



## *Symplocos jinshueiyingensis* (Symplocaceae), a new species from Taiwan

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**ABSTRACT:** A new species of *Symplocos* Jacq., *S. jinshueiyingensis*, found in Mt. Nandawu and Jin-shuei-ying Major Wildlife Habitat, Taiwan, is described. The new species differs from its congeners in having elliptic to ovate leaves with a long-caudate apex, fewer secondary veins (3–5 pairs), fewer-flowered inflorescences (2–5-flowered), and markedly fewer stamens (12–13). A detailed morphological description, phenology, distributional data, and photographic plates are provided, together with a key and comparative diagnostic table to distinguish it from related species.

**KEY WORDS:** critically endangered (CR), Jin-shuei-ying Major Wildlife Habitat, *Symplocos caudate*, *Symplocos modesta*, Taiwan.

### INTRODUCTION

The family Symplocaceae comprises 410 species (POWO, 2025) distributed across the tropical and subtropical regions of eastern and south-eastern Asia, the Americas and Australia (Nooteboom, 1975; Fritsch *et al.*, 2008; Fritsch and Almeda, 2015; Stephan *et al.*, 2021). The first record of *Symplocos* in Taiwan was made by Brand (1901), who documented two species: *S. modesta* Brand and *S. formosana* Brand. Subsequently, Matsumura and Hayata (1906) described six species: *S. crataegoides* Ham., *S. lancifolia* Siebold & Zucc., *S. myrtaea* Siebold & Zucc., *S. neriifolia* Siebold & Zucc., *S. sinica* Ker, and *S. spicata* Roxb. Hayata (1911) described a new species, *S. arisanensis* Hayata, in addition to the previously recognized native species *S. formosana*, *S. japonica* A. DC., and *S. prunifolia* Siebold & Zucc.. In 1915, Hayata reported 26 species of *Symplocos* under the family Symplocaceae in *Icones Plantarum Formosanarum*. Mori (1934) revised the family and recorded 30 species and four varieties, based on leaf characteristics. Kanehira (1936) reported 31 species, while Li (1963) documented 25 species and three uncertain species. Ying (1975) listed 25 species and six varieties and, later, Ying (1987) recorded 21 species. The first edition of the Flora of Taiwan (Nooteboom, 1978) included 14 species. In the second edition (Nagamasu, 1998), 26 species and one variety were recognised. Wang and Ou (1999a) revised the Symplocaceae of Taiwan, recording 24 species, based on herbarium specimens and field observations of living plants. Subsequently, Wang and Ou (1999b) added one new species. In Taiwan, Symplocaceae comprises 29 taxa, including 28 species and one variety (Editorial Committee of the Red List of Taiwan Plants, 2017).

The Jin-shuei-ying Major Wildlife Habitat in Pingtung, Taiwan, covers approximately 1,119 hectares, ranging from 500 to 1,688 m in elevation between

22°24'18"–22°25'58"N and 120°44'07"–120°47'20"E. It is covered by natural forest and is a significant area for biodiversity conservation (Wei and Chen, 2017). During botanical expeditions to Jin-shuei-ying from 2022 to 2024, we recorded 675 species of vascular plants from 368 genera, including 14 species of *Symplocos*: *S. congesta* Benth., *S. cochinchinensis* (Lour.) S.Moore, *S. formosana*, *S. formosana* Brand var. *taiheizanensis* (Mori) C.C.Wang, *S. glauca* (Thunb.) Koidz., *S. heishanensis* Hayata, *S. koshunensis* Kaneh., *S. migoi* Nagam., *S. modesta*, *S. morrisonicola* Hayata, *S. shilanensis* Y.C.Liu & F.Y.Lu, *S. stellaris* Brand, *S. wilkstroemifolia* Hayata and a newly-discovered species. Here, we describe this new species as *S. jinshueiyingensis*. Detailed morphological descriptions, phenology, distributional data, and photographic plates are provided, together with a key and a comparative diagnostic table (Table 1) to distinguish it from related species.

### TAXONOMIC TREATMENT

*Symplocos jinshueiyingensis* C.C.Wang, W.Yu Wang & C.K.Yang, *sp. nov.* **Figs. 1, 2 & S1A**

**Type:** TAIWAN. Pingtung Hsien: Chunri Township, Jin-shuei-ying Major Wildlife Habitat, in broadleaf forest, 24°24'27"N, 120°46'20"E, elevation. ca. 1,450 m, 9 Feb 2011, W.Y.Wang & C.K.Yang 711 (holotype: PPI; isotypes, HAST, PPI, TAI, TAIF, TNM, TNU).

**Diagnosis:** The new species can be readily distinguished from all other known species of *Symplocos* by the unique combination of elliptic to ovate leaf blades (3–4 × 0.8–1.5 cm) with a long-caudate apex, fewer secondary veins (3–5 pairs), reduced inflorescences (2–5-flowered), and a markedly lower number of stamens (12–13).

**Description:** Evergreen shrubs to small tree, up to 4 m tall. Bark grey, young branchlets greyish-brown to brown, twigs greyish-brown to brown, puberulous and densely to

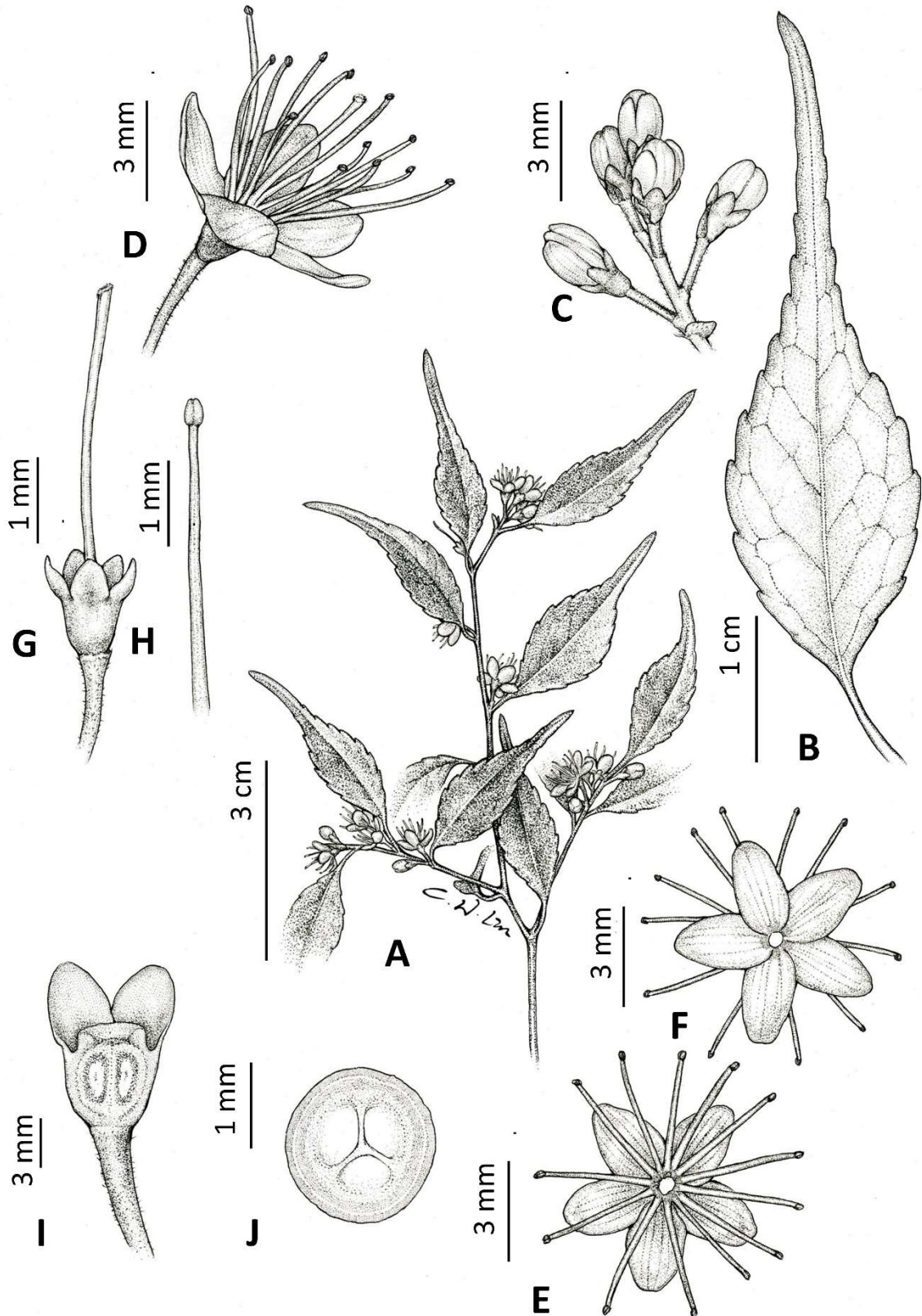
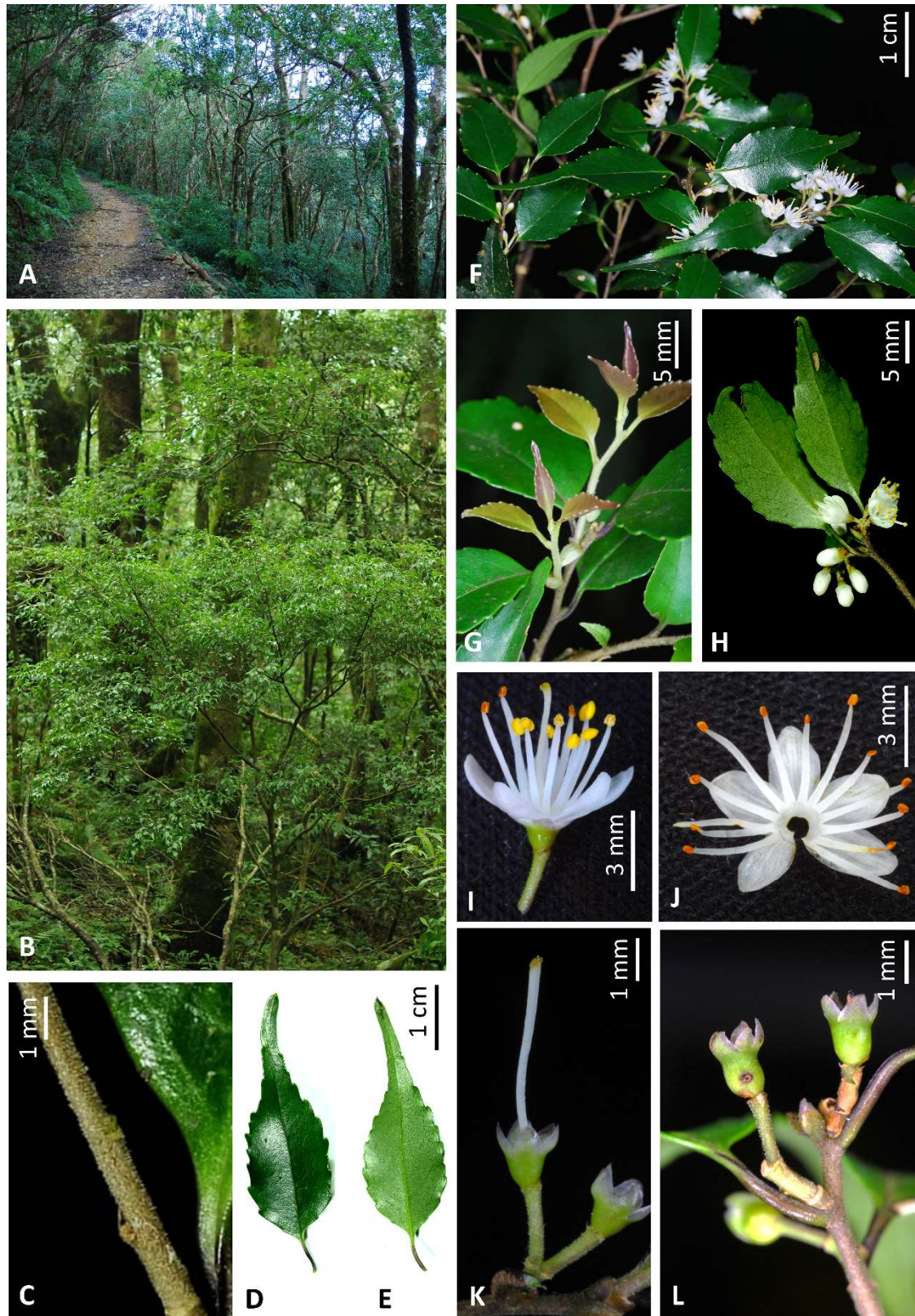


Fig. 1. *Symplocos jinshueiyingensis* C.C.Wang, W.YuWang & C.K.Yang. A. Flowering twig; B. details of one leaf; C. Inflorescence; D. Flower; E. Corolla of staminate flower, opened outwards to show epipetalous stamens, face view; F. Corolla of staminate flower, opened outwards to show epipetalous stamens, back view; G. Pistillate flower with corolla; H. Stamens; I. Fruit in longitudinal section; J. Fruit in cross section.



**Fig. 2.** *Symplocos jinshueiyingensis* C.C.Wang, W.Y.Wang & C.K.Yang **A.** habitat; **B.** habit; **C.** branchlet; **D.** leaf (adaxial) view; **E.** leaf (abaxial) view; **F.** flowers; **G.** young leaf; **H.** branchlet with flower buds and flowers on pendulous inflorescences; **I.** flower; **J.** corolla and stamens whorls; **K.** calyx tube, calyx and gynoecium, later view; **L.** fruit. (A, E-F, H-K) (photo by C.C.Wang, from Pingtung, Taiwan); (B-D, G) (photo by W.Y.Wang, from Pingtung, Taiwan).

**Table 1.** Comparison of *Symplocos jinshueiyingensis* sp. nov., *S. caudata*, and *S. modesta*.

Feature	<i>S. jinshueiyingensis</i>	<i>S. caudata</i>	<i>S. modesta</i>
Twig color	Greyish-brown to brown	Brown	Green
Indumentum	Puberulous and densely to sparsely pilose when young, becoming glabrate	Puberulous and densely to sparsely pilose when young, becoming glabrate	Glabrous
Terminal buds shape	Ovoid to subulate	Subulate	Ovoid to subulate
Apex	Acute	Often curved	Acute
Indumentum	Puberulous and densely to sparsely pilose	Puberulous and densely to sparsely pilose	Glabrous, except ciliate margin
Leaf Texture	Coriaceous	Coriaceous	Chartaceous to membranous
Shape	Elliptic to ovate	Elliptic to narrowly elliptic, rarely ovate	Elliptic to ovate
Size (cm)	3–4 × 0.8–1.5	4–9 × 1.5–4.5	3–6 × 1–3
Apex	Long caudate, with apiculate tip	Caudate, with apiculate tip	Long caudate, with apiculate tip
Base	Cuneate-attenuate, slightly recurved	Cuneate-attenuate, slightly recurved	Rounded to acute
Margin	Crenate-serrate with teeth 1–4 mm apart	Crenate-serrate with teeth 2–5 mm apart	Glandular-serrate with teeth 1–3 mm apart
Venation	3–5 pairs, slightly prominent on both surfaces	5–7 pairs, slightly prominent on both surfaces	4–6 pairs, slightly prominent on lower surfaces
Petiole	3–6 mm, glabrous	2–10 mm, glabrous or puberulous and sparsely pilose	1.5–4 mm, glabrous
Inflorescences	2–5 flowered	5–10 flowered	2–8 flowered
Bract			
Shape	Broadly elliptic	Broadly elliptic	Elliptic to triangular
Length	1–1.5 mm	2–5 mm	1.5–2 mm
Indumentum	Densely pubescent	Densely pubescent (partly glabrous)	Glabrous or sparsely pubescent
Calyx			
Lobe shape	Widely triangular	Mostly triangular	Semi-elliptic
Outer surface	Appressed pubescent at least near apex	Appressed pubescent at least near apex	Minutely glandular apiculate
Corolla length	2–4 mm	3–4 mm	5–6 mm
Ovary length	0.8–1 mm	0.5–1.25 mm	1.25–2 mm
Stamens	12–13	35–60	20–40
Distribution	Taiwan	Bhutan, India, Japan, Korea, Malaysia, Myanmar, Nepal, Taiwan, Thailand, Vietnam	Taiwan

sparsely pilose to glabrate, twigs with continuous growth; terminal buds small ovoid to subulate, with a few scales, apex acute, puberulous and densely to sparsely pilose. Leaves simple, alternate-spiral, exstipulate, coriaceous, elliptic to ovate, 3–4 × 0.8–1.5 cm, apex long caudate, with apiculate tip, base cuneate-attenuate, slightly recurved, crenate-serrate with teeth 1–4 mm apart, midvein prominent abaxially, impressed adaxially, secondary veins abaxially prominent, lateral veins 3–5 pairs, convergent towards apex, glabrous on both surfaces, petioles 3–6 mm long, brown, canaliculate near base on adaxial, glabrous. Inflorescences in axillary lax racemes on young and rarely on mature branches, occasionally flowers subsessile, rachis and pedicels pilose at bract nodes, bract caducous, broadly elliptic, densely pubescent, 1–1.5 mm long, bracteoles 2, caducous, ovate, keeled, densely pubescent, 0.7–1 mm long, pedicel densely pubescent, to 1–2 mm long. Flowers 2–5 in axillary lax racemes, to 5 mm long. Calyx tube green, 1 × 0.5 mm, appressed pubescent outside at least near apex, 5-lobed; lobes widely triangular, 0.4–0.7 × 0.4–0.6 mm, green to purple at margins, glabrous. Corolla white, 2–4 × 1–1.5 mm, deeply 5-lobed; lobes connate at base, elliptic, apex obtuse or subobtuse, 5-veined. Stamens 12–13, connate at base, 3–4 mm long; filaments equally wide from

base to apex; anthers yellow to orange, ca. 0.2 mm long; disc annular or shortly cylindrical, glabrous. Style 3–4 mm long, longer than corolla, constricted at middle, glabrous; stigma capitate. Fruits monopyrenous drupes, narrowly ovoid, 5–7 × 3–4 mm, often slightly curved, crowned by persistent calyx lobes, 3–5 mm long, 2–3 mm diam.

**Distribution and habitat:** This species is endemic to Taiwan. The habitats are mid-slope areas at elevations ranging from 1,400 to 1,500 m, which are humid and diverse, allowing many shade-tolerant plants to thrive. This hardwood forest is dominated by species from the Fagaceae, including *Castanopsis cuspidata* var. *carlesii* (Hemsl.) T.Yamaz., *Lithocarpus corneus* (Lour.) Rehder, *Lithocarpus dodonaeifolius* (Hayata) Hayata, *Quercus championii* Benth., *Quercus repandifolia* J.C.Liao and *Quercus sessilifolia* Blume, as well as the Lauraceae, including *Litsea lii* var. *nunkaotahangensis* (J.C.Liao) J.C.Liao, *Machilus pseudolongifolia* Hayata, *Machilus konishii* Hayata and *Machilus thunbergii* Siebold & Zucc.

The associated species in the understorey tree layer or shrub layer include *Fatsia polycarpa* Hayata, *Perrottetia arisanensis* Hayata, *Rhododendron formosanum* Hemsl., *Rhododendron leptosanctum* Hayata, *Hydrangea chinensis* Maxim., *Callicarpa hypoleucophylla* W.F.Lin &



J.L.Wang, *Osmanthus kaoi* (T.S.Liu & J.C.Liao) S.Y.Lu, *Cleyera japonica* Thunb., *Eurya lui* Y.H.Tseng & Y.Hung Wu, *Eurya leptophylla* Hayata and *Eurya loquaiana* Dunn.

The associated species in the herbaceous layer include *Plagiogyria dunnii* Copel., *Plagiogyria adnata* (Blume) Bedd., *Plagiogyria stenoptera* (Hance) Diels, *Woodwardia japonica* (L.f.) Sm., *Strobilanthes flexicaulis* Hayata, *Elatostema lineolatum* var. *majus* Wedd., *Cephalantheropsis gracilis* (Lindl.) S.Y.Hu, *Diplazium kawakamii* Hayata and *Diplazium pullingeri* (Baker) J.Sm.

The associated species in the ground-cover layer include *Selaginella doederleinii* Hieron., *Asplenium normale* D.Don and *Huperzia javanica* (Sw.) C.Y.Yang.

The epiphytic flora is quite abundant, with many fern species from the Hymenophyllaceae family, including *Abrodictyum obscurum* (Blume) Ebihara & K.Iwats., *Callistopteris apiifolia* (C.Presl) Copel., *Hymenophyllum acutum* (C.Presl) Ebihara & K.Iwats., *Hymenophyllum blandum* Racib., *Hymenophyllum devolii* M.J.Lai, *Hymenophyllum digitatum* (Sw.) Fosberg, *Hymenophyllum holochilum* (Bosch) C.Chr. and *Hymenophyllum semialatum* T.C.Hsu. Additionally, numerous species belong to the Polypodiaceae (including former Grammitidaceae), such as *Calymmodon gracilis* (Fée) Copel., *Calymmodon ordinatus* Copel., *Chrysogrammitis glandulosa* (J.Sm.) Parris, *Micropolypodium okuboi* (Yatabe) Hayata, *Oreogrammitis beddomeana* (Alderw.) T.C.Hsu, *Oreogrammitis blechnifrons* (Hayata), *Oreogrammitis congener* (Blume) Parris, *Oreogrammitis subevenosa* (Baker) Parris, *Oreogrammitis subnervosa* (T.C.Hsu) T.C.Hsu, *Prosaptia contigua* (G.Forst.) C.Presl, *Prosaptia formosana* (Hayata) T.C.Hsu and *Prosaptia obliquata* (Blume) Mett.

**Phenology:** Flowering was observed from February to March and fruiting from March to May.

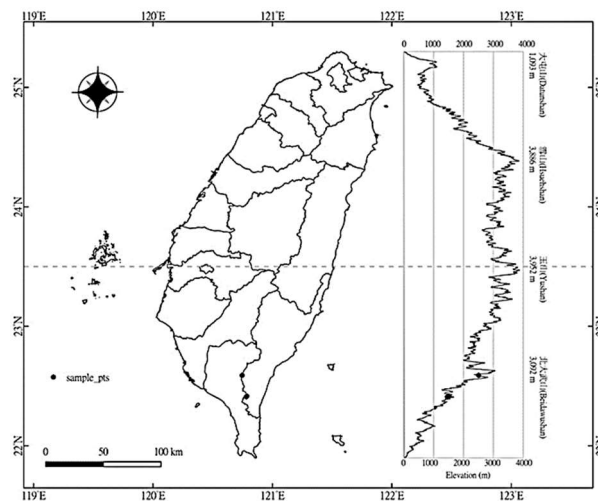
**Proposed Chinese name:** jìn-shuǐ-yíng-huī-mù (浸水營灰木).

**Etymology:** The specific epithet is derived from the collection locality of the holotype: Jin-shuei-ying Major Wildlife Habitat.

**Conservation status:** The new species is known from two populations separated by c. 18 km. Despite occurring within protected areas (Jin-shuei-ying Major Wildlife Habitat and Dawushan Nature Reserve), its extremely restricted distributional range (AOO < 10 km<sup>2</sup>, only two locations) and the small total population (~500 mature individuals) meet the IUCN criteria for listing as Critically Endangered (CR B2ab(ii, iii); C2a(i)) (IUCN, 2019). Continued monitoring is necessary to confirm population stability, and conservation measures remain crucial to prevent extinction.

**Additional specimens examined: Paratypes.** TAIWAN. Pingtung County: Chunri Township, Kutzuluenshan, 1,450–1,500 m elev., 19 Jan 2011, *W.Y. Wang* 600 (TNU); same loc., 24 Mar 2013, *W.Y. Wang* 1682 (TNU); Chunri Township, Tahanshan, 1,430–1,500 m elev., 27 Jul 2012, *W.Y. Wang* 682 (TNU); JinShuiYing, 15 Apr 1990, *S.Z. Yang* & *C.G. Lin* 22092 (PPI); 12 Nov 1990, *S.Z. Yang* 24601 (PPI); *S.Z. Yang*

24603 (PPI); Dec 1930, *K. Mori* s.n. (TI); 1,430–1,500 m elev., 9 Dec 2011, *W.Y. Wang* 710 (TNU, TAIIF); *W.Y. Wang* 712 (TNU); *W.Y. Wang* 725 (TNU); same loc., 1,400–1,500 m elev., 4 Mar 2020, *W.Y. Wang* 2681 (TAIF); same loc., 1,400–1,500 m elev., 13 Feb 2025, *W.Y. Wang* 3633 (TAIF); Taiwu Township, Nantawushan, 2,500 m elev., 6 Feb 2004, *S.H. Hueng* 42348 (PPI)



**Fig. 4.** Distribution map of *Symplocos jinshueiyingensis* C.C.Wang, W.YuWang & C.K.Yang.

## DISCUSSION

Recent molecular studies (Soejima and Nagamasu, 2004; Wang et al., 2004; Fritsch et al., 2006, 2008) have provided a robust phylogenetic framework based on DNA sequence data, allowing for a critical reassessment of the infrafamilial classification of Symplocaceae. Based on the classification proposed by Fritsch et al., (2008), Symplocaceae comprises two genera, *Cordyloblaste* and *Symplocos*. *Symplocos* is subdivided into two subgenera, *S.* subg. *Palura* and *S.* subg. *Symplocos*, the latter of which includes three sections: *S.* sect. *Lodhra*, *S.* sect. *Barberina*, and *S.* sect. *Symplocos*. Based on the diagnostic characters used in the key of Fritsch et al., (2008), *Symplocos jinshueiyingensis* is assignable to *S.* sect. *Lodhra*, characterized by an endocarp that is (1–) 3-celled and with the leaf midvein sulcate adaxially. *Symplocos jinshueiyingensis* is most similar to *S. modesta* Brand of Taiwan and *S. caudata* Wall. ex G. Don of Japan, China, Thailand, Burma, India, Malay Peninsula and northwest Taiwan in gross morphology, but can be distinguished by the characters in Table 1 (Figs. S1–B,C). The present study provides photographs of *S. jinshueiyingensis* and five closely related species including those above (Fig. S1), and an identification key to facilitate their recognition. In the *Flora of China*, *S. caudata* was treated as a synonym of *S. sumuntia* Buch.-Ham. ex D.Don (Wu and Nooteboom, 1996). However, examination of the protologue and original literature (Don, 1825), as well as the type material (K000009194), supports the separation of *Symplocos jinshueiyingensis*



from *S. sumuntia* by leaves that are 3–4 × 0.8–1.5 cm (vs. 6–13 × 2.3–4 cm), elliptic to ovate (vs. elliptic), and with a long-caudate apex (vs. acuminate). *Symplocos sumuntia* and *S. viridissima* Brand are keyed in close proximity in the *Flora of China* (Wu and Nootboom, 1996). After comparing the original description (Brand, 1901) and type specimens (GH00078188 and LE00016088), we found that *S. jinshueiyingensis* can be distinguished from *S. viridissima* by leaves coriaceous (vs. membranaceous), 3–4 × 0.8–1.5 cm (vs. 7–10 × 2.5–3 cm), and elliptic to ovate (vs. elliptic), and by having 12–13 stamens (vs. ca. 40).

**Key to *Symplocos jinshueiyingensis* with the similar species in Taiwan** (modified from Nagamasu (1998) and Wang and Ou (1999a)).

- 1a. Young twigs green ..... 2
- 1b. Young twigs soon turning grey, greyish-brown or brown ..... 4
- 2a. Young twig slender, medium-sized, 2–3 mm in diam.; leaves coriaceous, 4–13 cm long, 2–4 cm wide ..... *S. decora* (Fig. S1C-D)
- 2b. Young twig slender, less than 1.5 mm in diam.; leaves thinly coriaceous or chartaceous, 3–8 cm long, 1–3 cm wide ..... 3
- 3a. Leaf apex long caudate, margins glandular-serrate; pedicel slender, to 15 mm long; stamens 20–40 ..... *S. modesta* (Fig. S1I-J)
- 3b. Leaf apex shortly caudate, margins dentate or crenulate-serrate; pedicel 2–5 mm long; stamens 50 ..... *S. sasakii* (Fig. S1G-H)
- 4a. Young twigs glabrous; inflorescence shortly pedicelled, 10 to 30 flowered ..... *S. heishanensis*
- 4b. Young twigs pilose inflorescence shortly pedicelled, 2 to 10 flowered ..... 5
- 5a. Young twigs greyish-brown to brown; leaf blades elliptic to ovate, 3–4 cm long, 0.8–1.5 cm wide, apex long caudate; nerves 3–5 pairs; inflorescence 2 to 5 flowered; stamens 12–13 ... *S. jinshueiyingensis*
- 5b. Young twigs brown; leaf blades elliptic to narrowly elliptic, rare ovate, 4–9 cm long, 1.5–4.5 cm wide, apex caudate; nerves 5–7 pairs; inflorescence 5 to 10 flowered; stamens 35–60 . *S. caudata* (Fig. S1E-F)

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