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Salvia chingshuishanensis S.W. Chung & W.J. Huang (Lamiaceae), a new species from Taiwan

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ABSTRACT: A new perennial herb of *Salvia* L. (Lamiaceae) is described from Mt. Chingshui, Hualien County, Taiwan. The new species, *Salvia chingshuishanensis* S.W. Chung & W.J. Huang, is characterised by erect, quadrangular stems, standing 20–45 cm tall; tufted basal leaves that are pinnately compound; leaves with veins and nerves impressed adaxially and raised abaxially; terminal racemes up to 20 cm long; and a corolla that is white to pale purple-tinged, with the lower lip markedly infolded (vs. nearly spreading in other Taiwanese species). A comprehensive morphological description, a diagnostic comparison with allied species, an image of the holotype, an illustration of vegetative and reproductive structures, distribution and ecology data, phenological record, and a proposed IUCN conservation status are provided. Additionally, an identification key to the *Salvia* species in Taiwan has been prepared to assist field researchers.

KEY WORDS: Lamiaceae, Mentheae, morphology, Mt. Chingshui, Nepetoideae, new species, *Salvia* L., *Salvia keitaoensis*, Taiwan.

INTRODUCTION

Salvia L. (Mentheae, Nepetoideae, Lamiaceae) is the largest genus in its family, comprising more than 1,000 species distributed across tropical and temperate regions of both the Old and New World (POWO, 2025; Takano, 2017; WFO, 2025). Based on developmental, morphological, and phylogenetic studies, one of the most remarkable evolutionary traits of *Salvia* is the staminal lever mechanism. This floral innovation has independently evolved multiple times and is considered a significant factor driving the diversification of the genus. (Claßen-Bockhoff *et al.*, 2004; Walker and Sytsma, 2006; Hu *et al.*, 2018). In East Asia, including Taiwan, the presence of several narrowly distributed *Salvia* species points to a history of localized radiation. (Hu *et al.*, 2018).

In Taiwan, nine species, one variety and one uncertain species of *Salvia* have been recorded in "Flora of Taiwan 2nd edition" (Huang and Wu, 1998) (Fig. S1). The taxonomic treatment of "Flora of Taiwan 2nd edition" (Huang and Wu, 1998) focused exclusively on the species occurring in Taiwan, while species occurring on the outlying islands, such as the Matsu islands, were not considered. Notably, *S. tashiroi* Hayata (Fig. S1L), once considered an uncertain species (Huang and Wu, 1998), has been reconfirmed by Hsieh *et al.* (2010) based on integrated morphological, cytological, palynological, and ecological data in southern Taiwan. In this study, we reviewed previous taxonomic literature (Hance, 1885; Henry, 1896; Matsumura and Hayata, 1906; Hayata, 1908, 1917, 1919; Kawakami, 1910; Sasaki, 1928; Kudo, 1929, 1931; Murata, 1952; Yamazaki, 1969a, 1969b; Huang and Wu, 1975, 1978, 1998; Wu and Huang, 1975; Li and Hedge, 1994; Hsieh and Huang, 1998; Yang *et al.*, 2001; Kuo *et al.*, 2004; Fu, 2007; Hsieh, *et al.*, 2010; Chou and Hsieh, 2015; Chong and Hsieh, 2016, Lu, 2025) of *Salvia* in Taiwan and integrated the taxonomic treatments published over the years (Table 1). Currently, thirteen species (including the one described herein) and two varieties are recorded in Taiwan and its outlying islands (published literature, excluding theses and dissertations). Among these, four species have been added since "Flora of Taiwan 2nd edition" (Huang and Wu, 1998): *S. occidentalis* Sw. (Chou and Hsieh, 2015) (Fig. S1I) and *S. lyrata* L. (Chong and Hsieh, 2016) (Fig. S1G), which are naturalized in Taiwan; *S. bowleyana* Dunn (Kuo *et al.*, 2004), which is native to Matsu; and the new species described in the present study.

Although *Salvia* in Taiwan has been investigated by many researchers, several important issues remain unresolved and warrant further study. We recognized four major issues: (1) Since Wu (1973), no comprehensive taxonomic revision of *Salvia* in Taiwan has been conducted, while several newly naturalized species and new records have since been discovered in Taiwan. (2) Previous studies (Wu, 1973; Fu, 2007) lacked detailed color photographs of the reproductive organs. (3) The scientific names and voucher citations of some species remain controversial. (4) Variation in leaf division and trichomes among *Salvia* species in Taiwan (Wu, 1973) increases the difficulty of taxonomic identification. These issues have posed long-standing challenges to the identification and classification of *Salvia* in Taiwan, highlighting the need for continued taxonomic investigation

Table 1. Taxonomic history of ***Salvia*** species in Taiwan.

Note: ◎: nova recordatio; ●: taxon novum; ※: combinatio nova; □: status novus; △: nomem novum; ☆: translatio nova; ○: recordatum litterarum; ◇: nomen nudum; →: synonymia nominum.

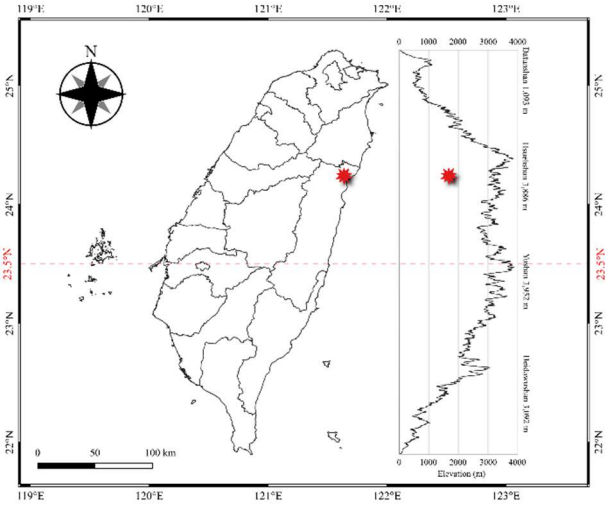

Fig. 1. Distribution of ***Salvia chingshuishanensis*** (red stars), based on Lin (2018).

based on integrated field observations, morphological comparisons, and examination of herbarium specimens. Such investigations are particularly important when populations exhibiting unusual morphological characteristics are encountered in the field, as they may represent previously overlooked or undescribed taxa.

During field investigations on Mt. Chingshui (Fig. 1), Hualien County, in July 2020, a *Salvia* population with unique floral morphology was discovered. Based on a comprehensive review of the literature and detailed comparisons of morphological characters and herbarium specimens, we determined that this population does not match any currently recognized *Salvia* species in Taiwan. We therefore describe this taxon as *Salvia chingshuishanensis* S.W. Chung & W.J. Huang *sp. nov.* Here, we provide a diagnostic description, illustrations, image of the holotype specimen (Fig. S2), comparative table comparing the new species with allied species, and information on distribution, ecology and phenology, and the proposed IUCN conservation status for this new species. In addition, we provide an identification key to *Salvia* species in Taiwan, which can serve as a practical basis for identification during field surveys.

Key to the *Salvia* taxa in Taiwan (including Matsu)

1a. Leaves all simple ……. 2
1b. Leaves pinnately compound, or partly simple…… 6
2a. Leaf blades hastate …… ***S. nipponica*** var. ***formosana***
2b. Leaf blades not hastate ……. 3
3a. Leaf blades ovate …… ***S. coccinea***
3b. Leaf blades not ovate ……. 4
4a. Leaf blades rhombic …… ***S. occidentalis***
4b. Leaf blades not rhombic …… 5
5a. Leaf margins cleft or undulate …… ***S. lyrata***
5b. Leaf margins crenate, serrate or dentate …… ***S. plebeia***
6a. Pinna margins with ≥ 20 pairs of serrations …… ***S. bowleyana***
6b. Pinna margins with < 20 pairs of serrations …… 7
7a. Corolla deep purple …… 8
7b. Corolla not deep purple …… 9
8a. Plant with stolons …… ***S. formosana*** var. ***formosana***
8b. Plant without stolons …… ***S. formosana*** var. ***matsudae***
9a. Corolla light purple …… 10
9b. Corolla white to tinged pale purple …… 11
10a. Plant with stolons …… ***S. japonica***
10b. Plant without stolons…… ***S. scapiformis***
11a. Central lobe of lower lip of corolla infolded …… ***S. chingshuishanensis***
11b. Central lobe of lower lip of corolla unfolded …… 12
12a. Plant with stolons …… ***S. tashiroi***
12b. Plant without stolons …… 13
13a. Terminal pinna at least twice as long as lateral pinna . ***S. keitaoensis***
13b. Terminal pinna less than twice as long as lateral pinna …… 14
14a. Pinna margins crenate …… ***S. hayatana***
14b. Pinna margins dentate …… ***S. arisanensis***

MATERIALS AND METHODS

Fieldwork was conducted in the Mt. Chingshui area, Hualien County, eastern Taiwan (Fig. 1). Living plants were photographed *in situ* and subsequently cultivated under controlled garden conditions for detailed observations. Morphological measurements of vegetative and reproductive structures were obtained from both fresh and dried specimens. Comparative analyses were made against all recognized Taiwanese *Salvia* species using material from the herbarium of National Taiwan University (TAI), the herbarium of Taiwan Biodiversity Research Institute (TAIE), and the herbarium of the Taiwan Forestry Research Institute (TAIF). The holotype specimen is deposited in TAIF.

TAXONOMIC TREATMENT

Salvia chingshuishanensis S.W. Chung & W.J. Huang, ***sp. nov.*** **清水山鼠尾草 (Figs. 2 & 3)**

Type: TAIWAN: Hualien County, Xiulin Township, Mt. Chingshui Entrance to Mt. Chingshui, elev. 1900 m, 15 July 2020, *S.W. Chung & W.J. Huang 14490* (holotype: TAIF!; Fig. S2).

Diagnosis: *Salvia chingshuishanensis* is similar to *Salvia keitaoensis*. The two taxa are difficult to distinguish based on leaf morphology, but they can be differentiated by floral characters. The corolla of *S. chingshuishanensis* is white to pale purple-tinged, whereas that of *S. keitaoensis* is white. *S. chingshuishanensis* has glandular hairs on the outer surface of the calyx, whereas *S. keitaoensis* has non-glandular hairs. In addition, they differ in shape of the central lobe of the lower corolla lip (infolded vs. unfolded).

Description: Perennial herb. **Stems** simple, erect, quadrangular, 20–45 cm tall. **Leaves** opposite, mostly radical; basal leaves tufted, pinnately compound with 1–2 pairs of pinnae; petiole pubescent or villous, 2–9 cm long; pinnae petiolulate, petiolules 1–5 mm long; pinnae ovate, base truncate or shallowly cordate, apex acute, adaxial surface dark green, minutely pubescent or glabrous, venation reticulate, veins impressed adaxially, raised abaxially, margins serrate; terminal pinna 2–4 × 1.5–3.5

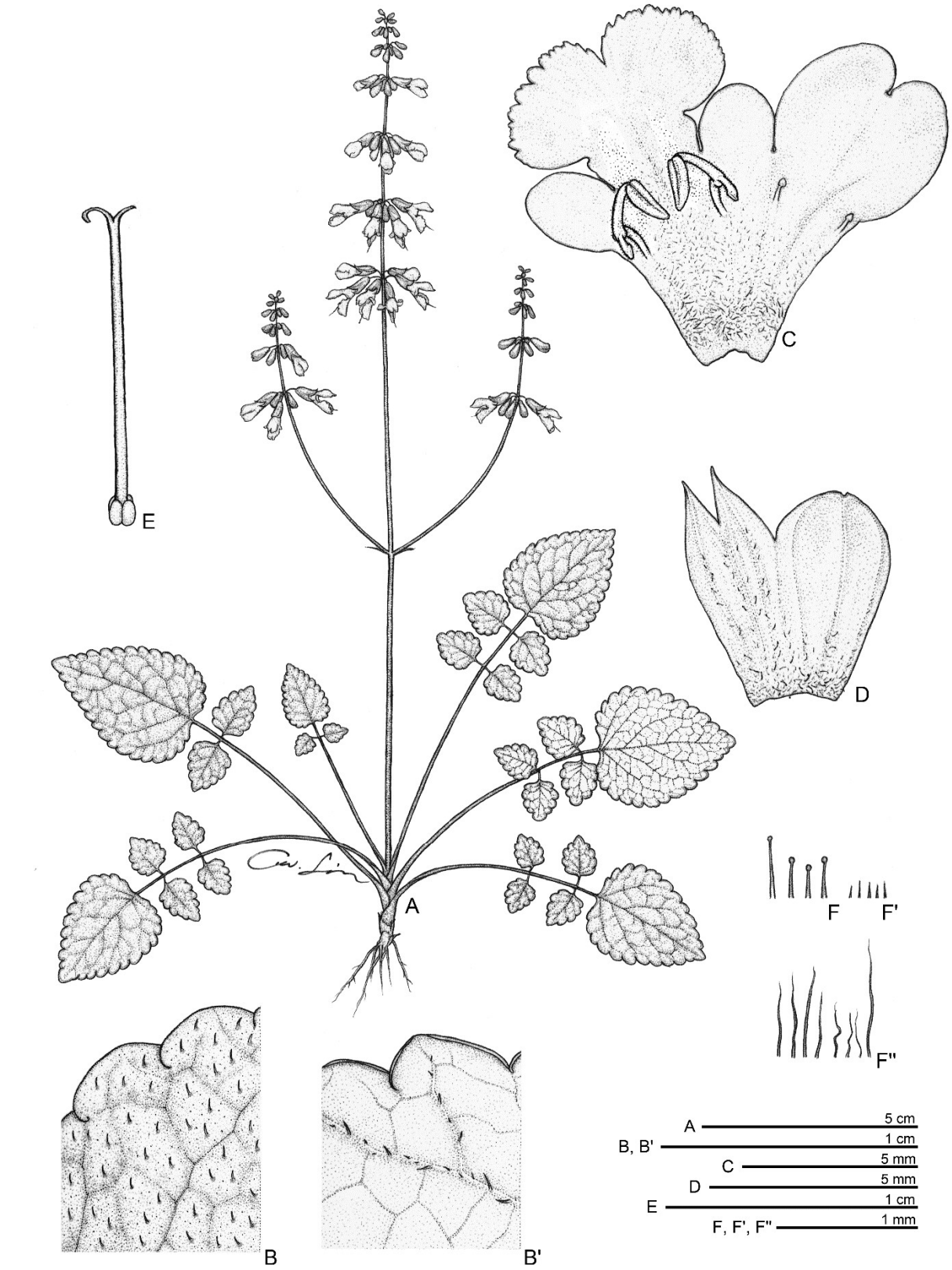

Fig. 2. Illustration of ***Salvia chingshuishanensis***. **A.** Habit. **B.** Adaxial leaf surface. **B'.** Abaxial leaf surface. **C.** Dissected flower showing internal stamens. **D.** Calyx opened to show inner surface. **E.** Pistil and ovary. **F.** Glandular trichome. **F'.** Puberulent hair. **F''.** Villous hair. (Drawn from C.-W. Lin)

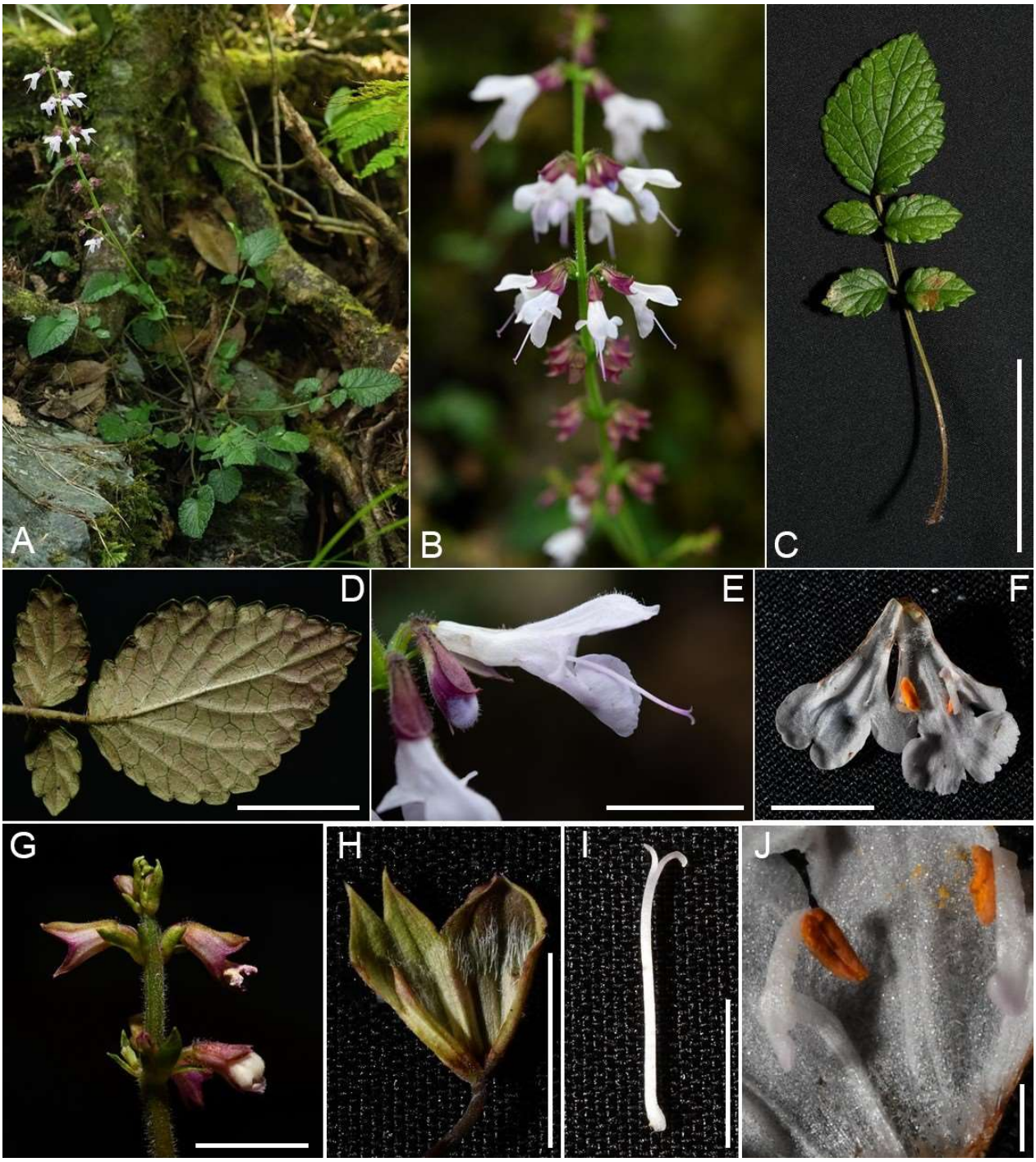

Fig. 3. Morphology of ***Salvia chingshuishanensis***. **A.** Habitat in primary montane forest. **B.** Inflorescence with white to tinged pale purple flowers. **C.** Adaxial leaf surface. **D.** Abaxial leaf surface. **E.** Corolla, lateral view. **F.** Dissected flower showing internal stamens. **G.** Inflorescence with persistent calyces after corolla wilting. **H.** Calyx opened to show the inner surface. **I.** Pistil (stigma and style). **J.** Corolla frontal view showing stamens (anthers, connective and filaments). Scale bars: C = 3 cm; D, G = 1 cm; E, F, H, I = 5 mm; J = 2 mm.

cm, larger than the lateral pinnae; lateral pinnae 0.7–1.5 × 0.7–1.0 cm, smaller than the terminal pinna; cauline leaves one pair at mid-stem, smaller than the basal leaves, ternate or simple. **Inflorescence** a terminal raceme of verticillasters, simple or branched at base, glandular- and eglandular-pubescent, up to 20 cm long; verticillasters 2–8-flowered, lower ones widely spaced, upper ones crowded; **bracts and bracteoles** lanceolate, 3–7 × ca. 1.3 mm, margins entire, minutely pubescent; pedicels 2–3 mm long, densely puberulent; **calyx** tubular, bilabiate, 4.5–5.5 mm long, sparsely glandular-pubescent, throat minutely pubescent inside, upper lip oblanceolate, ca. 5.5

Table 2. Morphological comparison between ***Salvia chingshuishanensis*** and allied species in Taiwan.

	S. arisanensis	*S. chingshuishanensis*	*S. hayatana*	*S. hualiensis*, *nom. nud.*	*S. keitaoensis*
Leaf type	pinnately or bipinnately compound	trifoliolate or pinnately compound	pinnately or bipinnately compound	mainly trifoliolate or pinnately compound, sometimes simple	pinnately compound
Lateral pinnae number	2–3 pairs	1–2 pairs	3–6 pairs	1–2 pairs or simple leaf	1–3 pairs
Lateral and terminal pinnae size	similar, but terminal pinnae slightly larger than lateral pinnae	terminal pinnae larger than lateral pinnae	similar, but terminal pinnae slightly larger than lateral pinnae	terminal pinnae larger than lateral pinnae	terminal pinnae larger than lateral pinnae
Pinnae shape	obovate, oblong, rhombic or irregularly parted	ovate to cordate	ovate to cordate, sometimes rhombic	ovate to cordate	ovate to cordate
Pinnae base	cuneate	truncate or shallowly cordate	round or cuneate	cuneate or cordate	round or shallowly cordate
Inflorescence hairiness	pubescent, sometimes with glandular	glandular and eglandular pubescent	pubescent, sometimes with glandular	glandular and eglandular pubescent	pubescent
Trichome types on the outer surface of the calyx	pubescent, sometimes with glandular	glandular and pubescent	pubescent, sometimes with glandular	pubescent	pubescent
Corolla color	white	white to tinged pale purple	white	white to tinged pale purple	white
Central lobe shape of corolla lower lip	truncate, emarginate or obcordate	cordate	truncate or emarginate	truncate, cordate or emarginate	truncate, emarginate or obcordate
Central lobe of corolla lower lip folded or not	unfolded	infolded	unfolded	unfolded	unfolded

Data compiled from monographic studies (Wu, 1973; Lu, 2025)

× 3 mm, lower lip triangular-lanceolate, acuminate; **corolla** tubular, bilabiate, white to tinged pale purple, pubescent outside, tube 5–6 mm long, with an internal hair ring, upper lip 2–3 mm, bilobed, lower lip 3.5–4.5 mm, 3-lobed, central lobe largest, widely orbiculate, cordate at tip, margin irregularly serrate, infolded, lateral lobes 2, spreading, round, margin entire; **fertile stamens 2**, included; **filaments** ca. 1 mm long, slightly curved; **upper arm**, ca. 1.25 mm long, bearing an anther ca. 1 mm long at the apex; **lower arm**, ca. 1 mm; **sterile stamens** 2, included, ca. 0.5 mm long. **Fruit** nutlet 4, sometimes not fully developed, ellipsoid, brown, ca. 2 mm long, with a central ridge on one side.

Distribution: *Salvia chingshuishanensis* is endemic to Taiwan and is known only from the type locality on Mt. Chingshui, Taroko National Park, eastern Taiwan. To date, complete quantitative data on population size, total number of individuals, and the full distribution range of this species are lacking. It is currently known only from a single locality near the trailhead of Mt. Chingshui, where it was observed and collected during our field surveys, and no additional populations have yet been confirmed from other localities. It occurs along the hiking trail in primary montane cloud forest with intact vegetation structure, year-round humidity, and humus-rich soil.

Phenology: Flowering May to August. Fruiting June to September.

***Etymology*:** Named after the type locality, Mt. Chingshui (清水山).

Proposed IUCN conservation status: *S. chingshuishanensis* is currently known only from Mt. Chingshui area in Hualien, Taiwan. However, this locality was affected by an earthquake in April 2024, making it difficult to access the site for current population surveys. Therefore, in the present study, the conservation status of *S. chingshuishanensis* is provisionally assessed as Data Deficient (DD).

Additional specimens examined: TAIWAN: Hualien County, Chingshuishan, 1,500–2,400 m, 25 Jul. 1986, *T.C. Huang et al. 12867* (TAI); Mt. Chingshui Entrance to Mt. Chingshui, elev. 1,900 m, 15 Jul. 2020, *S.W. Chung & W.J. Huang 14491* (TAIF), *S.W. Chung & W.J. Huang 14492* (TAIF); Mt. Qingshui hiking entrance to 1st bare rock, elev. 2,320–2,325 m, 6 Sep. 2020, *M.Y. Shen 6498* (TAIE).

Note: The new species belongs to sect. *Sobiso* (Raf.) Hu, Takano & Drew (Hu *et al*., 2018). It is closely related to *S. hualiensis* was treated in Wu's (1973) master's thesis; the name represents a nomen nudum. However, the central lobe of the corolla lower lip of *S. chingshuishanensis* is infolded (Fig. 3E). Furthermore, *S. chingshuishanensis* is similar to *S. arisanensis*, *S. hayatana*, and *S. keitaoensis* in Taiwan. In addition, the new species can also be distinguished from these allied species by leaf type, number of lateral pinnae, lateral and terminal pinnae size, pinnae shape, pinnae base, inflorescence hairiness, trichome types on the outer surface of the calyx, corolla

color, and the shape of the central lobe of the lower corolla lip. Table 2 compares external morphological characters of *S. chingshuishanensis* and allied species.

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LITERATURE CITED

Chong, M.-J., Hsieh, T.-H. 2016 *Salvia lyrata* L.—a newly naturalized lyreleaf sage in Taiwan. Taiwan J. Biodivers. **18(2)**: 131–136. [in Chinese]

Chou, H.-C., Hsieh, T.-H. 2015 *Salvia occidentalis* Sw.–a newly naturalized West Indian sage in Taiwan. Taiwan J. Biodivers. **17(1)**: 75–79. [in Chinese]

Claßen-Bockhoff, R., Speck, T., Tweraser, E., Wester, P., Thimm, S., Reith, M. 2004 The staminal lever mechanism in *Salvia* L. (Lamiaceae): a key innovation for adaptive radiation? Org. Divers. Evol. **4(3)**: 189–205.

Drew, B.T., González-Gallegos, J.G., Xiang, C.L., Kriebel, R., Drummond, C.P., Walker, J.B., Sytsma, K.J. 2017 *Salvia* united: the greatest good for the greatest number. Taxon **66(1)**: 133–145.

Fu, H.-L. 2007 Molecular systematics of the pinnate-leaf group of *Salvia* L. (Lamiaceae) in Taiwan. Master's thesis, Department of Materials Science, National University of Tainan, Tainan City. [in Chinese]

Hance, H.F. 1885 A new Chinese *Salvia*. J. Bot. **23**: 368–371.

Hayata, B. 1908 Flora montana formosae: An enumeration of the plants found on Mt. Morrison, the central China, and other mountainous regions of Formosa at altitudes of 3,000–13,000 ft. J. Coll. Sci. Imp. Univ. Tokyo **25**: 182–183.

Hayata, B. 1917 General Index to the Flora of Formosa, Supplement to Icones Plantarum Formosanarum **6**: 57–58.

Hayata, B. 1919 Icones Plantarum Formosanarum nec non et Contributiones ad Floram Formosanam **8**: 95–101.

Henry, A. 1896 A list of plants from Formosa: with some preliminary remarks on the geography, nature of the flora and economic botany of the island. Trans. Asiatic Soc. Japan **24**: 72–73.

Hsieh, T.-C., Chiang, P.-Y., Hsieh, C.-W., Yeh, C.-L., Chen, C.-W. 2010 A Rediscovery of *Salvia tashiroi* Hayata (Lamiaceae) from Taiwan. Taiwan J. Biodivers. **12(1)**: 73–82. [in Chinese]

Hsieh, T.-H., Huang, T.-C. 1998 Notes on the flora of Taiwan (32): Miscellaneous notes on Lamiaceae of Taiwan. Taiwania **43(1)**: 58–65.

Hu, G.-X., Takano, A., Drew, B.T., Liu, E.-D., Soltis, D.E., Soltis, P.S., Peng, H., Xiang, C.-L. 2018 Phylogeny and staminal evolution of *Salvia* (Lamiaceae, Nepetoideae) in East Asia. Ann. Bot. **122(4)**: 649–668.

Huang, T.-C., Wu, J.-T. 1975 A revision of Formosan *Salvia*. Taiwania **20(2)**: 213–228.

Huang, T.-C., Wu, J.-T. 1978 *Salvia*. In: Huang, T.-C. *et al.* (eds.), Flora of Taiwan, **4**: 509–519. Editorial Committee, Department of Botany, NTU, Taipei, Taiwan.

Huang, T.-C., Wu, J.-T. 1998 *Salvia*. In: Huang, T.-C. *et al.* (eds.), Flora of Taiwan, **4**: 516–530. Editorial Committee, Department of Botany, NTU, Taipei, Taiwan.

Kawakami, T. 1910 A List of Plants of Formosa. Bureau of Productive Industries, Government of Formosa, Taihoku. Formosa. pp. 85–88.

Kudo, Y. 1929. Labiatarum Sino-Japonicarum Prodromus. Mem. Fac. Sci. Agr., Taihoku Imp. Univ. **2(2)**: 37–332.

Kudo, Y. 1931 Materials For a Flora of Formosa. V. J. Soc. Trop. Agric. **3(3)**: 225–227.

Kuo, C.-M., Su, S.-H., Wu, W.-H., Lai, Y.-J., Huang, Y.-L., Chen, H.-Y., Weng, M.-L., Zheng, T.-T., Li, J.-H., Huang, S.-H., Chien, K.-J., Yu, C.-H., Chiang, I.-H., Kao, M.-F. 2004. Flora of Matsu. Lienchiang County Government, Lienchiang County, pp. 565–566. [in Chinese]

Li, H.-W., Hedge I.C. 1994 Lamiaceae. Flora of China **17**: 198–225.

Lin, C.-T. 2018 QGIS template for displaying species distribution by horizontal and vertical view in Taiwan. DOI: 10.5281/zenodo.1493690 [accessed 30 Nov 2025]

Lu, Y.-Z. 2025. A Taxonomic Study of *Salvia* (Lamiaceae) in Taiwan. Department of Biological Resources, National Chiayi University, Chiayi City. [in Chinese]

Matsumura, J., Hayata, B. 1906 Enumeratio plantarum Formosanarum: in insula Formosa sponte crescentium huscusque rite cognitarum adjectis descriptionibus et figuris specierum pro regione novarum. J. Coll. Sci. Imp. Univ. Tokyo **22**: 311–313.

Murata, G. 1952 Japanese and Formosa Akinotamurasou subspecies. Acta Phytotax. Geobot. **14(6)**: 184–190.

POWO 2025 Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Available at: https://powo.science.kew.org [accessed 30 Nov 2025]

Sasaki, S. 1928 List of Plants of Formosa. pp. 359–360.

Takano, A. 2017 Taxonomic study on Japanese *Salvia* (Lamiaceae): Phylogenetic position of *S. akiensis*, and polyphyletic nature of *S. lutescens* var. *intermedia*. PhytoKeys **80**: 87–104.

Walker, J.B., Sytsma, K.J. 2006 Staminal evolution in the genus *Salvia* (Lamiaceae): molecular phylogenetic evidence for multiple origins of the staminal lever. Ann. Bot. **100(2)**: 375–391.

WFO 2025 World Flora Online. Available at: http://www.worldfloraonline.org [accessed 30 Nov 2025]

Wu, J.-T., Huang, T.-C. 1975 Biosystematic Studies of Formosan *Salvia*. Taiwania **20(1)**: 77–98.

Wu, J.-T. 1973 Biosystematics Studies of Formosana *Salvia.* Master thesis, the Faculty of the Graduate School of Botany, National Taiwan University, Taipei. [in Chinese]

Yamazaki, T. 1969a Supplement of the flora of Ryukyu and Formosa (6). Formosa Akinotamurasou. J. Jap. Bot. **44(10)**: 317–319.

Yamazaki, T. 1969b New combination and new name in two taxa. Formosa Akinotamurasou. J. Jap. Bot. **44(12)**: 366.

Yang, Y.-P., Liu, H.-Y., Peng, C.-I, Shih, B.-L., Lu, S.-Y. 2001 Manual of Taiwan Vascular Plants, Vol. 4: 145–147.

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