A New species of Elsholtzia (Lamiaceae): E. byeonsanensis M. Kim

Changhak Choi, Kyeongsuk Han, Jungsim Lee, Soonku So, Yong Hwang and Muyeol Kim*

Department of Biological Sciences, Chonbuk National University, Jeonju 561-756, Korea
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The genus Elsholtzia Willd. (Lamiaceae) consists of approximately 40 species and is distributed primarily in temperate regions of the Northern Hemisphere including China, Russia, Europe, and North America (Li and Hedge, 1994; Jeon and Hong, 2006). The genus Elsholtzia are characterized by opposite leaves, compact spikes, ovate bracts, cylindrical calyx, and nutlet fruit (Hong, 2007). Six taxa of Elsholtzia are distributed in Korea (Lee, 2000; Lee et al., 2011). Of 6 taxa, E. splendens occur widely in Korea, while E. minima and E. angustifolia are rather rare and sporadically distributed.

During field work in 2011, a new species from Byeonsan in Jeollabukdo Province, Korea was discovered. In this paper, we named this new taxon as Elsholtzia byeonsanensis M. Kim and described several morphological features relative to its related species E. splendens. The new species shares several characteristics with its related species, but it can be distinguished based on habit (i.e., small plants), leaf textures (i.e., coriaceous), bract abaxial surface (i.e., glabrous), habitat (i.e., on the steep cliff near sea), etc. Also, molecular data confirmed that Elsholtzia byeonsanensis is a new species and distinguished from its
related species (M. Kim et al., unpubl. data).

_Elsholtzia hyeonsanensis_ M. Kim, sp. nov. Figs. 1, 2, 3

**Korean name:** Byeonsan-Hyangyu 변산향유

Herba annulata, erecta, ramosa, 20–35 cm alta. Caulis purpurea. Folia opposita, corium; lamina ovata, 3.5–4.5 cm longa, 1.5–2.2 cm lata, supra glabra, subtus glandulosa; petioli glabra, 2.0–3.2 cm longi; margo serratus. Spicae 3.5–4.5 cm longae; bracteae ovatae, glabrae, 5 × 6–7 mm; pedicelli 1 mm longi. Calyx cylindraceus, 2–3 mm longa, 5 lobis. Corolla purpurea, 6–7 mm longa, pilosis et glandulae externae. Stamina 4, exserta; filamenta purpurea, glabra; antherae rubrae. Ovaria 4 lobis; stylis linearis, rubellis, exserta; stigmata 2 lobis. Fructus rufus; semina bruneolus. Flores Novembris anthesis, purpurea.

Herb annual, erect, branched, 20–35 cm high. Stem purple. Leaves opposite, coriaceous; leaf blade ovate, 3.5–4.5 × 1.5–2.2 cm, glabrous adaxially, densely impressed glandular abaxially; petiole 2.0–3.2 cm; margin serrate. Spikes secund, 3.5–4.5 cm; bracts broadly ovate, 5 × 6–7 mm. Pedicel 1 mm. Calyx cylindrical, 2–3 mm, villous, 5 lobes. Corolla purple, 6–7 mm, hairy and glandular outside, upper lip emarginate, lower lip 3 lobes. Stamens 4, exserted, 2 anterior ones longer; filaments purplish, glabrous; anther red. Ovary 4 lobed, style redish, exserted; stigma 2 cleft. Fruit nutlets; seeds brown. Flowering November, purple.

**Type Locality:** Byeonsan, Jeollabukdo Province, Korea.


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_Fig. 1._ Photographs of *Elsholtzia hyeonsanensis* M. Kim at type locality. A. adult plant; B. flower; C. bract; D. habitat; E. inflorescence. Scale bars 1 cm in A and E; 2 mm in B and 1 mm in C.
Fig. 2. *Elsoltzia byeonsanensis* M. Kim. A. habit; B. calyx; C. flower; D. bract; E. pistil.

_Flowering:_ November

_Distribution:_ Byeonsan, Jeollabukdo Province, Korea.

_Etymology:_ The specific epithet is derived from Byeonsan where this new species is located.

_Habitats:_ The natural habitats of *Elsoltzia byeonsanensis* M. Kim were discovered at coastal regions in the Byeonsan, Jeollabukdo Province, Korea. Hundreds of new individuals occur on steep cliffs along the 1–2 km seaside dominated by *Carpinus turczaninowii*, *Eucaurus macrophylla*, and *Ulmus parvifolia*. The new species also occurs with other herbaceous species dominated by *Dendranthema indicum*, *Aster spathulifolius*, and *Cytisium falcatum*.

**Key to Elsoltzia byeonsanensis** M. Kim and its related taxa

1. Spikes cylindrical
   2. Stem quadrilateral, 10–20 cm high
      —-*E. saxatilis* 얘기형유
   2. Stem rounded, 2–5 cm high —-*E. minima* 총형유
   1. Spikes secund
      3. Corolla 4–5 mm —-*E. ciliata* 항유
      3. Corolla more than 5 mm
      4. Petioles absent, leaf blade linear
         —-*E. angustifolia* 가늘잎형유
      4. Petioles present, leaf blade ovate
5. Coriaceous leaf textures, petioles and adaxial surface of leaf blade glabrous; bract surface glabrous; marine habitats .................. *E. byeonsanensis* 변산항유
5. Chartaceous leaf textures, petioles and adaxial surface of leaf blade pubescent; bract surface pubescent; woodland habitats
6. Plants 40–70 cm .................... *E. splendens* 꽃향유
6. Plants 7–15 cm ..................... *E. splendens* var. hallasanensis 한라꽃향유

Large populations of the new species, *Elsholtzia byeonsanensis* M. Kim were first discovered at Byeonsan, Jeollabukdo Province, Korea. *Elsholtzia byeonsanensis* shares several characteristics (secund spikes, ovate leaves, long corolla length, etc.) with its related species *E. splendens*, but it is distinct from *E. splendens* which has a large plant, green stem color, chartaceous leaf textures, non-shiny leaf surfaces, pubescent petioles, pubescent leaf blade surface, pubescent bract surface, and open woodland habitats by having a small plant, purple stem color, coriaceous leaf textures, shiny leaf surfaces, glabrous petioles, glabrous leaf blade surface, glabrous bract surface, and marine habitats. Thus, the authors described this taxon as a new species of the genus *Elsholtzia*.

Molecular data provided some insights into the taxonomical
Table 1. Comparison of morphological characters between Elsholtzia byeonsanensis M. Kim and its related species E. splendens.

<table>
<thead>
<tr>
<th>Characters</th>
<th><em>E. byeonsanensis</em></th>
<th><em>E. splendens</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants</td>
<td>small (20–35 cm)</td>
<td>large (40–70 cm)</td>
</tr>
<tr>
<td>Stem branching</td>
<td>much</td>
<td>few</td>
</tr>
<tr>
<td>Stem shape</td>
<td>quadrilateral</td>
<td>quadrilateral</td>
</tr>
<tr>
<td>Stem color</td>
<td>green</td>
<td>purple</td>
</tr>
<tr>
<td>Leaf textures</td>
<td>coriaceous</td>
<td>chartaceous</td>
</tr>
<tr>
<td>Leaf surfaces</td>
<td>shiny</td>
<td>non-shiny</td>
</tr>
<tr>
<td>Petiole</td>
<td>glabrous</td>
<td>pubescent</td>
</tr>
<tr>
<td>Petiole length</td>
<td>3.0±0.5</td>
<td>3.7±0.6</td>
</tr>
<tr>
<td>Leaf blade shape</td>
<td>ovate</td>
<td>ovate</td>
</tr>
<tr>
<td>Leaf blade (adaxial surface)</td>
<td>glabrous</td>
<td>pubescent</td>
</tr>
<tr>
<td>Leaf blade length</td>
<td>4.0±0.6</td>
<td>4.5±0.7</td>
</tr>
<tr>
<td>Leaf blade width</td>
<td>1.6±0.4&quot;</td>
<td>2.4±0.5</td>
</tr>
<tr>
<td>Spikes length</td>
<td>4.0±0.5</td>
<td>7.0±0.9</td>
</tr>
<tr>
<td>Bracts (abaxial surface)</td>
<td>glabrous</td>
<td>pubescent</td>
</tr>
<tr>
<td>Flowering</td>
<td>Nov.</td>
<td>Sep.-Oct.</td>
</tr>
<tr>
<td>Flower color</td>
<td>purple</td>
<td>purple</td>
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<tr>
<td>Calyx lobes</td>
<td>glabrous</td>
<td>pubescent</td>
</tr>
<tr>
<td>Habitats</td>
<td>steep cliffs near the sea</td>
<td>open woodland</td>
</tr>
</tbody>
</table>

*unit is cm
"mean±SD

suggested that Elsholtzia byeonsanensis is an independent species and is distinguished from other Korean species (M. Kim et al., unpubl. data).

Acknowledgement

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Literature Cited


