are not enough to observe all the morphological characters of Chinese P. serra in detailed, the species is distinguished clearly from Korean S. ternifolium by the presence of clearly peltiolated terminal leaflets. Except for the character above, S. ternifolium and P. serra are almost identical. Therefore, the taxonomic position and rank of the Chinese P. serra (treated as S. serra) is urgently needed.

Key to the species of Korean Sium L. and their related species

1. Number of rays 7-12, apex of leaflets acuminate.
   2. Upper cauline leaves dissected pinnately, rays stout
      3. Stems rarely branched, all leaves dissected ternately, involucral bracts absent, bractlets non-deflexed
         S. ternifolium
   2. Upper cauline leaves dissected ternately, rays slender
      3. Stems branched above, lower cauline leaves dissected pinnately, involucral bracts present, bractlets deflexed
         S. serra
      3. Stems rarely branched, all leaves dissected ternately, involucral bracts absent, bractlets non-deflexed
         S. ternifolium

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**Literature Cited**


