

植物分類著作電子叢書 (e-books)

新植物及新名稱

(NEW TAXA & NEW NAMES)

(第七卷, Volume Seven)

應紹舜 (Shao-shun Ying) 著



植物分類著作電子叢書 (e-books)

新植物及新名稱

(NEW TAXA & NEW NAMES)

(第七卷, Volume Seven)

應紹舜著

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Boehmeria lalashanensis S.S.Ying, *sp. nov.*



Pseudoajania S.S. Ying, *gen. nov.*



Balanophora lalashanensis S. S. Ying *sp. nov.*

Messages from Research Gate

10.17. 2024.

Great job, Ying!

Your research items reached 1,500 reads

Achieved on October 17, 2024

09.17.2024

Well done, Ying!

Your book reached 100 reads

Achieved on September 17, 2024

[Book: NEW TAXA & NEW NAMES, vol 6-part one](#)

09.10. 2024.

Way to go, Ying!

Your book reached 400 reads

Achieved on September 10, 2024

[Book: New Taxa and New Names Vol.5](#)

12.29. 2023.

Great job, Ying!

Your book reached 300 reads

Achieved on December 28, 2023

[Book: New Taxa and New Names,2019 \(自動儲存\) \(自動儲存\)](#)

This series of e-books were also upload to websites of Research Gate and National Library
(Rublic of China)

Preface

Pseudoajania S.S. Ying is a new genus of Asteraceae which I proposed it in this e-book, the type species *Pseudoajani taiwanensis* was collected on the montane slope and at the elevations of 800-1,010 meters between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. The genus is somewhat like the genus *Ajania* Poljakov, but our plant is a tall robust perennial herb; with different habit, especially in leaves and achenes (with elongate white pappi in our genus).

Shang yang (向陽), Lidao (利稻) and Tian-lung Bridge (天龍橋), the elevations between 800 and 2,300 meters and the altitude difference about 1,500 meters in eastern slope of Central Mountains of Taiwan, The forests of the area are luxuriant, mainly *Pinus taiwanensis* Hayata, *Pinus fragilissima* Businsky and *Pinus x hayatae* Businsky mixed with numerous kinds of broad-leaved tree species, various of rare, precious and valuable species are growing at this area, Due to it is a remote area and inadequate transportation, a few botanical researchers to visit, collected and study there. but this is one of the place where I focus on botanical study and collections, I visited the area nearly once a month this year.

Pseudoajani taiwanensis, A new genus and new species, I collected from the area which I mentioned above.

Ficus lidaoensis is characterized by its lithophytic habitat usually mixed with mosses; the plant bodies completely prostrate on grounds; the species growing about 850-950 meters above sea level. it is the highest elevations of Taiwan *Ficus* species growing,

Scutellaria lidaoensis, the sole species in shrub habit of genus *Scutellaria* in Taiwan, is characterized by its shrub habit about 2 m high, flowers many, scentless, 8-10 mm in diameter when opened, bluish violet, in a terminal and axillary raceme.

Odontochilus shaolinchianus is readily recognized by its pale purplish fleshy rhizome; reddish purpleish stem and smaller dark green ovate leaves; with 3-4 smaller flower, white spur at sepal base; lip white, exserted, rectangular, with a middle groove from base to apex and divided it to two part, acute at apex, wavy at margins; a peculiar orchid species.

A lot of new species were described and collected at this area, due to space

limitations, no more detailed description here.

Hohuanshan (合歡山), A famous high mountain in central Taiwan, 3,417 meters above sea level in elevations, I did not remember how many times have been there; but I focus on summit of main peak of the mountain to study and collect the alpine plants this year.

Angelica alpinohohuanshanensis and *Epilobium alpinohohuanshanense*, those two species were collected near to summit of main peak of the mountain, about 3,410 meters above sea level. the former usually growing mixed with *Artemisia niitakayamensis* Hayata and *Reynoutria japonica* Houtt. Its flowering time is late of August. And the later was found at opened rocky places, it is characterized by purplish red flowers and erect covered with white villous hairs fruits.

Platanthera wulinensis S.S. Ying, the sole species which the flowers is yellow color in Taiwan *Platanthera* genus, is characterized by its 1-2 leaf (leaves) with 10-12 flowers. other alpine plants I collected and described in this alpine area were *Galium rubrocarpum*, *Sedum wulinense*, *Hypericum kuanyangensis* and *Bromus hohuanshanensis*, each has its own characteristics.

Wufengchi Waterfalls (五峰旗瀑布) is one of famous waterfalls of northern Taiwan, there are three waterfalls locate at different elevations of the mountain, the highest one is about 300 meters above sea level. Due to with rocky terrain formed by the ancient settlement, 4-month- long northeaster monsoon blown, and more than 3,500 mm average annual rainfall, the natural environment of this area has conceived its distinguished plant and resource structure, therefore forms its special flora and plant society development model. *Chloranthus wufengchiwaterfallensis* is a dominant plant at the area, it crowd gathering on cliffs of waterfall, it is characterized by its subshrub with fleshy rhizome which only 1 stem; leaves 4, verticillate on the top of stem, largest of Taiwan *Chloranthus* species; spikes 4-6, opposite, bracts like a cup, truncate and ciliate at apex; stamens 1, anther 3-celled, white, the middle one somewhat elongate. It is confines to Wufengchi Waterfall and around the waterfall about 60 meters only..

Commelina shengmushanensis is characterized by its leaves largest of the genus *Commelina* in Taiwan, flowers 2 in each spathe, white to pale violet in color; other new

species described from the area are *Mazus wufeiwaterfallensis*, *Elatostema wufengchiwaterfallense*, *Maesa shengmushanensis*, *Isachne taiwanensis*, *Leptopetalum wufengchiwaterfallianum*, *Maesa shengmushanensis*, *Lysimachia humilis*, *Ophiopogon wufengchiwaterfallensis* and *Emilia shengmushanensis* etc. Each has its own characteristics.

Lalashan (拉拉山), Tungyanshan (東眼山) and Guanwu (觀霧), The mountains I visited and field studied regularly as usual, some new species are described here; *Balanophora lalashanensis* is a peculiar plant, *Chamaecyparis formosensis* is its host plant, its tubers 4-6, usually fuse each other and forming a complex body; female flowers numerous, minute, subsessile to short-pedicels, mostly arranged on the main axis among claviform bodies. Some new orchids are described from Guanwu area; *Valeriana taiwaniana* was also collected at Guanwu, its flowers were subtended by 1-3 conspicuous, green bracts, rare seen on the genus *Valeriana* of the World.

A small and applicable herbarium (TPRCH) was established in August this year under Taiwan Plant Research Center, all holotypes and isotypes of this study has transfered and deposited to this TPRCH herbarium, if you have any problems about holotypes and isotypes of this study, please not hesitate to mail yingshaoshun43@gmail. com., we will give the answer quickly. I am very sorry to late professor Tang-shui Liu (劉棠瑞教授), the founder of NTUF herbarium, for I have no ability to keep the NTUF herbarium validly, since I am retired as a professor from Department of Forestry, National Taiwan University 15 more years, The NTUF herbarium had gone in this year.

Thanks to editors of The IPNI, Plant & Fungal Team, Royal Botanical Gardens, Kew, Jodrell Laboratory who give me many valuable suggests about botanical nomenclature and let me know many rules about it.

A grateful to Mr. Sen-Ming, Li (李聲銘先生), Hsinchu Branch, Forestry and Nature Conservation Agency (林業及保育署新竹分署), he plays an important role for discovering the species of *Polygonatum lisemingensis* S. S. Ying. Thanks to many anonymous who gave me a hitchhike convenience on the way of field study.

Total together with 594 pages and 707 pictures of this e-book to discuss, explain and describe of one new genus, 95 new species, four new combinations and one new name;

among those, the genus *Pseudoajans* is the new records of flora of Taiwan. It is a bumper harvest year for me, however, mostly new matters proposed in this e-book are very rare in the wild, I hope that this e-book will stimulate interest in the intriguing group of plants which mentioned in the book, whilst at the same time encourage more effort to help to protect the more species in the wild.

Shao-shun Ying

Emeritus Professor, National Taiwan University



Valeriana taiwaniana S.S. Ying , sp. nov.

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1.Three New Species of Genus *Mazus* (Mazaceae) in Taiwan

A.Mazus taiwanensis S. S. Ying

Mazus taiwanensis S.S. Ying , *sp. nov.* 台灣通泉草

TYPE:TAIWAN. Miaoli County, Taian Townshaip (泰安鄉) , Guanwu (觀霧) 2018 m alt.

S. S. Ying , *s.n.* November 16, 2023 ° (holotype , **TPRCH**) °



Fig. 001. *Mazus taiwanensis* S. S. Ying, plant growing in situ

Morphology : Annual to biennial herbs, stem absent, without stolon. Leaves radical, rosulate, tufted, broadly ovate to ovate- spatulate, 3-4.5 cm long, 1.5-2.1 cm wide, obtuse at apex, attenuate to cuneate at base, chartaceous, lustrous green surface, pale green beneath, crenate and ciliate at margins, scattered long-gland hairs at base of leaf surface, glabrous to scattered gland-hairs on lower part beneath, midrib and lateral veins (2-

4 per side) impressed on surface and elevated beneath. Petioles 1-1.3 cm long, slightly winged on both sides, densely scattered with long white hairs.



Fig. 002. *Mazus taiwanensis* S. S. Ying, close-up of inflorescences

Flowers solitary, rather smaller, 5-7 mm in diameter when opened, white tinged with purple; scape 2-4 from central of leaf-fascicled, short, erect to ascending, 0.9-1.8 cm long, somewhat robust, purplish red, densely scattered with white long hairs; bracts linear to narrow lanceolate, 6-9 mm long about 1.5 mm wide, acuminate at apex; calyx campanulate, 4.5-5.5 mm long, 3.5-4.5 mm wide, green, scattered with white long hairs outside, green and glabrous inside, 5-lobed at apex; lobes ovate, equal in length, 2.5-3.5 mm long, 1.8-2.5 mm wide, acuminate and arista at apex; corolla bilabiate, 5-7 mm long, 4.5-6 mm in diameter, white tinged with purple outside and white inside, wavy at margins; upper lobe short, obtuse and inconspicuous 2-lobulated at apex; lower lobe extended, larger, 2.5-3 mm long, 2.1-3.2 mm wide, 3-lobed at apex, with 2 brownish and glandular hairs keels in the middle, glandular hairs in throat; lateral lobules rounded, obtuse at apex; middle lobules oblong, obtuse and emarginate at apex; stamens 4, didynamous, included; ovary ovoid, emarginated at apex nearly glabrous; style slender, included, white; stigma capitate.



Fig. 003. *Mazus taiwanensis* S. S. Ying, close-up of corolla



Fig. 004. *Mazus taiwanensis* S. S. Ying, the holotype TPRCH-113-001

(this holotype has transfered and deposited at TPRCH herbarium)

Diagnosis.

Mazus taiwanensis is a distinctive new species and recognized by its solitary flower in a very pedicel and several pedicels from fascicled leaves ; flower rather smaller, corolla bilabiated, white tinged with purple outside and white inside, wavy at margins; lower lobe extended, larger, 2.5-3 mm long, 2.1-3.2 mm wide, 3-lobed at apex, with 2 brownish and glandular hairs keels in the middle, glandular hairs in throat; lateral lobules rounded, obtuse at apex; middle lobules oblong, obtuse and emarginate at apex.



Fig. 005. *Mazus taiwanensis* S. S. Ying, several pedicels with one flower from leaf fascicle

Distribution and phenology.

Mazus taiwanensis S.S. Ying is endemic to Taiwan . It is known on forest edge along the roadsides between Guanwu (觀霧) and Sheipa Leiaure Farm (雪霸休閒農場), Guanwu area, Taian Townshaip (泰安鄉) , Miaoli County, central Taiwan. . It was discovered the species under the forest edge and the roadsides at elevations of 1,900-2,200 meters. Its flowering time is November and fruiting time is November to December.

B.Mazus wuchiwaterfallensis S. S. Ying

Mazus wufeiwaterfallensis S.S. Ying , *sp. nov.* 五峰旗瀑布通泉草

TYPE:TAIWAN. I-Lan County,Chaochi Township (礁溪鄉) , Wufengchi Waterfall (五峰旗瀑布) 280 m alt. S. S. Ying , *s.n.* May 16, 2024 . (holotype , **TPRCH**) .

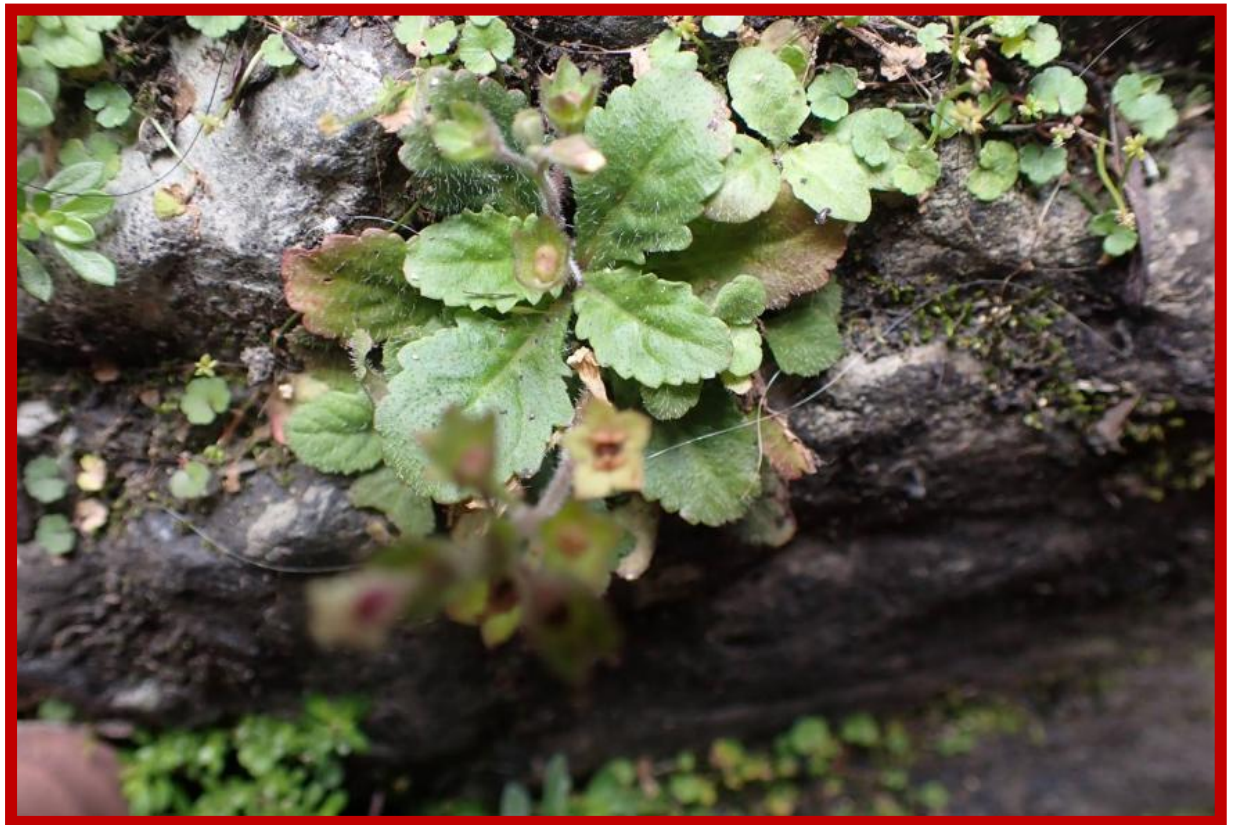


Fig. 006. *Mazus wufengchiwaterfallensis* S. S. Ying, plant growing in situ

Morphology : Annual to biennial herbs, stem absent, without stolon. Leaves radical, rosulate, tufted, ovate to broadly ovate, 2-3.5 cm long, 1.1-1.7 cm wide, obtuse at apex, attenuate, cuneate to obtuse at base, chartaceous, lustrous green surface, pale green beneath, crenate at margins, scattered with hirsute on both surfaces, midrib and lateral veins (2-3 per side) impressed on surface and elevated beneath, lateral veins inconspicuous. Petioles 5-9 mm long, slightly winged on both sides, scattered with hirsute.



Fig. 007. *Mazus wufengchiwaterfallensis* S. S. Ying, leaves



Fig. 008. *Mazus wufengchiwaterfallensis* S. S. Ying, close-up of inflorescence

Flowers 3-7, rather smaller, 4-5 mm in diameter when opened, white tinged with viole, in a racemose; scape 2-4 from central of leaf-fascicled, erect to ascending, 2.5-4.8 cm long, somewhat robust, green to purplish red, densely scattered with white glandular hairs; bractssomewhat like the leaf but much smaller, 4-5 mm long about 2.3 mm wide,



Fig. 009. *Mazus wufengchiwaterfallensis* S. S. Ying, close-up of flowers

obtuse at apex; pedicels 3-6 mm long, green, terete, with glandular hairs; calyx campanulate, 4.5-5.5 mm long, 3.5-4.5 mm wide, green tinged with purplish at apex, scattered with white glandular hairs outside, green, white spots and glabrous inside, 5-lobed at apex; lobes ovate, equal in length, 2.5-3.5 mm long, 1.5-2.5 mm wide, acuminate and arista at apex; corolla bilabiated, 3.5-4.7 mm long, 2.5-3 mm in diameter, white tinged with purple outside and white inside, slightly wavy at margins; upper lobe ovate, 1.6-2 mm long, acute and entire at apex; lower lobe extended, larger, 2.6-3.5 mm long, 3.2-3.6 mm wide, 3-lobed at apex, with 2 low pale brownish spots on the keels in the middle, glabrous in throat; lateral lobules rounded, larger than the middle one, obtuse at apex; middle lobules oblong, obtuse at apex; stamens 4, didynamous, included; ovary ovoid, emarginated at apex nearly glabrous; style slender, included, white; stigma capitate.



Fig. 010. *Mazus wufengchiwaterfallensis* S. S. Ying, close-up of corolla



Fig. 011. *Mazus wufengchiwaterfallensis* S. S. Ying, flower bud,,calyx and young fruits



Fig. 012. *Mazus wufengchiwaterfallensis* S. S. Ying, the holotype TPRCH-113-002

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 013. *Mazus wufengchiwaterfallensis* S. S. Ying, mature opened fruit

Fruit a capsule, compressed, included in cupular persistent calyx, ovoid, 3-3.5 mm long and wide, brown when mature; seeds rounded, brownish, glabrous.

Diagnosis.

Mazus wufengchiwaterfallensis is recognized by its broadly ovate to broadly ovate leaves; flowers 3-7, rather smaller, 4-5 mm in diameter when opened, white tinged with violet, in a racemose; bilabiate corolla which 3.5-4.7 mm long, 2.5-3 mm in diameter, and upper lobe ovate, acute and entire at apex; lower lobe extended, larger, 3-lobed at apex, with 2 low pale brownish spots on the keels in the middle, glabrous in throat; lateral lobules rounded, larger than the middle one, obtuse at apex; middle lobules oblong, obtuse at apex.

The species confines to 50 meters around secondary and third layer waterfall.

Distribution and phenology.

Mazus wufengchiwaterfallensis S.S. Ying is endemic to Taiwan. It is known from Wufengchi Waterfall(五峰旗瀑布) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on cliff leavges around the waterfall at elevations of 250-280 meters. Its flowering time is May to April and fruiting times May to June.



Fig. 014. *Mazus wufengchiwaterfallensis* S. S. Ying, plants growing in situ

C.Mazus lidaoensis S. S. Ying

Mazus lidaoensis S.S. Ying, *sp. nov.* 利稻通泉草

TYPE:TAIWAN. Taitung county , Haiduan township (海端鄉) , Between Xiangyang (向陽) and Lidao (利稻). 1431 m alt. S. S. Ying , *s.n. June 22, 2024* ° (holotype, **TPRCH**) °



Fig. 015. *Mazus lidaoensis* S. S. Ying, plants growing in situ

Morphology : Annual herbs, stem absent, without stolon. Leaves radical, rosulate, tufted, oblong to oblong-spathulate, 3-4.5 cm long, 1.2-1.8 cm wide, obtuse at apex, attenuate at base, chartaceous, lustrous green surface, pale green beneath, dentate and shortly lobed and

-13-



Fig. 016. *Mazus lidaoensis* S. S. Ying, leaves and scape

ciliate at margins, scattered with hirsute on both surfaces, midrib and lateral veins (2-4 per side) impressed on surface and elevated beneath, lateral veins inconspicuous. Petioles 1.2-1.6 cm long, slightly winged on both sides, scattered with hirsute.

Flowers 5-12, rather smaller, 4.5-5 mm in diameter when opened, white, racemose; scape 2-4 from central of leaf-fascicled, erect to ascending, 5.5-14.8 cm long, somewhat slender, erect to ascending, purplish red, densely scattered with white glandular hairs; bracts oblong to lanceolate, 4-5.5 mm long about 2.5 mm wide, acuminate at apex, hirsute; pedicels 5-6.5 mm long, purplish red, terete, with glandular hairs; calyx campanulate, 4.5-5.5 mm long, 3.5-4.5 mm wide, green tinged with purplish at apex, scattered with white glandular hairs outside, green and white spots inside, 5-lobed at apex; lobes ovate-triangular, equal in length, 2.5-3.5 mm long, 1.5-2.5 mm wide, acute at apex; corolla bilabiate, 9.5-11.5 mm long, 4.5-5 mm in diameter, white tinged with purple outside and white inside, entire at margins; upper lobe ovate, 3.6-4 mm long, obtuse and entire at apex; lower lobe extended, larger, 5.6-6.5 mm long, 3.5-3.8 mm wide, 3-lobed at apex, with 2 low yellow spots on the keels in the middle, glabrous in throat; lateral lobules cuneate,



Fig. 017. *Mazus lidaoensis* S. S. Ying, part of scape



Fig. 018. *Mazus lidaoensis* S. S. Ying, close-up of flowers

larger than the middle one, obtuse at apex; middle lobules spatulate, acute at apex; stamens 4, didynamous, included; ovary globose, obtuse at apex glabrous, green; style slender, included, pale yellow; stigma capitate.



Fig. 019. *Mazus lidaoensis* S. S. Ying, close-up of young fruit

Fruit a capsule, compressed, ovoid, 3-4.5 mm long and wide, brown when mature, calyx persistent; seeds rounded, grownish, glabrous.

Diagnosis.

Mazus tlidaoensis is recognized by its oblong to oblong-spathulate leaves; flowers 5-12, rather smaller, 4.5-5 mm in diameter when opened, white, racemose; scape 2-4 from central of leaf-fascicled, erect to ascending, 5.5-14.8 cm long, erect to ascending, purplish red, densely scattered with white glandular hairs; corolla bilabiate, 9.5-11.5 mm long, 4.5-5 mm in diameter, white tinged with purple outside and white inside; lower lobe extended, larger 3-lobed at apex, with 2 low yellow spots on the keels in the middle, glabrous in throat; lateral lobules cuneate.



Fig. 020. *Mazus lidaoensis* S. S. Ying, the holotype TPRCH-113-003

(this holotype has transferred and deposited at TPRCH herbarium)

Distribution and phenology.

Mazus lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Xiangyang (向陽) and Li-dao (利稻), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky montane slope at elevations of 1,100-1,810 meters. Its flowering time is June to July and fruiting time is July to August.



Fig. 021. *Mazus lidaoensis* S. S. Ying, plant growing in situ

2. One New Species of Genus *Impatiens* (Balsaminaceae) in Taiwan

Impatiens shaolinchiana Ying

Impatiens shaolinchiana S.S. Ying, *sp. nov.* 邵氏鳳仙花

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Nanhutashan (南湖大山)
2010 m alt. S. S. Ying, *s.n.* November 30, 2023. (holotype, **TPRCH**).



Fig. 022. *Impatiens shaolinchiana* S. S. Ying, blooming flower plant

Morphology : Annual to biennial herbs, stem elongate, somewhat creeping, usually forming a small plant colony, 20-45 cm long, fleshy, terete, green, glabrous, usually with a node on the branches; nodes swollen; branches 10-25 cm long, creeping to ascending. Leaves simple, alternate, ovate, 4.5-6 cm long, 2.6-3.5 cm wide, acute to acuminate at apex, obtuse to attenuate at base, chartaceous, dentate and slightly ciliate at margins, lustrous green surface and pale green beneath, scattered with hirsute surfaces, hairy along midrib and veins beneath; midrib and lateral veins (3-4 per side) impressed surface and



Fig. 023. *Impatiens shaolinchiana* S. S. Ying, leaves, flower-buds and flowers



Fig. 024. *Impatiens shaolinchiana* S. S. Ying, flowers, see from front

elevated beneath. Petioles 1.5-2.5 cm long, slightly winged both sides, hairy to glabrous, green.



Fig. 025. *Impatiens shaolinchiana* S. S. Ying, flower, see from side

Flower solitary to paired, white, rather large, 1.6-2.4 cm in diameter when opened, scentless, produced from leaf-axil of upper part of stem; peduncles 4-5 cm long, ascending, pale purplish; pedicels 1-1.6 cm long, pale purple, glabrous; bracts at the base of the pedicel, oblong to ovate, green, caducous, acuminate at apex; lateral sepals 2, navicular, oblong, 1.5-1.8 cm long, 6-7 mm wide, acuminate at apex, somewhat membranous at margins; lower sepal (lip) white tinged with pink, outside and white with yellowish base which scattered with many red spots, 3-4 red veins; 2.5-3.2 cm long, mouth beaked, beak 2 mm, spur pink to pale purple, 2 - 2.9 cm long, linear-filiform, curved, tip slightly bifid, white to pink; upper petal (standard) white tinged with pink at base, suborbicular, 1.5-2.2 cm long, 1.4-1.8 cm wide, obtuse and with an awn at apex; lateral united petals (wings) white, bilobed; the basal lobe yellow blotch with many red spots, ovate to ovate-oblong, 1.3-1.6 cm long, 5.5-6.5 mm wide, obtuse at apex; the upper lobe white, oblong-lanceolate, 1.8-2.4 cm long, 4-6 mm wide, acuminate at apex, slightly wavy at margins, not clawed; stamens 5, united, enclosing ovary, upright 4 mm long, anther obtuse.



Fig. 026. *Impatiens shaolinchiana* S. S. Ying, close-up of flower structure

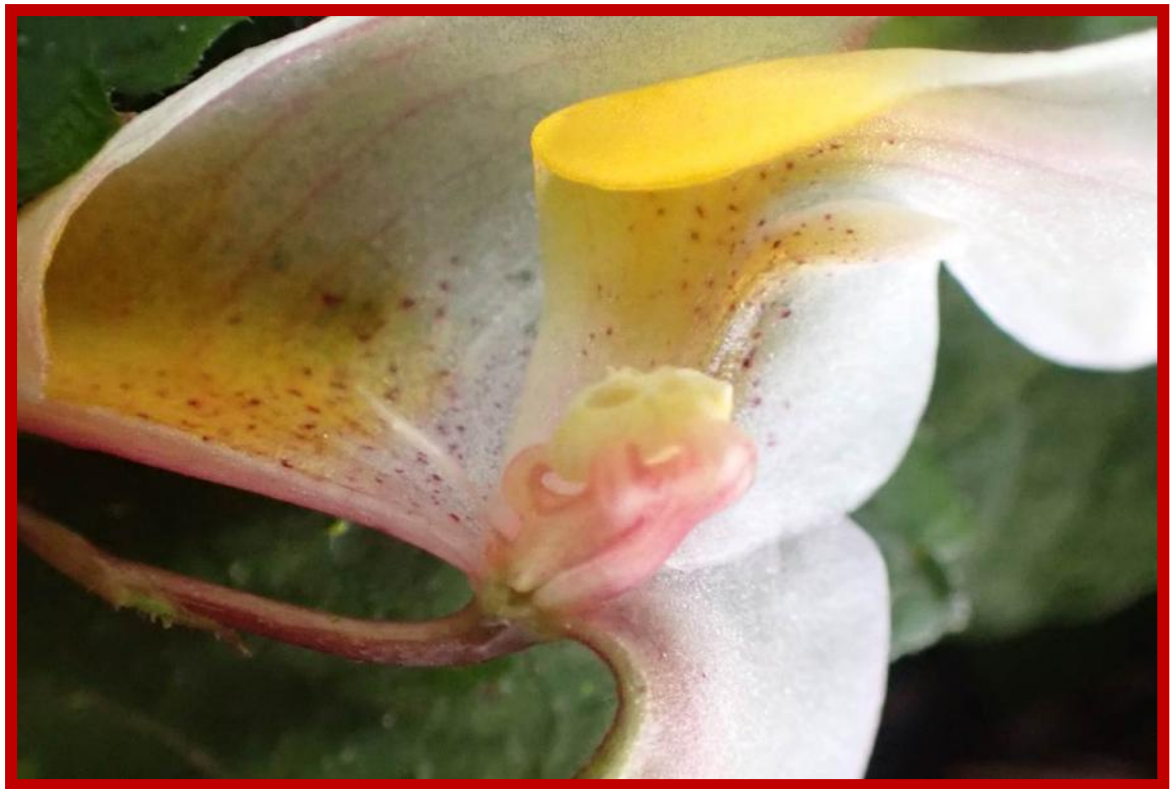


Fig. 027. *Impatiens shaolinchiana* S. S. Ying, close-up of androecium

Capsule linear, green, 5 ridged, 3.8 – 4.2 cm long, green, glabrous, with a articulate at top of pedicels, glabrous; seeds globose, white, brown when dry, slightly papillose.



Fig. 028. *Impatiens shaolinchiana* S. S. Ying, fruits



Fig. 029. *Impatiens shaolinchiana* S. S. Ying, fruit

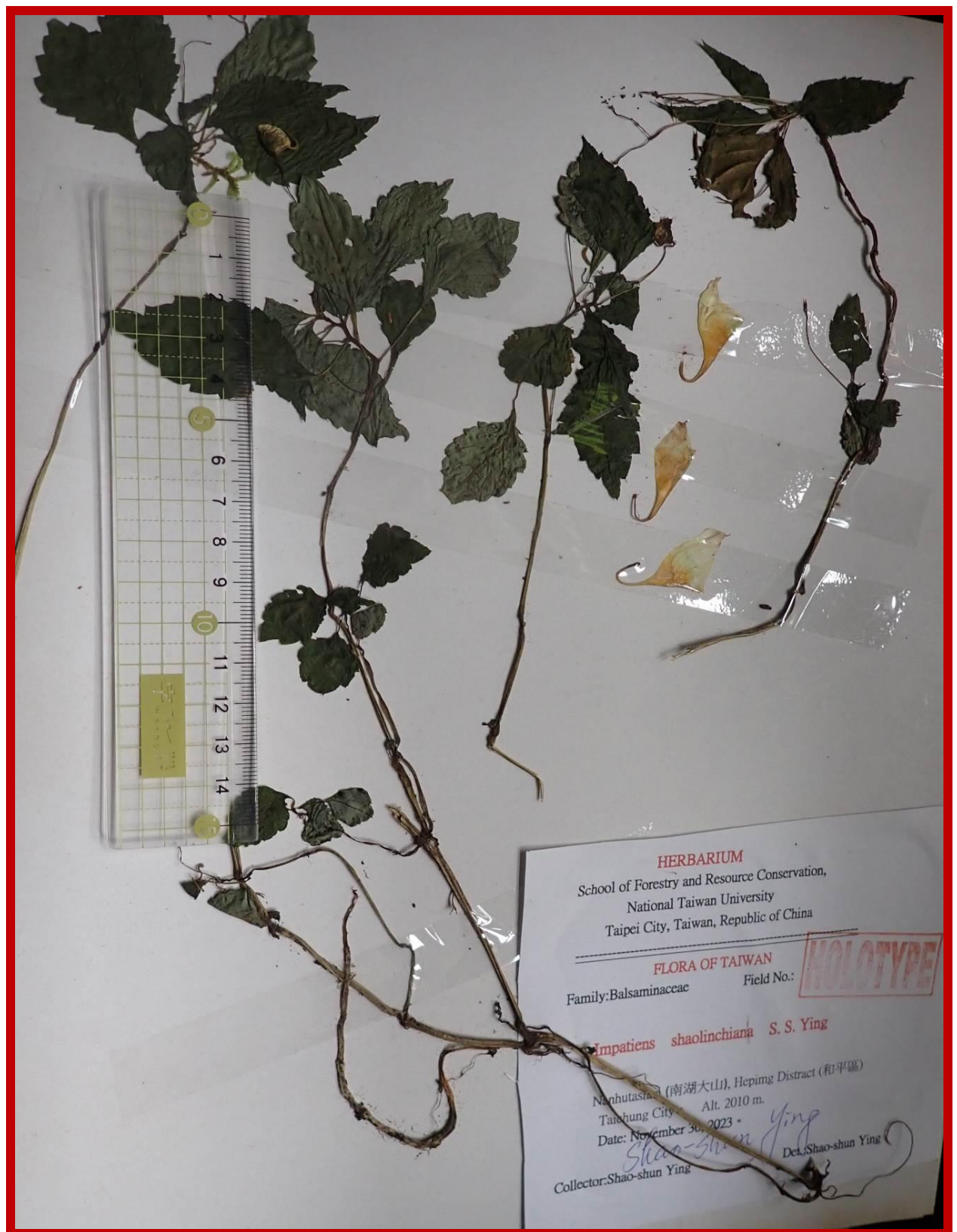


Fig. 030. *Impatiens shaolinchiana* S. S. Ying, the holotype TPRCH -113-004

(this holotype has transferred and deposited at TPRCH herbarium)

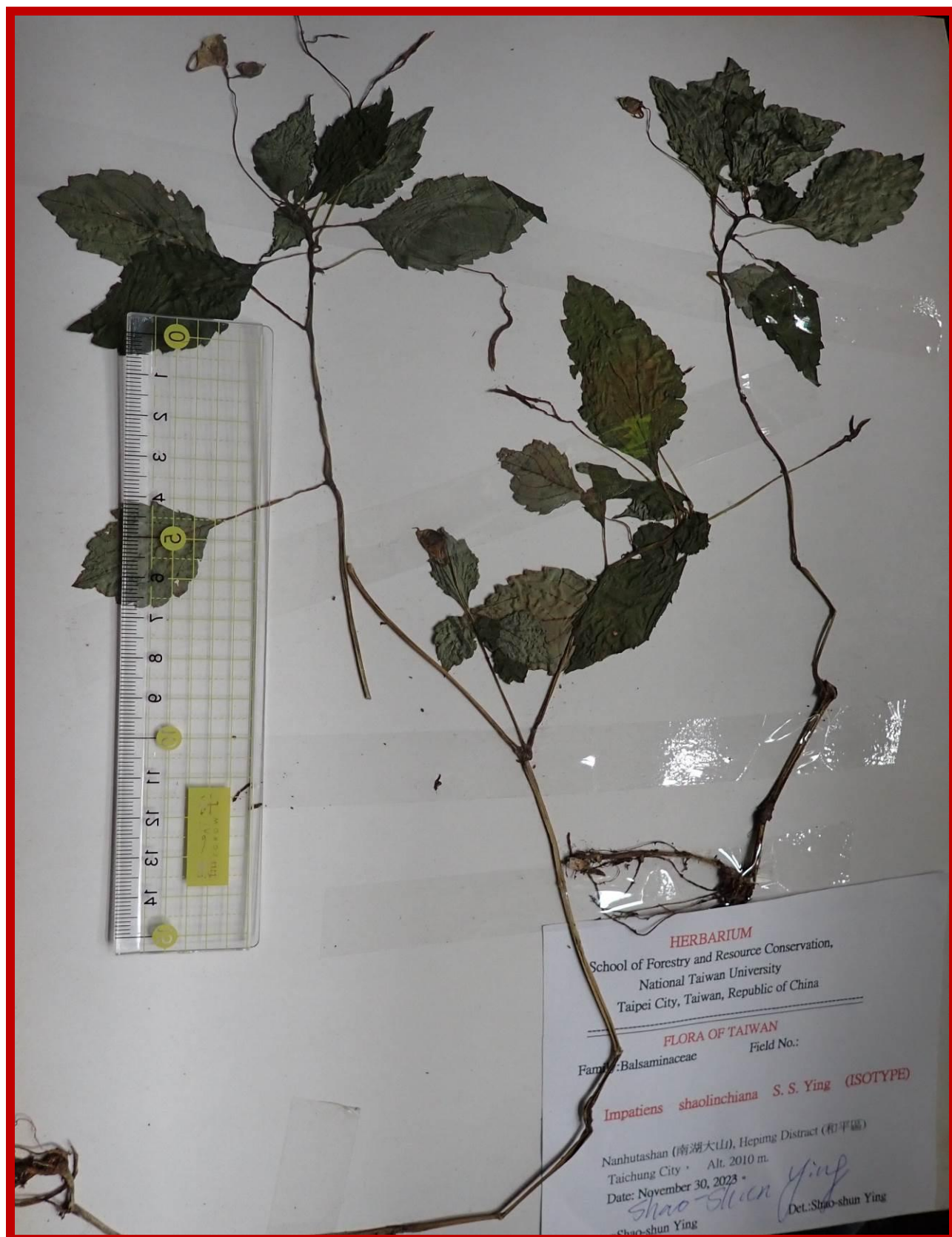


Fig. 031. *Impatiens shaolinchiana* S. S. Ying, the isotype TPRCH -113-005

(this isotype has transfered and deposited at TPRCH herbarium)

Diagnosis.

Impatiens shaolinchiana is a distinctive new species of Taiwan, it can be recognized by its rather larger white flower, white tinged with pink, outside and white with yellowish base which scattered with many red spots lower sepal (lip), white tinged with pink at base upper petal (standard), white, bilobed lateral united petals (wings) which the basal lobe yellow blotch with many red spots, ovate to ovate-oblong, obtuse at apex and the upper lobe white, oblong-lanceolate, acuminate at apes, slightly wavy at margins, not clawed.



Fig. 032. *Impatiens shaolinchiana* S. S. Ying, plants growing in situ

Distribution and phenology.

The species is endemic in Taiwan, It is known from Nanhutashan(南湖大山) , Hoping District (和平區) , Taichung City , northern Taiwan ° It was discovered at edge of the forests, at elevation between 1,950 and 2,100 meters, Its flowering time is from late November to December, and fruiting time in December.

3. One New Species of Genus *Pilea* (Urticaceae) in Taiwan

Pilea guanwuensis S. S. Ying 觀霧冷水麻

Pilea guanwuensis S.S. Ying, *sp. nov.* 觀霧冷水麻

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧) 2018 m alt.

S. S. Ying, *s.n.* November 16, 2023. (holotype, **TPRCH**).



Fig. 033. *Pilea guanwuensis* S. S. Ying, plants with female inflorescences

Morphology : Flowers dioecious: Annual terrestrial large herbs, usually 60-100 cm high. Stem simple, not branched, erect to ascending, 60-100 cm long, brownish to greenish brown, terete to slightly angular, glabrous. Leaves simple, opposite, oblong to ovate-oblong, 16.5-20.5 cm long, 6.5-8.5 cm wide, acuminate to a caudate at apex, obtuse at base, chartaceous, dentate at margins, glabrous on both surfaces, 3-nerved impressed



Fig. 034. *Pilea guanwuensis* S. S. Ying, leaves

surface and elevated beneath, lateral veins 4-5 per side also impressed surface and elevated beneath. Petioles 4.5-6.5 cm long, fleshy, purplish, grooved above, glabrous.

Flowers dioecious: female flowers, small, green to pale green, 1.6-2.2 mm in diameter when opened, usually in a compound axillary cymes; inflorescence rachis 2.5-3.5 cm long, pale yellow, angular, glabrous; peduncles 3-5, spreading, 2.5-4 cm long, pale yellow, angular; pedicels 0-0.5 mm long, glabrous; bracts ovate, 1.5-2 mm long, 0.6-0.8 mm wide, obtuse at apex; sepals 4, ovate-lanceolate, 2.2-3.1 mm long, 1.5-16 mm wide, acute at apex, slightly connate at base, pale yellow; ovary ovoid to ellipsoid, 0.4-0.5 mm long, glabrous, stigma penicillate, 0.2-0.3 mm long, cauduous. Staminate flowers unknown.

Achene biconvex, ovoid to ellipsoid, 0.7-0.8 mm long, 0.3-0.35 mm wide, obtuse at both ends, black, densely verruculose.



Fig. 035. *Pilea guanwuensis* S. S. Ying, inflorescences



Fig. 036. *Pilea guanwuensis* S. S. Ying close-up of inflorescences

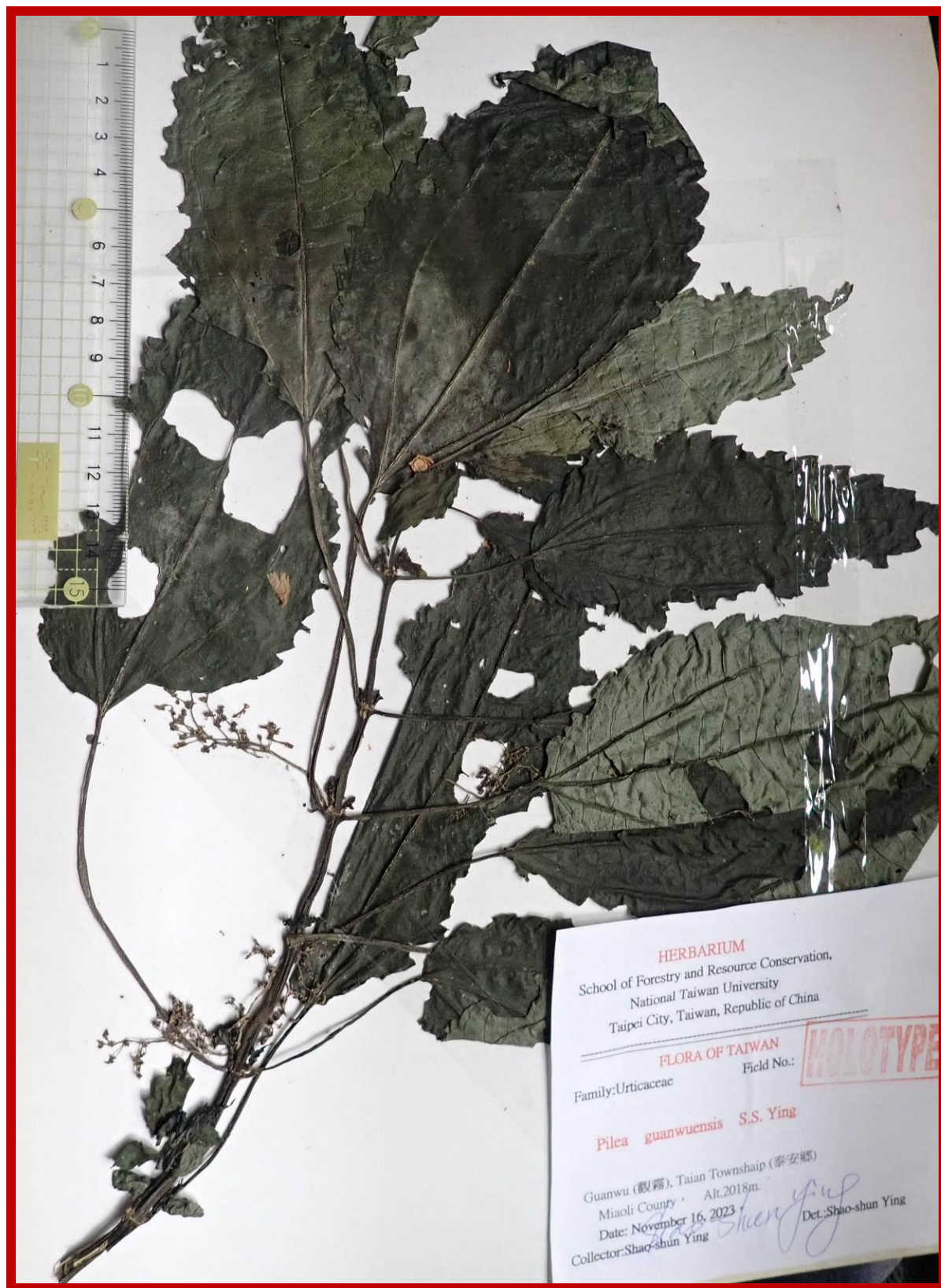


Fig. 037. *Pilea guanwuensis* S. S. Ying the holotype TPRCH -113-006

(this holotype has transferred and deposited at TPRCH herbarium)

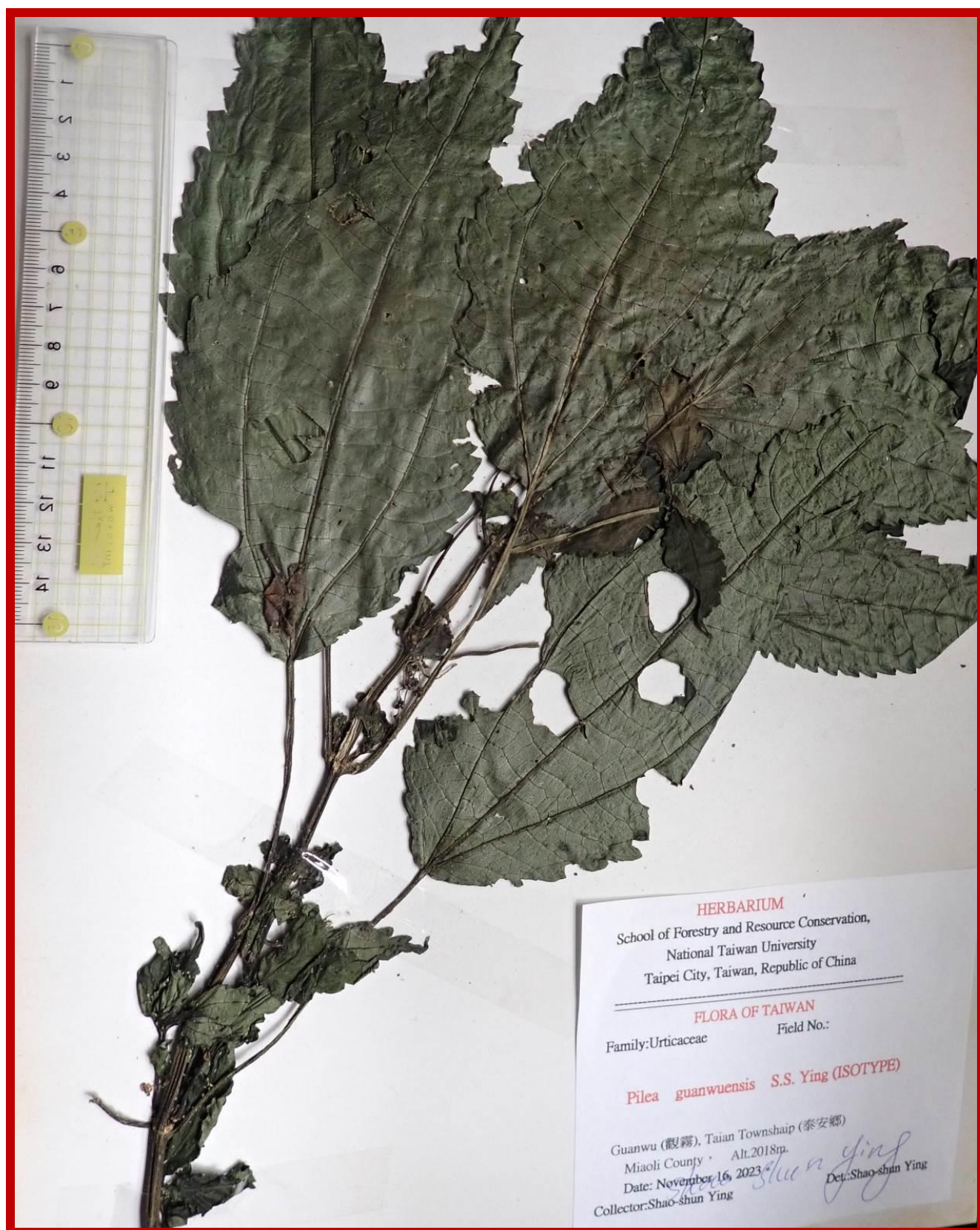


Fig. 038. *Pilea guanwuensis* S. S. Ying the isotype TPRCH -113-007

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 039. *Pilea guanwuensis* S. S. Ying close-up of part inflorescences



Fig. 040. *Pilea guanwuensis* S. S. Ying close-up of achenes

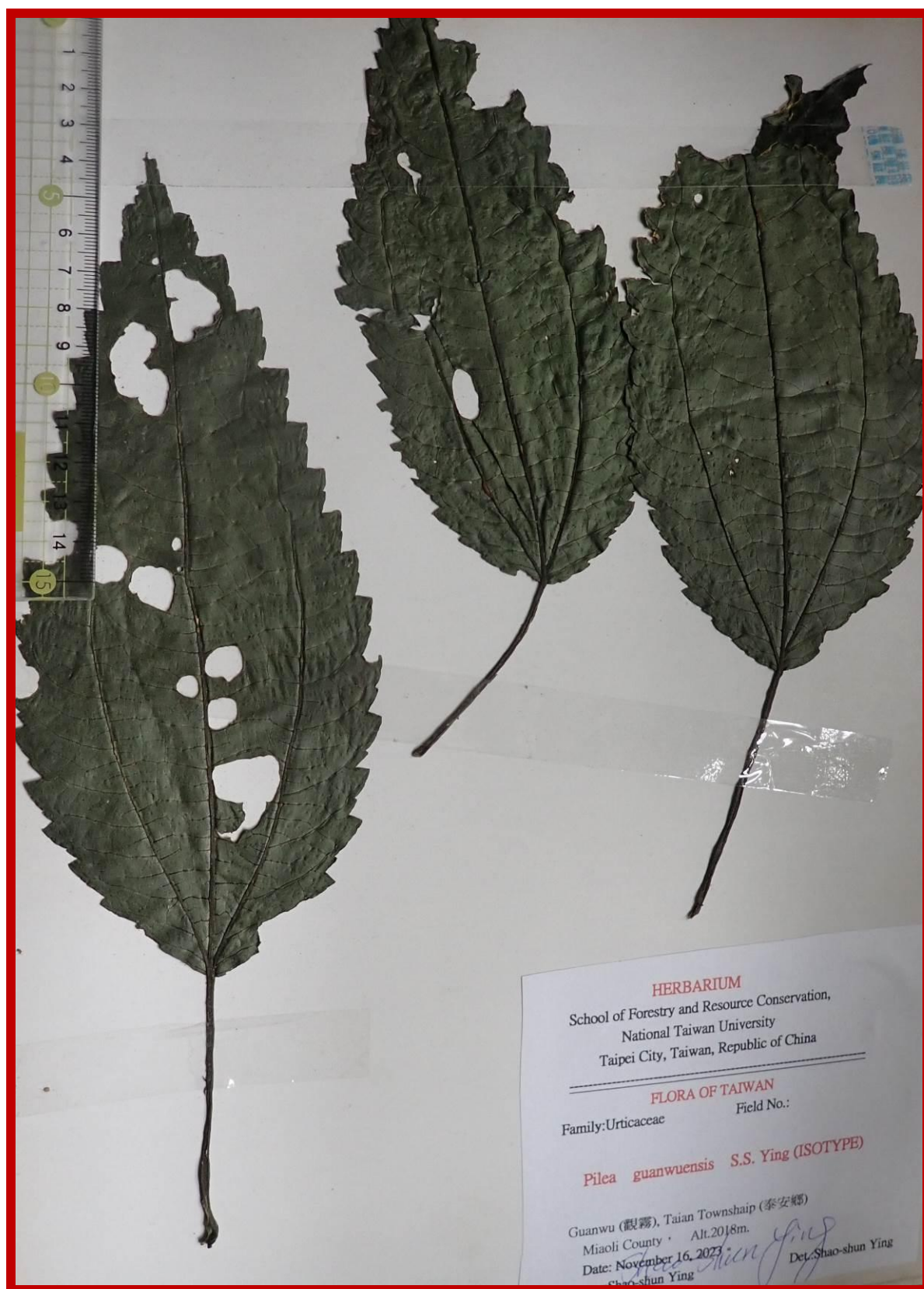


Fig. 041. *Pilea guanwuensis* S. S. Ying the isotype TPRCH -113-008

(this isotype has transferred and deposited at TPRCH herbarium)

Diagnosis.

Pilea guanwuensis is recognized by its dioecious large plants, with larger 16.5-20.5 cm long, 6.5-8.5 cm wide leaves; female flowers, small, many, green to pale green, usually in a compound axillary cymes; inflorescence rachis, peduncles and pedicels pale yellow, glabrous; ovate-lanceolate sepals and black anthers,



Fig. 042. *Pilea guanwuensis* S. S. Ying ,plants growing in situ

Distribution and phenology.

Pilea goanwuensis S.S. Ying is endemic to Taiwan. It is known on forest edge along the roadsides between Guanwu (觀霧) and Sheipa Leiaure Farm (雪霸休閒農場), Guanwu area, Taian Townshaip (泰安鄉) , Miaoli County, central Taiwan. It was discovered the species under the forest edge and the roadsides, which mixed with other shade-love plants at elevations of 1,900-2,150 meters. Its flowering time is November and fruiting time is November to December.

4. One New Species of Genus *Lasianthus* (Rubiaceae) from Taiwan

Lasianthus taiwanensis S. S. Ying 台灣雞屎樹

Lasianthus taiwanensis S.S. Ying, *sp. nov.* 台灣雞屎樹

TYPE: TAIWAN. Taoyuan city, Fuhsin District (復興區), Tungyuanshan (東眼山), 1155 m alt. S. S. Ying, *s.n.* December 07, 2023. (holotype, **TPRCH**) .



Fig. 043. *Lasianthus taiwanensis* S. S. Ying, plants growing in situ
(Mind it is an under shrubs, about 30-50 cm high)

Morphology : Under shrubs, 30-50 cm high, much branches. Branches elongate, usually 60-120 cm long, terete, glabrous, blackish brown. Leaves simple, opposite, distichous, oblong to elliptic-oblong, 14-20 cm long, 5.6-6.7 cm wide, thinly coriaceous, acuminate to a caudate at apex, obtuse at base, glabrous on both surfaces, dark green surface, pale green beneath, entire to slightly wavy at margins, midrib and lateral veins (7-9 per side) impressed surface and elevated beneath; stipules triangular, 2-3 mm long, acute at apex, glabrous.



Fig. 044. *Lasianthus taiwanensis* S. S. Ying, habit, mind branches and leaves

Flowers few, usually 4-5, fascicled on each leaf-axil, white tinged with pink at apex, 6-7 mm in diameter when opened, scentless; bracts ovate, 1-1.5 mm long, acute at apex, glabrous; calyx tube campanulate, ivory-white, 1.5-2 mm long, 1.6 mm wide, glabrous, 4-lobed at apex; lobes ovate, 2.5-3 mm long, 1.5-2 mm wide, obtuse at apex, glabrous; corolla white tinged with pink at apex outside, white inside, salverform, 5-5.5 mm long, 5-lobed at apex; lobes ovate, 3.5-4.5 mm long, 3-3.5 mm wide, obtuse and with mucro at

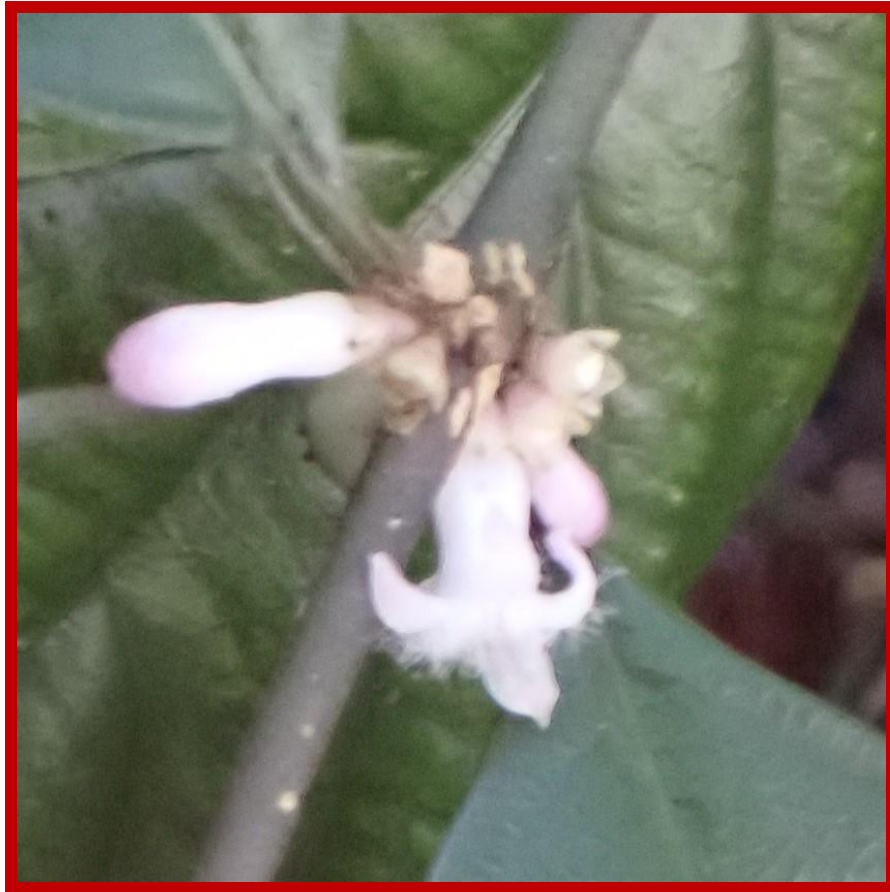


Fig. 045. *Lasianthus taiwanensis* S. S. Ying, inflorescence

apex, puberulous outside and villous inside; stamens 5, inserted on the throat of corolla; filaments short; anthers oblong, dorsifixed, included; style slender, includes; ovary ovoid, white, emarginate at apex.

Fruits drupaceous, globose, 5-5.5 mm in diameter, deeply blue, pulpy, glabrous, crowned by persistent, glabrous calyx lobes. Pyrenes 4 in each fruit, thick wall, smooth, pale yellow in color.

Diagnosis.

Lasianthus taiwanensis is recognized by its under shrub, larger glabrous leaves being 14-20 cm long, 5.6-6.7 cm wide; 4-5 flowers fascicled each leaf-axil, which white tinged with pink at apex; calyx ivory-white, 4-lobed at apex; corolla salverform, 5-lobed at apex and fruits with 4 pyrenes.



Fig. 046. *Lasianthus taiwanensis* S. S. Ying, the holotype TPRCH -113-009

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 047. *Lasianthus taiwanensis* S. S. Ying, the isotype TPRCH-113-010
(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 048. *Lasianthus taiwanensis* S. S. Ying, flower buds and fruits

Distribution and phenology.

Lasianthus taiwanensis S.S. Ying is endemic to Taiwan ° It is known from Tungyuanshan (東眼山) , Fuhsin District (復興區) , Taoyuan city , northern Taiwan. ° It was discovered the species under the *Cryptomeria japonica* forest at elevations of 1,000-1,450 meters. Its flowering time is November to December and fruiting time is December.

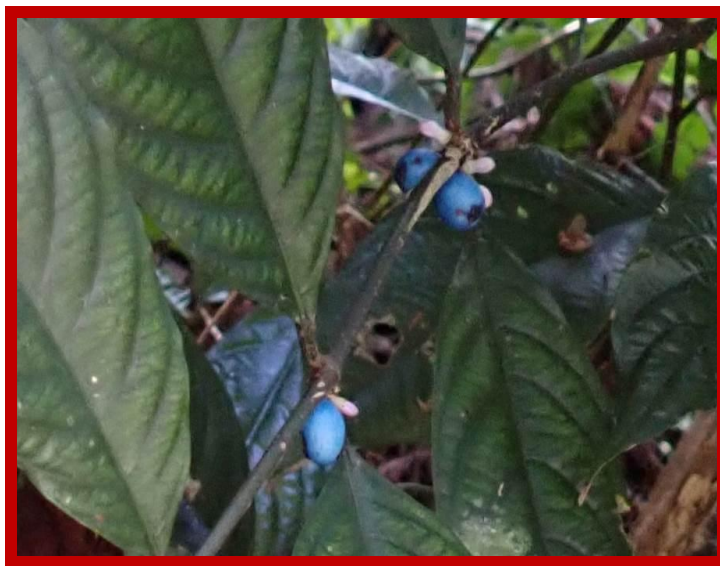


Fig. 049. *Lasianthus taiwanensis* S. S. Ying, close-up of fruits

5. Five New Species of Genus *Elatostema* (Urticaceae) from Taiwan

A. Elatostema gigantifolium S. S. Ying 巨葉樓梯草

Elatostema gigantifolium S.S. Ying, *sp. nov.* 巨葉樓梯草

TYPE: TAIWAN. Taoyuan city, Fuhsin District (復興區), Tungyuanshan (東眼山), 1050 m alt. S. S. Ying, *s.n.* December 07, 2023. (holotype, **TPRCH**).



Fig. 050. *Elatostema gigantifolium* S. S. Ying, plants growing in situ

Morphology : Terrestrial perennial herbs, about 85-130 cm long, stem simple, erect to ascending, green to pale green, fleshy, angular, smooth, terete, glabrous, without winged. Leaves 8-13 on a stem, simple, alternate, remotely distichous; nanophyll absent; lamina oblong to oblong-lanceolate, uppermost largest and smaller gradually to base, 14.5-21.5 cm long, 3.5-5.8 cm wide, herbaceous, acuminate and caudate at apex, slightly oblique and

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asymmetrical at base, lustrous green surface and pale green beneath, dentate and long-ciliate at margins, obliquely 3-nerved impressed surface and elevated beneath; lateral veins (2-3 per side) impressed surface and elevated beneath usually inconspicuous, glabrous surface and scattered white hairs along veins and lateral veins beneath; stipules minute, lanceolate, 1.6-2.5 mm long, 0.6-0.7 mm wide, acute at apex, cauduous. Petioles short, 4.5-7.5 mm long, green, fleshy, glabrous or nearly so.



Fig. 051. *Elatostema gigantifolium* S. S. Ying, stems and leaves

Flowers green, dioecious, small; female flowers numerous immerse in a fleshy discoid inflorescence, 0.8-1.5 mm in diameter when opened; peduncles short, 3-4.5 mm long, green, glabrous; bracts 2-3, at base of discoid, ovate, 2.5-3 mm long, 2.5 mm wide, acute at base; inflorescence discoid, 0.6-1.2 cm in diameter, usually divided by 4 chambers, each with 2-4 female flowers; the chamber subtended by a calyx-like involucre; involucre with 4-6 fleshy bract; bracts ovate, 2.5-3 mm long, 1.5 mm wide, acute at apex,

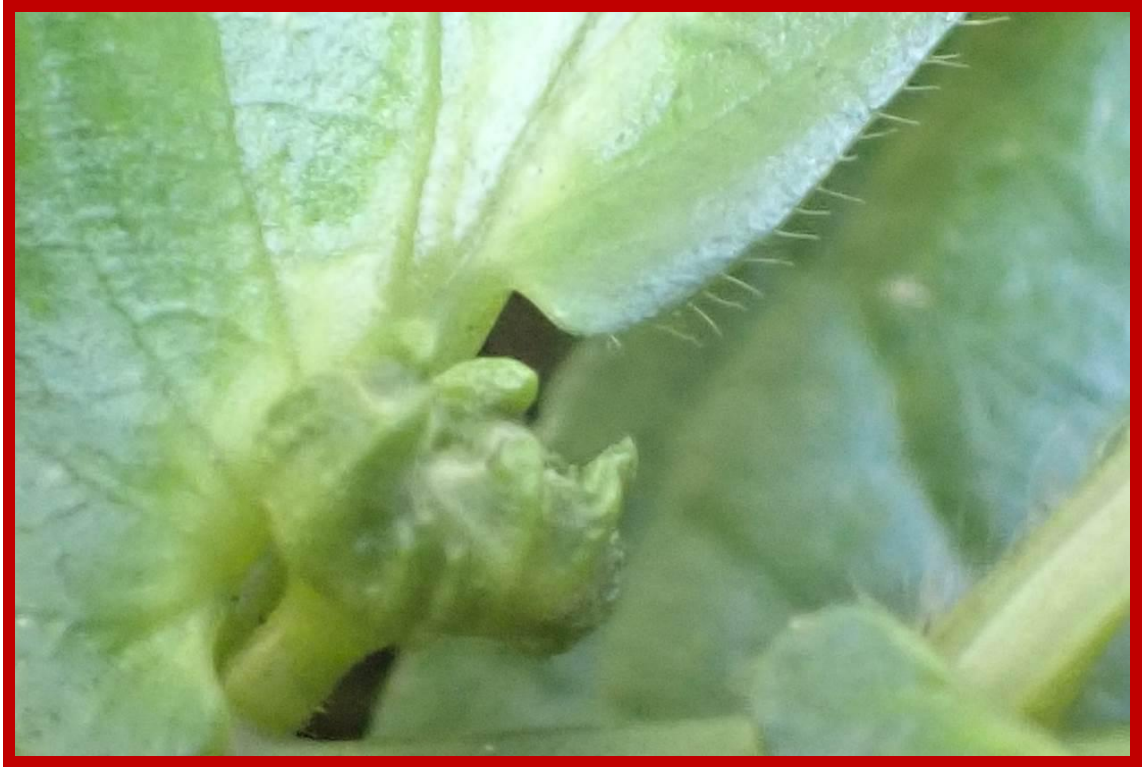


Fig. 052. *Elatostema gigantifolium* S. S. Ying, inflorescence, see from side



Fig. 053. *Elatostema gigantifolium* S. S. Ying, inflorescence, see from front

green, glabrous; pedicels 0; bracteoles linear, 0.2-0.3 mm long, about 0.1 mm wide; sepals 4-5, ovate-triangular, 1.5-1.7 mm long, 0.4-0.5 mm wide, obtuse at apex, white; ovary ovoid to ellipsoid, 0.25-0.3 mm long, glabrous, 0.2-0.3 mm long, about 0.1 mm wide; stigma 1-2 haired, 0.2-0.3 mm long, cauduous. Staminate inflorescence unknown.



Fig. 054. *Elatostema gigantifolium* S. S. Ying, inflorescence, see from side

Diagnosis.

Elatostema gigantifolium is characterized by its larger leaves, dioecious flowers, only female inflorescences were found; female inflorescence in a in a fleshy, short peduncle, discoid, which is divided by 4 chambers, each with 2-4 female flowers; the chamber subtended by a calyx-like involucre; involucre with 4-6 fleshy bract; bracts ovate, 2.5-3 mm long, 1.5 mm wide, acute at apex and white female flowers. ,

Distribution and phenology.

Elatostema gigantifolium S.S. Ying is endemic to Taiwan ° It is known



Fig. 055. *Elatostema gigantifolium* S. S. Ying, the holotype TPRCH -113-011

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 056. *Elatostema gigantifolium* S. S. Ying, the isotype TPRCH -113-012

(this isotype has transfered and deposited at TPRCH herbarium)

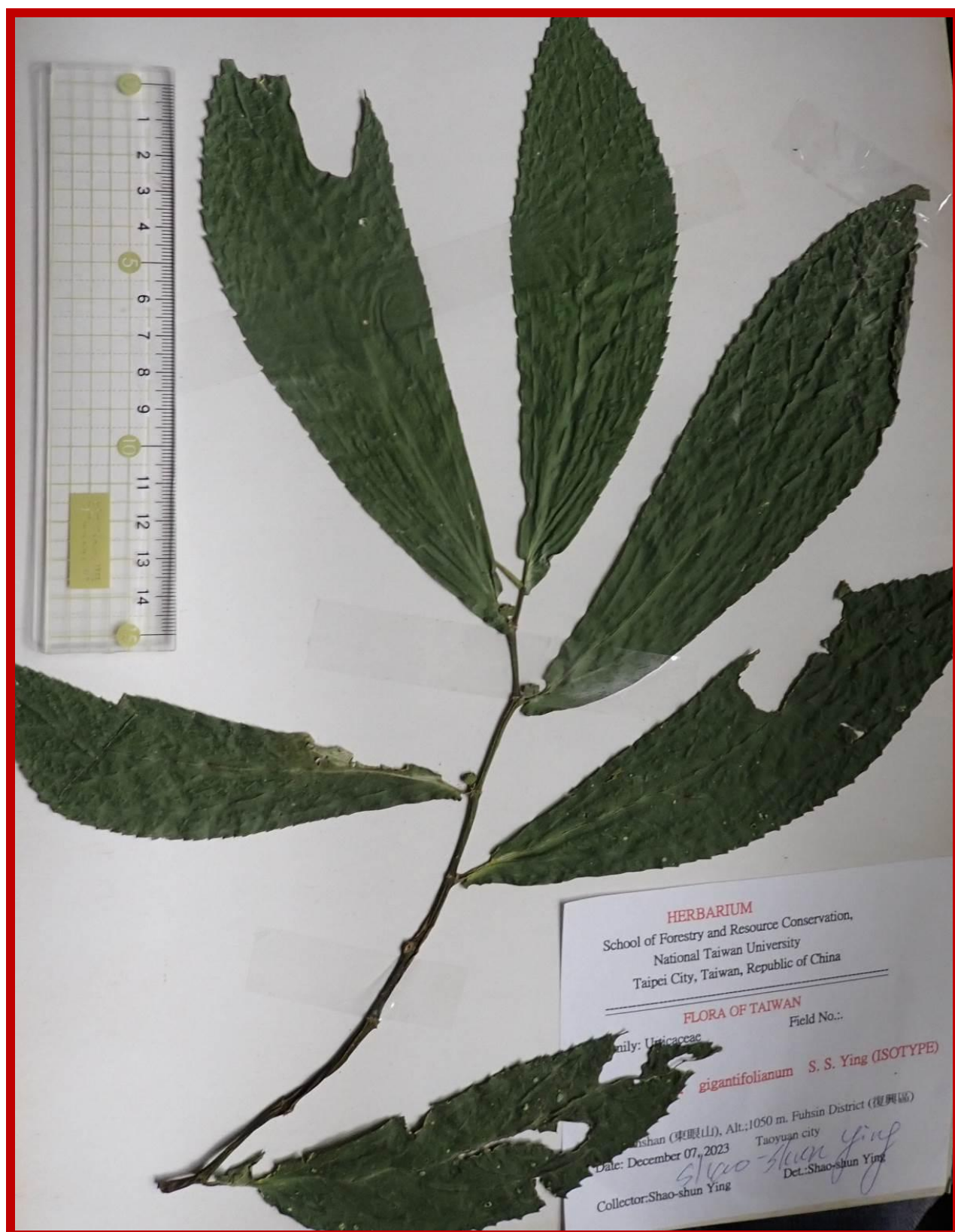


Fig. 057. *Elatostema gigantifolium* S. S. Ying, the isotype TPRCH -113-13

(this isotype has transferred and deposited at TPRCH herbarium)

from Tungyuanshan (東眼山), Fuhsin District (復興區), Taoyuan city, northern Taiwan. ◦ It was discovered the species on the way between Tungyanshan and Manyueyuan (滿月圓) and which crowd gathering on a small creek valley at elevations of 700-850 meters. Its flowering time is December.



Fig. 058. *Elatostema gigantifolium* S. S. Ying, plants growing in situ

B.Elatostema wufengchuwaterfallense S. S. Ying 五峰旗瀑布樓梯草

Elatostema wufengchiwaterfallense S.S. Ying , *sp. nov.* 五峰旗瀑布樓梯草

TYPE:TAIWAN. I-Lan County,Chaochi Township (礁溪鄉) , Wufengchi Waterfall (五峰旗瀑布) 250 m alt. S. S. Ying , *s.n.* March 28, 2024 . (holotype , **TPRCH**) .



Fig. 059. *Elatostema wufengchiwaterfallense* S. S. Ying, plant with flowers

Morphology : Aquatic to wet-loving perennial herbs, about 15-30 cm long, stem simple to branched at base, erect to ascending, green to pale purple, fleshy, terete, smooth, hirsute, without winged. Leaves simple, alternate, remotely distichous; nanophyll absent; lamina oblong to oblong-ovate, uppermost largest and smaller gradually to base, 2.5-3.5 cm long, 8.5-10.8 mm wide, herbaceous, acuminate and caudate at apex, slightly oblique and asymmetrical at base, lustrous green surface and pale green beneath, dentate and long-ciliate at margins, obliquely 3-nerved impressed surface and elevated beneath; lateral veins



Fig. 060. *Elatostema wufengchiwaterfallense* S. S. Ying, plants growing in situ

(2-3 per side) impressed surface and elevated beneath usually inconspicuous, hairy surface and scattered white hairs along veins and lateral veins beneath; stipules minute, lanceolate, 1.6-2.5 mm long, 0.6-0.7 mm wide, acute at apex, cauduous. Petioles short, 1.5-2.5 mm long, green, fleshy, hairy.

Flowers pale yellow, dioecious, small; the female flowers in an axillary discoid inflorescence; the peduncles short, 5-8 mm long, hairy; inflorescence discoid, 3.5-4.5 mm in diameter; bracts 1-2 series, linear to linear-lanceolate, 2.2-3.3 mm long, about 1.5 mm wide, obtuse at apex, greenish; each inflorescence with 35-48 flowers; pedicels 0-1.5 mm long, pale green, glabrous; bracteoles linear, 0.2-0.3 mm long, about 0.1 mm wide, short-caudate at apex; sepals 4, ovate-triangular, 1.4-1.8 mm long, 0.8-1.2 mm wide, obtuse at apex, pale yellow to yellowish green; ovary ovoid to ellipsoid, 0.2-0.3 mm long, glabrous, brownish; stigma 1-2 haired, 0.2-0.3 mm long, cauduous. Staminate inflorescence unknown.



Fig. 061. *Elatostema wufengchiwaterfallense* S. S. Ying, close-up of inflorescences



Fig. 062. *Elatostema wufengchiwaterfallense* S. S. Ying, close-up of inflorescences



Fig. 063. *Elatostema wufengchiwaterfallense* S. S. Ying, the holotype TPRCH -113-014

(this holotype has transferred and deposited at TPRCH herbarium)

Diagnosis: *Elatostema wufengchiwaterfallense* is characterized by its aquatic to wet loving in habitat and dioecious flowers, only female inflorescences were found, stem simple or branched at base; 35-48 flowers in a discoid inflorescence and ovoid to ellipsoid, 0.2-0.3 mm long, glabrous, brownish ovary.



Fig. 064. *Elatostema wufengchiwaterfallense* S. S. Ying, plants growing in situ
(A *Chloranthus wufengchiwaterfallensis* S.S. Ying growing aside)

Distribution and phenology.

Elatostema wufengchiwaterfallense S.S. Ying is endemic to Taiwan. It is known from Wufengchi Waterfall(五峰旗瀑布) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on cliff and wet areas around the waterfall at elevations of 180-250 meters. Its flowering time is March to April and fruiting times April to May.

C.Elatostema elongatobracteolatum S. S. Ying 長小苞樓梯草

Elatostema elongatobracteolatum S.S. Ying , *sp. nov.* 長小苞樓梯草

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Tungyuanshan (東眼山), 1155 m alt. S. S. Ying , *s.n. April 04, 2024* ° (holotype, **TPRCH**) °



Fig. 065. *Elatostema elongatoracteolatum* S. S. Ying, close-up of inflorescences

Morphology: **Terrestrial** to shade-loving perennial herbs, about 20-35 cm long, stem simple, not branched, erect to ascending, dark to pale purple, fleshy, terete, smooth, glabrous, without winged. Leaves simple, alternate, remotely distichous; nanophyll absent; lamina lanceolate to oblong-lanceolate, uppermost largest and smaller gradually to base, 6.5-9.5 cm long, 1.5-2.5 cm wide, herbaceous, acuminate and caudate at apex, slightly oblique and asymmetrical at base, lustrous green surface and pale green beneath, dentate and long-ciliate at margins, obliquely 3-nerved impressed surface and elevated beneath; lateral veins (2-4 per side) impressed surface and elevated beneath usually inconspicuous,

glabrous on both surfaces; stipules minute, lanceolate, 1.5-2.5 mm long, 0.6-0.7 mm wide, acute at apex, cauduous. Petioles short, 1.5-2.5 mm long, terete, dark purple, fleshy, glabrous.



Fig. 066. *Elatostema elongatoracteolatum* S. S. Ying, plants growing in situ, mind leaves

Flowers pale yellow, dioecious, small; the female flowers in an axillary discoid inflorescence; the peduncles short, 3-6 mm long, pale brownish, glabrous; inflorescence discoid, 8.5-10.5 mm in diameter; bracts 1-2 series, lanceolate to ovate-lanceolate, 5.5-7.5 mm long, about 3.5 mm wide, acute at apex, greenish; each inflorescence with 35-65 flowers; pedicels 0-1.5 mm long, pale green, glabrous; bracteoles elongate, linear, 6.5-9.5 mm long, about 0.3 mm wide, short-caudate at apex; sepals 4, ovate-rounded, 1.5-2.2 mm long, 1.2-1.5 mm wide, obtuse at apex, white to pale yellow; ovary ovoid to ellipsoid, 0.3-0.5 mm long, glabrous, brownish; stigma 1-2 haired, 0.2-0.3 mm long, cauduous. Staminate inflorescence unknown.



Fig. 067. *Elatostema elongatoracteolatum* S. S. Ying, close-up of an inflorescence

Diagnosis: *Elatostema elongatobracteolatum* is characterized by its terrestrial to shade loving in habitat and dioecious flowers, only female inflorescences were found, stem simple, dark purple, glabrous; 35-65 flowers in a discoid inflorescence; ; bracteoles elongate, linear, 6.5-9.5 mm long, about 0.3 mm wide, short-caudate at apex; sepals 4, ovate-rounded, obtuse at apex and ovoid to ellipsoid, 0.3-0.5 mm long, glabrous, brownish ovary.



Fig. 068. *Elatostema elongatoracteolatum* S. S. Ying, the holotype TPRCH -113-015

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 069. *Elatostema elongatoracteolatum* S. S. Ying, the isotype TPRCH -113-016

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 070. *Elatostema elongatoracteolatum* S. S. Ying, plants growing in situ

Distribution and phenology.

Elatostema elongatoracteolatum S.S. Ying is endemic to Taiwan. It is known from Tungyuanshan (東眼山), Fuhsin District (復興區), Taoyuan city, northern Taiwan. It was discovered under the *Cunninghamia lanceolata* forest at elevations of 1,000-1,350 meters. Its flowering time is April to May and fruiting time is May.

D.Elatostema minutifolium S. S. Ying 小葉樓梯草

Elatostema minutifolium S.S. Ying , *sp. nov.* 小葉樓梯草

TYPE:TAIWAN. Miaoli County, Taian Townshaip (泰安鄉), Guanwu (觀霧), Chengshan Forest Road (榛山林道), 1980 m alt. S. S. Ying , s.n.June 13, 2024 ° (holotype , TPRCH) °



Fig. 071. *Elatostema minutifolium* S. S. Ying, plants growing in situ

Morphology: **Terrestrial** to shade-loving perennial herbs, about 15-20 cm long, stem simple, not branched, creeping to decumbent, pale green to green, fleshy, terete, smooth, glabrous, without winged. Leaves simple, alternate, closely distichous, somewhat imbricate ; nanophyll absent; lamina oblong to ovate-oblong, lowermost largest and smaller gradually to apex, 3.2-4.3 mm long, 2.5-3.5 mm wide, herbaceous, obtuse at apex, slightly oblique, asymmetrical and amplexicual the stem at base, lustrous slightly dark green surface and pale green beneath, dentate and ciliate at margins, obliquely 3-nerved impressed surface and elevated beneath; lateral veins inconspicuous, glabrous and scattered with white spots surface and glabrous beneath; stipules minute, lanceolate, 1.5-2.5 mm long, 0.6-0.7 mm wide, acute at apex, cauduous. Petioles 0.



Fig. 072. *Elatostema minutifolium* S. S. Ying, close-up of leaves and flowers

Flowers white, dioecious, small; the male flowers in an axillary discoid inflorescence; the peduncles 4-7 mm long, pale brownish, glabrous; inflorescence discoid, 5.5-7.5 mm in diameter; bracts 1-2 series, lanceolate to ovate-lanceolate, 4.5-5.5 mm long, about 2.5-3.5 mm wide, acute at apex, greenish; each inflorescence with 1-4 flowers; pedicels 4-5.5 mm long, pale green, glabrous; bracteoles linear, 2.5-3.5 mm long, about 0.6 mm wide, short-caudate at apex; sepals 4, ovate-rounded, 2.5-3.2 mm long, 1.5-2.5 mm wide, obtuse with an arista at apex, white; stamens 4, opposite to the sepals; filaments white, 2.4-3 mm long; anthers horse-shoe like, 0.5-0.7 mm long, basifixied. The female flowers unknown.

Diagnosis: *Elatostema minutifolium* is characterized by its terrestrial to shade loving in habitat and dioecious flowers, only staminate inflorescences were found; leaves closely distichous, somewhat imbricate, smaller, lowermost largest and smaller gradually to apex, 3.2-4.3 mm long, 2.5-3.5 mm wide, slightly oblique, asymmetrical and amplexical the stem at base; stamens 4, opposite to the sepals; filaments white, 2.4-3 mm long; anthers horse-shoe like, 0.5-0.7 mm long, basifixied.



Fig. 073. *Elatostema minutifolium* S. S. Ying, close-up of flowers



Fig. 074. *Elatostema minutifolium* S. S. Ying, plants growing in situ



Fig. 075. *Elatostema minutifolium* S. S. Ying, the holotype TPRCH -113-017

(this holotype has transfered and deposited at TPRCH herbarium)

Distribution and phenology.

Elatostema minutifolium S.S. Ying is endemic to Taiwan. It is known on under the *Chamaecyparis formosensis* forests of Chengshan Forest Road (榛山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species under the forests on mountain slopes at elevations of 1,950-2,450 meters. Its flowering time is June to July.



Fig. 076. *Elatostema minutifolium* S. S. Ying, plants growing in situ

E. Elatostema uniflorum S. S. Ying 單花樓梯草

Elatostema uniflorum S.S. Ying , *sp. nov.* 單花樓梯草

TYPE:TAIWAN. Miaoli County, Taian Townshaip (泰安鄉) , Guanwu (觀霧), Kueishan Forest Road (檜山林道), 2180 m alt. S. S. Ying , s.n. June 13, 2024 ° (holotype , **TPRCH**) °



Fig. 077. *Elatostema uniflorum* S. S. Ying, close-up of male flower

Morphology: **Terrestrial** to shade-loving perennial herbs, about 10-16 cm long, stem simple, not branched, creeping to decumbent, pale green to green, fleshy, angular, smooth, glabrous, without winged. Leaves simple, alternate, remotely distichous; nanophyll absent; lamina oblong to elliptic-oblong, uppermost largest and smaller gradually to base, 1.2-2.3 cm long, 4.5-5.5 mm wide, herbaceous, acute at apex, slightly oblique, asymmetrical and amplexicual the stem at base, lustrous slightly dark green surface and pale green beneath, dentate at margins, midrib impressed surface and elevated beneath; lateral veins inconspicuous, glabrous at both surfaces; stipules minute, lineat- lanceolate, 2.5-3.5 mm long, 0.6-0.7 mm wide, acute at apex, caudous. Petioles 0.



Fig. 078. *Elatostema uniflorum* S. S. Ying, stem and leaves

Flowers white, dioecious, small; the male flowers in an axillary discoid inflorescence; the peduncles elongate, 2.5-4.5 cm long, pale green, glabrous; inflorescence discoid, 4.5-5.5 mm in diameter; bracts one series, lanceolate to linear-lanceolate, 2.5-3.5 mm long, about 1.2-2.1 mm wide, acute at apex, greenish; each inflorescence with mostly one flower, rarely 2-3 flowers; pedicels 0-1.5 mm long, pale green, glabrous; bracteoles linear, 2.5-3.5 mm long, about 0.5 mm wide, short-caudate at apex; sepals 4, ovate to ovate-rounded, 2.7-3.6 mm long, 1.6-2.7 mm wide, obtuse with a caudate at apex, pale green; stamens 4, opposite to the sepals; filaments pale green, 2.4-3 mm long; anthers horse-shoe like, 0.5-0.7 mm long, basifixied. The female flowers unknown.

Diagnosis: *Elatostema uniflorum* is characterized by its terrestrial to shade loving in habitat and dioecious flowers, only staminate inflorescences were found; leaves remotely distichous, larger, uppermost largest and smaller gradually to base, 1.2-2.3 cm long, 4.5-5.5 mm wide, slightly oblique, asymmetrical and amplexicual the stem at base; peduncles elongate, 2.5-4.5 cm long, pale green, glabrous; stamens 4, opposite to the sepals.



Fig. 079. *Elatostema uniflorum* S. S. Ying, the holotype TPRCH -113-018

(this holotype has transfered and deposited at TPRCH herbarium)



Fig. 080. *Elatostema uniflorum* S. S. Ying, plants growing in situ, mind flowers



Fig. 081. *Elatostema uniflorum* S. S. Ying, close-up of flowers

Distribution and phenology.

Elatostema uniflorum S.S. Ying is endemic to Taiwan. It is known on under the *Chamaecyparis formosensis* forests of Kueishan Forest Road (檜山林道), Guanwu (觀霧) area, Taian Townshap (泰安鄉), Miaoli County, central Taiwan. It was discovered the species under the forests on mountain slopes at elevations of 1,950-2,550 meters. Its flowering time is June to July.



Fig. 082. *Elatostema uniflorum* S. S. Ying, plants growing in situ

5. One New Species of Genus *Ruellia* (Acanthaceae) from Taiwan

Ruellia taiwanensis S. S. Ying 台灣蘆利草

Ruellia taiwanensis S.S. Ying, *sp. nov.* 台灣蘆利草

TYPE: TAIWAN. Pingtung County, Shitze Townshap (獅子鄉), Shuangpiu Forest Recreation Area (雙流森林遊樂區) 330 m alt. *S. S. Ying*, *s.n.* December 14, 2023. (holotype, **TPRCH**).



Fig. 083. *Ruellia taiwanensis* S. S. Ying, flowers

Morphology : Terrestrial perennial herbs, about 45-110 cm long, stem prostrate on ground and usually forming a small colony, much branched, green, angular, glabrous, rooting at nodes; branches numerous, 30-50 cm long, green, glabrous. Leaves simple, opposite, oblong to oblong-lanceolate, 2.5-4 cm long, 1-1.5 cm wide, acute to obtuse at apex, obtuse at base, thinly coriaceous, entire and long-ciliate at margins, hirsute especially on midrib



Fig. 084. *Ruellia taiwanensis* S. S. Ying, leaves and calyx



Fig. 085. *Ruellia taiwanensis* S. S. Ying, close-up of leaves

and veins on both surfaces, lustrous green surface and pale green beneath; midrib and lateral veins (2-3 per side) impressed surface and elevated beneath. Petioles 5-7 mm long, grooved above, slightly hairy, green.



Fig. 086. *Ruellia taiwanensis* S. S. Ying, close-up of flower

Flower solitary, axillary, axillary, 1.5-2 cm in diameter when opened, white with purple lower corolla-lobe, scentless; bracts 2-3, somewhat leaf-like, 1.2-1.5 cm long, 5-6 mm wide, obtuse at apex, entire and ciliate at margins; pedicels short, 9-13 mm long, green, glabrous or nearly so; calyx tubular, 4-6 mm long, green, glabrous 5-lobed at apex; lobes lanceolate to linear-lanceolate, 4-4.5 mm long, 2-3 mm wide acute at apex, hairy and ciliate at margins; corolla infundibuliform, 1.8-2.3 cm long, 1.5-2 cm wide hairy outside and glabrous inside, white tinged with purple lobes; basal tube 5-6 mm long; throat 1.2-1.5 cm long; 5-lobed at apex; lobes rounded, 9-12 mm long, 8-10 mm wide, obtuse at apex; stamens 4, didynamous, filament 0.6-1.3 cm long, pubescent at base; anthers thecae, 3-3.5

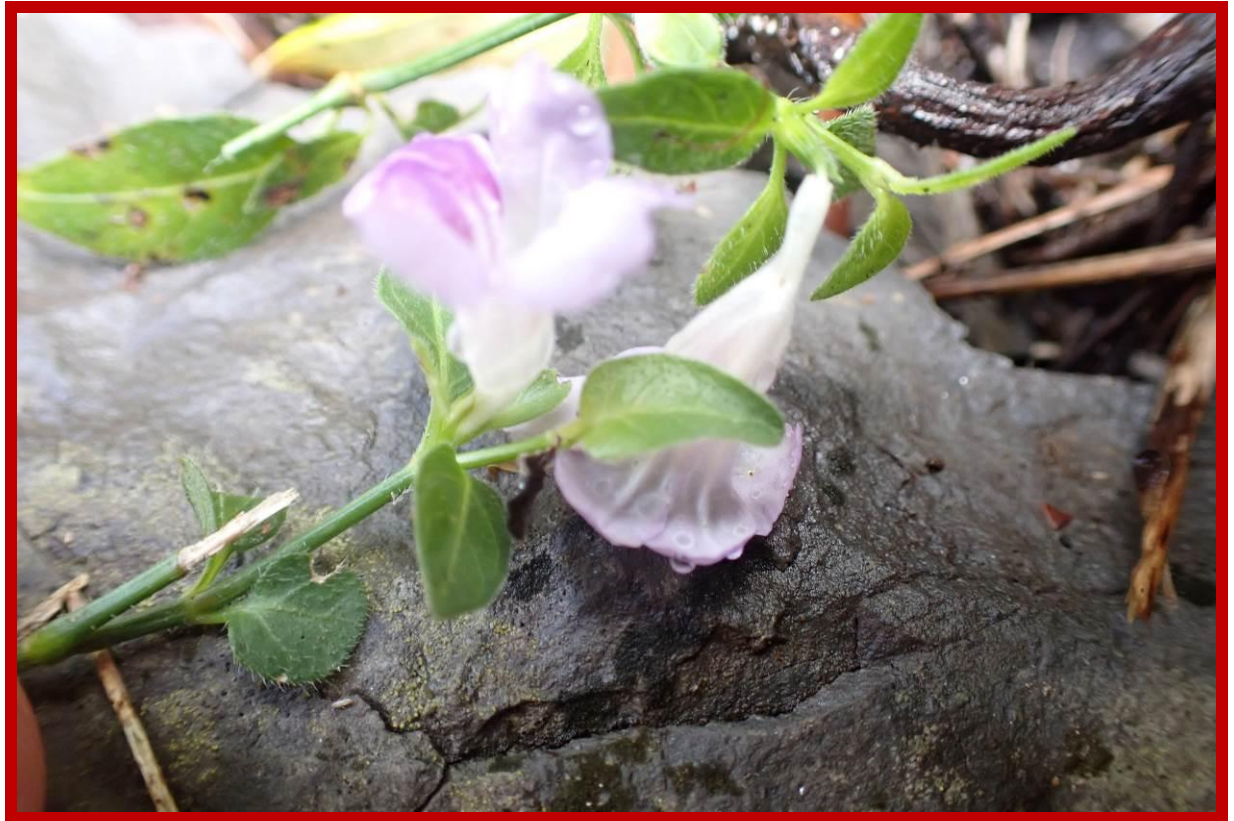


Fig. 087. *Ruellia taiwanensis* S. S. Ying, close-up of flowers



Fig. 088. *Ruellia taiwanensis* S. S. Ying, close-up of flowers, see from front side

mm long, equal, glabrous; style included, 1.4-1.6 cm long, hairy; stigma minutely papillose; nectar disc annular. Capsule not seen.



Fig. 089. *Ruellia taiwanensis* S. S. Ying, plants growing in situ, like a carpet

Diagnosis.

Ruellia taiwanensis is characterized by its prostrate plants which like a carpet colonized a small area of ground; leaves small, oblong to oblong-lanceolate, 2.5-4 cm long, 1-1.5 cm wide, entire and long-ciliate at margins; flower solitary, axillary, white with purple corolla lobes, hairy outside and glabrous inside; stamens 4, didynamous, filament 0.6-1.3 cm long, pubescent at base; anthers thecae, equal, glabrous; style included, hairy; stigma minutely papillose; nectar disc annular

Distribution and phenology.

Ruellia taiwanensis S.S. Ying is endemic to Taiwan ° It is known from mountains

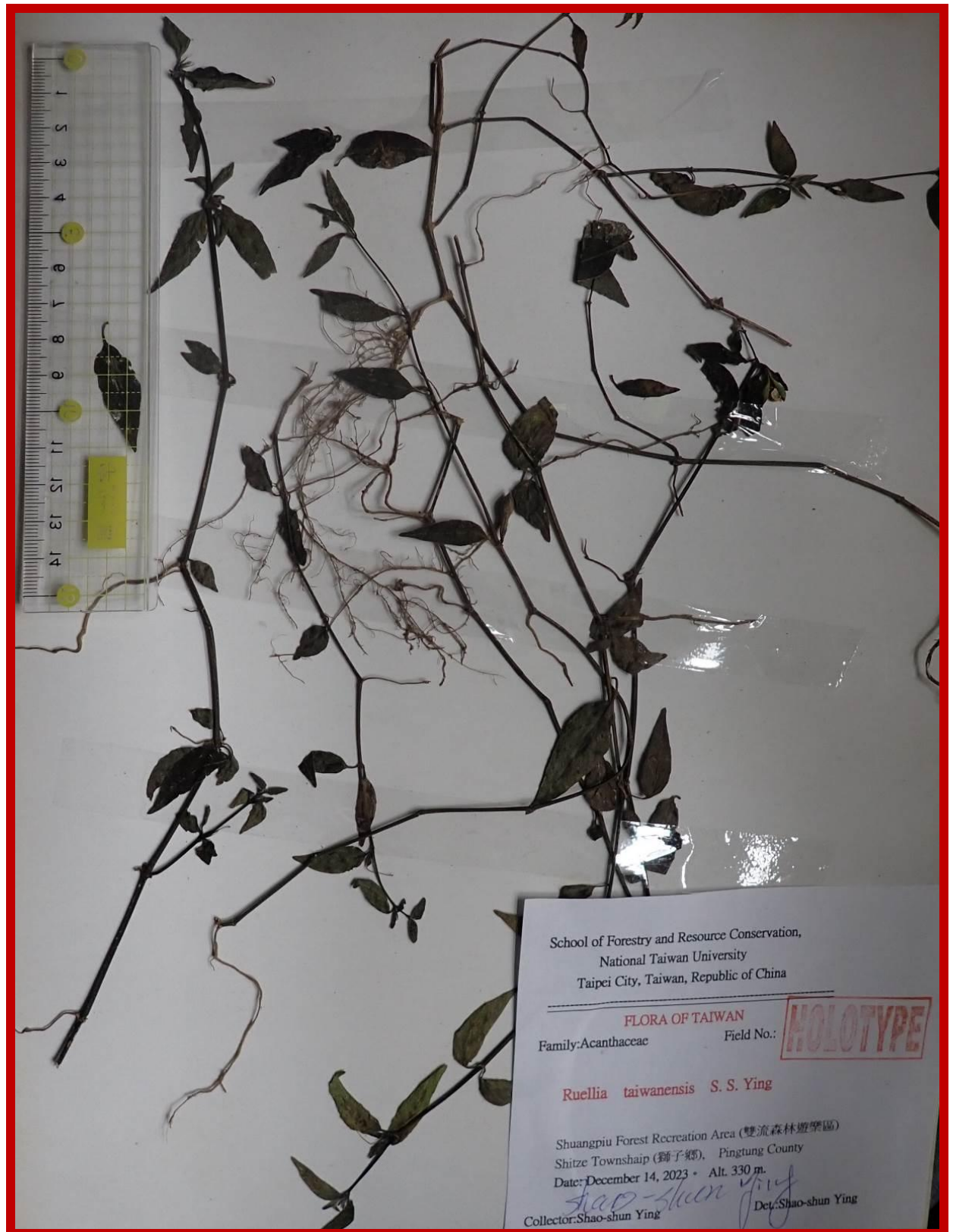


Fig. 090. *Ruellia taiwanensis* S. S. Ying, the holotype TPRCH -113-019

(this holotype has transferred and deposited at TPRCH herbarium)

of Shuangpiu Forest Recreation Area (雙流森林遊樂區), Shitze Township (獅子鄉), Pingtung county, southern Taiwan. It was collected on forest-edge of natural broad-leaved forests, between 250 and 350 m altitudes; and flowering times is from November to December.

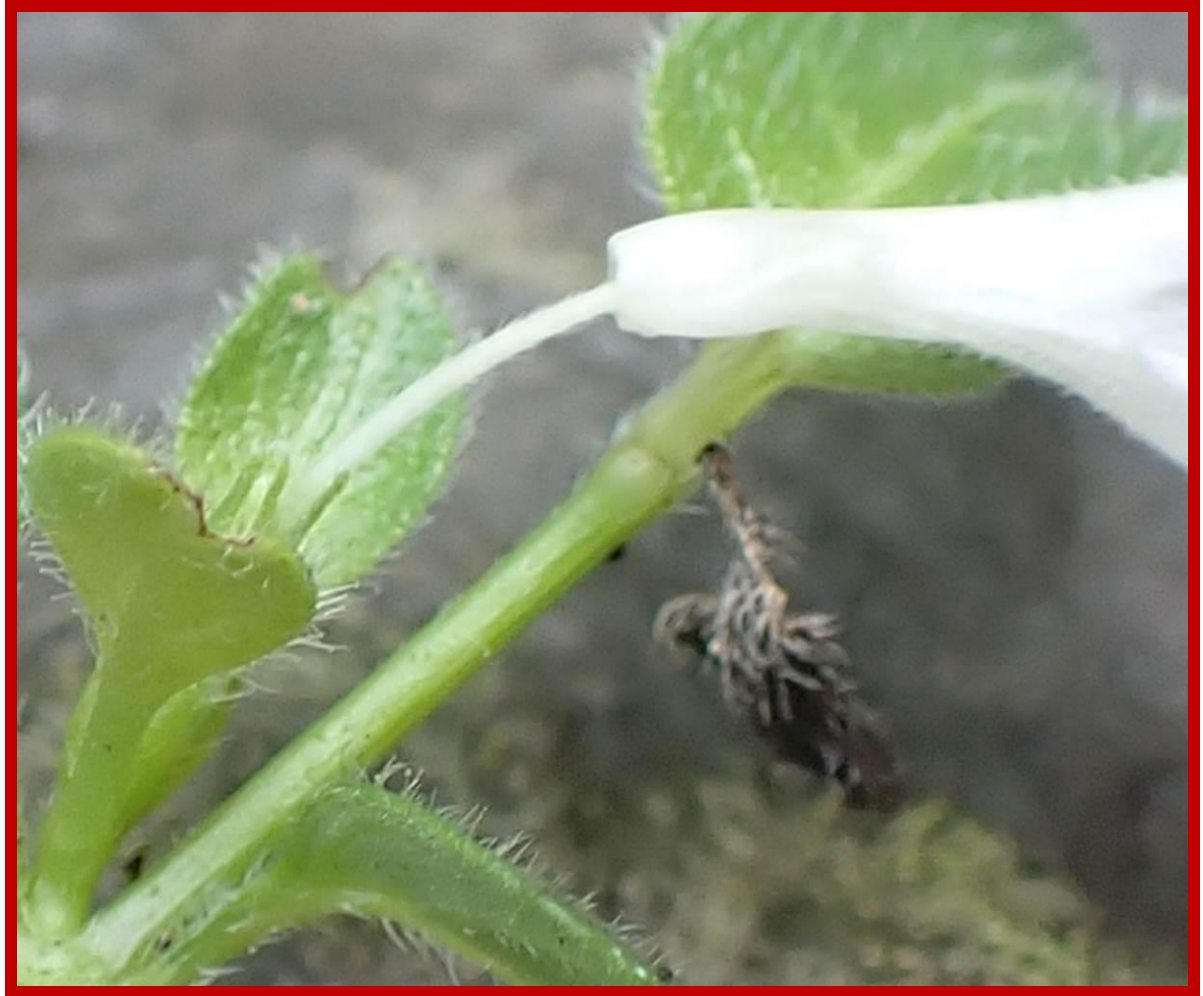


Fig. 091. *Ruellia taiwanensis* S. S. Ying, bracts, hairy style and hairy corolla

7. One New Species of Genus *Mosla* (Lamiaceae) from Taiwan

Mosla taiwanensis S. S. Ying 台灣石薺薺

Mosla taiwanensis S.S. Ying, *sp. nov.* 台灣石薺薺

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧) 2180 m alt.

S. S. Ying, *s.n.* December 19, 2023. (holotype, **TPRCH**).



Fig. 092. *Mosla taiwanensis* S. S. Ying, plants growing in situ

Morphology : Terrestrial annual herbs, about 12-25 cm high, stem erect to ascending, angular, green tinged with purple, glabrous; branched opposite, 8-17 cm long, ascending, angular, glabrous; stem and branches usually turned to purple red when old. Leaves simple, opposite, ovate to ovate-lanceolate, 2.5-3.2 cm long, 9-14mm wide, obtuse at apex, attenuate to obtuse at base, chartaceous, dentate at margins, midrib and lateral veins (2-3



Fig. 093. *Mosla taiwanensis* S. S. Ying, the plant

per side) impressed surfaces and elevated beneath, green surface and pale green beneath.

Petioles 8-14mm long, groove above, green, glabrous or nearly so.

Flowers numerous, smaller, purplish red, 3-4 mm in diameter when opened, opened one by one, not simultaneous opened, in terminal and axillary racemes to paniculate; inflorescence rachis 15-22 cm long, erect to ascending, angular, green tinged purple, glabrous; peduncles 6-9 cm long, erect to ascending, angular, green, glabrous; pedicels 4-6 mm long, angular, green to purple red, glabrous to hairy; bracts linear, 4.5-5.5 mm long, 1-1.3 mm wide, acute at apex; calyx campanulate, 4.5-5.5 mm long, 3-4 mm wide, hairy outside and elongate glandular hairs inside, green turned to purple red when old, 5-lobed at apex; lobes triangular, 1.5-2.5 mm long, 1 mm wide, acute at apex; corolla 2-labiate, purplish red, 5-6 mm long, about 4 mm wide, glabrous outside and hairy in corolla-throat; upper lobe 3-lobed, the lobes rounded, 2-2.5 mm long, obtuse at apex; lower lip 2-lobed, emarginate apex; lobes oblong, 2-2.3 mm long, 2.5 mm wide, somewhat wavy at margins;



Fig. 094. *Mosla taiwanensis* S. S. Ying, inflorescences, few flowers just opened



Fig. 095. *Mosla taiwanensis* S. S. Ying, calyx, elongate glandular hairs inside



Fig. 096. *Mosla taiwanensis* S. S. Ying, close-up of a flower

spreading; stamens 4, included; filaments short, 2-3 mm long, white; anthers oblong, 2.5 mm long, connective distinct; style short, 1.5-2.5 mm long, stigma bifid.

Nutlets brown to purplish brown, ellipsoid, 1-1.4 mm long, 0.8-0.9 mm wide, glabrous or nearly so, Pitted with small depressions.

Diagnosis.

Mosla taiwanensis is characterized by its annual herb about 12-25 cm high, stem angular, green tinged with purple, glabrous, much branched; flowers numerous, smaller, purplish red, in terminal and axillary racemes to paniculated; calyx campanulate, hairy outside and elongate glandular hairs inside, green turned to purple red when old; corolla 2-labiate, purplish red, upper lobe 3-lobed and lower lip 2-lobed.

Distribution and phenology.



Fig. 097. *Mosla taiwanensis* S. S. Ying, the holotype

TPRCH -113-020

(this holotype has transferred and deposited at TPRCH herbarium)

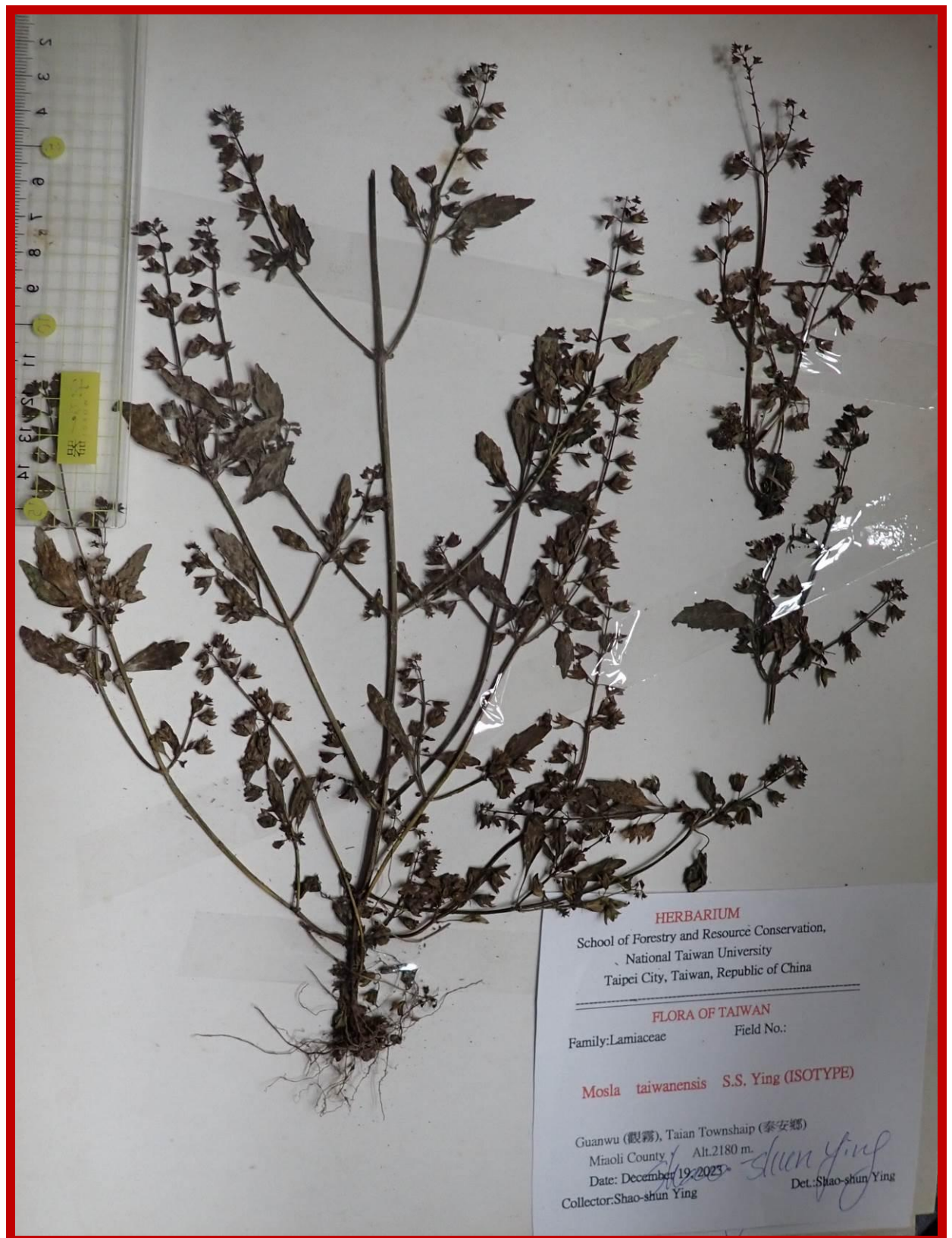


Fig. 098. *Mosla taiwanensis* S. S. Ying, the isotype TPRCH -113-021

(this isotype has transfered and deposited at TPRCH herbarium)

Mosla taiwanensis S.S. Ying is endemic to Taiwan. It is known on forest edge along the roadsides of thinning forest road (疏伐林道), Guanwu (觀霧) area, Taian Townshap (泰安鄉), Miaoli County, central Taiwan. It was discovered the species around the forest edge and the roadsides, which mixed with other sunny-love plants at elevations of 1,950-2,250 meters. Its flowering time is December and fruiting time is December.



Fig. 099. *Mosla taiwanensis* S. S. Ying, most inflorescences in panicle



Fig. 100. *Mosla taiwanensis* S. S. Ying, part of inflorescences

8. One New Species of Genus *Pittosporum* (Pittosporaceae) from Taiwan

Pittosporum taiwanense S. S. Ying 台灣海桐

Pittosporum taiwanense S.S. Ying, *sp. nov.* 台灣海桐

TYPE: TAIWAN. Taoyuan City · Fuhsin District (復興區) · Lalashan (拉拉山), 1950 m alt.

S. S. Ying, *s.n.* December 26, 2023. (holotype, **TPRCH**) .



Fig. 101. *Pittosporum taiwanense* S. S. Ying, fruiting branches

Morphology : **Terrestrial** medium-sized evergreen trees, about 8-10 m high; bark smooth, grayish black; trunk straight, smooth, brownish, much branched upward; branches erect to ascending, brownish, smooth, glabrous, with lenticels. Leaves simple, alternate, oblong to oblong-lanceolate, 12-16 cm long, 3.5-4.9 cm wide, acuminate to a caudate at apex, obtuse at base, thinly coriaceous, entire to slightly wavy at margins, lustrous and somewhat dark

green surface, pale green beneath, midrib and later veins (6-9, somewhat inconspicuous) impressed surface and elevated beneath, glabrous on both surfaces. Petioles 3-4 cm long, grooved above, green, glabrous or nearly so.



Fig. 102. *Pittosporum taiwanense* S. S. Ying, branches and leaves

Flowers bisexual, many, yellow, slightly scent, 3-4 mm in diameter when opened, in terminal corymbose to paniculate,; inflorescence rachis 5-7 cm long, green, glabrous; peduncles 2-3.5 cm long, glabrous, 4-6 flowers at top and arranged like an umbel; pedicels 6-13 mm long, glabrous, with an articulate at both ends; bracts lanceolate, 8-11 mm long, 2-3 mm wide, acute at apex, glabrous, green; bracteoles linear to lanceolate, 4-5 mm long, about 1.5 mm wide, green; calyx small, sepals 5, elliptic, 1.5-1.9 mm long, acute at acute; petals oblong, 5-6 mm long, 2-3 mm wide, acute at apex, cohering to the middle, then free and recurving; stamens 5, filament adnate to petal, filiform, 4.5-5.5 mm long, glabrous; anthers oblong, 1.5-2 mm long, without apiculate, longitudinal slit opened; style straight, 4-5 mm long, with a little white capitate stigma



Fig. 103. *Pittosporum taiwanense* S. S. Ying, inflorescences



Fig. 104. *Pittosporum taiwanense* S. S. Ying, close-up of flowers

stigmatic devilmint; ovary globose, 2 mm in diameter, on a 2 mm stipe from basal nectary.



Fig. 105. *Pittosporum taiwanense* S. S. Ying, infructescences

(mind fruit opened by 2-valved)

Fruit a globose capsule, 5-6 mm in diameter, dehiscent loculicidal, 2-valved when mature, with a mucro at apex; exocarp brownish yellow but turning to black when mature, smooth, glabrous; valves bright; funicles inserted basally in 2 loculi; seeds 4-7 per fruit, reniform, 2.5-3 mm long, about 1.5 mm wide, with succulent red resinous outer layer.

Diagnosis.

1. *Pittosporum daphniphylloides* was described by B. Hayata in 1911, it is an epiphytic shrub growing in medium to high altitudes of Taiwan. Our species is a medium-sized tree and terrestrial in habit,

2. *Pittosporum taiwanensis* is characterized by its somewhat larger leaves, bisexual



Fig. 106. *Pittosporum taiwanense* S. S. Ying, the holotype TPRCH -113-022

(this holotype has transfered and deposited at TPRCH herbarium)



Fig.107. *Pittosporum taiwanense* S. S. Ying, the isotype TPRCH -113-023

(this holotype has transferred and deposited at TPRCH herbarium)



Fig.108. *Pittosporum taiwanense* S. S. Ying, the syntype TPRCH -113-024

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 109. *Pittosporum taiwanense* S. S. Ying, close-up of fruits



Fig. 110. *Pittosporum taiwanense* S. S. Ying, a medium-sized terrestrial tree



Fig. 111. *Pittosporum taiwanense* S. S. Ying, close-up of inflorescence

flowers in a terminal corymbose to paniculate; pedicels 6-13 mm long, glabrous, with an articulate at both ends; smaller calyx with 5 smaller sepals and 5 oblong petals; Fruit a globose capsule, 5-6 mm in diameter, dehiscent loculicidal, 2-valved when mature, with a mucro at apex; seeds 4-6 per fruit, reniform, 2.5-3 mm long, about 1.5 mm wide, with succulent red resinous outer layer.

Distribution and phenology.

Pittosporum taiwanensis S.S. Ying is endemic to Taiwan ° It is known from Lalashan (拉拉山), between Entrance of trail (步道入口) and Giant trees group (巨木群) , Fuhsin District(復興區) , Taoyuan city , northern Taiwan ° It was collected in thickets at between 1,800 and 2,100 m elevation and flowering time from May to June, fruiting time from November to December ° Some individuals of the species are just around Lalashan Visitor Center (拉拉山遊客中心).

9. Two New Species of Genus *Boehmeria* (Urticaceae) from Taiwan

A.Boehmeria tungyuanshanensis S. S. Ying 東眼山苧麻

Boehmeria tungyuanshanensis S.S. Ying , *sp. nov.* 東眼山苧麻

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Tungyuanshan (東眼山), 955 m alt. S. S. Ying , *s.n. January 01, 2024* . (holotype, **TPRCH**) .



Fig. 112. *Boehmeria tungyuanshanensis* S. S. Ying, infructescences

Morphology : Small creeping on rocks subshrubs, stem prostrate, woody, usually rooting at nodes, branched; branches 20-30 cm long, prostrate to somewhat ascending, green to brownish, woody, pubescent. Leaves simple, alternate, ovate to rounded-ovate, 4-6 cm long, 3-4.8 cm wide, acute at apex, obtuse to slightly cordate at base, chartaceous, serrate and ciliate at margins, lustrous green surface and pale green slightly glaucous beneath, glabrous on both surfaces, 3-5 nerved impressed surface and elevated beneath. Petioles 2.5-4 cm long, terete, green, somewhat fleshy, pubescent.



Fig. 113. *Boehmeria tungyuanensis* S. S. Ying, leaves on beneath side

Flowers dioecious, the female flowers numerous, small, 2-3 mm in diameter when opened, green, usually many flowers to form a cluster, 5-9 clusters to form a spike; the spike 1-2 cm long, axillary, green; peduncles 4-6 mm long, green, glabrous or nearly so; bracts subtending flowers narrowly triangular, 0.4-0.5 mm long, 0.4 mm wide, acute at apex, soon caducous; clusters spaces 0 mm apart; clusters 2.5-3 mm in diameter; perianth lobes 4, ovate, 1.5-2 mm long, about 1 mm wide, acute at apex, ovary ovoid, 0.5 mm long, style elongate, 2-2.5 mm long, stigma small.

Achenes usually with persistent glabrous perianth which fused with the pericarp, ovoid, 1-1.5 mm long, about 1.2 mm wide, compressed, glabrous; seeds obovoid, 0.5 mm long, 0.4 mm wide, with short wing along margins, style persistent at apex.

Diagnosis.



Fig. 114. *Boehmeria tungyuanensisensis* S. S. Ying, close-up of female flowers



Fig. 115. *Boehmeria tungyuanensisensis* S. S. Ying, plants growing in situ



Fig. 116. *Boehmeria tungyuanensis* S. S. Ying, the holotype TPRCH -113-025

(this holotype has transferred and deposited at TPRCH herbarium)

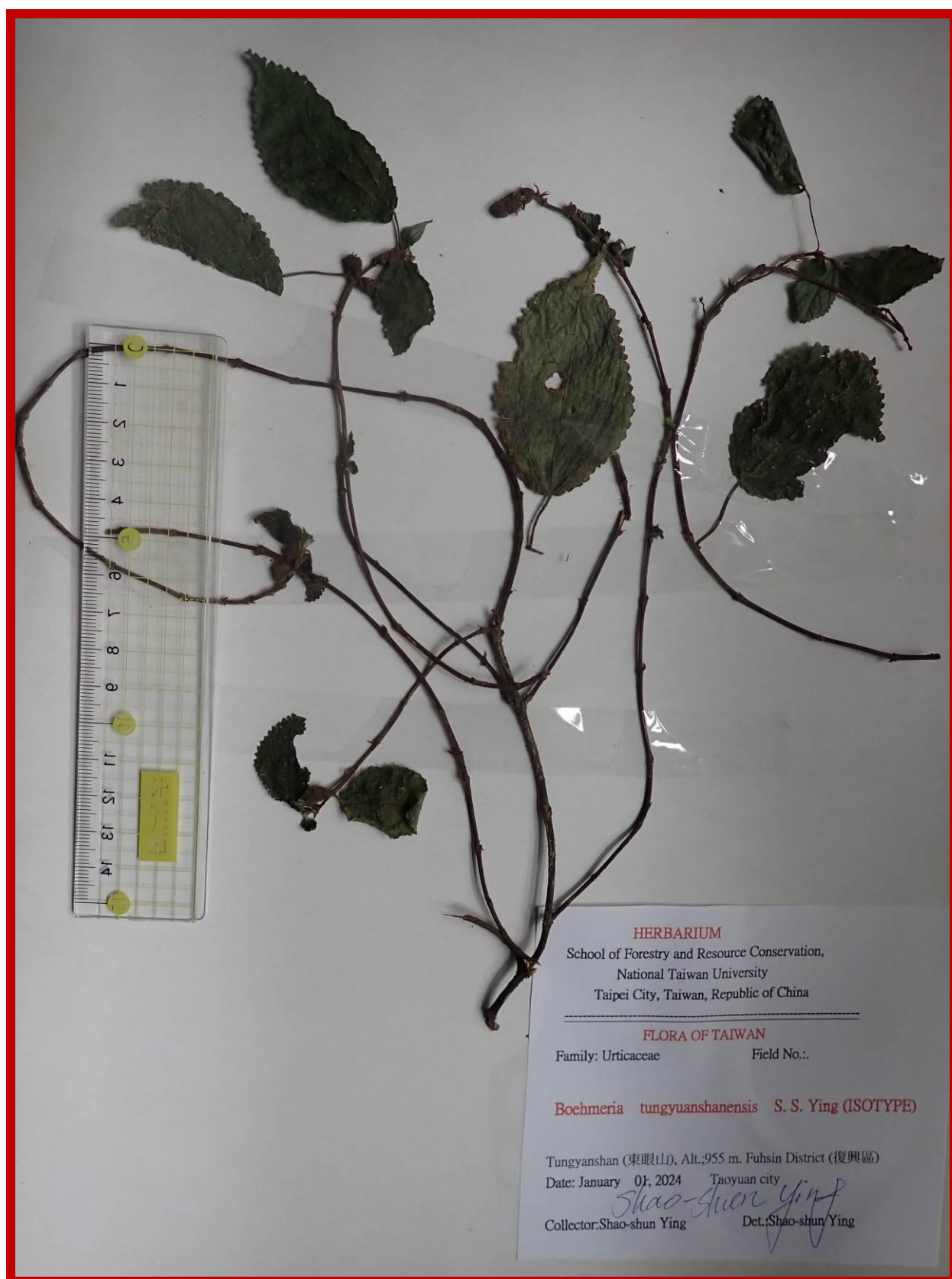


Fig. 117. *Boehmeria tungyuanensis* S. S. Ying, the isotype TPRCH -113-026

(this isotype has transferred and deposited at TPRCH herbarium)

Boehmeria tungyuanshanensis is characterized by its lithophytic herb in habit, usually creeping on rocks; inflorescences usually in axillary spike which 1-2 cm long, and consist of 5-9 approximate clusters; female 4-merous and achenes usually with persistent glabrous perianth which fused with the pericarp.



Fig. 118. *Boehmeria tungyuanshanensis* S. S. Ying, plants growing in situ

Distribution and phenology.

Boehmeria tungyuanshanensis S.S. Ying is endemic to Taiwan. It is known from Tungyuanshan (東眼山), Fushin District (復興區), Taoyuan city, northern Taiwan. It was discovered on the way between Tungyuanshan and Manyueyuan (滿月圓) and which epiphytic on rocks at elevations of 1020-950 meters. Its flowering time is November to December and fruiting times December to January.

B.Boehmeria songmaoensis S. S. Ying 松茂芋麻

Boehmeria songmaoensis S.S. Ying , *sp. nov.* 松茂芋麻

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Songmao Forest Road (松茂林道) 1850 m alt. *S. S. Ying* , *s.n. February 22, 2024* ° (holotype , **TPRCH**) °



Fig. 119. *Boehmeria songmaoensis* S. S. Ying, plants growing in situ

Morphology : Small terrestrial perennial herbs about 30-45 cm tall, stem erect, woody at base, branched upward, smooth; branches 15-30 cm long, erect to ascending, shortly hairy, green to pale green. Leaves simple, opposite, ovate, broadly ovate to rounded-ovate, 5-8 cm long, 4.5-7.5 cm wide, obtuse at apex, slightly cordate at base, chartaceous, dentate at margins, lustrous green surface and pale green slightly glaucous beneath, glabrous on both surfaces, 3 nerved impressed surface and elevated beneath, lateral veins conspicuous.

Petioles 3.2-4.5 cm long, terete, pale purple to greenish purple, somewhat fleshy, pubescent.



Fig. 120. *Boehmeria songmaoensis* S. S. Ying, branches and leaves

Flowers dioecious, the female flowers numerous, small, 1.5-2 mm in diameter when opened, pale yellow, usually many flowers to form a cluster, 5-12 clusters to form a spike; the spikes simple to panicle-like, 1.5-4.5 cm long, slender, axillary, green, pubescent; peduncles 1-2 cm long, green, pubescent; bracts subtending flowers, narrowly triangular, 0.4-0.5 mm long, 0.4 mm wide, acute at apex, soon caducous; clusters spaces 1-8 mm apart; clusters 1.5-2 mm in diameter; perianth lobes 4, ovate to ovate-triangular, 1.5-2 mm long, about 1 mm wide, acute at apex, ovary ovoid, 0.3 mm long, style elongate, 1-1.5 mm long, stigma small.

Achenes usually with persistent glabrous perianth which fused with the pericarp, ovoid, 0.7-1.0 mm long, about 1.0 mm wide, compressed, glabrous; seeds obovoid, 0.45



Fig. 121. *Boehmeria songmaoensis* S. S. Ying, panicle-like inflorescence



Fig. 122. *Boehmeria songmaoensis* S. S. Ying, inflorescence



Fig. 123. *Boehmeria songmaoensis* S. S. Ying, the holotype TPRCH -113-027

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 124. *Boehmeria songmaoensis* S. S. Ying, the isotype TPRCH -113-028

(this isotype has transferred and deposited at TPRCH herbarium)

mm long, 0.4 mm wide, with short wing along margins, style persistent at apex.

Diagnosis.

Boehmeria songmaoensis is characterized by its terrestrial herb in habit, with broadly ovate to rounded-ovate 3-nerved leaves; dioecious flowers, the female ones numerous, small, 1.5-2 mm in diameter when opened, pale yellow, usually many flowers to form a cluster, 5-12 clusters to form a spike; the spikes simple to panicle-like, 1.5-4.5 cm long, slender, axillary, green, pubescent.



Fig.125. *Boehmeria songmaoensis* S. S. Ying, plants growing in situ

Distribution and phenology.

Boehmeria songmaoensis S.S. Ying is endemic to Taiwan. It is known from Songmao Forest Road (松茂林道), Hoping District (和平區), Taichung City, central Taiwan. It was discovered the species on the edge of forests at elevations of 1650-1950 meters. Its flowering time is February to March and fruiting times March to April.

10. Two New Species of Genus *Chloranthus* (Chloranthaceae) from Taiwan

A. Chloranthus taiwanensis S. S. Ying 台灣及已

Chloranthus taiwanensis S.S. Ying , *sp. nov.* 台灣及已

TYPE: TAIWAN. Taitung county , Beinan Township (卑南鄉) , Chiben (知本), 235 m alt.
S. S. Ying , *s.n.* January 11, 2024 ° (holotype, **TPRCH**) °



Fig. 126. *Chloranthus taiwanensis* S. S. Ying, plants growing in situ

Morphology : Small subshrubs about 25-40 cm in height. Rhizome corm-like, fleshy, 4-6 cm in diameter, blackish brown, slightly smell, 5-8 stem tufted from it. Stem simple, not branched, 20-38 cm long, erect to ascending, dark purple, glabrous, apparently 2-3 nodes; internodes; internodes 5-8 cm long, each node with one pair of scale-like leaves, ovate to ovate-triangular, 1.5-3 mm long, about 1.5 mm wide, acute at apex, amplexicaul at base.

Leaves simple, opposite, rarely 4 at the apex of the stem and suboppositely; stipules

triangular, caducous; blade elliptic to obovate, 9-11 cm long, 7-8.5 cm wide, acute **and** mucronate at apex, cuneate at base, thinly coriaceous, glandular serrate at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib and lateral veins (5-7 per side) impressed surface and elevated beneath; petioles 1.2-1.6 cm long, terete, glabrous, green tinged with purple.



Fig. 127. *Chloranthus taiwanensis* S. S. Ying, leaves opposited

Flowers small, white, 2-3 mm in diameter when opened, scentless, in terminal spikes; inflorescence rachis 6-8 cm long, purple, glabrous; spikes 2 to 4, opposite, 4-6 cm long, green sometimes tinged with purple; bracts ovate, somewhat cup-like, 2-2.5 mm long, 2-3 mm wide, truncate at apex, pale green, glabrous; stamens 1, anthers 2-celled, 3-4 mm long, 0.6-0.8 mm wide, white, obtuse at apex, glabrous; ovary ovoid, 1-1.2 mm long and wide, green, glabrous; style 0; stigma capitate.

Fruit a drupe, oval, 2-2.5 mm in diameter, smooth, without striate, sessile, with a mucronate at apex, green when young.



Fig. 128. *Chloranthus taiwanensis* S. S. Ying, close-up of a spike
(Mind the bract like a cup, embrace the ovary, anther at apex of ovary)

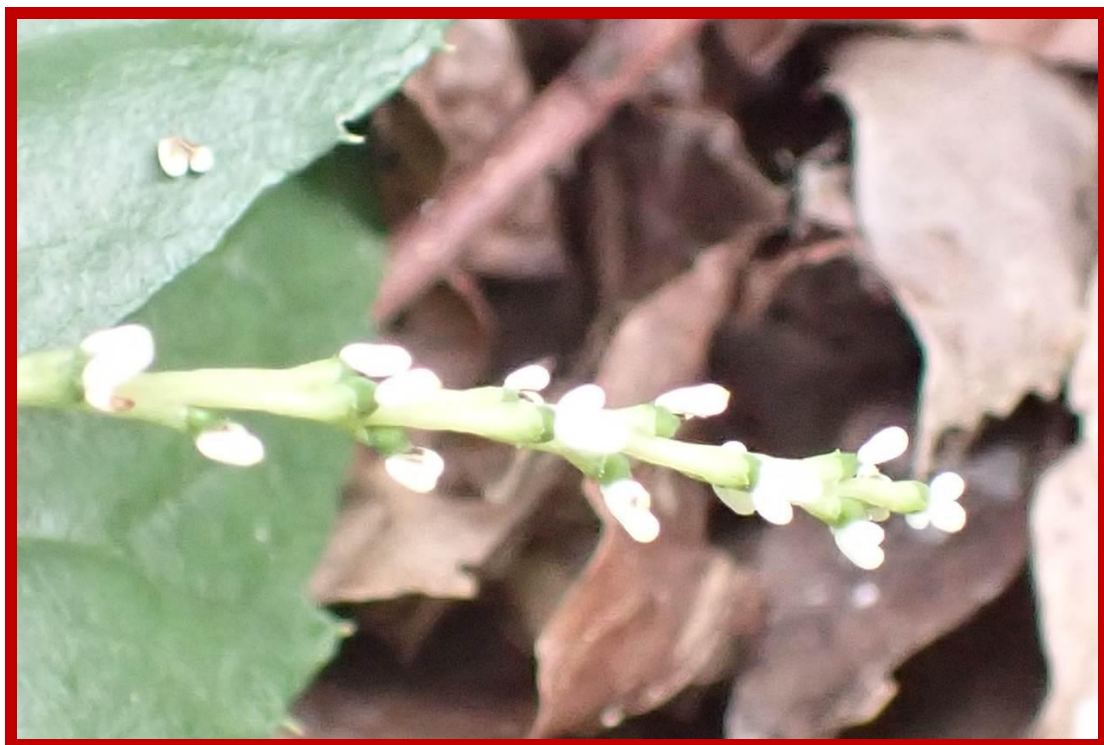


Fig. 129. *Chloranthus taiwanensis* S. S. Ying, close-up of a spike
(mind anther attached on apex side of ovary)



Fig. 130. *Chloranthus taiwanensis* S. S. Ying, the holotype TPRCH -113-029

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 131. *Chloranthus taiwanensis* S. S. Ying, the isotype TPRCH -113-030

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 132. *Chloranthus taiwanensis* S. S. Ying, the isotype TPRCH -113-031

(this isotype has transferred and deposited at TPRCH herbarium)

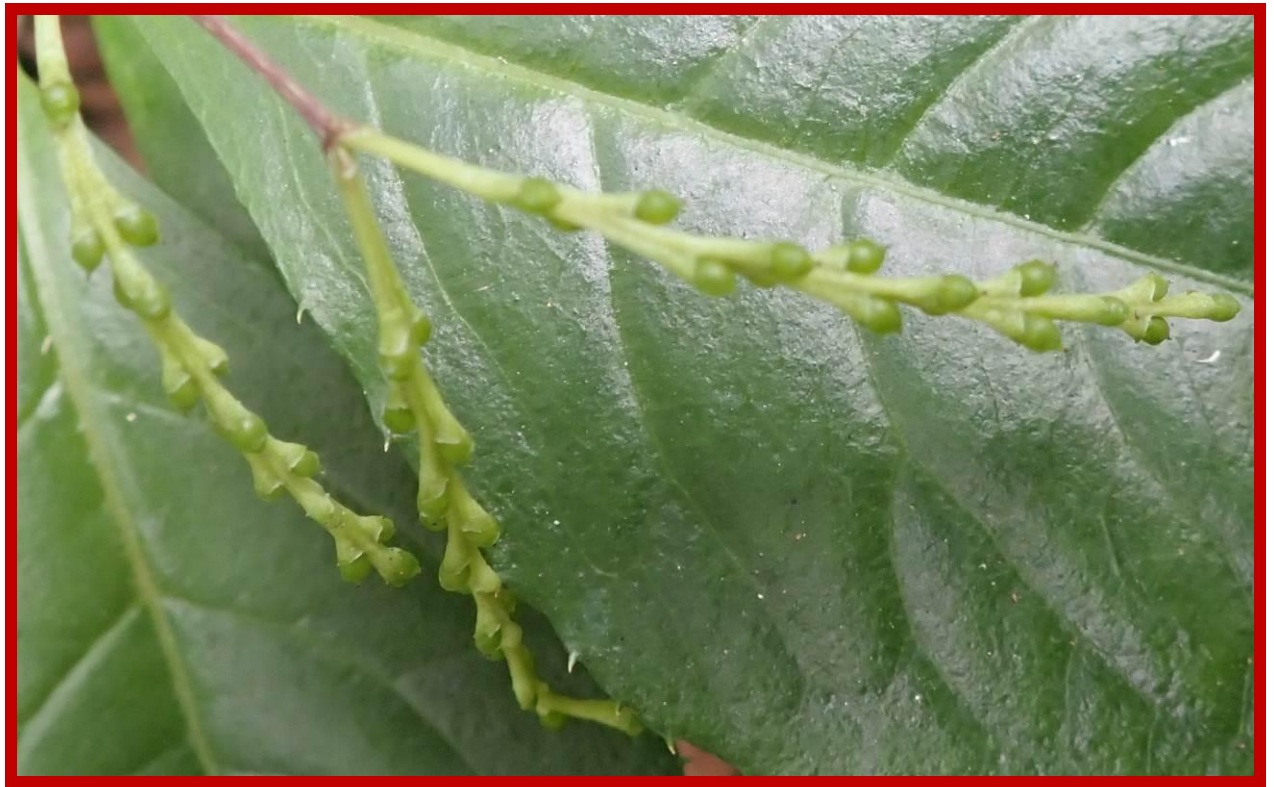


Fig. 133. *Chloranthus taiwanensis* S. S. Ying, infructescence

Diagnosis.

Chloranthus taiwanensis is characterized by its subshrub with fleshy rhizome which tufted 5-8 stems; stems erect to ascending, purple and glabrous; leaves opposite, somewhat smaller than other species of the genus of Taiwan; spikes 2-4, opposite, bracts like a cup, truncate at apex; stamens 1, anther 2-celled, (*C. oldhamii* 3-celled), white, attached on apex side of ovary and fruit an oval smooth drupe.

Distribution and phenology.

Chloranthus taiwanensis S.S. Ying is endemic to Taiwan ° It is known from Chiben (知本), Beinan Township (卑南鄉), Taitung county, south-eastern Taiwan. ° It was discovered the species under broad-leaved forests at elevations of 200-250 meters. Its flowering time is January and fruiting times January to February.



Fig. 134. *Chloranthus taiwanensis* S. S. Ying, plants growing in situ



Fig. 135. *Chloranthus oldhamii* Solms. anthers 3-celled

B.Chloranthus wufengchiwaterfallensis S. S. Ying 五峰旗瀑布及已

Chloranthus wufengchiwaterfallensis S. S. Ying , *sp. nov.* 五峰旗瀑布及已

TYPE:TAIWAN. I-Lan County,Chaochi Township (礁溪鄉) , Wufengchi Waterfall (五峰旗瀑布) 250 m alt. S. S. Ying , s.n. March 28, 2024 . (holotype , **TPRCH**) .

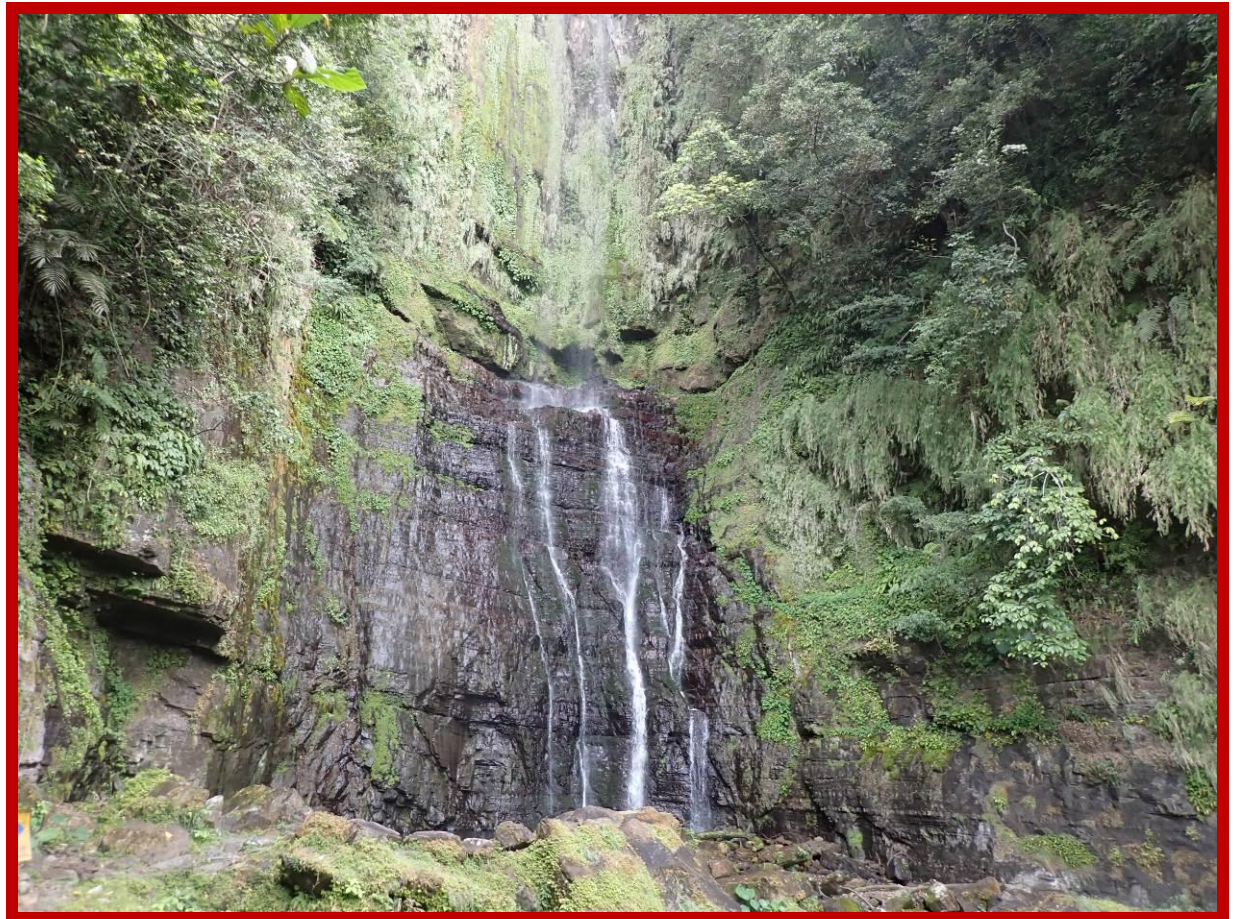


Fig.136. *Chloranthus wufengchiwaterfallensis* S.S. Ying plants growing in situ (plants are crowd gathering on cliffs of waterfall)

Morphology : Small aquatic and wet-loving subshrubs about 35-60 cm in height. Rhizome corm-like, fleshy, 6-8 cm in diameter, blackish brown, slightly smell, only one stem produced from it. Stem simple, not branched, 32-58 cm long, erect to ascending, reddish purple, glabrous, apparently 3-5 nodes; internodes; internodes 7-12 cm long, each node with one pair of scale-like leaves, ovate to ovate-triangular, 4.5-6 mm long, about 2.5 mm

-113-



Fig. 137. *Chloranthus wufengchiwaterfallensis* S.S. Ying leaves only 4 on each plant

wide, acute at apex, amplexicaul at base, purplish red. Leaves simple, 4, verticillate on the top of stem; stipules triangular, caducous; blade ovate to obovate-oblong, 12-18 cm long, 8-10.5 cm wide, obtuse with a cusp at apex, obtuse at base, thinly coriaceous, glandular serrate at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib and lateral veins (5-6 per side) impressed surface and elevated beneath; petioles 1.5-1.8 cm long, terete, glabrous, purplish red.

Flowers small, white, 2.5-3.6 mm in diameter when opened, scentless, in terminal spikes; inflorescence rachis 15-18 cm long, purple, glabrous; spikes mostly 6, rarely 4, opposite, 6-7.5 cm long, green sometimes tinged with purple, pendulous; bracts ovate, somewhat cup-like, 2-2.5 mm long, 2-3 mm wide, truncate and ciliate at apex (margins), green, glabrous; stamens 1, anthers 3-celled, 3-4 mm long, 0.8-1.2 mm wide, usually the middle one somewhat elongate, white, obtuse at apex, glabrous; ovary ovoid, 1-1.5 mm long and wide, green, glabrous; style 0; stigma brush-like, white.



Fig. 138. *Chloranthus wufengchiwaterfallensis* S.S. Ying, flowering plants growing in situ

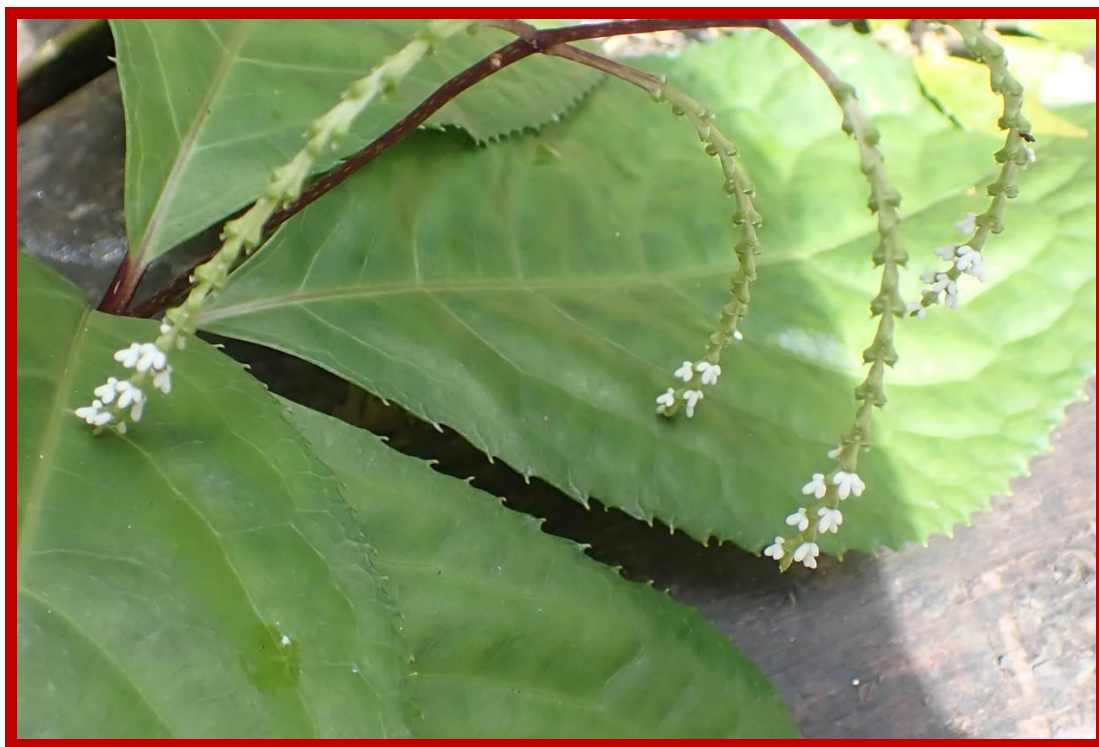


Fig.139. *Chloranthus wufengchiwaterfallensis* S.S. Ying, inflorescences

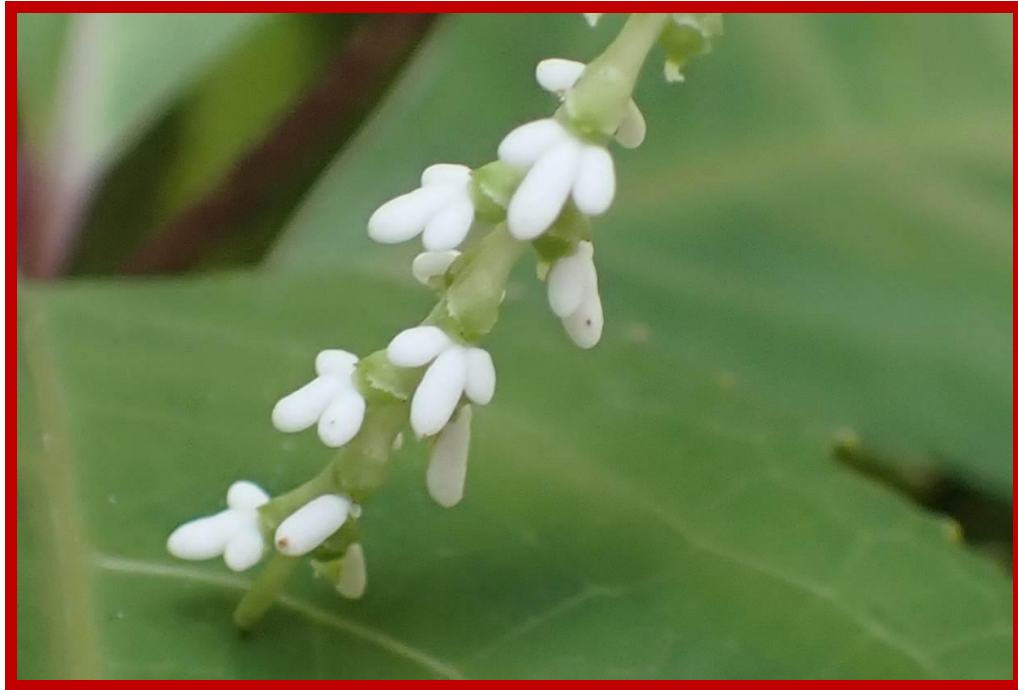


Fig. 140. *Chloranthus wufengchiwaterfallensis* S.S. Ying, close-up of flowers

Fruit a drupe, oval, 2.5-3.5 mm in diameter, smooth, without striate, sessile, with a mucronate at apex, green when young.

Diagnosis.

1. Wufengchi Waterfall contains 3 waterfalls on different elevations above sea level, the first one located at the mountain about 140 meters above sea level, there is no *Chloranthus wufengchiwaterfallensis* occurrence; the second waterfall located at the mountain about 180 meters above sea level, there are few *Chloranthus wufengchiwaterfallensis* growing on the cliff and nearby wet areas of the waterfall; the third waterfall located at the mountain about 250 meters above sea level, *Chloranthus wufengchiwaterfallensis* growing fully on cliffs and nearby wet areas, is a dominant plant of the area,

2. The species confines to Wufengchi Waterfall and around the waterfall about 60 meters circle.

3. *Chloranthus wufengchiwaterfallensis* is characterized by its subshrub with fleshy rhizome which only 1 stem; leaves 4, verticillate the top of stem, it's the largest



Fig. 141. *Chloranthus wufengchiwaterfallensis* S.S. Ying, the holotype TPRCH -113-032

(this holotype has transferred and deposited at TPRCH herbarium)

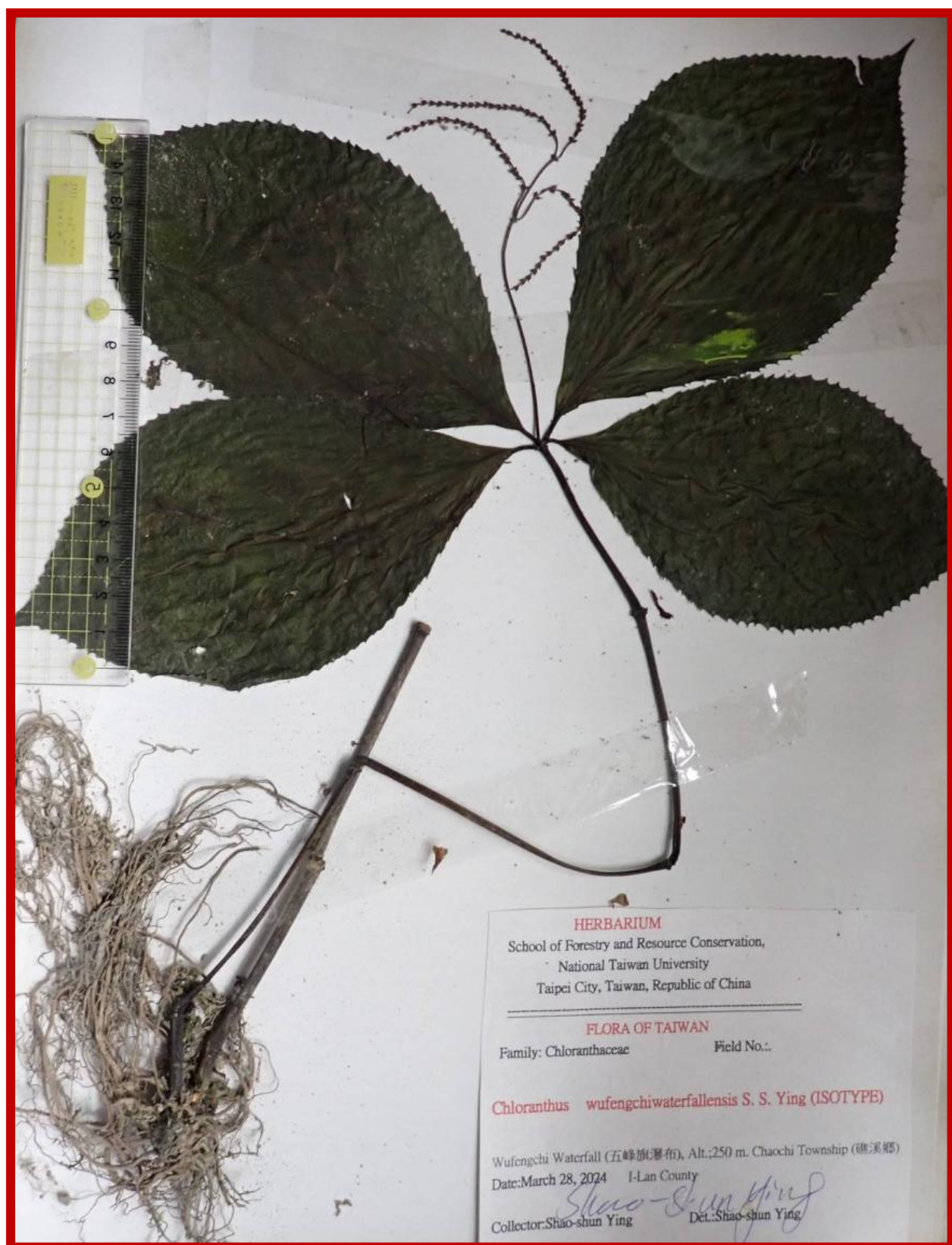


Fig. 142. *Chloranthus wufengchiwaterfallensis* S.S. Ying, the isotype TPRCH -113-033

(this isotype has transfered and deposited at TPRCH herbarium)



Fig. 143. *Chloranthus wufengchiwaterfallensis* S.S. Ying, close-up of young fruits



Fig. 144. *Chloranthus wufengchiwaterfallensis* S.S. Ying plants growing in situ

one of Taiwan *Chloranthus* species; spikes 4-6, opposite, bracts like a cup, truncate and ciliate at apex; stamens 1, anther 3-celled, white, the middle one somewhat elongate.

Distribution and phenology.

Chloranthus wufengchiwaterfallensis S.S. Ying is endemic to Taiwan. It is known from Wufengchi Waterfall(五峰旗瀑布) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on cliff and wet areas around the waterfall at elevations of 180-250 meters. Its flowering time is March to April and fruiting times April to May.



Fig.145. *Chloranthus wufengchiwaterfallensis* S.S. Ying plants growing in situ

11. One New Species of Genus *Hypoestes* (Acanthaceae) from Taiwan

Hypoestes taiwanensis S. S. Ying 台灣槍刀藥

Hypoestes taiwanensis S.S. Ying, *sp. nov.* 台灣槍刀藥

TYPE: TAIWAN. Taitung county, Beinan Township (卑南鄉), Chiben (知本), 235 m alt.
S. S. Ying, s.n. January 11, 2024. (holotype, **TPRCH**).



Fig. 146. *Hypoestes taiwanensis* S. S. Ying, plant with flowers and fruits

Morphology : Perennial stoloniferous herb 23-45 cm tall; rhizome creeping, somewhat fleshy; stem prostrate to ascending, branched, somewhat quadrangular, swollen above the nodes, densely covered by white hairs throughout. Leaves simple, opposite, oblong to ovate-oblong, 2-3.5 cm long, 0.5-1.2 cm wide, obtuse at apex, slightly cordate at base, chartaceous, entire and slightly ciliate at margins, lustrous green sometimes with color spots and plaques surface and pale green beneath, glabrous surface and pubescent along midrib and lateral veins, midrib and lateral vein 2-4 per side) impressed surface and elevated beneath. Petioles 1.2-2.5 cm long, grooved above, pubescent.



Fig. 147. *Hypoestes taiwanensis* S. S. Ying, leaves

Flowers pink purple, scentless, 8-12 mm in diameter, 4-6 terminal to axillary spike; inflorescence rachis 7-9 cm long, erect to ascending, densely covered with white villous; bracts somewhat leaf-like, but smaller, 5-15 mm long, 4-6 mm wide, obtuse at apex, pubescent on both surfaces; calyx tubular, 9-11 mm long, 1.5-2.5 mm wide, densely covered with white hairs outside and fewer hairs inside, tube 5-6 mm long; 2-lobed at apex; the lobes spatulate, 4-5 mm long, obtuse at apex; corolla bilabiate, white outside and pink to purplish pink inside, tube subcylindrical, to expanded distally into a narrow throat, 1-1.3 cm long, white hairy outside; limb 2-lipped, upper lip larger, 6-7 mm long, 4-5 mm wide, with white specks near to throat, 3-marginate to shallowly lobed; lower lip lanceolate to narrowly oblong, 4-5 mm long, 2.5-3 mm wide, obtuse at apex, reflexed; stamens 2, inserted near apex of corolla-tube; anthers 1-theous; theca muticous; ovary ovoid, green, about 2 mm across; style exserted from mouth of corolla; stigma capitate.



Fig. 148. *Hypoestes taiwanensis* S. S. Ying, flowers



Fig. 149. *Hypoestes taiwanensis* S. S. Ying, close-up of flowers

Fruit a capsule, cylindrical, 9-12 mm long, 2.5-3 mm wide, densely covered by white long hairs, 4-5 longitudinal ribs, opened by terminal 2-valved; valves 4-5 mm long, acute at apex; stipitate 3.5-5 mm long, pubescent; seeds few, ovoid, 0.8-1 mm across, smooth, glabrous.



Fig. 150. *Hypoestes taiwanensis* S. S. Ying, close-up of fruits

Diagnosis.

Hypoestes taiwanensis is characterized by its stoloniferous perennial herb with prostrate to ascending stem which densely covered by white hairs; leaves oblong to ovate-oblong, with obtuse apex and slightly cordate at base; 4-6 flowers in terminal and axillary spike, pink purple, scentless, 8-12 mm in diameter when opened; inflorescence rachis erect to ascending, densely covered with white villous; calyx tubular and 2-lobed at apex; corolla bilabiate, white outside and pink to purplish pink inside; limb 2-lipped; fruit a capsule, cylindrical, densely covered by white long hairs, 4-5 longitudinal ribs, opened by terminal 2-valved; seeds few, ovoid, 0.8-1 mm across, smooth, glabrous.



Fig.151. *Hypoestes taiwanensis* S. S. Ying, the holotype TPRCH -113-034

(this holotype has transferred and deposited at TPRCH herbarium)

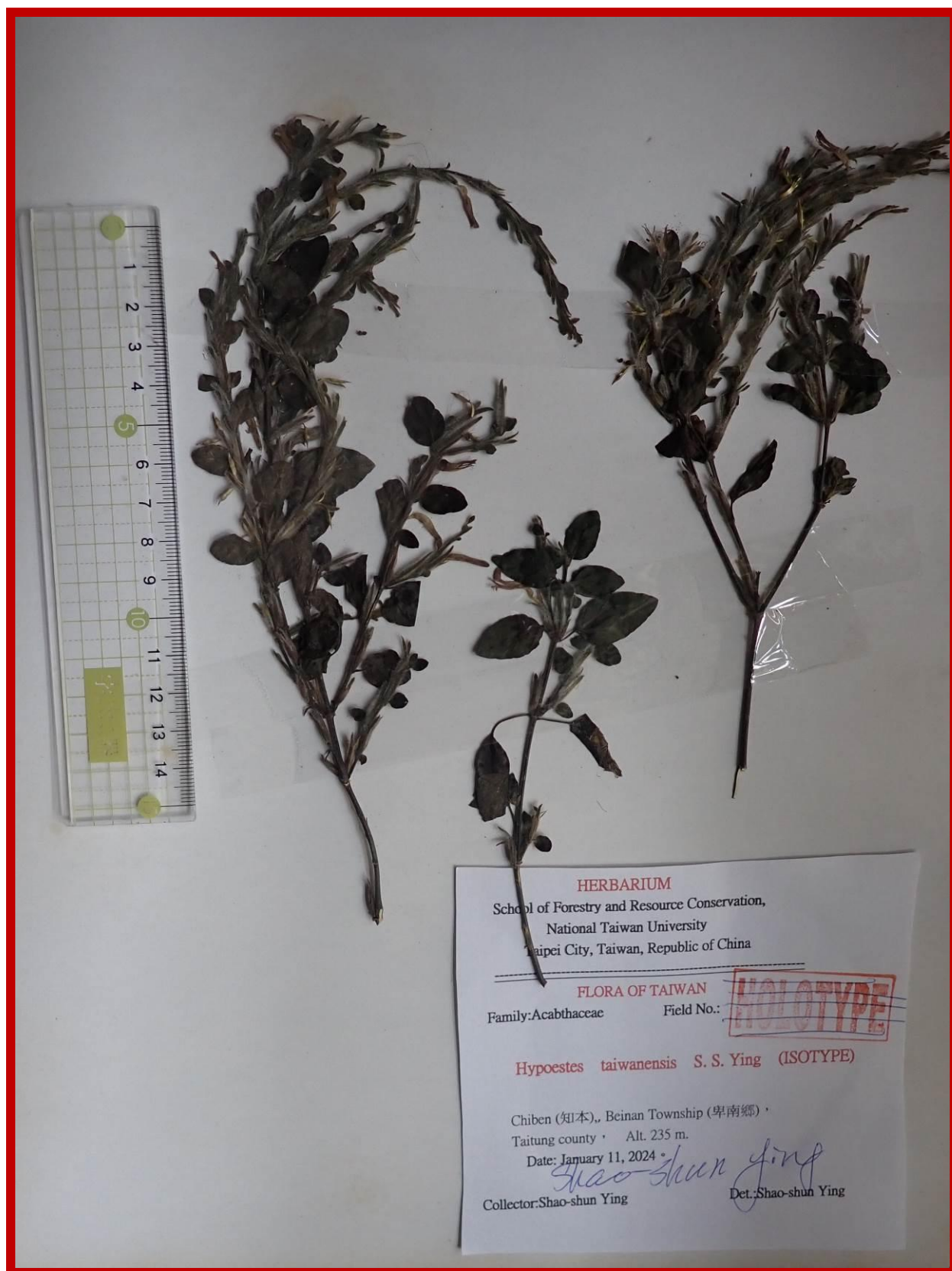


Fig. 152. *Hypoestes taiwanensis* S. S. Ying, the isotype TPRCH -113-035

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 153. *Hypoestes taiwanensis* S. S. Ying, plants growing in situ

Distribution and phenology.

Hypoestes taiwanensis S.S. Ying is endemic to Taiwan ° It is known from Chiben (知本) ,Beinan Township (卑南鄉),Taitung county ,south eastern Taiwan. ° It was discovered the species under broad-leaved forests at elevations of 210-270 meters. Its flowering time is December to January and fruiting times January to March.

12. One New Species of Genus *Utricularia* (Lentibulariaceae) from Taiwan

Utricularia taiwaniana S. S. Ying 台灣狸藻

Utricularia taiwaniana S.S. Ying, *sp. nov.* 台灣狸藻

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 860 m alt. *S. S. Ying*, *s.n. January 27, 2024* (holotype, **TPRCH**) .



Fig. 154. *Utricularia taiwaniana* S. S. Ying, plants growing in situ

Morphology : Small aquatic and lithophytic herb about 2.5-3.5 cm tall. Roots fibrous, slender, usually penetrate into rock-lacunas, somewhat hard to find. Stem simple, 2-3.5 cm long, erect to ascending, pale purple to greenish purple, glabrous. Leaves 2-3, at base of stem, ovate to ovate-rounded, 2-3 mm long, 1.8-2.8 mm wide, obtuse and emarginate at

apex, attenuate at base, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib and lateral veins inconspicuous. Petioles 1-1.5 mm long, glabrous.



Fig. 155. *Utricularia taiwaniana* S. S. Ying, close-up of the plant

Flowers 2-3, white, scentless, 3-4 mm in diameter when opened, in a terminal raceme; inflorescence rachis 8-13 mm long, green tinged with purple, glabrous; pedicels 1.5-2.5 mm long, pale purple, glabrous; bracts 2, opposite, ovate, 0.6-0.7 mm long and wide, obtuse at apex, red; calyx lobes unequal, red to pink, glabrous; the upper ovate, 1-1.5 mm long, 1.2 mm wide, obtuse at apex; the lower one oblong, 1.7-1.9 mm long, about 1.4 mm wide, obtuse at apex; corolla white to pink, 2-2.5 mm long, glabrous; upper lip slightly constricted below middle; the superior part oblong, rounded at apex; the inferior part ovate; lower lip broadly ovate, galeate, 3-lobed at apex, with a yellow speck at base; the median lobe dentate at apex; the lateral lobes obtuse at apex; spur subulate, acute at apex, pink, slightly longer than and widely diverging from the lower lip; filaments about 1 mm long, straight; anther thecae distinct; ovary ooid, style short.



Fig. 156. *Utricularia taiwaniana* S. S. Ying, close-up of flowers



Fig. 157. *Utricularia taiwaniana* S. S. Ying, close-up of flowers, showing the spur

Diagnosis.

Utricularia taiwaniana is characterized by its smaller herb with aquatic and lithophytic habit; leaves ovate to ovate rounded, 2-3 mm long, 1.8-2.8 mm wide; flowers 2-3, racemose; calyx unequal, red; the upper ovate, the lower one oblong; corolla white to pink, 2-2.5 mm long, glabrous; upper lip slightly constricted below middle; the superior part oblong, rounded at apex; the inferior part ovate; lower lip broadly ovate, galeate, 3-lobed at apex, with a yellow speck at base; the median lobe dentate at apex; the lateral lobes obtuse at apex.



Fig. 158. *Utricularia taiwaniana* S. S. Ying, close-up of flowers, showing the calyx

Distribution and phenology.

Utricularia taiwaniana S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the wet montane slope and often mixed with mosses and other water-loving plants at elevations of 850-910 meters. Its flowering time is January.



Fig. 159. *Utricularia taiwaniana* S. S. Ying, the holotype TPRCH -113-036

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 160. *Utricularia taiwaniana* S. S. Ying, plants growing in situ



Fig. 161. *Utricularia taiwaniana* S. S. Ying, plants growing in situ

13. One New Species of Genus *Lespedeza* (Fabaceae) from Taiwan

Lespedeza taiwaniana S. S. Ying 台灣胡枝子

Lespedeza taiwaniana S.S. Ying, *sp. nov.* 台灣胡枝子

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 760 m alt. S. S. Ying, *s.n.* January 27, 2024 (holotype, TPRCH) .

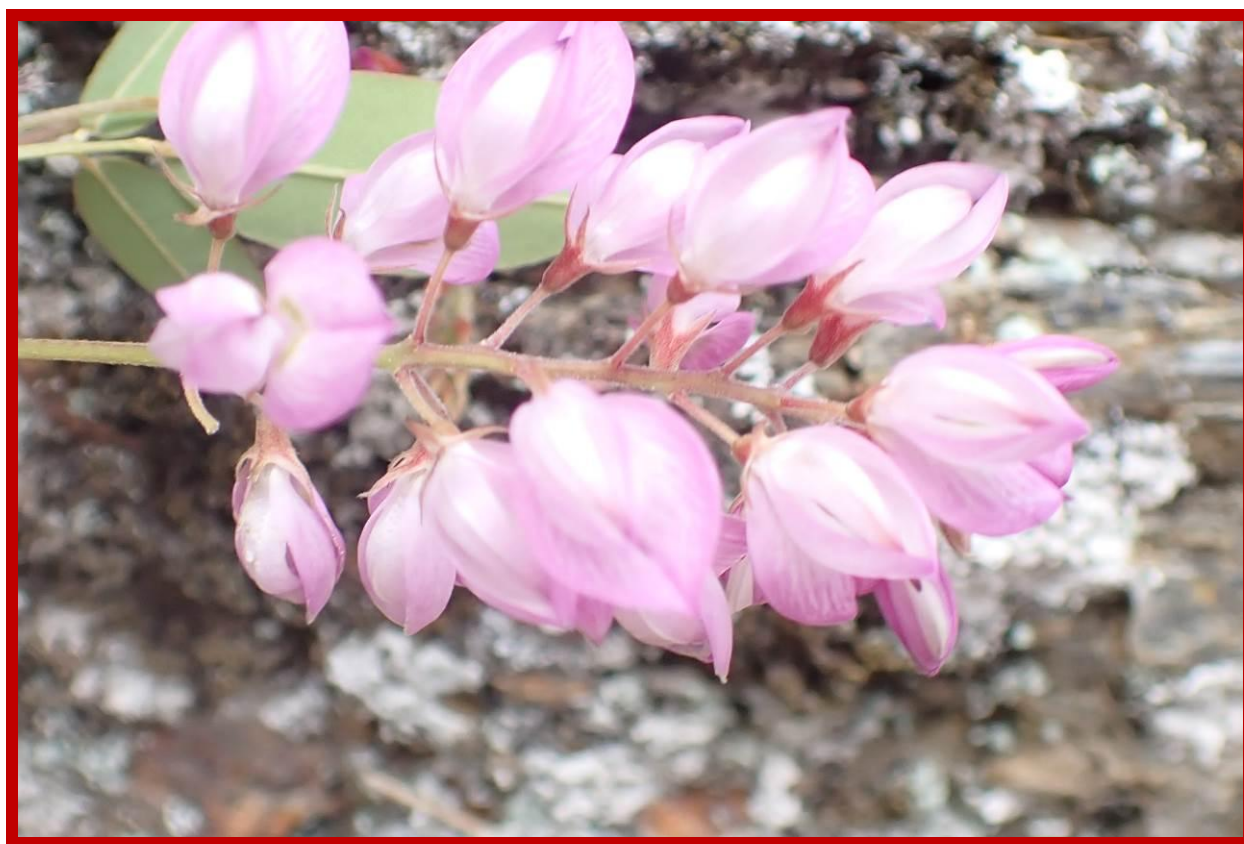


Fig. 162. *Lespedeza taiwaniana* S. S. Ying, the inflorescence

Morphology : Small shrub about 1.2-2.5 m tall. Trunk short, much branches from base; branches erect to ascending, 60-150 cm long, green to greenish brown, pubescent, angular. Leaves 3-foliolate, alternate; terminal leaflet larger than lateral ones, oblong, 3-3.5 cm long, 1.4-1.6 cm wide, obtuse and with an awn at apex, rounded at base, chartaceous, glabrous surface and somewhat sericeous beneath; midrib impressed surface and elevated

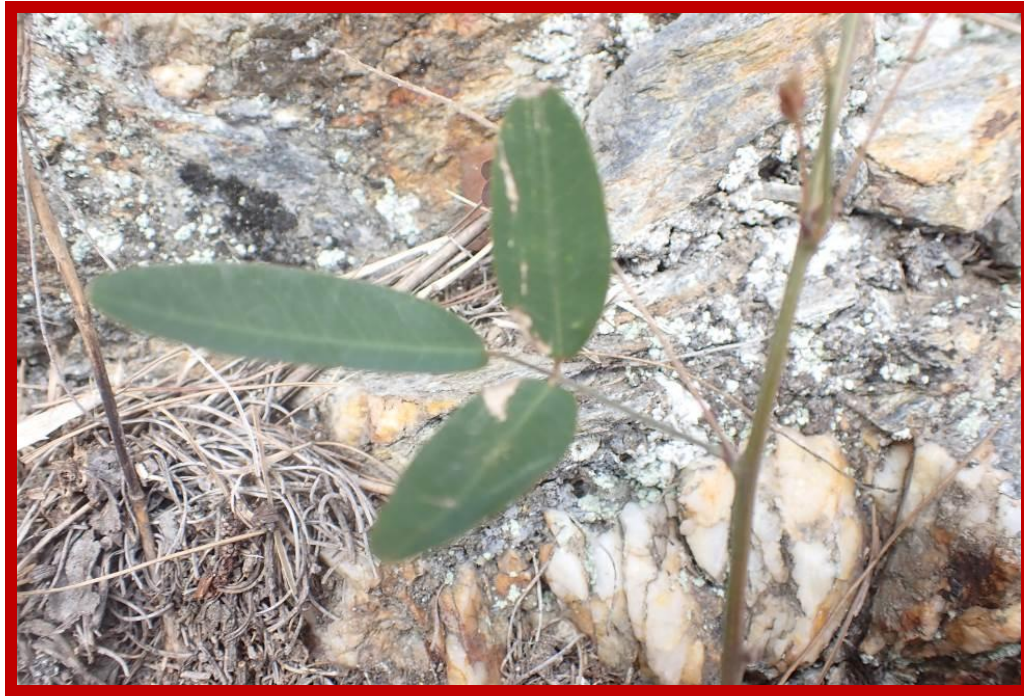


Fig. 163. *Lespedeza taiwaniana* S. S. Ying, 3-foliolate

beneath; pulvinus 0.3-0.35 mm long; the rachis 1.2-1.6 cm long, pubescent; lateral leaflets oblong, 2.3-2.7 cm long, 8-14mm wide, shortly petiolate, pulvinate of 0.25-0.3 mm long; petioules 1-1.5 mm long. Petioles 1.5-2.2 cm long, pubescent; stipules linear-lanceolate, 2.5-4.5 mm long, 1.5 mm wide, sparsely appressed-pubescent.

Flowers pink, not widely opened, 5-7 mm in diameter when opened, 15-25 in a terminal and axillary racemes, usually to form a panicle in a whole; inflorescence 7-10 cm long, erect to ascending, pubescent, flower rachis 4.5-6 cm long, pubescent; bracts linear to lanceolate, 2.5-3 mm long, 1.5 mm wide, cauduous; pedicels 3.5-4.5 mm long, pubescent, purplish red; calyx campanulate, 5-lobed at apex, red to purplish red, pubescent outside and glabrous inside; tube 2.5-3 mm long; lobes uniform, linear to linear-lanceolate, 3-3.5 mm long, 1.5 mm wide, acuminate at apex; corolla 8-11 mm long; standard pink with a large green speck at base inside, ovate-rounded, 7-9 mm long, 8-9 mm wide, pubescent outside and glabrous inside, emarginate at apex, abruptly narrowed to claw, claw 1.5 mm long; wings pink outside and somewhat white inside, oblong, 6-7.5 mm long, 3-4 mm wide, obtuse at apex, abruptly narrowed to claw, claw 1.5-2 mm long, pubescent outside and glabrous in side; keel-petals white with a pink apex, crescent, 6-7 mm long,

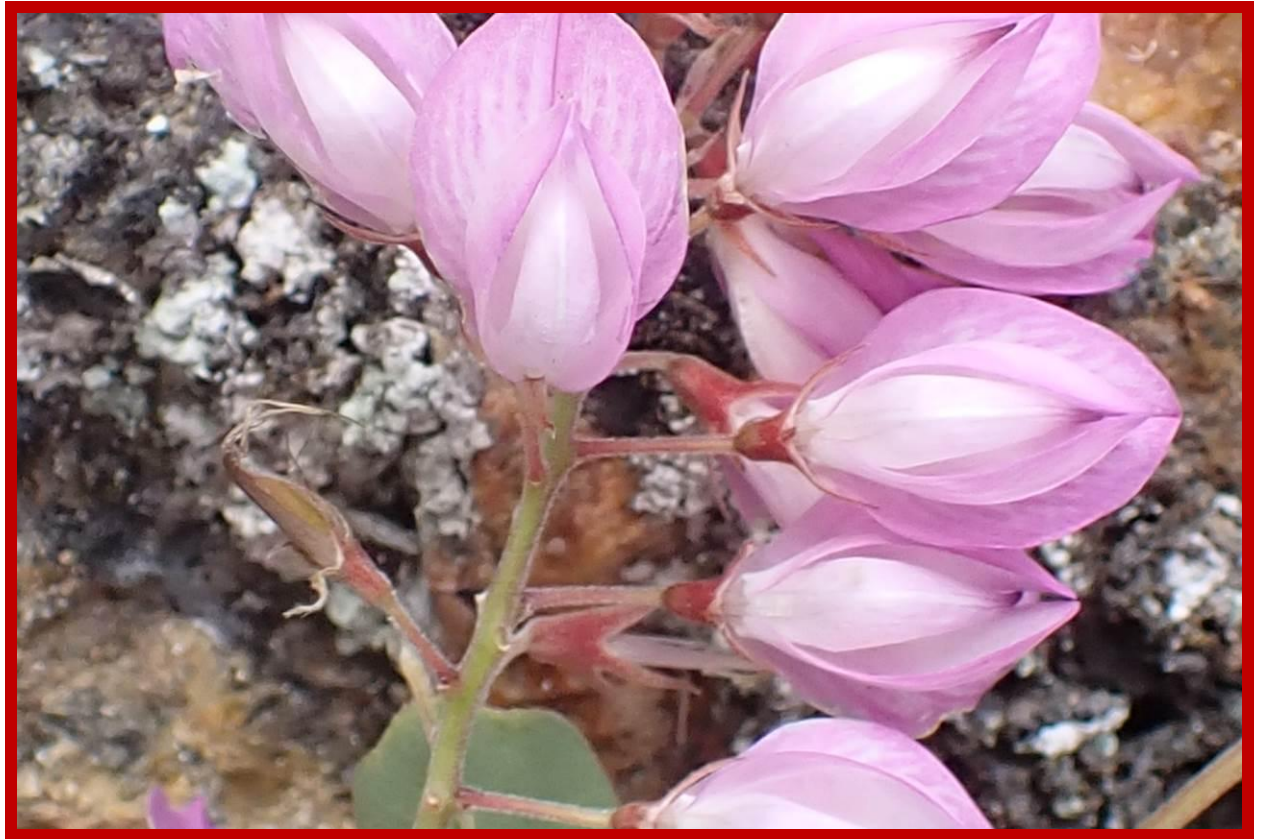


Fig. 164. *Lespedeza taiwaniana* S. S. Ying, close-up of flowers



Fig. 165. *Lespedeza taiwaniana* S. S. Ying, close-up of standard and part of calyx



Fig. 166. *Lespedeza taiwaniana* S. S. Ying, close-up of wings, keel-petal and stamens

2.5-3 mm wide, obtuse at apex, abruptly narrowed to claw, claw 1.5-2.5 mm long; stamens 10, diadelphous (9+1), about as long as keel length, curved upwards in distal part; anthers uniform, ovoid, 0.25 mm long, yellow; filaments slender, glabrous, white; pistil 5-6 mm long, ovary narrowly elliptic, shortly stipitate, appressed pubescent, uniovulate; style filamentous, curved upward in distal part; stigma terminal, capitate.

Pod elliptic, 1-1.5 cm long, 4-5 mm wide, purplish brownish when mature, with short remnant of style, nearly glabrous. Seed one, ovate, 5-6 mm long, 4.5 mm wide, smooth, glabrous.

Diagnosis.

Lespedeza taiwaniana is characterized by its smaller shrub with lithophytic habit; leaves 3-foliolate, terminal leaflet larger than lateral ones, oblong; Flowers pink, not widely opened, 5-7 mm in diameter when opened, 15-25 in a terminal and axillary racemes, usually to form a panicle in a whole; calyx campanulate, 5-lobed at apex, red to

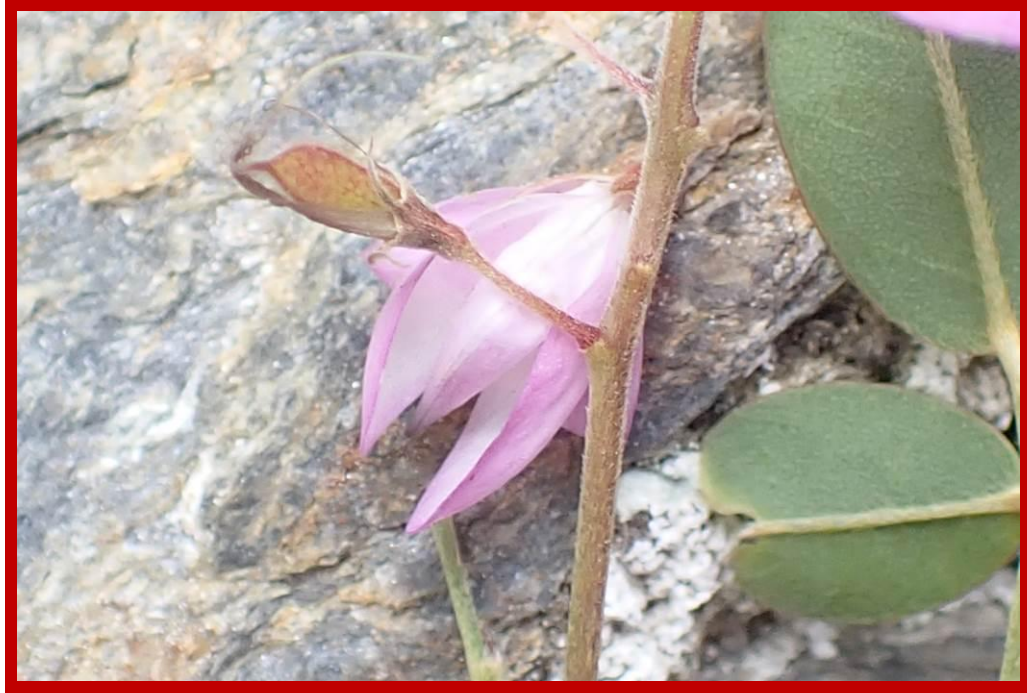


Fig. 167. *Lespedeza taiwaniana* S. S. Ying, close-up of young fruit



Fig. 168. *Lespedeza taiwaniana* S. S. Ying, mature fruits for last year



Fig. 169. *Lespedeza taiwaniana* S. S. Ying, the holotype TPRCH -113-037

(this holotype has transferred and deposited at TPRCH herbarium)

purplish red, pubescent outside and glabrous inside; lobes uniform, linear to linear-lanceolate; standard pink with a large green speck at base inside, ovate-rounded, 7-9 mm long, 8-9 mm wide, pubescent outside and glabrous inside, emarginate at apex and elliptic pod.



Fig. 170. *Lespedeza taiwaniana* S. S. Ying, plant growing in situ

Distribution and phenology.

Lespedeza taiwaniana S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky montane slopes at elevations of 750-950 meters. Its flowering time is January to February and fruiting time from February to November.

14. One New Species of Genus *Pilea* (Urticaceae) from Taiwan

Pilea minultifolia S. S. Ying 微葉冷水麻

Pilea minutifolia S.S. Ying , *sp. nov.* 微葉冷水麻

TYPE: TAIWAN. Taitung county · Haiduan township (海端鄉) · Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 840 m alt. *S. S. Ying* , *s.n. January 27, 2024* ° (holotype, TPRCH) °



Fig. 171. *Pilea minutifolia* S. S. Ying, plant colony

Morphology : Flowers dioecious: Annual terrestrial to lithophytic, often mixed with mosses, smaller herbs, roots fibrous, slender, 4-7 mm long. Stem simple, 8-15 mm long, erect to ascending, slightly fleshy, pale green, glabrous. Leaves simple, opposite, ovate to ovate-triangular, 3-5 mm long, 2.5-4 mm wide, fleshy, dentate at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib impressed surface and



Fig. 172. *Pilea minutifolia* S. S. Ying, close-up of leaves

elevated beneath, lateral veins inconspicuous. Petioles short, 1.5-2 mm long, fleshy, glabrous.

Flowers dioecious; female flowers numerous, in a clustered axillary head-like inflorescence, 0.3-0.6 mm in diameter when opened; peduncles 0.35-4 mm long, erect to ascending, scattered few hairs; involucre 1.5-2.5 mm in diameter, green to pale green, 5-6 lobed at apex, glabrous; lobes linear, 1-1.5 mm long, about 0.5-0.6 mm wide, acute at apex, white to pale yellow; each inflorescence with numerous flowers; pedicels 0; bracteoles lanceolate, 0.2-0.3 mm long, about 0.1 mm wide, obtuse at apex; sepals 4-5, ovate-triangular, 0.4-0.5 mm long, 0.2-0.35 mm wide, obtuse at apex, pale yellow to white; ovary ovoid to ellipsoid, 0.15-0.2 mm long, glabrous, stigma 1-2 haired, 0.12-0.13 mm long, cauduous.

Achene elliptic to ovoid, 1-1.5 mm long, about 1 mm wide, slightly compressed, somewhat oblique at apex, smooth, pale brownish, glabrous.



Fig.173. *Pilea minutifolia* S. S. Ying, close-up of inflorescence, some achenes were seen



Fig. 174. *Pilea minutifolia* S. S. Ying, close-up of inflorescence, some achenes were seen

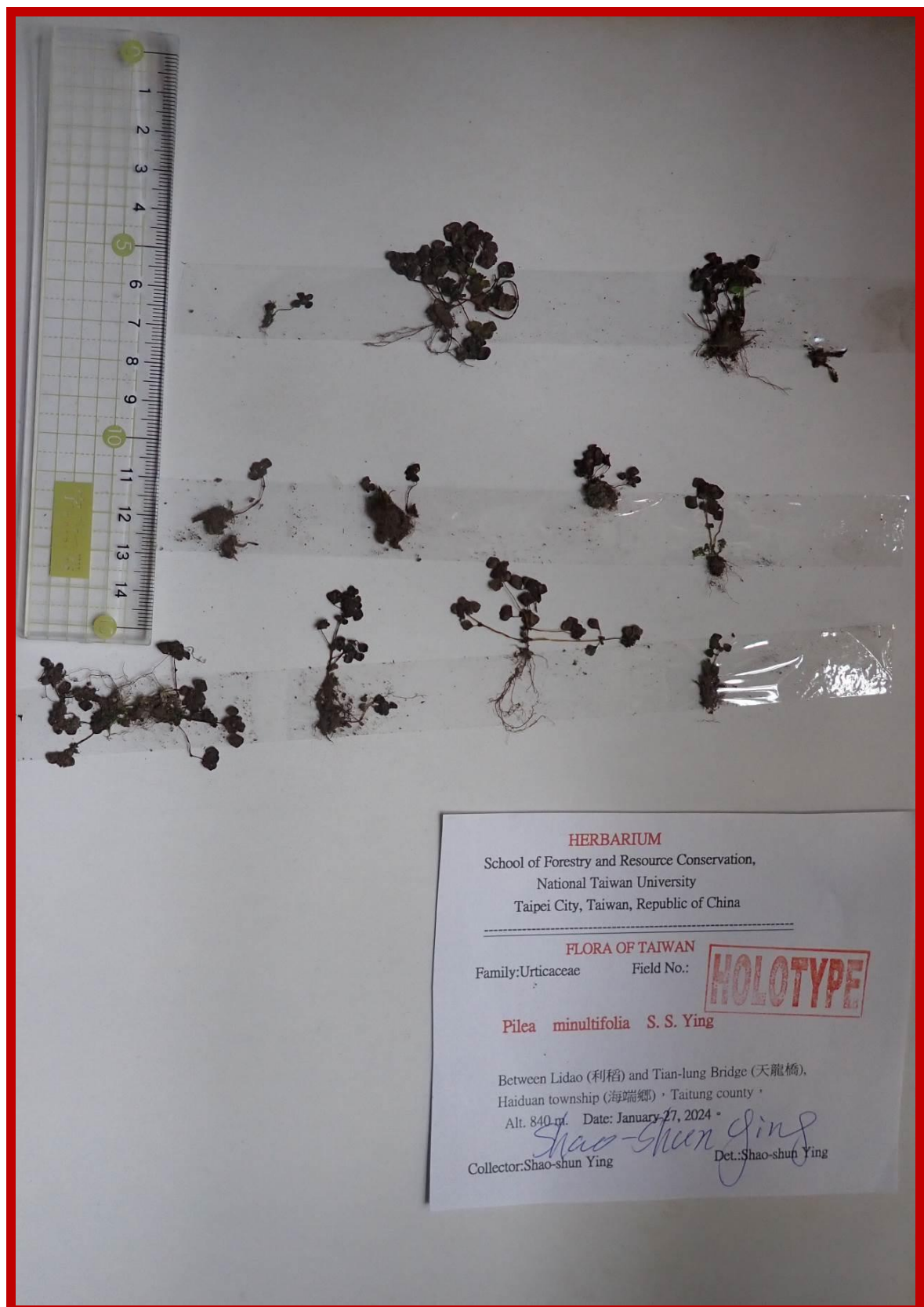


Fig. 175. *Pilea minitifolia* S. S. Ying, the holotype TPRCH -113-038

(this holotype has transferred and deposited at TPRCH herbarium)

Diagnosis.

Pilea minutifolia is recognized by its dioecious plants, with very smaller ovate to ovate-triangular leaves; female flowers very smaller, numerous in a clustered axillary head-like inflorescence; pedicels 0; bracteoles lanceolate, obtuse at apex; sepals 4-5, ovate-triangular, pale yellow to white and slightly compressed, somewhat oblique at apex, smooth, pale brownish achenes.



Fig. 176. *Pilea minutifolia* S. S. Ying, plants growing in situ

Distribution and phenology.

Pilea minutifolia S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the moosy rocky montane slopes at elevations of 810-980 meters. Its flowering time is January to February and fruiting time from February to March.

15. Two New Species of Genus *Salvia* (Lamiaceae) from Taiwan

A. Salvia lidoensis S. S. Ying 利稻鼠尾草

Salvia lidoensis S.S. Ying, *sp. nov.* 利稻鼠尾草

TYPE: TAIWAN. Taitung county · Haiduan township (海端鄉) · Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 760 m alt. *S. S. Ying*, *s.n. January 27, 2024* ° (holotype, TPRCH) °



Fig. 177. *Salvia lidoensis* S. S. Ying, inflorescence, mind bracts at inflorescence rachis

Morphology : Annual herb, with inflorescence 12-16 cm tall; stem absent. Leaves radical, fascicled, trifoliate, with petioles 6.5-8.5 cm long; the petioles 4.5-6.6 cm long, glabrous or nearly so; leaflets 3, the terminal one largest, oblong to broadly oblong, 3.5-4.5 cm long, 1.8-2.9 cm wide, slightly coriaceous, obtuse at apex, slightly cordate at base,

glabrous on both surfaces, palmately veins impressed surface and elevated beneath, lateral veins inconspicuous, lustrous green surface and pale green beneath; petioles 1-1.5 cm long, glabrous; rachis 1-1.5 cm long, glabrous to pubescent, green; lateral leaflets 2, smaller, opposite, oblong, 1-1.5 cm long, 8-11 mm wide, obtuse at apex, obtuse to slightly cordate at base, dentate at margins, pubescent then to glabrous, palmately veins impressed surface and elevated beneath, lustrous green surface and pale green beneath. Petioles 2.5-4 mm long.



Fig. 178. *Salvia lidaoensis* S. S. Ying, close-up of trifoliate

Flowers 2-labiate, white, 4-5 mm in diameter when opened, 1-3 flowers in a verticillate; 5-6 verticillate on the inflorescence; inflorescences produced from fascicled leaves, erect to ascending, 12-16 cm long, glabrous, often tinged with pale purple, simple, not branched; bracts 3-4, at inflorescence rachis, triangular, 3-4.5 mm long, 1.5-2.5 mm wide, acute at apex, glabrous; pedicels 4-4.5 mm long, green tinged with purple, glabrous; bracteoles 2 at base of each pedicels, opposite, unequal, one lanceolate, 2.5-3 mm long, 1.5 mm wide, acute at apex; the other triangular, 0.8-1.2 mm long, 1 mm wide acute at apex;

calyx campanulate, 4.5-5.5 mm long, 3.5-4.5 mm wide, 2-lipped, greenish tinged with purple upward, glabrous; upper lip entire, about 2.5 mm long, acute at apex; lower lip 2-lobed at apex, slightly longer than upper one, the lobes acute at apex; corolla 2-lipped, tube nodding or nearly so, 7.5-12 mm long, glandular hairs outside, upper lip straight, oblong, 5-6 mm long, 3-shallowly lobed, mucronate at apex; lower lip 3-lobed; the median lobe longer, oblong, 5.5-6.5 mm long, slightly wavy at margins; lateral lobes rounded, 3-4 mm long, obtuse at apex; stamens 2, filaments included on the corolla, pendulous, connectives prolonged, linear, T-shaped; upper arms with fertile linear anther cells; lower arms slender, with fertile or sterile anther cells; staminodes 2, small; style slender, exserted out the corolla, 2-cleft, the lobes linear, unequal, pale purplish.

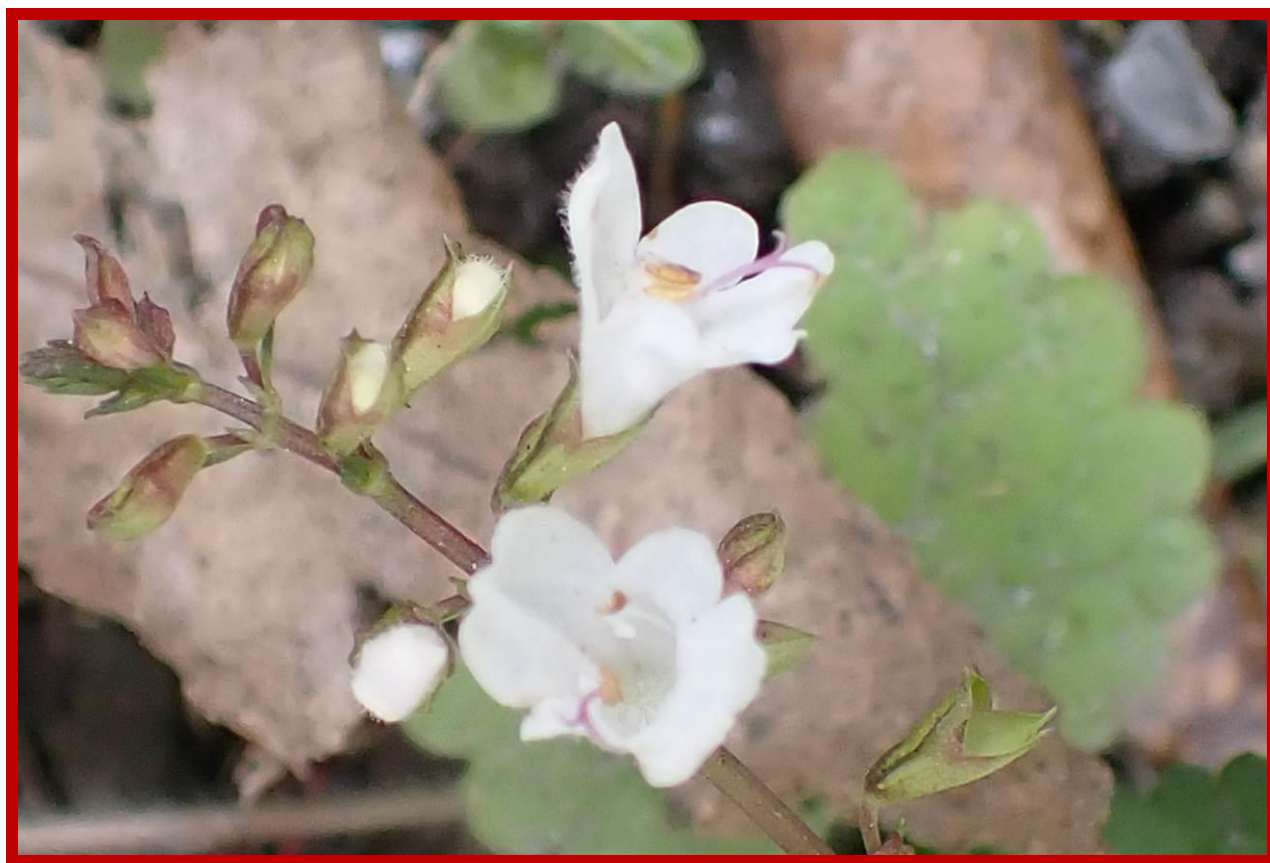


Fig. 179. *Salvia lidaoensis* S. S. Ying, close-up of inflorescence, mind bracteoles unequal

Diagnosis.

The species is characterized by its a small tufted plant; stem absent, with trifoliate

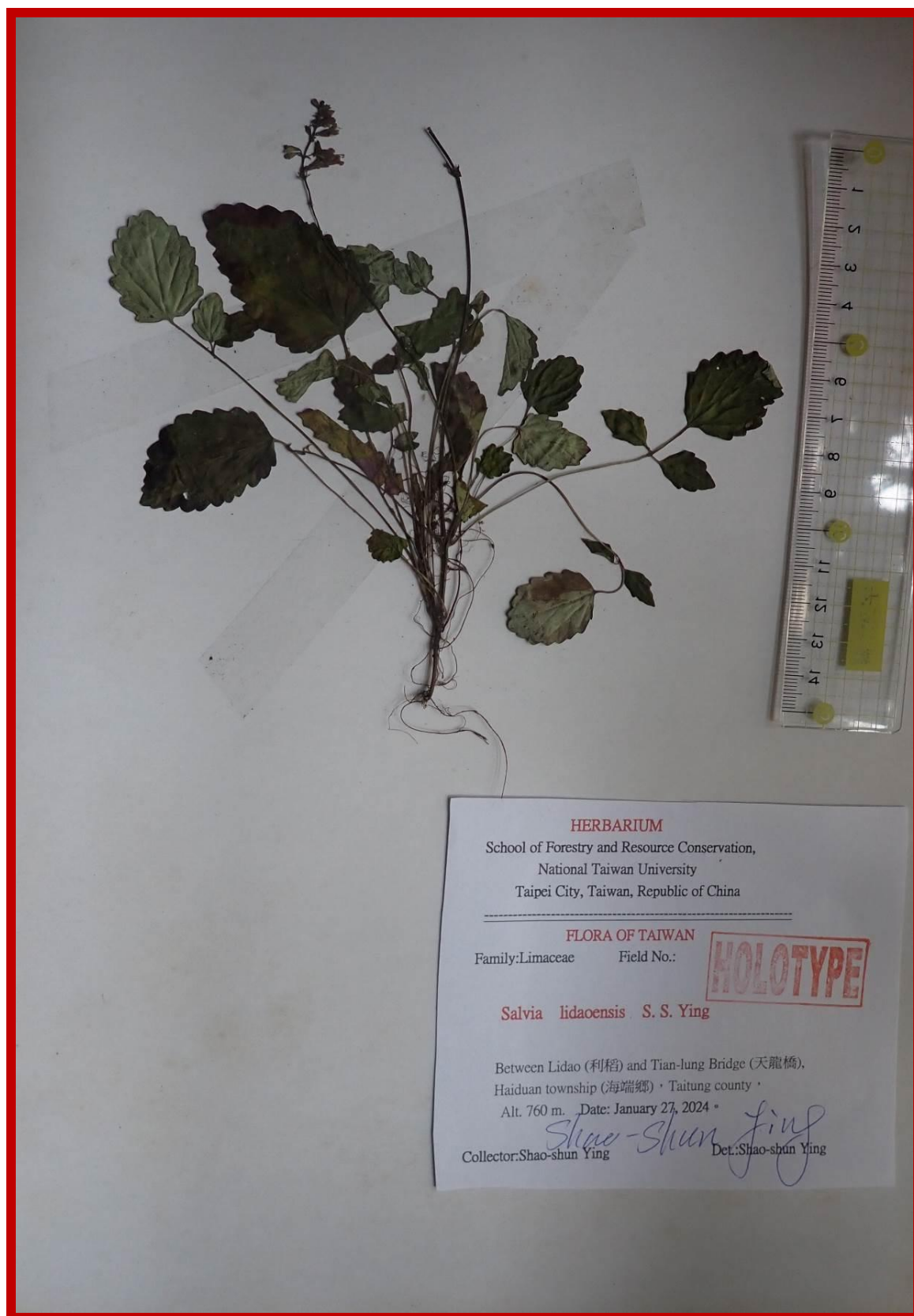


Fig. 180. *Salvia lidaoensis* S. S. Ying, the holotype TPRCH -113-039

(this holotype has transferred and deposited at TPRCH herbarium)

leaves, the lateral leaflets shortly petioles; inflorescences simple; flowers few, 1-3 flowers in a verticillate, white, calyx 2-lipped, the upper lip entire and lower lip 2-lobed at apex; corolla 2-lipped, upper lip straight, oblong, 3-shallowly lobed, mucronate at apex; lower lip 3-lobed; the median lobe longer.



Fig. 181. *Salvia lidaoensis* S. S. Ying, plant growing in situ

Distribution and phenology.

Salvia lidaoensis S.S. Ying is endemic to Taiwan ° It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. ° It was discovered on the rocky montane slopes at elevations of 815-980 meters. Its flowering time is January to February and fruiting time from February to March.

B.Salvia tungyanshanensis S. S. Ying 東眼山鼠尾草

Salvia tungyanshanensis S.S. Ying , *sp. nov.* 東眼山鼠尾草

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Tungyuanshan (東眼山), 1055 m alt. *S. S. Ying* , *s.n. June 08, 2024* ° (holotype, **TPRCH**) °



Fig. 182. *Salvia tungyanshanensis* S. S. Ying, the habit

Morphology : Aannual lithophytic small herb, with inflorescence 8-14 cm tall; stem absent. Leaves radical, fascicled, pinnate, with petioles 3.5-5.5 cm long; the petioles 0.45-1.6 cm long, glabrous or nearly so; leaflets 5, the terminal one largest, oblong to ovate oblong, 1.5-2.5 cm long, 1.3-2.2 cm wide, slightly coriaceous, obtuse at apex, slightly cordate at base, dentate at margins, glabrous on both surfaces, midrib impressed surface and elevated beneath, lateral veins 2-4 per side, somewhat inconspicuous, lustrous green surface and pale green beneath; petioles 6-8 mm long, glabrous; rachis 1-1.5 cm long, glabrous, green; lateral leaflets 4, smaller, opposite, ovate to oblong, 4-8 mm long, 4.5-6 mm wide, obtuse at apex, obtuse to slightly cordate at base, dentate at margins, pubescent then to glabrous,

midrib impressed surface and elevated beneath, lustrous green surface and pale green beneath. Petioles 0.5-1 mm long.



Fig. 183. *Salvia tungyanshanensis* S. S. Ying, leaves

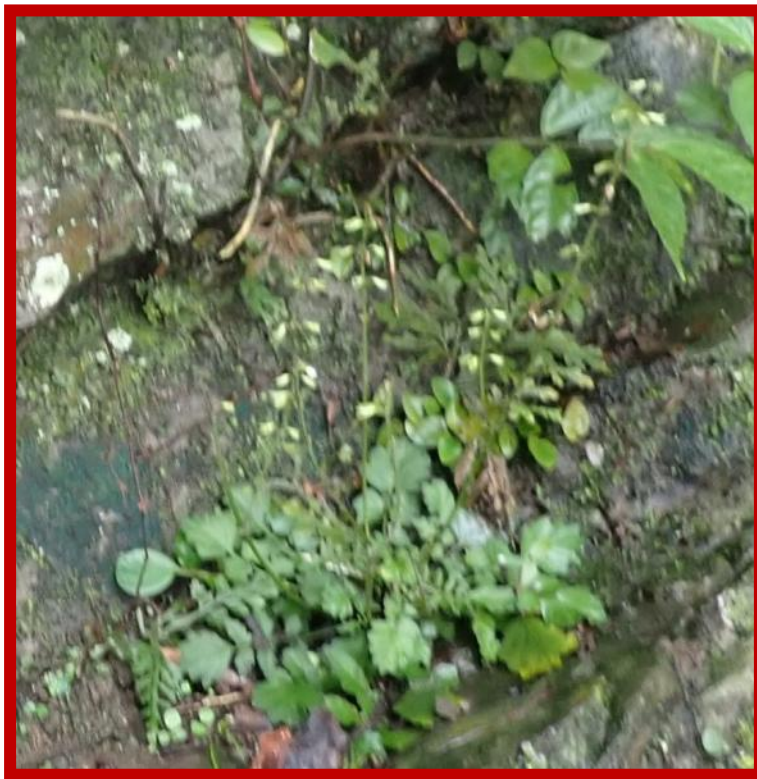


Fig. 184. *Salvia tungyanshanensis* S. S. Ying, flowering plants

Flowers 2-labiate, white, small, 2.5-3.2 mm in diameter when opened, few flowers (6-8) in a terminal raceme; inflorescences produced from fascicled leaves, erect to ascending, 6-11 cm long, glabrous, often tinged with purple, simple, not branched; bracts 1-2, at inflorescence rachis, ovate, 0.8-1.5 mm long, 0.5-0.9 mm wide, obtuse at apex, glabrous; pedicels 2-2.5 mm long, green tinged with purple, glabrous; bracteoles 1-2 at base of each pedicels, opposite, ovate, 0.5-1 mm long, 0.45 mm wide, acute at apex; calyx campanulate, 4-5 mm long, 3-3.8 mm wide, 2-lipped, greenish, glabrous; upper lip entire, about 0.6 mm long, obtuse at apex; lower lip 2-lobed at apex, slightly longer than



Fig. 185. *Salvia tungyanshanensis* S. S. Ying, pedicels, bractules, calyx and corolla

upper one, the lobes acute at apex; corolla 2-lipped, tube nodding or nearly so, 4.5-5 mm long, glandular hairs outside, upper lip straight, oblong, 2.5-3 mm long, 3-shallowly lobed, obtuse at apex; lower lip 3-lobed; the median lobe longer, oblong, 2.5-3.5 mm long, emarginate to slightly 2-lobed at apex, entire at margins; lateral lobes rounded, 1-1.5 mm long, obtuse at apex; stamens 2, filaments exerted outside the corolla, white, slender; anthers yellow, connectives prolonged, linear, T-shaped; upper arms with fertile linear anther cells; lower arms slender, with fertile or sterile anther cells; staminodes 2, small;



Fig. 186. *Salvia tungyanshanensis* S. S. Ying, the holotype TPRCH -113-040

(this holotype has transferred and deposited at TPRCH herbarium)

style slender, white, exerted out the corolla, 2-cleft, the lobes short, linear, slightly unequal, brownish.



Fig. 187. *Salvia tungyanshanensis* S. S. Ying, plants growing in situ

Diagnosis.

The species is characterized by its a small tufted plant; stem absent, with pinnate, leaves; the leaflets 5, the terminal one largest, oblong to ovate oblong, 1.5-2.5 cm long, 1.3-2.2 cm wide; flowers 2-labiate, white, small, 2.5-3.2 mm in diameter when opened, few flowers (6-8) in a terminal raceme; corolla 2-lipped, upper lip straight, oblong, 3-shallowly lobed, lower lip 3-lobed; the median lobe longer, oblong, 2.5-3.5 mm long, emarginate to slightly 2-lobed at apex, entire at margins.

Distribution and phenology.

Salvia tungyanshanensis S.S. Ying is endemic to Taiwan ° It is known from Tungyuanshan (東眼山), Fuhsin District (復興區), Taoyuan city, northern

Taiwan. ° It was discovered the species on roky cleavgees at elevations of 900-1,450 meters. Its flowering time is June to July.



Fig. 188. *Salvia tungyanshanensis* S. S. Ying, plants growing in situ

16. A New combination of Genus *Jurinea* (Asteraceae) from Taiwan

Jurinea hohuanshanensis (S.S.Ying) S.S. Ying, comb. nov.

Himalaiella hohuanshanensis S.S. Ying in New Taxa New Names 2: 109 (2022)

Since the genus *Jurinea* Cass. is a valid generic name, and *Himalaiella* is a synonym of *Jurina*, I transferred the species of *Himalaiella hohuanshanensis* to the genus *Jurinea* as above

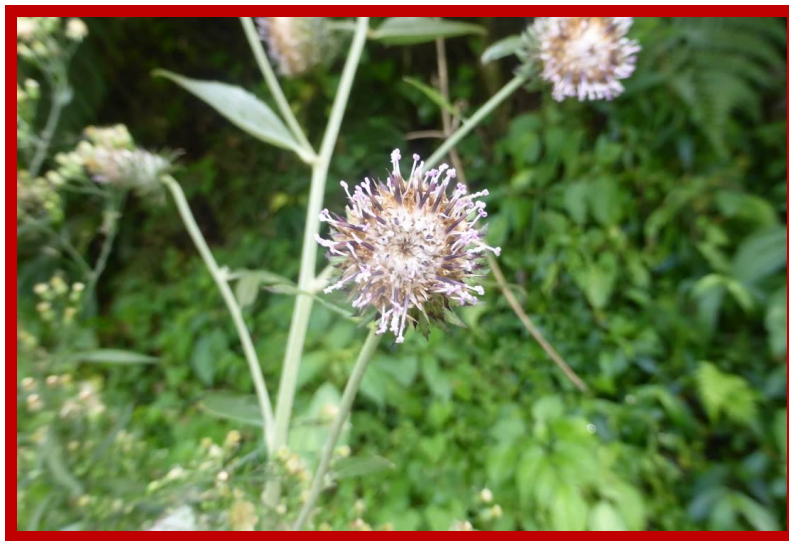


Fig. 189. *Jurinea hohuanshanensis* (S.S. Ying) S.S. Ying



Fig. 190. *Jurinea hohuanshanensis* (S.S. Ying) S.S. Ying

17. One New Species of Genus *Sinocrassula* (Crassulaceae) from Taiwan

Sinocrassula lidaoensis S. S. Ying 利稻石蓮

Sinocrassula lidaoensis S.S. Ying, *sp. nov.* 利稻石蓮

TYPE: TAIWAN. Taitung county · Haiduan township (海端鄉) · Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 1050 m alt. S. S. Ying, *s.n.* March 02, 2024 ° (holotype, TPRCH) °



Fig. 191. *Sinocrassula lidaoensis* S. S. Ying, habit

Morphology : Lithophytic perennial herbs, usually forming rosettes colony. rosettes usually 1.5 – 2.7 cm in diameter, sterile stems absent. Leaves basal, closely approximate each other, imbricate, sessile, succulent, purplish red to purple, fleshy, spatulate to ovate-spathulate, 9-12 mm long, 2.5-3.5 mm wide, about 2.2 mm thick, obtuse at apex,

attenuate at base, densely scattered glandular hairs all over and secret mucilage, entire and glandular-ciliate at margins, midrib and lateral veins inconspicuous. Petioles flat, 2.6-3.5 mm long, 1.6 mm wide, scattered glandular hairs, purplish red in color.



Fig. 192. *Sinocrassula lidaoensis* S. S. Ying, rosette leaves

Flowers yellow, few, rather smaller, 3-4.5 mm in diameter when opened, in terminal racemes, inflorescences (floral stem) erect to ascending, 4.5-9 cm long, purplish red, densely scattered with glandular hairs; cauline leaves same as the radical ones but smaller; racemose rachis 2.5-4 cm long, erect to ascending, purple red, densely scattered with glandular hairs; bracts none; pedicels slender, 6-18 mm long, densely scattered with glandular hairs, purple red; calyx globose, 3-4 mm in diameter, 5-deeply lobed; sepals broadly lanceolate, 2.5-4 mm long, 1.8-2.5 mm wide, acute at apex, green tinged with purple red, densely scattered with glandular hairs outside and glabrous inside; petals 5,



Fig. 193. *Sinocrassula lidaoensis* S. S. Ying, plants growing in situ



Fig. 194. *Sinocrassula lidaoensis* S. S. Ying, close-up of flower and calyx

Oblong-lanceolate, 4-5.5 mm long, 1.5-2.5 mm wide, acute at apex, concave at base, glabrous; stamens 10, 5 longer and 5 shorter, the longer one alternate at petals, inserted on sepals, shorter than petals; filaments slender, 1.2-1.8 mm long, pale green; anthers rounded, white, basifixed, 0.4 mm long and wide; nectar scales entire, slightly rectangular, 0.35-0.4 mm long, 0.35-0.45 mm wide, dentate at apex; carpels 5, erect, rounded, 2.5-3.5 mm long, glabrous, style short, 0.6 mm long, white; stigma capitate, 0.3 mm across, white.

Fruit a follicle, oblong, connate at base, 3.5-4.5 mm long, 2.5-3.0 mm wide, pale brownish when mature, apically with straight beak, dehiscent from the apex by lateral split. Seeds many, rounded, 0.2-0.4 mm across, smooth, glabrous, brownish.



Fig. 195. *Sinocrassula lidaoensis* S. S. Ying, plants growing in situ

Diagnosis.

The species is characterized by its lithophytic habitat; radical leaves usually forming



Fig. 196. *Sinocrassula lidaoensis* S. S. Ying, the holotype TPRCH -113-041

(this holotype has transferred and deposited at TPRCH herbarium)

a rosette; spatulate to ovate-spatulate, densely scattered glandular hairs all over and secrete mucilage leaves and few yellow flowers with 10 stamens.



Fig. 197. *Sinocrassula lidaoensis* S. S. Ying, plants growing in situ, flowering stems just growing

Distribution and phenology.

Sinocrassula lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky montane slopes at elevations of 895-1050 meters. Its flowering time is March to April and fruiting time from April to May.

18. One New Species of Genus *Ficus* (Moraceae) from Taiwan

Ficus lidaoprostrata S. S. Ying 利稻爬地榕

Ficus lidaoprostrata S.S. Ying, *sp. nov.* 利稻爬地榕

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 910 m alt. S. S. Ying, *s.n.* March 02, 2024. (holotype, TPRCH).



Fig. 198. *Ficus lidaoprostrata* S. S. Ying, plants growing in situ

Morphology : Large prostrate shrubs, stem and branches total prostrate on ground, usually rooting at nodes. Stem terete, 3-4 mm in diameter, dark brown, glabrous, much branched;



Fig. 199. *Ficus lidaoprostrata* S. S. Ying, plants completely prostrate on ground

branches spreading, slender, 60-100 cm long, purplish brown to dark brown, glabrous, smooth. Leaves simple, alternate, oblong to oblong-lanceolate, 1.2-1.8 cm long, 4.5-6.5 mm wide, thinly coriaceous, acute at apex, obtuse at base, entire, glabrous on both surfaces, dark lustrous green surface and pale green beneath, midrib impressed surface and elevated beneath, lateral veins 5-7 per side, sometimes the midrib and lateral veins turning to yellowish white. Petioles 6-9 mm long, terete, glabrous, purplish red.

Fig solitary, axillary on branches to leaf-axil, erect, papillary to pear-like, 4.5-5.5 mm long, 4-5 mm in diameter, red to dark red, scattered with white glandular hairs, emarginate at apex; pedicels 2.5-3.5 mm long, glabrous, purplish red, with bracts at base; bracts triangular, 1-1.2 mm long, about 1 mm wide, acute at apex; ostiole 0.7-0.8 mm in diameter, upper ostiolar bracts pale red, glabrous; internal hairs absent; staminate flowers dispersed, numerous, sessile; tepal 3-4, free, linear, reddish brown, with 1-2 stamens; pistillate flowers sessile, tepals 2-2, lanceolate, free, ovary with or without stipe.

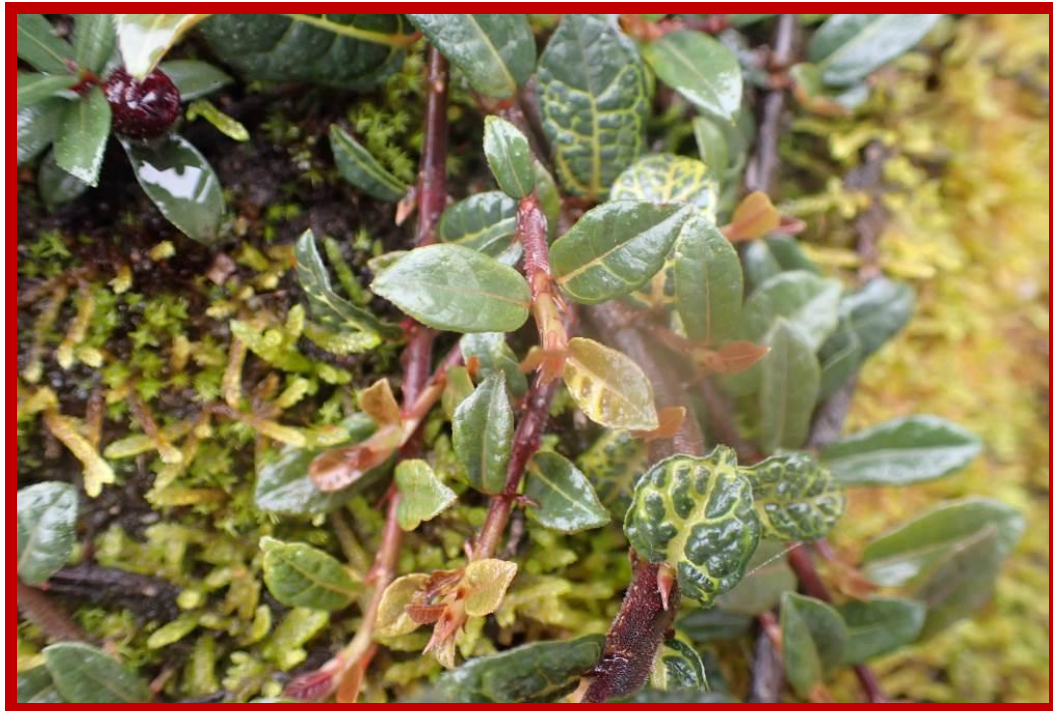


Fig. 200.*Ficus lidaoprostrata* S. S. Ying, sometimes midrib and lateral veins
turning to yellowish white



Fig. 201.*Ficus lidaoprostrata* S. S. Ying, longitudinal section of fig



Fig. 202. *Ficus lidaoprostrata* S. S. Ying, the holotype TPRCH -113-042

(this holotype has transfered and deposited at TPRCH herbarium)



Fig. 203. *Ficus lidaoprostrata* S. S. Ying, the isotype TPRCH -113-043

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 204. *Ficus lidaoprostrata* S. S. Ying, figs, see from top side

Diagnosis.

The species growing the highest elevations of Taiwan *Ficus* species, about 850-950 meters above sea level.

The species is characterized by its lithophytic habitat usually mixed with mosses; the plant bodies completely prostrate on grounds; leaves oblong to oblong-lanceolate, 1.2-1.8 cm long, 4.5-6.5 mm wide, thinly coriaceous; fig solitary, axillary on branches to leaf-axil, erect, papillary to pear-like, 4.5-5.5 mm long, 4-5 mm in diameter, red to dark red, scattered with white glandular hairs, emarginate at apex.

Distribution and phenology.

Ficus lidaoprostratas S.S. Ying is endemic to Taiwan. ° It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. ° It was discovered on the rocky montane slopes at elevations of 850-950 meters. Its flowering time is all year round and fruiting times all year round too.



Fig. 205. *Ficus lidaoprostrata* S. S. Ying, plant conlony

19.Five New Species of Genus *Galium* (Rubiaceae) from Taiwan

A. Galium lidaoense S. S. Ying 利稻豬殃殃

Galium lidaoense S.S. Ying , *sp. nov.* 利稻豬殃殃

TYPE:TAIWAN. Taitung county·Haiduan township (海端鄉)·Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 980 m alt. *S. S. Ying* , *s.n. March 02, 2024* ° (holotype, TPRCH) °



Fig. 206. *Galium lidaoense* S. S. Ying, flowers

Morphology : A somewhat erect annual herb, stems elongate, usually erect to ascending, 25-45 cm long, much-branched, striated, glabrous, green tinged with purplish red ; the branches erect to ascending, 4-angled, 1.5-2 mm in diameter, striated, glabrous to few hairy. Leaves 4, verticillate, oblong to ovate-oblong, 4-6 mm long, 2.5-3.5 mm wide, obtuse at apex, narrowed to obtuse at base, chartaceous, entire and ciliate at margins,



Fig. 207. *Galium lidaoense* S. S. Ying, branches and leaves

midrib somewhat impressed surface and elevated at beneath, lateral veins inconspicuous, scattered hirsute on both surfaces; petioles short, 1.5-2.5 mm long, hairy.

Flowers white, 3-5 in a simple umbel, usually 1-2 umbels on each branchlet, terminal or upper leaf-axil on the branchlets, smaller, 1.2-1.8 mm in diameter when opened; peduncles 8-12 mm long, slender, green, glabrous to few hairy; bracts ovate to ovate, 2-3 mm long, 1-2 mm wide acute at apex; pedicels 4-5 mm long, slender, green tinged with purple, glabrous; calyx 4-lobed, terminal on the ovary, the lobes triangular, 0.8-1.0 mm long, acute at apex, green, glabrous; corolla 2.3-2.5 mm long, 4-lobed at apex; the lobes ovate triangular, 1.2-1.5 mm long, 1.25 mm wide, white, acute at apex, glabrous; stamens 4, alternate to the corolla-lobed ; filaments shorter than lobed; anthers dorsifixed, yellow; ovary inferior, didymous, compressed ovoid, green, glabrous; style short, stigma 2-lobed, short, cauduous.

Fruits black when mature, shortly hirsute on surfaces, with 2 mericarps, the



Fig. 208. *Galium lidaoense* S. S. Ying, close-up of flower and young fruits



Fig. 209. *Galium lidaoense* S. S. Ying, close-up of fruits

mericarps compressed ovoid, 0.8-1.0 mm long, 0.7-0.9 mm wide, with shortly hirsute and few trichomes; pedicels slender, 9-13 mm long, green, glabrous or nearly so.



Fig. 210. *Galium lidaoense* S. S. Ying, plants growing in situ

Diagnosis.

The species usually growing with mosses on mountain slope.

The species is characterized by its somewhat lithophytic habitat; the plant bodies usually erect to ascending; leaves 4, verticillate, oblong to ovate-oblong, flowers smaller, 3-5 in a simple umbel, usually 1-2 umbels on each branchlet, terminal or upper leaf-axil on the branchlets, corolla 2.3-2.5 mm long, 4-lobed at apex; the lobes ovate triangular, 1.2-1.5 mm long, 1.25 mm wide, white, acute at apex, glabrous; fruits black when mature, shortly hirsute on surfaces, with 2 mericarps.



Fig. 211. *Galium lidaoense* S. S. Ying, the holotype TPRCH -113-044

(this holotype has transferred and deposited at TPRCH herbarium)

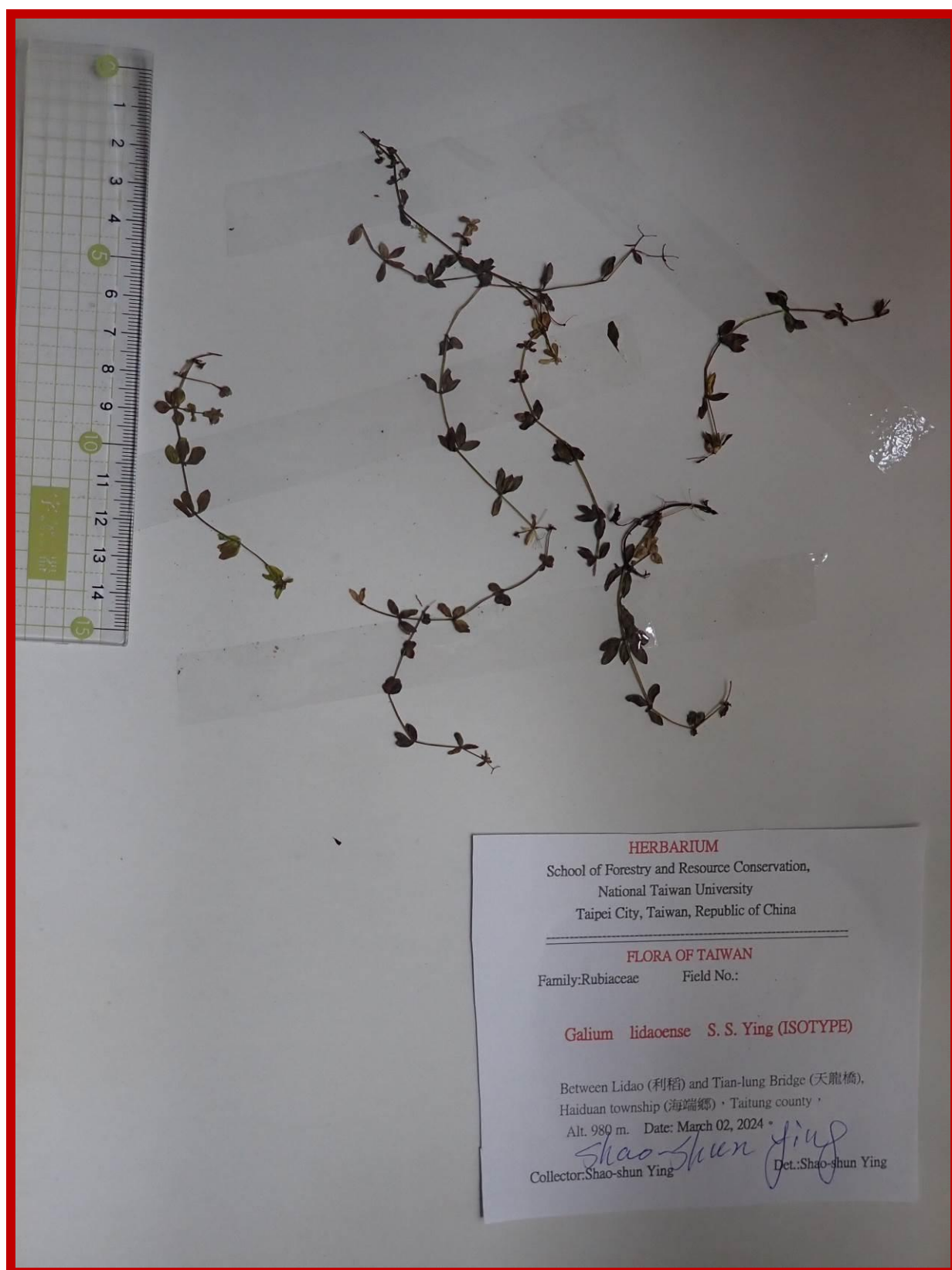


Fig. 212. *Galium lidaoense* S. S. Ying, the isotype TPRCH -113-045

(this isotype has transferred and deposited at TPRCH herbarium)

Distribution and phenology.

Galium lidaoense S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the mossy rocky montane slopes at elevations of 850-1150 meters. Its flowering time is February to March and fruiting times is March to April.



Fig. 213. *Galium lidaoense* S. S. Ying, plants growing in situ

B. Galium songmaoense S. S. Ying 松茂豬殃殃

Galium songmaoense S. S. Ying , *sp. nov.* 松茂豬殃殃

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Songmao Forest Road (松茂林道) 1860 m alt. *S. S. Ying* , *s.n. April 11, 2024* ° (holotype , **TPRCH**) °



Fig.214. *Galium songmaoense* S. S. Ying,plants growing in situ

Morphology : A erect to ascending herb, stems elongate, 30-50 cm long, simple or few-branched upward, green, glabrous, smooth when touch, 4-angled, 1-1.5 mm in diameter, grooved. Leaves 6, verticillate, oblong, 1.7-2.5 cm long, 5-7 mm wide, obtuse and with short-acicular at apex, obtuse to narrowed at base, chartaceous, entire and ciliate at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib

impressed surface and elevated on beneath, lateral veins inconspicuous. Petioles 2.5-3.5 mm long, green, glabrous.



Fig. 215. *Galium songmaoense* S. S. Ying, leaves

Flowers 8-15, pure white, 2.5-3 mm in diameter when opened, in simple terminal umbel; peduncles 8-17 mm long, slender, green, grooved, glabrous; bracts 2-3, terminal on peduncle, minute, ovate, 1.5-2.5 mm long, about 1.5 mm wide, acute at apex, green, glabrous; pedicels slender, 1.5-2.5 mm long, pale green, terete, glabrous or nearly so; calyx 4-lobed, terminal on the ovary, the lobes triangular to ovate-triangular, 1-1.5 mm long, acute at apex, glabrous; corolla 1.5-2.5 mm long, 4-lobed at apex; the lobes oblong, 1.5-2.0 mm long, 1.5 mm wide, acute at apex, glabrous; stamens 4, alternate to the corolla-lobed ; filaments short than lobed, white, included; anthers dorsifixed, white; ovary inferior, didymous, globose to ovoid, pale green, glabrous, without trichomes; style short, stigma 2-lobed, short, cauduous.



Fig. 216. *Galium songmaoense* S. S. Ying, inflorescences



Fig. 217. *Galium songmaoense* S. S. Ying, close-up of inflorescences

Fruits black when mature, shortly hirsute on surfaces, with 2 mericarps, the mericarps compressed ovoid, 0.8-1.0 mm long, 0.7-0.9 mm wide, with shortly hirsute and few trichomes; pedicels slender, 9-13 mm long, green, glabrous or nearly so.



Fig. 218. *Galium songmaense* S. S. Ying, plants growing in situ

Diagnosis.

The species is characterized by its terrestrial habitat; the plant bodies usually erect to ascending; leaves 6, verticillate, oblong, glabrous on both surfaces and ciliate at margins; flowers smaller, white, 8-15, in simple terminal umbel; calyx 4-lobed, terminal on the ovary, the lobes triangular to ovate-triangular; corolla 4-lobed at apex; the lobes oblong, 1.5-2.0 mm long, 1.5 mm wide, acute at apex, glabrous; stamens 4, filaments short than lobed, white; anthers dorsifixed, white.



Fig. 219. *Galium songmaoense* S. S. Ying, the holotype TPRCH -113-046

(this holotype has transferred and deposited at TPRCH herbarium)

Distribution and phenology.

Galium songmaoense S.S. Ying is endemic to Taiwan. It is known from Songmao Forest Road (松茂林道), Hoping District (和平區), Taichung City, central Taiwan. It was discovered on the roadsides and forest edges of forests at elevations of 1650-1850 meters. Its flowering time is April to May and fruiting time is May to June.



Fig. 220. *Galium songmaoense* S. S. Ying, plants growing in situ

C. Galium penicillatum S.S. Ying 刷毛豬殃殃

Galium penicillatum S. S. Ying , *sp. nov.* 刷毛豬殃殃

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Songmao Forest Road (松茂林道) 1860 m alt. *S. S. Ying* , *s.n. April 11, 2024* ° (holotype , **TPRCH**) °



Fig. 221. *Galium penicillatum* S.. S. Ying, close-up of flowers

Morphology : A erect to ascending herb, stems elongate, 35-70 cm long, much branched, green, hirsute, rough when touch, 4-angled, 1.2-1.6 mm in diameter, grooved; branches many, spreading, 30-53 cm long, hirsute, angular, grooved.. Leaves 6-8, mostly 6-7,

verticillate, lanceolate to lanceolate-oblong, 1.7-2.6 cm long, 2-3 mm wide, obtuse and with short-acicular at apex, obtuse to narrowed at base, chartaceous, entire and ciliate at margins, hirsute on both surfaces, especially on midrib, lustrous green surface and pale green beneath, midrib impressed surface and elevated on beneath, lateral veins inconspicuous. Petioles 0 mm long.



Fig. 222. *Galium penicillatum* S. S. Ying, leaves

Flowers 3-5, pure white to pink, 2.5-3.5 mm in diameter when opened, usually forming an umbel, often 2-5 umbels to form a ramose inflorescence, terminal and axillary; peduncles 2-4.5 cm long, slender, green, grooved, hirsute; bracts 4-6, terminal on peduncle, somewhat like leaf but much smaller, 5.5-6.5 mm long, about 1.5 mm wide, acute at apex, green; pedicles (rays) slender, 4.5-6.5 mm long, green, angular, hirsute; calyx 4-lobed, terminal on the ovary, the lobes triangular to ovate-triangular, 1-1.5 mm long, acute at apex, glabrous, green; corolla 1.5-2.5 mm long, 4-lobed at apex; the lobes ovate, 2.5-3.0 mm

long, 1.8 mm wide, obtuse and with short-acicular at apex, glabrous; stamens 4, alternate to the corolla-lobed ; filaments short than lobed, white, included; anthers dorsifixed, pale yellow; ovary inferior, didymous, globose to ovoid, pale green, glabrous, densely covered by white trichomes; style short, stigma 2-lobed, short, cauduous.



Fig. 223. *Galium penicillatum* S.. S. Ying, inflorescences



Fig. 224. *Galium penicillatum* S.. S. Ying, close-up of a young fruit

Fruits green when young, shortly hirsute on surfaces, with 2 mericarps, the mericarps compressed ovoid, 0.9-1.3 mm long, 0.8-1.0 mm wide, with shortly hirsute and densely covered white trichomes; pedicels slender, 12-19 mm long, green, hirsute.



Fig.225. *Galium penicillatum* S. S. Ying, plant colony

Diagnosis.

The species is characterized by its terrestrial habitat; the stem usually erect to ascending, much branched, green, hirsute, rough when touch; leaves 6-8, verticillate, lanceolate to lanceolate-oblong, hirsute on both surfaces, especially on midrib, entire and ciliate at margins; flowers smaller, white to pink, 3-5, 2.5-3.5 mm in diameter when opened, usually forming a umbel, often 2-5 umbels to form a ramose inflorescence, terminal and axillary; fruits green when young, shortly hirsute on surfaces, with 2 mericarps, the mericarps compressed ovoid, densely covered white trichomes.



Fig. 226. *Galium penicillatum* S. S. Ying, the holotype TPRCH -113-047

(this holotype has transferred and deposited at TPRCH herbarium)

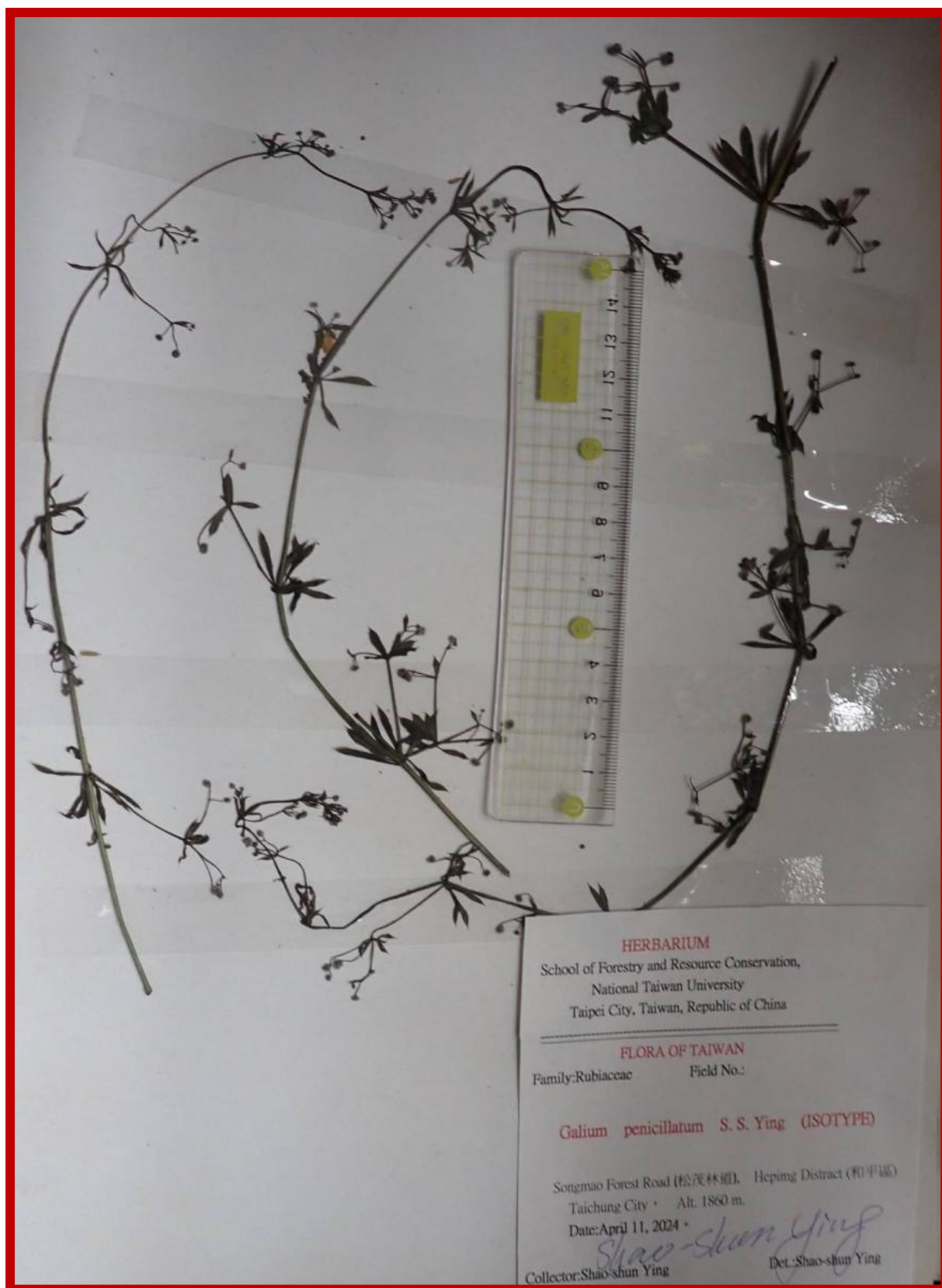


Fig. 227. *Galium penicillatum* S. S. Ying, the isotype

TPRCH -113-048

(this isotype has transferred and deposited at TPRCH herbarium)

Distribution and phenology.

Galium penicillatum S.S. Ying is endemic to Taiwan. It is known from Songmao Forest Road (松茂林道), Hoping District (和平區), Taichung City, central Taiwan. It was discovered on the roadsides and forest edges of forests at elevations of 1650-1850 meters. Its flowering time is April to May and fruiting time is May to June.



Fig.228. *Galium penicillatum* S. S. Ying, inflorescences

D. Galium glomeratiflorum S. S. Ying 團花豬殃殃

Galium glomeratiflorum S. S. Ying, *sp. nov.* 團花豬殃殃

TYPE: TAIWAN. Miaoli County, Taian Townshai (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2230 m alt. S. S. Ying, s.n. July 11, 2024. (holotype, **TPRCH**).



Fig. 229. *Galium glomeratiflorum* S. S. Ying, plants growing in situ, (fruiting)

Morphology : A erect to ascending herb, stems elongate, 35-60 cm long, much branched, green, angular, glabrous, rough when touch, 4-angled, 1.2-1.6 mm in diameter, pubescent, spreading; branches erect to ascending, 10-30 cm long, angular, grooved, pubescent. Leaves 4, verticillate, oblong, 1.5-2.0 cm long, 4-5.5 mm wide, obtuse and with short-acicular at apex, obtuse to narrowed at base, chartaceous, entire and ciliate at margins, hirsute on both surfaces, especially on nerves, lustrous green surface and pale green beneath, 5-nerves (palmated) impressed surface and elevated on beneath, lateral veins inconspicuous. Petioles short, 1-2 mm long, hirsute.



Fig. 230. *Galium glomeratiflorum* S. S. Ying, branches and leaves



Fig. 231. *Galium glomeratiflorum* S. S. Ying, plants growing in situ, (flowering)



Fig. 232. *Galium glomeratiflorum* S. S. Ying, inflorescences



Fig. 233. *Galium glomeratiflorum* S. S. Ying, close-up of flowers

Flowers numerous, pure white, 1.5-2.5 mm in diameter when opened, usually 2-5 flowers forming a raceme or sub-umbel, nearly all leaf-axil 1-3 inflorescences to produce and forming a large panicle as a whole, terminal and axillary; peduncles 2-4.5 cm long, slender, green, grooved, hirsute; bracts 3-4, somewhat leaf-like but smaller, terminal on peduncle,, 3.5-4.5 mm long, about 1.5 mm wide, acute at apex, green; pedicels (rays) slender, 3.5-4.5 mm long, green, angular, hirsute; calyx 4-lobed, terminal on the ovary, the lobes triangular to ovate-triangular, 0.8-1.2 mm long, acute at apex, glabrous, green; corolla 1.2-2.2 mm long, 4-lobed at apex; the lobes ovate, 1.5-2.2 mm long, 1.5 mm wide, obtuse and with short-acicular at apex, glabrous; stamens 4, alternate to the corolla-lobed ; filaments short than lobed, white, included; anthers dorsifixed, pale yellow; ovary inferior, didymous, globose to ovoid, pale green, glabrous, densely covered by white trichomes; style short, stigma 2-lobed, short, cauduous.



Fig. 234. *Galium glomeratiflorum* S. S. Ying, infructescence

Fruits pale brownish when young, shortly hirsute on surfaces, with 2



Fig. 235. *Galium glomeratiflorum* S. S. Ying, the holotype TPRCH -113-049

mericarps, the mericarps compressed ovoid, 0.7-0.9 mm long, 0.5-0.7 mm wide, with shortly hirsute and densely covered white trichomes; pedicels slender, 10-15 mm long, green, hirsute.



Fig. 236. *Galium glomeratiflorum* S.S. Ying, close-up of fruits

Diagnosis.

The species is characterized by its numerous, pure white flowers which 1.5-2.5 mm in diameter when opened, usually 2-5 flowers forming a raceme or sub-umbel, nearly all leaf-axil 1-3 inflorescences to produce and forming a large panicle as a whole.

Distribution and phenology.

Galium glomeratiflorum S.S. Ying is endemic to Taiwan. ◦ It is known from Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉),

Miaoli County, central Taiwan. ◦ It was discovered the species on the broad-leave forest at the elevations of 1,800-2,400 meters. Its flowering time is July and fruiting time is October..

E. Galium rubrocarpum S. S. Ying 紅果豬殃殃

Galium rubrocarpum S. S. Ying, *sp. nov.* 紅果豬殃殃

TYPE: TAIWAN. Nantou County, Jenai Townshaip (仁愛鄉), Between Kuanyang (崑陽) and Wulin (武嶺), Hohuanshan (合歡山), 3120 m alt. S. S. Ying, s.n. July 18, 2024. (holotype, **TPRCH**).



Fig. 237. *Galium rubrocarpum* S. S. Ying, infructescences

Morphology : A lithophytic, decumbent to ascending herb, stems elongate, 25-55 cm long, much branched, green tinged with purple, angular, pubescent, rough when touch, 4-angled, 1.2-1.5 mm in diameter, spreading; branches erect to ascending, 12-28 cm long, angular, grooved, pubescent. Leaves 3-4, verticillate, oblong, 8-15 mm long, 4-5 mm wide, obtuse at apex, obtuse to narrowed at base, chartaceous, entire and ciliate at margins, hirsute on both surfaces, lustrous green surface and pale green beneath, 3-nerves impressed surface

and elevated on beneath, lateral veins inconspicuous. Petioles short, 0.5-1 mm mm long, hirsute.



Fig. 238. *Galium rubrocarpum* S. S. Ying, branches and leaves

Flowers numerous, white, 1.8-2.6 mm in diameter when opened, scentless, usually 3-7 flowers forming a raceme or sub-umbel, nearly all leaf-axil having 1-3 inflorescences to produce and forming a large panicle as a whole, terminal and axillary; peduncles 2-5.5 cm long, slender, green tinged with purple, grooved, hirsute; bracts 1-3, somewhat leaf-like but smaller, terminal on peduncle, 3.2-4.5 mm long, about 2.5 mm wide, obtuse at apex, green tinged with purple; pedicels (rays) slender, 2.5-3.5 mm long, purple, angular, hirsute; calyx 4-lobed, terminal on the ovary, the lobes ovate-triangular, 0.9-1.5 mm long, acute at apex, glabrous, purple; corolla 1.5-2.5 mm long, 4-lobed at apex; the lobes ovate, 1.5-2.2 mm long, 1.5 mm wide, acute at apex, glabrous; stamens 4, alternate to the corolla-lobed; filaments longer than lobed, white, exserted; anthers dorsifixed, white; ovary inferior, didymous, globose to ovoid, purplish red, glabrous, densely covered by white trichomes; style short, stigma 2-lobed, short, caudate.



Fig.239. *Galium rubrocarpum* S. S. Ying, flowers and inflorescences

Fruits purplish red, shortly hirsute on surfaces, with 2 mericarps, the mericarps compressed ovoid, 0.8-1.5 mm long, 0.6-0.9 mm wide, with shortly hirsute and densely covered white trichomes; pedicels slender, 12-17 mm long, green, hirsute.

Diagnosis.

The species is characterized by its 3-4 verticillate, oblong, leaves; flowers numerous, white, 1.5-2.5 mm in diameter when opened, usually 2-5 flowers forming a raceme or sub-umbel, nearly all leaf-axil 1-3 inflorescences to produce and forming a large panicle as a whole and purplish red, shortly hirsute on surfaces fruits which with 2 compressed ovoid mericarps.

Distribution and phenology.

Galium rubrocarpum S.S. Ying is endemic to Taiwan ° It is known from between

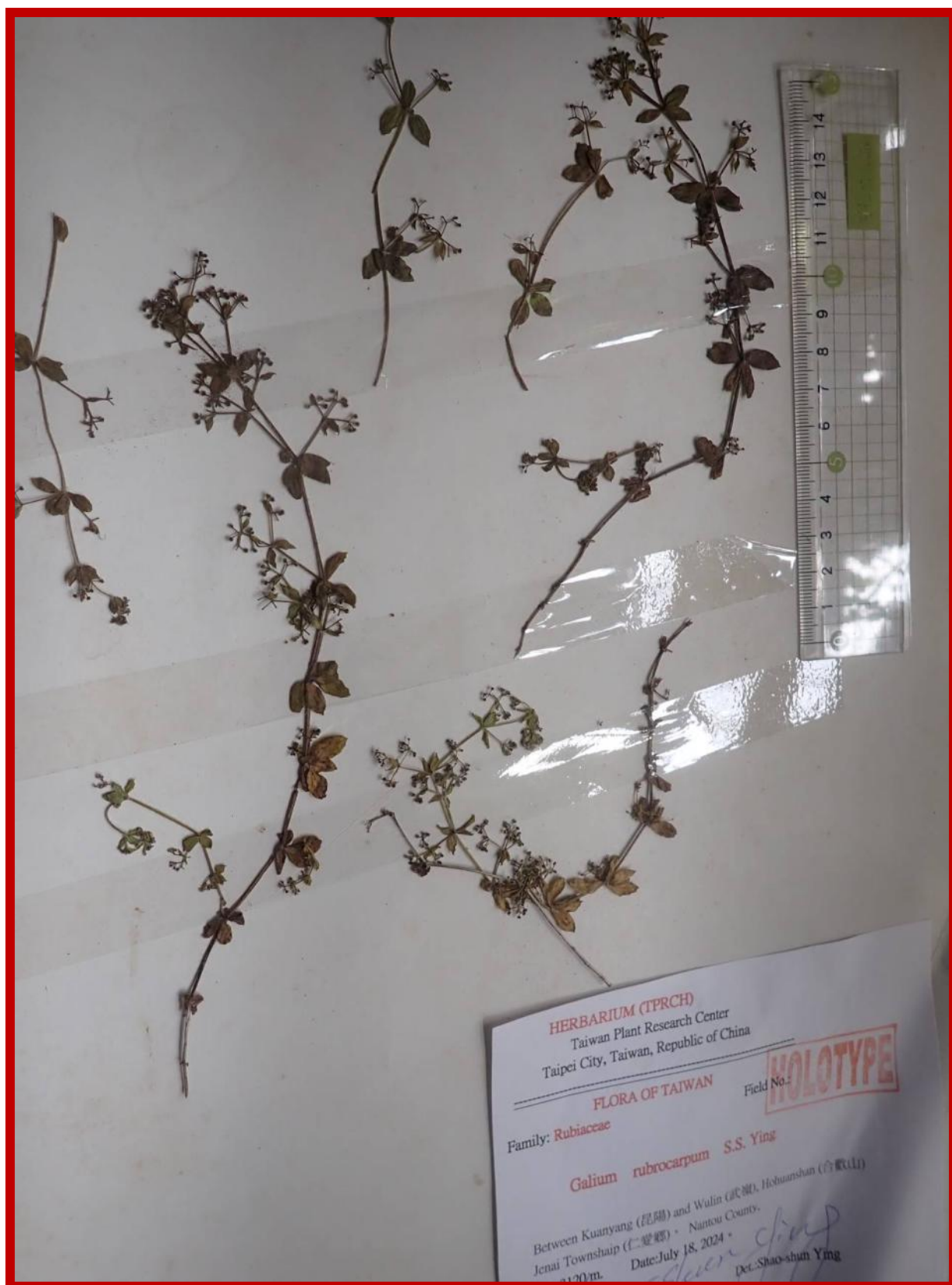


Fig.240. *Galium rubrocarpum* S. S. Ying, the holotype

TPRCH -113-050

Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan(合歡山)), Jenai Townshaip (仁愛鄉) , central Taiwan. ° It was discovered the species on rocky mountain slope at the elevations of 3,070- 3250 meters. Its flowering time is July and fruiting time is July to August.



Fig. 241. *Galium rubrocarpum* S. S. Ying, close-up of fruits



Fig. 242. *Galium rubrocarpum* S. S. Ying, cplants growing in situ

20. One New Species of Genus *Litsea* (Lauriaceae) from Taiwan

Litsea taiwanensis S. S. Ying 台灣木薑子

Litsea taiwanensis S.S. Ying, *sp. nov.* 台灣木薑子

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2230 m alt. S. S. Ying, s.n. March 14, 2024. (holotype, TPRCH).



Fig. 243. *Litsea taiwanensis* S. S. Ying, flowering branches

Morphology : Medium-sized tree up to 10 m high, 6-9cm in DBH, trunk straight, bark grayish, smooth; branches numerous, erect to ascending, green to yellowish green, glabrous, smooth. Leaves simple, alternate, oblong-lanceolate to broadly lanceolate, 6-8

cm long, 3-2.5 cm long, acuminate at apex, obtuse at base, thinly coriaceous, lustrous green surface, glaucous beneath, midrib and lateral veins (3-5 per side) impressed surface and impressed beneath, sometimes 3-nerved are available at some leaves. Petioles 1.3-1.6 cm long,



Fig. 244. *Litsea taiwanensis* S. S. Ying, branches and leaves (surface and beneath)

Flowers dioecious, smaller, 3-4 mm in diameter when opened, usually 4-6 in an umbel and 3-5 umbells in a cluster in axils of leaf and along branchlets; peduncles 3-4 mm long, villose; bracts ovate to broadly ovate, 3.5-4 mm long, 3-3.5 mm wide, obtuse at apex, pale yellow tinged with pink at apex, villose outside; male flowers: tepals 4-5, oblong, 2-2/5 mm long, 1.2-1.5 mm wide, obtuse at apex, yellow to pale yellow, membranous, glabrous; pedicels 0.2-0.4 mm long, glabrous; stamens 8-9 arranged in 2 whorls, outer whorls usually longer the inner ones; anthers onlong, 0.7-1.2 mm long, 4-celled, all introrse; filaments slender, pale yellow to white, glabrous; the outer whorl without glands, the inner whor with 2 glands at base of filaments; glands ovoid, 0.5-0.6



Fig. 245. *Litsea taiwanensis* S. S. Ying, umbel clustered



Fig. 246. *Litsea taiwanensis* S. S. Ying, close-up of male flowers



Fig. 247. *Litsea taiwanensis* S. S. Ying, tepals, glands, filaments and anthers (pollens drop out)

mm long and wide, yellow, rudimentary ovary not seen. Pistillate flowers and fruits unknown.

Diagnosis.

The species is characterized by its dioecious flowers and the male flowers usually 4-6 in an umbel and 3-5 umbells in a cluster in axils of leaf and along branchlets; stamens 8-9 arranged in 2 whorls, outer whorls usually longer the inner ones; anthers oblong, 0.7-1.2 mm long, 4-celled, all introrse; filaments slender, pale yellow to white, glabrous; the outer whorl without glands, the inner whorl with 2 glands at base of filaments; glands ovoid, 0.5-0.6 mm long and wide, yellow.

Distribution and phenology.

Litsea taiwanensis S.S. Ying is endemic to Taiwan. It is known from Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉),

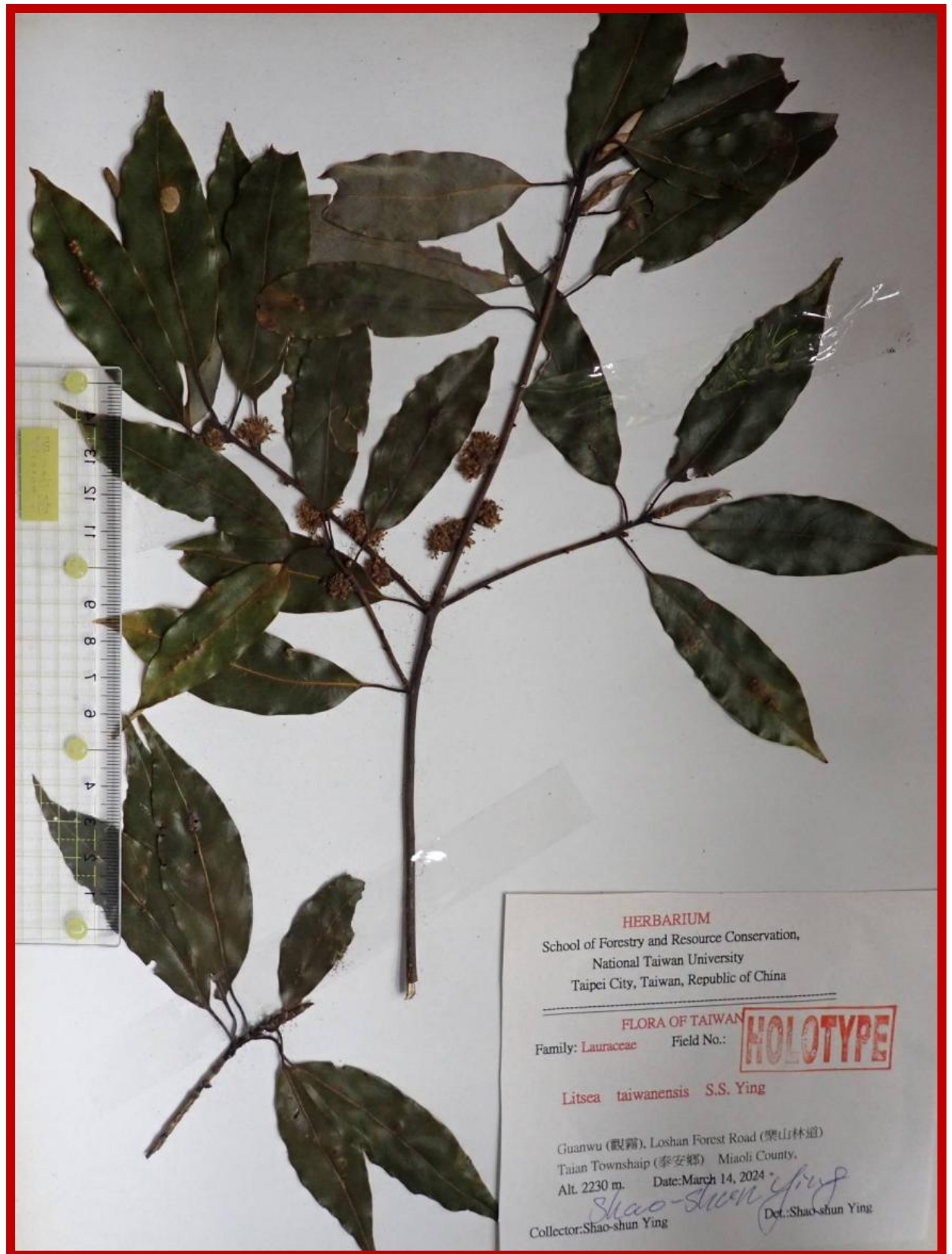


Fig. 248. *Litsea taiwanensis* S. S. Ying, the holotype TPRCH -113-051

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 249. *Litsea taiwanensis* S. S. Ying, the isotype TPRCH -113-052

(this isotype has transfered and deposited at TPRCH herbarium)

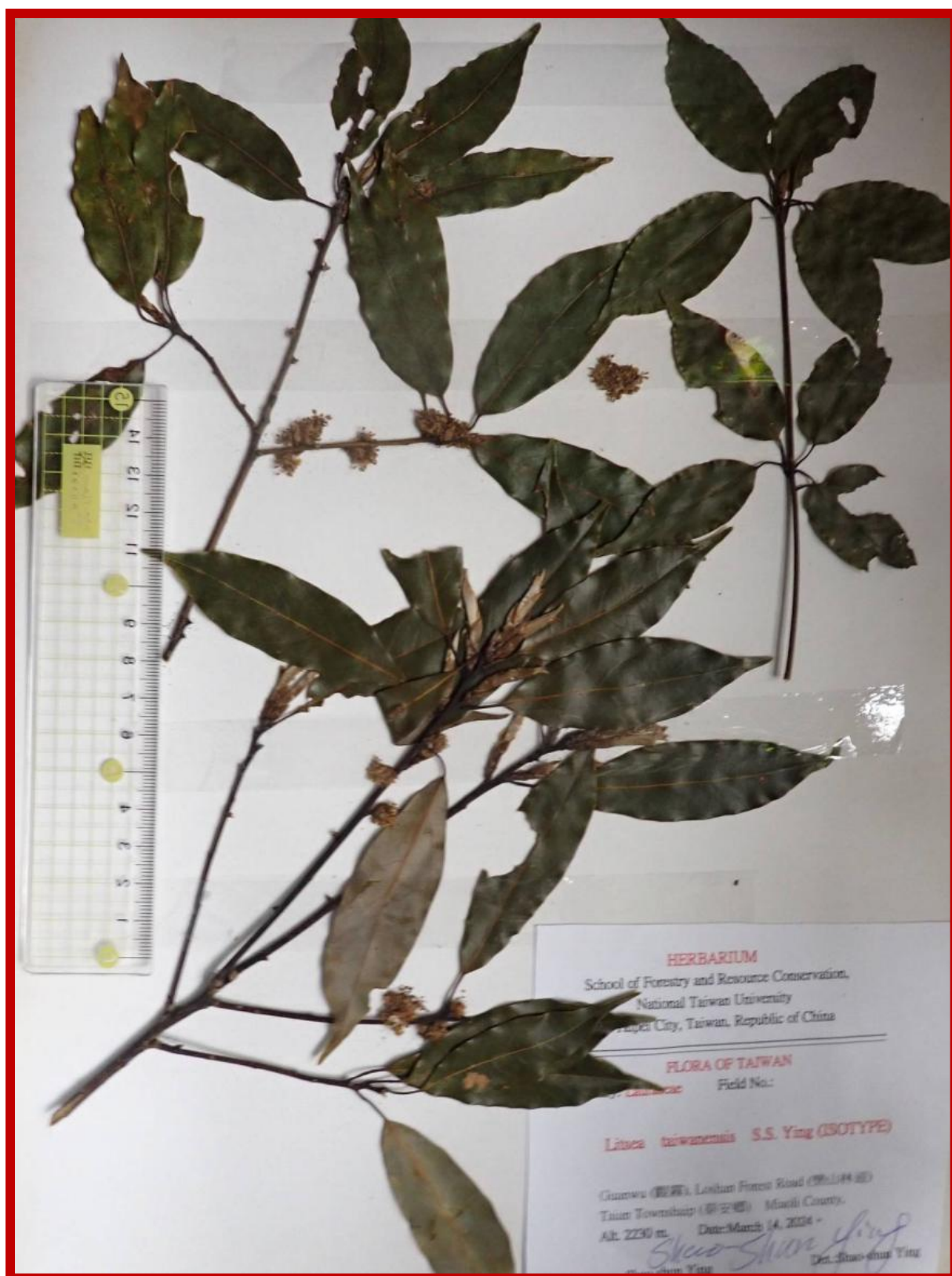


Fig. 250. *Litsea taiwanensis* S. S. Ying, the isotype TPRCH -113-053

(this holotype has transferred and deposited at TPRCH herbarium)

Miaoli County, central Taiwan. ° It was discovered the species on the broad-leave forest at the elevations of 1,800-2,400 meters. Its flowering time is March to April.



Fig.251. *Litsea taiwanensis* S. S. Ying, habit

21. One New Species of Genus *Camellia* (Theaceae) from Taiwan

Camellia loshanensis S. S. Ying 樂山山茶花

Camellia loshanensis S.S. Ying, *sp. nov.* 樂山山茶花

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2460 m alt. S. S. Ying, s.n. March 14, 2024. (holotype, TPRCH).



Fig. 252. *Camellia loshanensis* S. S. Ying, close-up of a flower

Morphology: A tree, about 10 m high, much branched; branches and branchlets erect to ascending, grayish, smooth, glabrous. Leaves simple, alternate, oblong to oblong-lanceolate, 5.2-6.2 cm long, 2.2-2.7 cm wide, acuminate to obtuse at apex, attenuate at base, coriaceous, entire to few serrulate at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib elevated on both surfaces, lateral

veins inconspicuous. Petioles 7-8.5 mm long, terete, green, grooved above, glabrous.



Fig. 253. *Camellia loshanensis* S. S. Ying, leaves and flowers

Flowers white, solitary or nearly so, axillary on the leaf-axil of upward branches, usually opened one by one, scentless, 12-17 mm in diameter when opened; pedicels Short, 2.5-3 mm long; bracts 2-3, ovate-triangular, 2.5-3.5 mm long, 2-3.5 mm wide, acute at apex, glabrous, caducous; sepals 5, ovate, 7.5-8.2 mm long, 4.5-5.5 mm wide, obtuse at apex, white tinged with red outside, glabrous, entire at margins; petals 5, ovate to ovate-oblong, 14-18 mm long, 6.5-7 mm wide, obtuse and slightly emarginate at apex, wavy at margins, narrowed at base, glabrous; stamens 12-15 only, united at middle; filaments lanceolate, 8-14 mm long, 2-3.5 mm wide, white, glabrous, inflexed; anthers oblong or nearly so, brownish, 1-1.5 mm long and wide, 2-celled; ovary ovoid, about 1.2 mm in diameter, glabrous; style short, included, 3-4 mm long, 3-fided at apex.



Fig. 254. *Camellia loshanensis* S. S. Ying, close-up of an opened flower



Fig. 255. *Camellia loshanensis* S. S. Ying, close-up of stamens and a bud



Fig.256. *Camellia loshanensis* S. S. Ying, the holotype TPRCH -113-054

(this holotype has transfered and deposited at TPRCH herbarium)

Diagnosis.

The species growing on cliff of mountain, it is somewhat difficult to pick up the branches with flowers, I collected the leaves and flowers on the ground.

The species is recognized by its a medium-sized tree, with smaller opened flowers, sepals 5, ovate, white tinged with red outside; petals 5, ovate to ovate-oblong, obtuse and slightly emarginate at apex, wavy at margins, and 12-15 stamens which united at middle.



Fig. 257. *Camellia loshanensis* S. S. Ying, habitat, the largest tree

Distribution and phenology.

Camellia loshanensis S.S. Ying is endemic to Taiwan. It is known from Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species on cliff of the mountain at the elevations of 2,300-2,600 meters. Its flowering time is March to April.

22. One New Species of Genus *Viscum* (Santalaceae) from Taiwan

Viscum songmaoense S. S. Ying 松茂槲寄生

Viscum songmaoense S.S. Ying, *sp. nov.* 松茂槲寄生

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Songmao Forest Road (松茂林道) 1860 m alt. S. S. Ying, *s.n.* March 21, 2024. (holotype, **TPRCH**).



Fig. 258. *Viscum songmaoense* S. S. Ying, the plant

Morphology : A dioecious, delicate shrub, 30-60 cm long, erect at first and then becoming somewhat pendulous. Stem numerous, fascicled, 12-55 cm long, 1- 1.5 mm across, compressed and flat terete, articulate, somewhat inflated at top, green to yellowish green, glabrous; branches 3 verticillate, 3-7 cm long, 1.0-1.5 mm wide, glabrous, with 1-4 ridged on both surfaces; branchlets 3 verticillate, 2-5 cm long, leafless.

Flowers dioecious, male flowers unknown; female flowers smaller, usually solitary on the lateral side of articulation of stem; pedicel short, 2-3 mm long, blackish brown, glabrous or nearly so; bracts ovate, 0.5-1 mm long, 0.4-0.6 mm wide, obtuse at apex;



Fig. 259. *Viscum songmaoense* S. S. Ying, small flower on lateral side of articulate



Fig.260. *Viscum songmaoense* S. S. Ying, habitat



Fig. 261. *Viscum songmaoense* S. S. Ying, the holotype TPRCH -113-055

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 262. *Viscum songmaoense* S. S. Ying, the isotype TPRCH -113-056

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 263. *Viscum songmaoense* S. S. Ying, habitat

bracts ovate, 0.5-0.6 mm long, 0.4 mm wide, acute at apex; tepals 4, minute; style not evident; stigma somewhat expanded at summit of the ovary.

The plant usually parasitic on the dead plant body and *Quercus* tree crown/

Diagnosis.

Viscum songmaoense is characterized by its 3 branches and branchlets verticillate, which compressed and flat terete, articulate, somewhat inflated at top, green to yellowish green, glabrous; glabrous, with 1-4 ridged on both surfaces leafless; flowers dioecious; female flowers solitary on the lateral side of articulate.

Distribution and phenology.

Viscum songmaoense S.S. Ying is endemic to Taiwan. It is known from Songmao Forest Road (松茂林道), Hoping District (和平區), Taichung City,

central Taiwan. ° It was discovered the species on the dead tree crown and *Quercus* tree crown of forests at elevations of 1650-1850 meters. Its flowering time is March.



Fig. 264. *Viscum songmaoense* S. S. Ying, close-up of plant colony

23. One New Species of Genus *Dianthus* (Caryophyllaceae) from Taiwan

Dianthus songmaoensis S. S. Ying 松茂石竹

Dianthus songmaoensis S.S. Ying, *sp. nov.* 松茂石竹

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Songmao Forest Road (松茂林道) 1650 m alt. S. S. Ying, *s.n.* March 21, 2024. (holotype, **TPRCH**).



Fig. 265. *Dianthus songmaoensis* S. S. Ying, close-up of flower

Morphology : Perennial herbs to 24-40 cm tall, rhizome creeping, somewhat lignified, 5-10 cm long, glabrous, grayish brownish, branched from it. branches many, caespitose, 15-25 cm long, erect to ascending, green, glabrous. Leaves simple, opposite, linear to inear-



Fig. 266. *Dianthus songmaoensis* S. S. Ying, juvenile plants with leaves

lanceolate, 3.5- 5.5 cm long, 3.2-4 mm wide, acuminate at apex and amplexicual at base forming a 1.5-2.5 mm long sheath, chartaceous, entire at margins, lustrous green surface and pale green beneath, glabrous on both surface, midrib and lateral veins inconspicuous on both surfaces

Flowers solitary to pairs, terminal on end of branches, rather larger, 3.2-3.8 cm in diameter when opened, pink with some dr red spots at base of petals; bracts 4 at base of calyx, linear to lanceolate, 4-6 mm long, about 1.5-2.5 mm wide, acuminate at apex, green; calyx campanulate, 1.6-2.2 cm long, 4-5 mm wide, green, glabrous, 5-toothed at apex; teeth triangular, 0.7 mm long, obtuse at apex; petals 5, pink with dark red spots at base of limb and at claw, 2.7-3.4 cm long, claw 1.5-2 cm long, surrounded by clayx tube; limb ovate, 1.3-1.6 cm long, 8-10 mm wide, fimbriate for 1/3 of its length; throat slightly hairy; stamens 8-10, exserted, filaments filiform, unequal, 3.5-4.6 cm long, white with a purple tip; anthers only 3, elliptoid, 0.7 mm long; ovary ovoid, 3-4 mm long, glabrous; style 2,



Fig. 267. *Dianthus songmaoensis* S. S. Ying, leaves

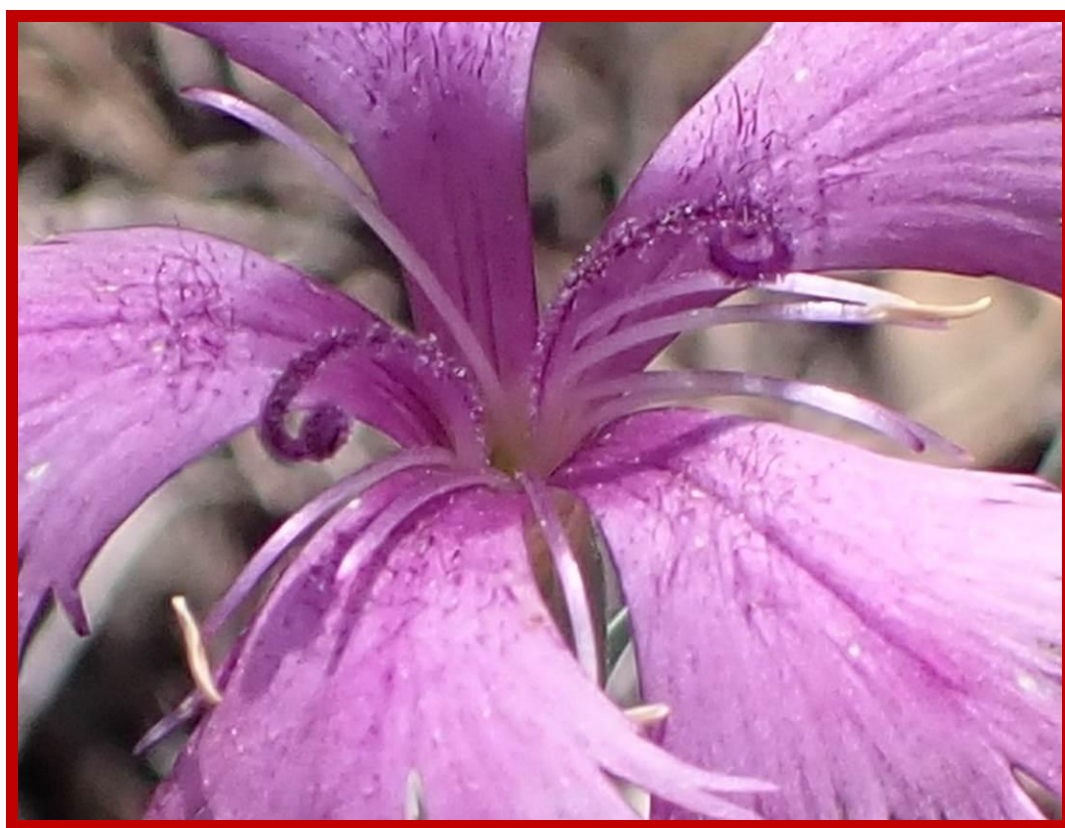


Fig. 268. *Dianthus songmaoensis* S. S. Ying, filaments, anthers (only 3) and 2 styles

elongate, exserted, arch-like, purplish red with white glands; stigmas ovoid, about 0.3 mm long and wide, purplish red in colour.

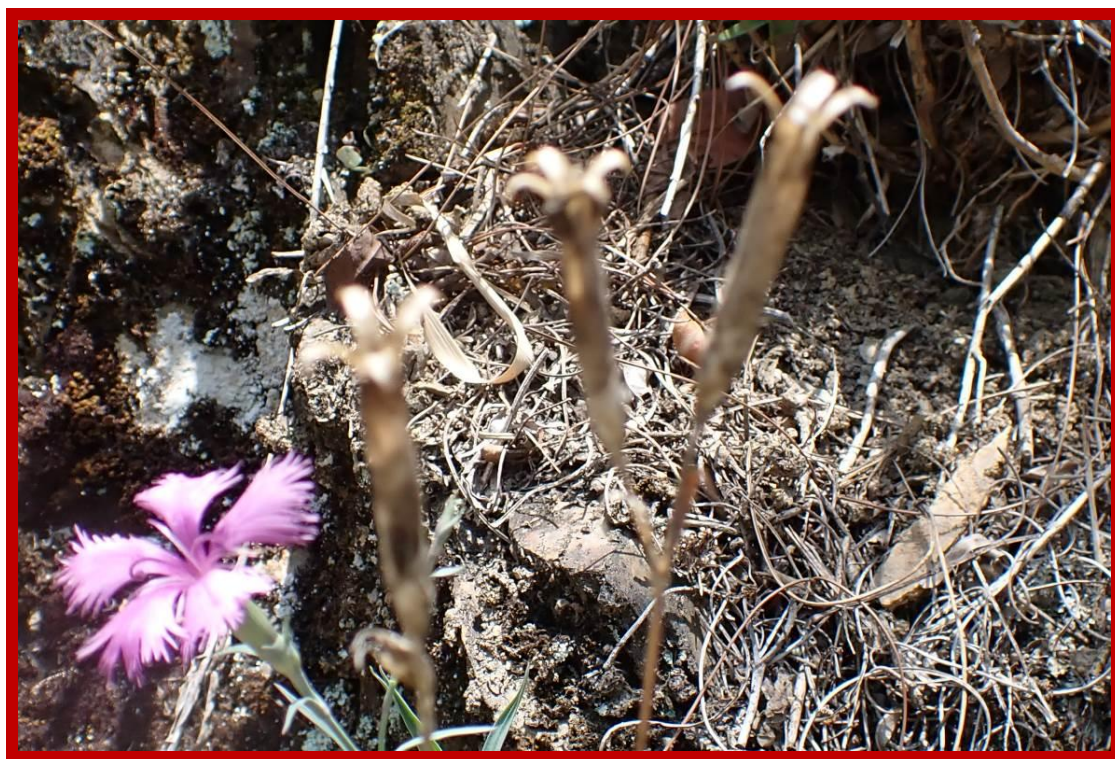


Fig. 269. *Dianthus songmaoensis* S. S. Ying, flower and fruits

Fruit a capsule, cylindrical, 2.5-3.5 cm long, 2.5-3 mm wide, dehiscent by 4-lobed at apex; the lobes oblong, 3-4 mm long, obtuse at apex. Seeds many, ovoid, 1.6-2.3 mm long, 1.2-1.5 mm wide, minutely cuspidate at apex, brownish black when mature.

Diagnosis.

Dianthus songmaoensis is characterized by its linear to linear-lanceolate leaves which 3.5- 5.5 cm long, 3.2-4 mm wide, one of elongate leaves species of Taiwan *Dianthus* species. Its flower solitary to pair, terminal on the branchlets. petals 5, pink with dark red spots at base of limb and at claw, fimbriate for 1/3 of its length; stamens 8-10, exserted, anthers only 3, ellipsoid; style 2, elongate, exserted, arch-like, purplish red with white glands; stigmas ovoid.



Fig. 270. *Dianthus songmaoensis* S. S. Ying, the holotype TPRCH -113-057

(this holotype has transferred and deposited at TPRCH herbarium)

Distribution and phenology.

Dianthus songmaoensis S.S. Ying is endemic to Taiwan. It is known from Songmao Forest Road (松茂林道), Hoping District (和平區), Taichung City, central Taiwan. It was discovered the species on the forest edge and sunny roadsides at elevations of 1680-2185 meters. Its flowering time is March and fruiting times from March to April.



Fig. 271. *Dianthus songmaoensis* S. S. Ying, plants spreading on roadsides of forest edge

22. One New Species of Genus *Maesa* (Primulaceae) from Taiwan

Maesa shengmushanensis S. S. Ying 聖母山山桂花

Maesa shengmushanensis S.S. Ying, sp.nov. 聖母山山桂花

TYPE: TAIWAN. I-Lan County, Chaochi Township (礁溪鄉), Shengmushan (聖母山) 360 m alt. S. S. Ying, s.n. March 28, 2024. (holotype, **TPRCH**).



Fig. 272. *Maesa shengmushanensis* S. S. Ying, plants growing in situ

Morphology : Small subshrubs less than 60 cm high, few branched, glabrous, brownish, lenticels conspicuous; branches 25-35 cm long, erect to ascending, slender, green, grooved, lenticels present; pith solid. Leaves simple, alternate, oblong to ovate-oblong, 7-9.5 cm long, 3.2-4.5 cm wide, acute at apex, obtuse at base, chartaceous, dentate margins, lustrous green surface and pale green beneath; midrib elevated surface and impressed beneath, the

lateral veins (4-5 per side) impressed surface and elevated beneath, glabrous on both surfaces. Petioles slender, 8-11 mm long, terete, slightly grooved above.



Fig. 273. *Maesa shengmushanensis* S. S. Ying, inflorescences

Flowers few in terminal and axillart ramces, bisexual, white to pale yellow, 1.5-2.2 mm in diameter when opened, scentless; the inflorescence rachis 1.5-2.5 cm long, erect, glabrous to hairy, brownish; 5-7 flowers to form a raceme; bracts ovate-triangular, 0.4-0.7 mm long, acute at apex, pale green; pedicels short, about 1.8--2.6 mm long, brownish to pale brown, hairy; calyx campanulate, adnate to ovary, 1.5-2 mm wide, brownish green, glabrous, 5-lobed at apex; lobes ovate, 0.8-1.3 mm long, obtuse at apex, brownish green; corolla white to pale yellow, campanulate, 2.8-3.5 mm long, about 2.7 mm wide, 5-lobed at apex; the lobes triangular, 0.3-0.5 mm long, obtuse at apex; stamens 5, included, opposite to corolla-lobe; filaments slender, 0.5-0.6 mm long, white; anthers reniform, yellow; ovary globose, 0.4-0.5 mm across, green, glabrous; style slender, 0.5-0.6 mm long;



Fig. 274. *Maesa shengmushanensis* S. S. Ying, close-up of inflorescences



Fig. 275. *Maesa shengmushanensis* S. S. Ying, close-up of inflorescences



Fig. 276. *Maesa shengmushanensis* S. S. Ying, the holotype TPRCH -113-058

(this holotype has transferred and deposited at TPRCH herbarium)

stigma entire, disc-like, pale brownish.

Diagnosis.

Maesa shengmushanensis is characterized by its subshrub less than 60 cm high in habit; flowers not many in terminal and axillary racemes; corolla white to pale yellow, campanulate, 2.8-3.5 mm long, about 2.7 mm wide, 5-lobed at apex; the lobes triangular, 0.3-0.5 mm long, obtuse at apex.

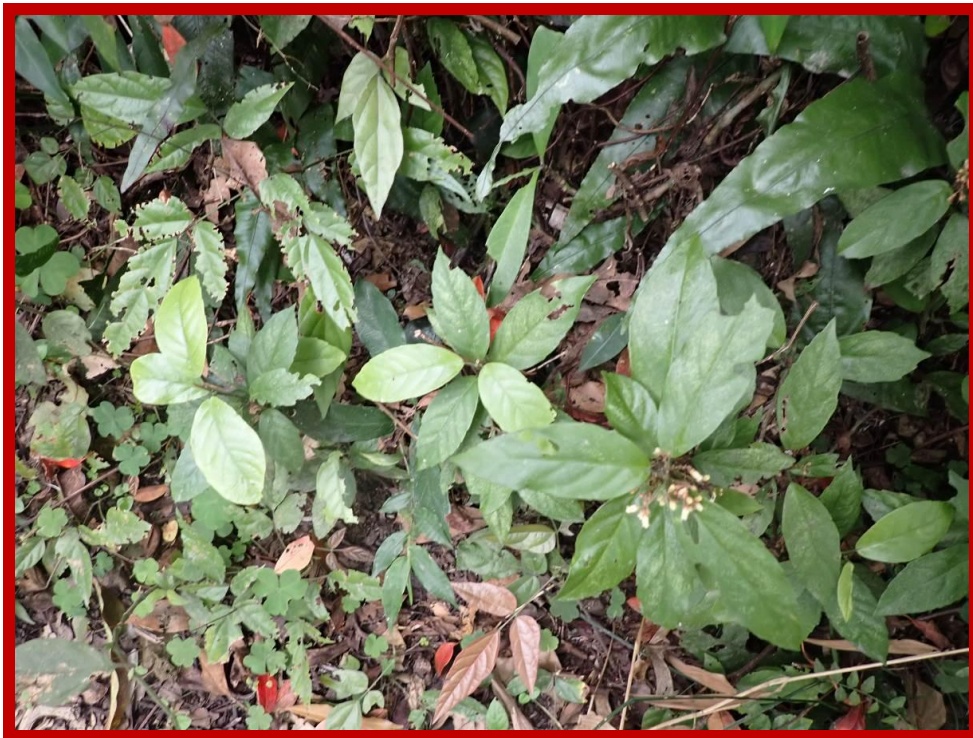


Fig. 277. *Maesa shengmushanensis* S. S. Ying, plants growing in situ

Distribution and phenology.

Maesa shengmushanensis S.S. Ying is endemic to Taiwan. It is known from Shengmushan(聖母山) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on roadsides under the forest edges at elevations of 285-490 meters. Its flowering time is March to April and fruiting times April to May.

25. One New Species of Genus *Lindera* (Lauraceae) from Taiwan

Lindera taiwnensis S. S. Ying 台灣釣樟

Lindera taiwanensis S.S. Ying, sp.nov. 台灣釣樟

TYPE: TAIWAN. Taoyuan city, Fuhsin District (復興區), Tungyuanshan (東眼山), 1155 m alt. S. S. Ying, s.n. April 04, 2024. (holotype, **TPRCH**).



Fig. 278. *Lindera taiwanensis* S. S. Ying, flowering branches

Morphology : Medium-sized evergreen trees up to 8 m high, trunk straight grayish brown, smooth, glabrous, lenticels inconspicuous, much branched upward; branches elongate, 65-150 cm long, erect to ascending, slender, green, terete, hairy when young and then become glabrous when adult; terminal buds 8-12 mm long, bud scales ovate to oblong, 8-14 mm long, acute at apex, brown. Leaves simple, lanceolate to oblong-lanceolate,



Fig. 279. *Lindera tiwanensis* S. S. Ying, bud scales and young leaves

4.5-6.5 cm long, 1.2-1.8 cm wide, acuminate at apex, attenuate at base, coriaceous, densely white hairy on both surfaces when young and then become glabrous on both surfaces, entire, lustrous dark green surface and pale green and slightly glaucous beneath, slightly 3-nerved and lateral veins (3-4 per side) impressed surface and elevated beneath. Petioles terete, 8-12 mm long, glabrous, green to pale green.

Flowers dioecious, the female flowers pale yellow to white, scentless, usually 3-7 in an axillary umbel which on the leaf-axil; involucre bracts 5-6, ovate to broadly ovate, 4-5 mm long, 2.5-3 mm wide, obtuse at apex, ciliate at margins; peduncles 2-3 mm long, hairy; pedicels 5-7 mm long, hairy, pale yellow; tepals 4-6, equal, ovate, 2.5-3 mm long, 2-2.5 mm wide, acute to obtuse at apex, white, glabrous; ovary ovoid, 1.5-2 mm across, green, glabrous; style short, 2.5-3 mm long, straight, white; stigma papillate, 0.4-0.5 mm wide; stamens various developed, often only 4 and reduced to glands which resembling those at base of normal stamens.

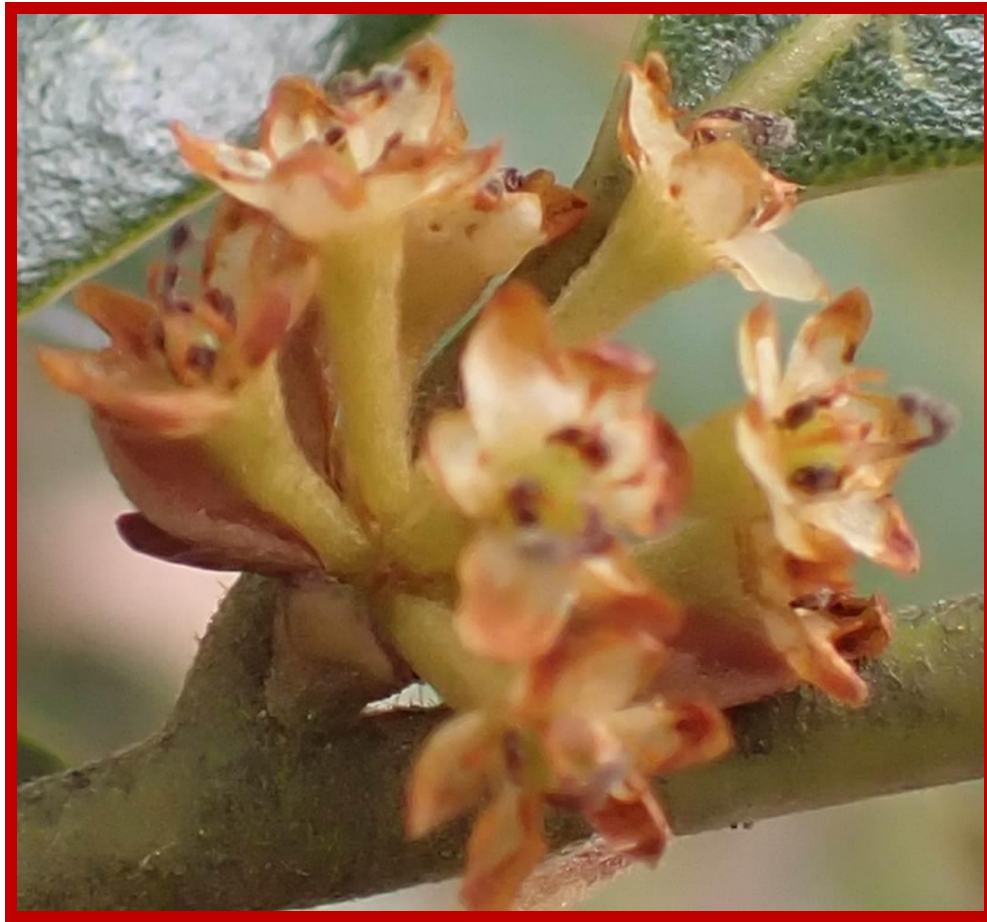


Fig. 280. *Lindera tiwanensis* S. S. Ying, close-up of an umbel



Fig. 281. *Lindera tiwanensis* S. S. Ying, close-up of umbels

Fruit a drupe, ellipsoid, 8-9 mm long, 4-5 mm wide, red when mature, rounded or apiculate at apex; pedicles 5-6 mm long, terete, glabrous.



Fig. 282. *Lindera taiwanensis* S. S. Ying, close-up of umbels

Diagnosis.

Lindera taiwanensis is characterized by its medium-sized evergreen tree up to 8 m high; lanceolate to oblong-lanceolate, 4.5-6.5 cm long, 1.2-1.8 cm wide leaves which densely white hairy on both surfaces when young and then become glabrous on both surfaces at adult; flowers dioecious, the female flowers pale yellow to white, scentless, usually 3-7 in an axillary umbel which on the leaf-axil; tepals 4-6, equal, ovate, white, glabrous; ovary ovoid; stamens various developed, often only 4 and reduced to glands which resembling those at base of normal stamens.

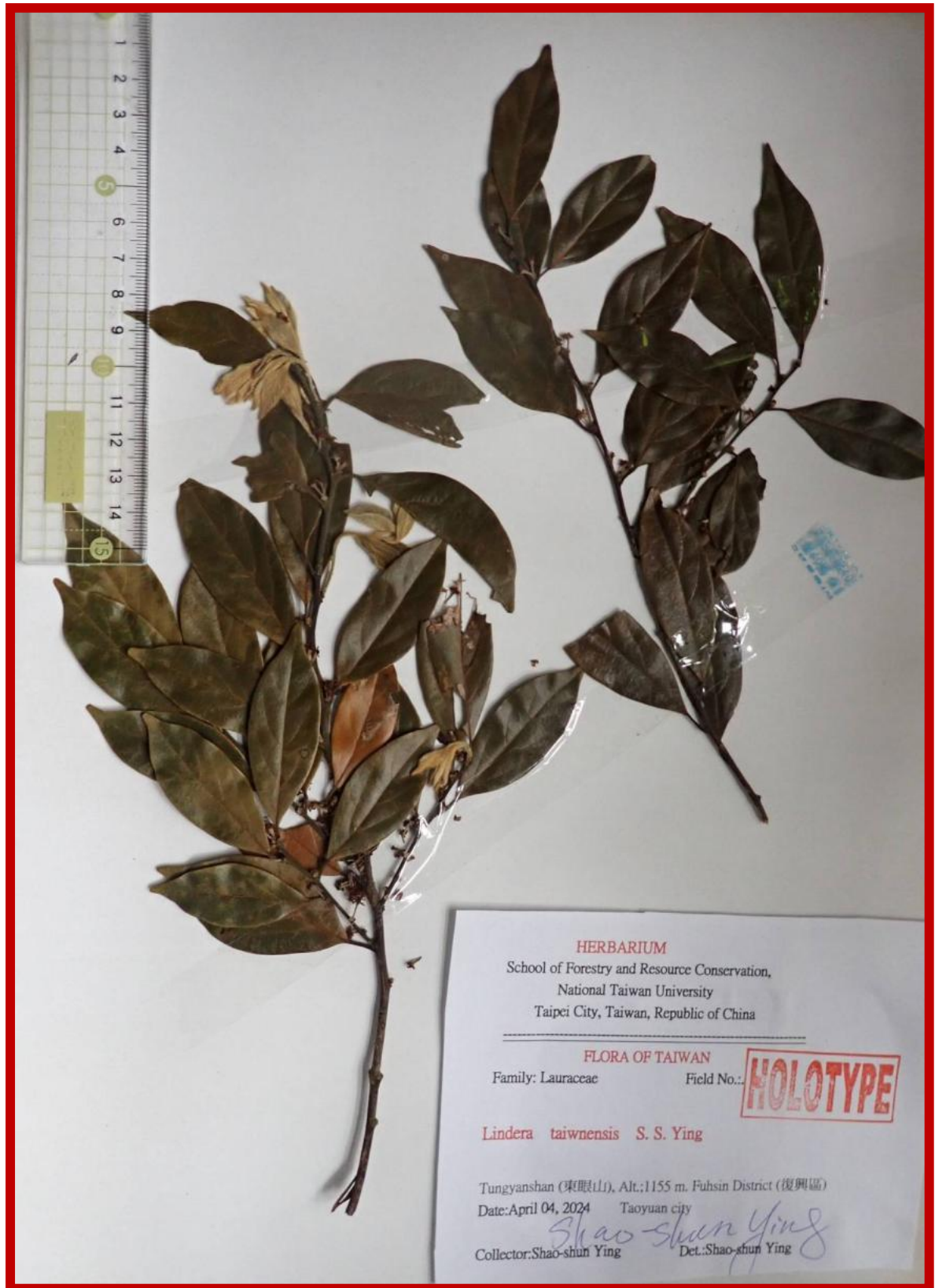


Fig. 283. *Lindera taiwanensis* S. S. Ying, the holotype TPRCH -113-059

(this holotype has transferred and deposited at TPRCH herbarium)



Fig.284. *Lindera tiwanensis* S. S. Ying, the isotype TPRCH -113-060

(this isotype has transfered and deposited at TPRCH herbarium)

Distribution and phenology.

Lindera taiwanensis S.S. Ying is endemic to Taiwan. It is known from Tungyuanshan (東眼山), Fuhsin District (復興區), Taoyuan city, northern Taiwan. It was discovered along ridges of the mountain forest at elevations of 1100-1350 meters. Its flowering time is April to May.



Fig. 285. *Lindera taiwanensis* S. S. Ying, plants growing in situ

26. One New Species of Genus *Rhamnus* (Rhamnaceae) from Taiwan

Rhamnus songmaoensis S. S. Ying 松茂鼠李

Rhamnus songmaoensis S.S. Ying, sp.nov. 松茂鼠李

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Songmao Forest Road (松茂林道) 1650 m alt. S. S. Ying, s.n. April 11, 2024. (holotype, **TPRCH**).



Fig. 286. *Rhamnus songmaoensis* S. S. Ying, branches with fruits

Morphology: Shrubs without prickles about 110-200 cm high, trunks short, much branched at base, pale brown to grayish brown, smooth; branches elongate, 120-150 cm long, often erect to ascending, terete, brownish, smooth, glabrous. Leaves simple, usually 3-6 fascicled on a short branchlets; blade spathulate to spathulate-ovate, 2-3.5 cm long, 1-1.5 cm wide, acuminate to obtuse at apex, attenuate at base, coriaceous, dentate at margins, glabrous on both surface, lustrous green surface and pale green beneath, midrib and lateral



Fig. 287. *Rhamnus songmaoensis* S. S. Ying, leaves on the short branchlets

veins (2-3 per side) impressed surface and elevated beneath. Petioles 5-6 mm long, not winged, terete, slightly groove above, purplish, glabrous.

Flowers 1-4 in a fascicle on the short branchlets with leaves, 4-merous, greenish yellow, 4-6 mm in diameter when opened, scentless; pedicels 2.5-3.2 mm long, green, glabrous; calyx campanulate, about 1 mm long, 4-lobed at apex; the lobes triangular, 2.5-3 mm long, 1.5 mm wide at base, acuminate at apex, truncate at base, pale yellow, glabrous; petals 0; stamens 4, alternate to calyx-lobed, filament 1.2-1.5 mm long, white; anthers ovoid, 0.4 mm long; ovary ellipsoid, 1.5-2.5 mm across, green, glabrous; style slender, erect, greenish, 3-4 mm long, glabrous; stigmas 2, somewhat reflexes, black.

Drupe ellipsoid, 4.5-5.5 mm long, 2.5 mm across, green when young, usually 2-3 stones, with persistent calyx-tube at base; fruiting pedicels 3.5-4.5 mm long, glabrous; seeds obovoid, 2.0-2.5 mm long, blackish to brown.



Fig. 288. *Rhamnus songmaoensis* S. S. Ying, young fruit with style and stigmas



Fig. 289. *Rhamnus songmaoensis* S. S. Ying, young fruits with calyx



Fig. 290. *Rhamnus songmaoensis* S. S. Ying, the holotype TPRCH -113-061

(this holotype has transferred and deposited at TPRCH herbarium)

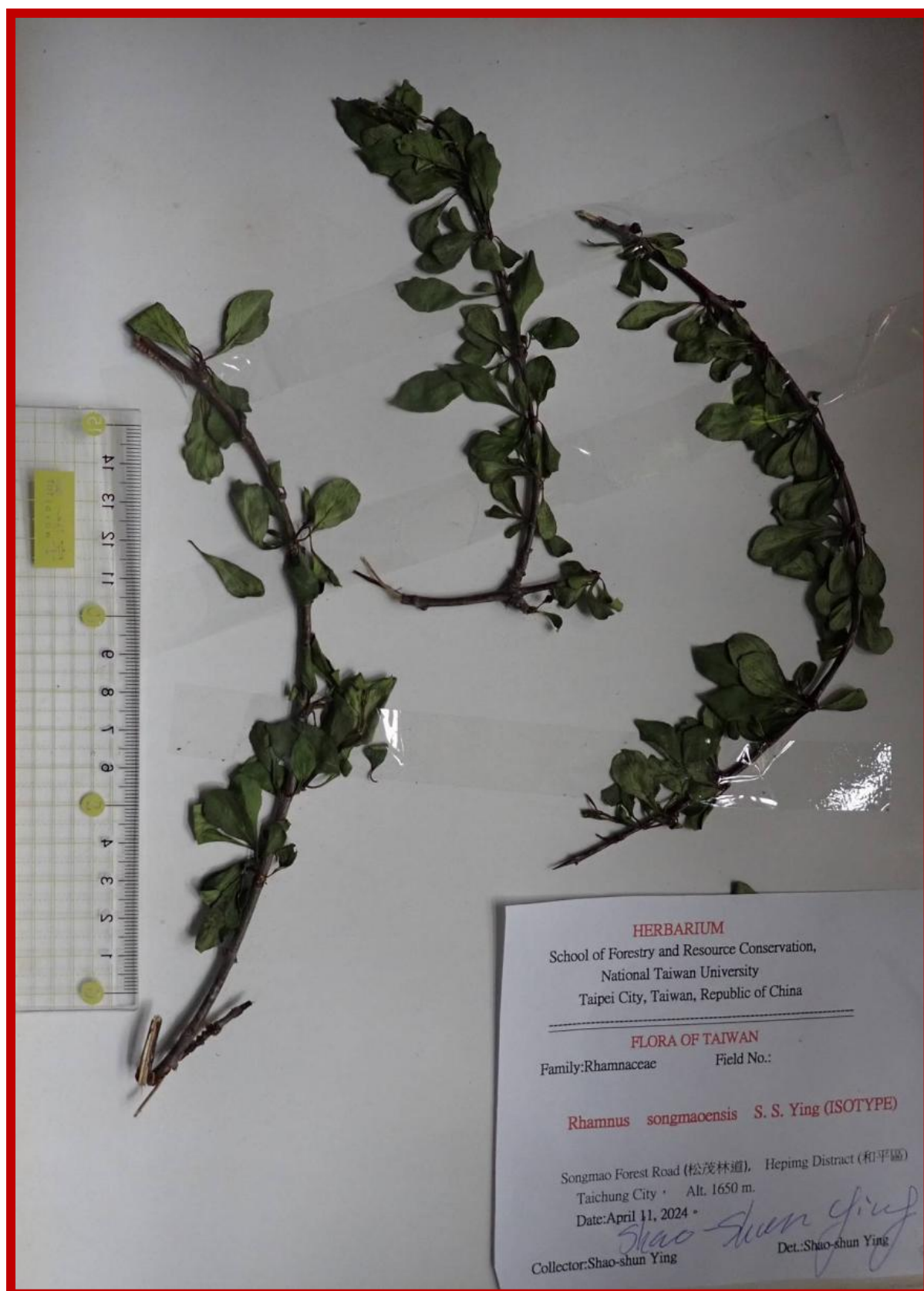


Fig. 291. *Rhamnus songmaoensis* S. S. Ying, the isotype TPRCH -113-062

(this isotype has transferred and deposited at TPRCH herbarium)

Diagnosis: *Rhamnus songmaoensis* is characterized by its low smooth shrub about 110-200 cm high, with much erect to ascending branches; leaves simple, usually 3-6 fascicled on a short branchlets; blade spathulate to spathulate-ovate; flowers 1-4 in a fascicle on the short branchlets with leaves, 4-merous, greenish yellow and drupes ellipsoid, 4.5-5.5 mm long, 2.5 mm across, green when young.



Fig. 292. *Rhamnus songmaoensis* S. S. Ying, plants growing in situ

Some botanical researchers of Taiwan misidentified this plant as *R. chingshuiensis* T. Shimizu or *R. utilis* var. *chingshuiensis* (T. Shimizu) T. Yamaz. However, the two species are different each other very clear, from the leaf shape, flower number and colour which are fascicled on a short branchlet for our species, the fruit shape are also different. I think our species is a distinct new species of Taiwan. Here I posted the holotype of *R. chingshuiensis* T. Shimizu for identification reference. e



Fig. 293. Holotype of *Rhamnus chingshuiensis* T. Shimizu

(*Rhamnus chingshuiensis*-台灣植物資訊整合查詢系統 (ntu.edu.tw))

Distribution and phenology.

Rhamnua songmaoensis S.S. Ying is endemic to Taiwan. It is known from Songmao Forest Road (松茂林道), Hoping District (和平區), Taichung City, central Taiwan. It was discovered the species on the edge of forests at elevations of 1650-1950 meters. Its flowering time is March to April and fruiting times April to May.



Fig. 294. *Rhamnus songmaoensis* S. S. Ying, leaf beneaths and fruits

27.A New Combination of *Rohdea fargesii*(Asparagaceae) from Taiwan

Rohdea fargesii var. *watanabei* (Hayata) S. S. Ying 台灣萬年青

Rohdea fargesii var. *watanabei* (Hayata) S.S. Ying, *comb.nov.* 台灣萬年青

Rohdea watanabei Hayata in Icon. Pl. Formos. 5:328 (1915).

Rohdea watanabei was described by professor B. Hayata in 1915, the genus *Rohdea* Roth was treated as a monotypic genus for a long time, *R. japonica* (Thunb.) Roth, the only species of the genus. Ying treated *R. watanabei* as a variety of *R. japonica* in 1991. Liang S. Y. & Tamura M.N. (2000) treated the species of genus *Rohdea* in *Flora of China* is just one species *R. japonica* only.

The generic circscription of genus *Rohdea* was later expanded by the evidence from molecular analyses which revealed that genus *Campylandra* Beck, *Gonioscypha* Baker and some species of genus *Tupistra* Krt Gawler might be merged with *Rohdea* (Yamashita & Tamura (2000, 2004) and led the latter a genus including 27 species distributed in Eastern and Souther Asia included Butan, India, Japan, China mainland, Laos, Myanmar, Nepal, Thailand, Taiwan and Vietnam.

Rohdea watanabei was treated as a conspecific species with *R. chinensis* in 2012 by Yamashita . Deng, Y.F. treated *R. fargesii* as a correct name and instead of *R. chinensis* in 2017, and therefore *Rohdea watanabei* was included the synonym of *R. fargesii*

Feng et al. (2023) treated *Rohdea watanabei* as a distinct species. However, many years of field study and morphological examination of the *Rohdea watanabei* and compared with that of *R. fargesii*. I concluded that it is better to recognized our species as a variety of *R. fargesii*.

The variety is somewhat similar to var. *fargesii* in having stamens and appendages are in the same position, but clearly distinguishable by the short, widely and green bracts (vs elongate, narrowly and pale green), orange perianth lobes and short smooth tube (vs. green perianth lobes, with whitish lamellae), **and succulent, swell outward, surface smooth (vs. minute vertical coroniform, surface with whitish lamellae).**



Fig. 295. *Rohdea fargesii* var. *watenabei* (Hayata) S. S. Ying, inflorescence



Fig. 296. *Rohdea fargesii* var. *watenabei* (Hayata) S. S. Ying, part of inflorescence



Fig. 297. *Rohdea fargesii* var. *watenabei* (Hayata) S. S. Ying, plants growing in situ



Fig. 298. *Rohdea fargesii* var. *watenabei* (Hayata) S. S. Ying, plants growing in situ

Reference

Feng, Hui Zhe, Yi Tong⁷, Lei Wu⁸, Yue Ning Gong⁹ & Wen Bo Liao (2023). **Rohdea brachyanthera* (Asparagaceae), a new species from Guangdong, southern China in *Phytotaxa* 626 (1): 060 – 066.

28. One New Species and One Neglect species of Genus *Lepidagathis*

(Acanthaceae) from Taiwan

A. One new specie

Lepidagathis lidaoensis S.S. Ying 利稻鳞球花

Lepidagathis lidaoensis S.S. Ying, *sp.nov.* 利稻鳞球花

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 1050 m alt. *S. S. Ying*, *s.n.* April 20, 2024. (holotype, TPRCH).



Fig. 299. *Lepidagathis lidaoensis* S. S. Ying, close-up of inflorescences

Morphology: A erect annual herb up to 30 cm high, stem erect, green to greenish brown,
-250-

pubescent. branched at base; branches 12-25 cm long, erect to ascending, angular, brownish, pubescent. Leaves simple, opposite, ovate to ovate-lanceolate, 6-8 cm long, 1.8-2.53 cm wide, acuminate at apex, cuneate at base, chartaceous, entire to slightly wavy at margins, green surface and pale green beneath, glabrous on both surfaces, midrib impressed surface and elevated beneath; lateral veins 2-3 per side impressed surface and slightly elevated beneath; petioles 8-12 mm long, glabrous, slightly winged on both sides, greenish brown.



Fig. 300. *Lepidagathis lidaoensis* S. S. Ying, habit

Flowers smaller, pure white with two red to brownish specks on lower corolla throat inside, 2.2-2.9 mm in diameter when opened, 12-20 in a terminal spike; spikes 2-5 clustered to form a umbel, unbranched, short, 1.0-1.5 cm long; peduncles 1.5-3.5mm long, angular, greenish brown, glabrous; rays short, 2-8 mm long, glabrous; bracts ovate to ovate-lanceolate, 4.5-5.2 mm long, about 256 mm wide, acute and with an short awn at apex, ciliate at margins, pubescent outside and glabrous inside, green tinged with purple at apex; pedicels 0.0-0.2 mm long; calyx 5-lobed at base, lanceolate, 5.2-6.2 mm long,



Fig. 301. *Lepidagathis lidaoensis* S. S. Ying, inflorescences mind bracts and calyx



Fig.302. *Lepidagathis lidaoensis* S. S. Ying, close-up of flowers

2.5-3.5 mm wide, acuminate and with an awn at apex, slightly pubescent outside and glabrous inside, ciliate at margins, green tinged with purple at apex; corolla white with two purplish red specks lower corolla throat inside, tube usually expanded into a distinct throat near middle, 1.5-2.5 mm long; limb 2-lipped, exserted the calyx ; lower lip 2.5-3.5 mm long, 3-lobed; lower lobule somewhat rounded, obtuse at apex; the lateral lobules oblong, reflexed at apex; upper lip oblong, erect, emarginate to slightly 2-lobed, lobes obtuse at apex; stamens 4, didynamous, included; filaments short, 2-2.5 mm long; anthers 2-theous; thecae oblong, spurred at base; ovary ovoid, about 1.5 mm long, 2-celled; style slender, stigma capitate.

Fruit a capsule, lanceolate, 3-3.5 mm long, about 2 mm wide, acuminate at apex, smooth, glabrous, with 2 distinct groove on lateral side. Seeds rounded, 1.2 mm in diameter, glabrous, brownish.

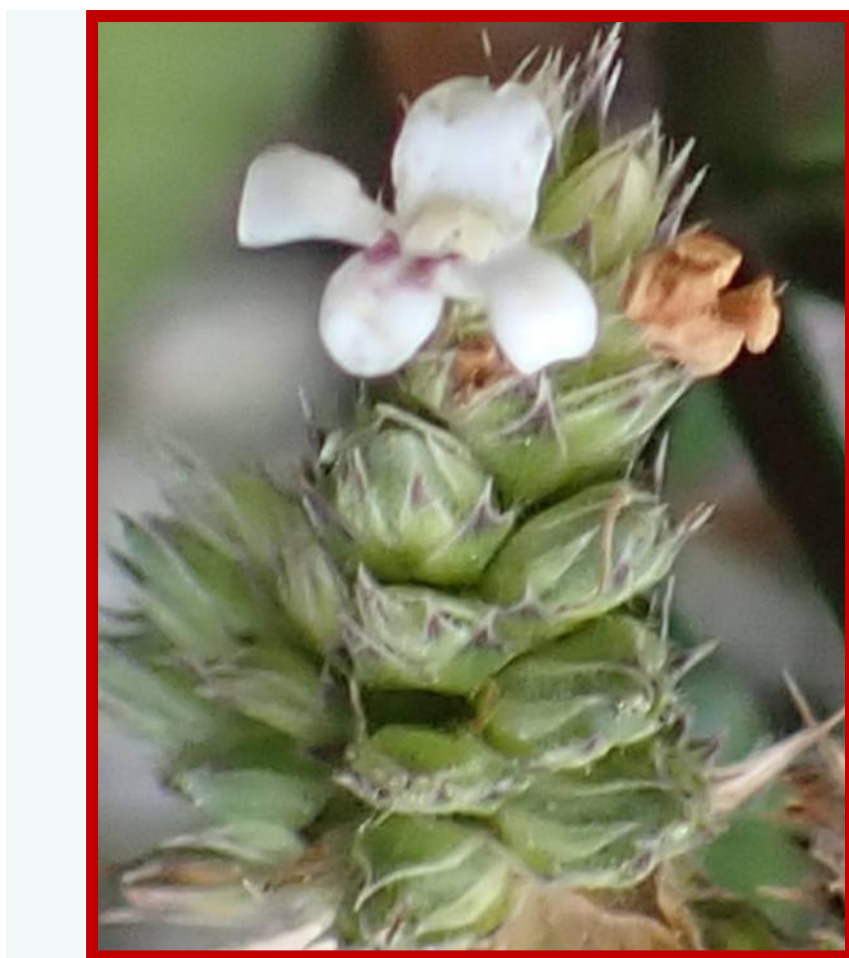


Fig.303. *Lepidagathis lidaoensis* S. S. Ying, close-up of flower



Fig. 304. *Lepidagathis lidaoensis* S. S. Ying, the holotype TPRCH -113-063

(this holotype has transferred and deposited at TPRCH herbarium)

Diagnosis.

The species is characterized by its somewhat lithophytic habitat; stem erect to ascending, much branched at base; leaves simple, opposite, ovate to ovate-lanceolate; flowers smaller, pure white with two red to brownish specks on lower corolla throat inside, 12-20 in a terminal spike; spikes 2-5 clustered to form a umbel, unbranched, short, 1.0-1.5 cm long; corolla white with two purplish red specks lower corolla throat inside, tube usually expanded into a distinct throat near middle.



Fig. 305. *Lepidagathis lidaoensis* S. S. Ying, plants growing in situ

Distribution and phenology.

Lepidagathis lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky montane slopes at elevations of 850-1150 meters. Its flowering time is April to May and fruiting times is May to June.

B. A neglected species

Lepidagathis taiwanensis S.S. Ying 台灣鱗球花

Lepidagathis taiwanensis S.S. Ying, in Col. Illustr. Fl. Taiwan rev. ed. 1:573, col. photo 683 (1999) 台灣鱗球花



Fig. 306. *Lepidagathis taiwanensis* S. S. Ying, plants growing in situ

Note: the species was described by myself in 1999, but the species was neglected by some botanical researchers of Taiwan, I described the species here again, and posted some pictures of the species for identification.

Morphology: Perennial herb, stem diffuse, often tinged with purple, erect to ascending, glabrous except pubescent at nodes; branches with spikes 15-25 cm long, tinged with purple, especially at nodes. Leaves opposite, petiolate, chartaceous, ovate, 4-6 cm long, 3.5-4.5 cm wide, acuminate at apex, obtuse or slightly coedate at base, crenate at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib and lateral veins white or pale white. slightly impressed surface and elevated beneath. Petioles 6-15 mm long, winged, purple or tinged purple above.



Fig. 307.*Lepidagathis taiwanensis* S. S. Ying, inflorescences and flower



Fig. 308.*Lepidagathis taiwanensis* S. S. Ying, flowers

Spikes 1-4, terminal, cylindric, 3-5 cm long, 4-5 mm in diameter, pedunculate; the peduncles 1-2 cm long, purple, glabrous; bract 1, linear-lanceolate, 3-4.5 mm long, 1-1.5 mm wide, acuminate or shortly caudate at apex, hyaline at margins, glandular hairs outside; calyx 4-5, deeply lobed, equal, greenish; lobes linear to linear-lanceolate, 6-7 mm long, 1-2 mm wide, acuminate at apex, pubescent outside; corolla white, the tubular and lip 5-6 mm long, 3-3.5 mm in diameter, 2-labiate at apex, glabrous; the upper lobe spatulate, 3-3.5 mm long, obtuse or rounded at apex; the lower lobe 3-lobulated; the lateral lobules oblong, 2.5-3 mm long, obtuse at apex; median lobule spatulate, 3-3.5 mm long, obtuse or rounded at apex, with some purplish spots on throat; stamens 4, white; filaments short, 2-2.5 mm long, pubescent; anthers 2-locular, 1-1.5 mm long; the cell unequal, upper cell attached with lower cell; ovary 1-1.5 mm long, hirsute upward; style filiform, 2-2.5 mm long; stigma capitate.



Fig.309. *Lepidagathis taiwanensis* S. S. Ying, infrutescences

Capsules conical, 5-6 mm long, 1-1.5 mm wide, glabrous. Seeds 4, compressed suborbicular, about 1-1.5 mm in diameter. ,



Fig. 310. *Lepidagathis taiwanensis* S. S. Ying, plant colony

Endemic, known from lower altitudes of 100-400 m in southern part of the island, under forest, rather common.



Fig. 311. *Lepidagathis taiwanensis* S. S. Ying, dehiscent infructescences

29. One New Species of Genus *Indigofera* (Fabaceae) from Taiwan

Indigofera lidaoiana S.S. Ying 利稻木藍

Indigofera lidaoiana S.S. Ying, *sp.nov.* 利稻木藍

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 850 m alt. *S. S. Ying*, *s.n.* April 20, 2024 ° (holotype, TPRCH) °



Fig. 312. *Indigofera lidaoiana* S. S. Ying, flowering plant

Morphology : An erect evergreen shrub, 1.5-2.5 m tall, trunk short, 6-15 cm long, glabrous, grayish green, much branched at base; branches erect to ascending, 1.5-1.9 m long, terete, glabrous, green. Leaves odd-pinnate, 3-4 cm long, 2.5-3.5 cm wide; rachis groove surface, hairy; stipules absent; leaflets 5-9, mostly 7-9, rounded to ovate-rounded, 1.2-1.5 cm long, -260-



Fig. 313. *Indigofera lidaoiana* S. S. Ying, leaves and inflorescence



Fig. 314. *Indigofera lidaoiana* S. S. Ying, young leaves and infructescence

5-7 mm wide, obtuse and slightly emarginate at apex, rounded at base, chartaceous, entire at margins, glabrous on both surfaces, midrib impressed surface and elevated beneath, lateral veins inconspicuous, lustrous dark green to green surface, pale green beneath; petioles 1.5-2.5 mm long, hairy.



Fig. 315. *Indigofera lidaoiana* S. S. Ying, close-up of part of infructescence

Flowers many, pink, 5-6 mm in diameter when opened, in axillary racemes; the inflorescence 4-7 cm long, often erect to ascending, green, hairy; bracts minute, caducous; pedicels 1-1.5 mm long, pale brown, hairy; calyx campanulate, 1.5-2.5 mm long, densely hairy both surfaces, pale brown, 5-lobed at apex; the lobes subequal, lanceolate to ovate-lanceolate, 2-2.5 mm long, acute at apex, ciliate at margins; corolla widely opened, purplish red to purplish pink; standard erect, broadly oblong, 5.5-6.5 mm long, 4.5-5.6 mm wide, somewhat like a hood, obtuse at apex, purplish pink but with a large white plaque at base, 8-12 white veins from it to median, white hairy outside and glabrous inside; wings conspicuous, oblong, 3.9-4.5 mm long, 2.8-3.5 mm wide, obtuse at apex, short claw at base, hairy on both surfaces; keel conspicuous, duck-spathulate like, elongate, 4.5-5 mm

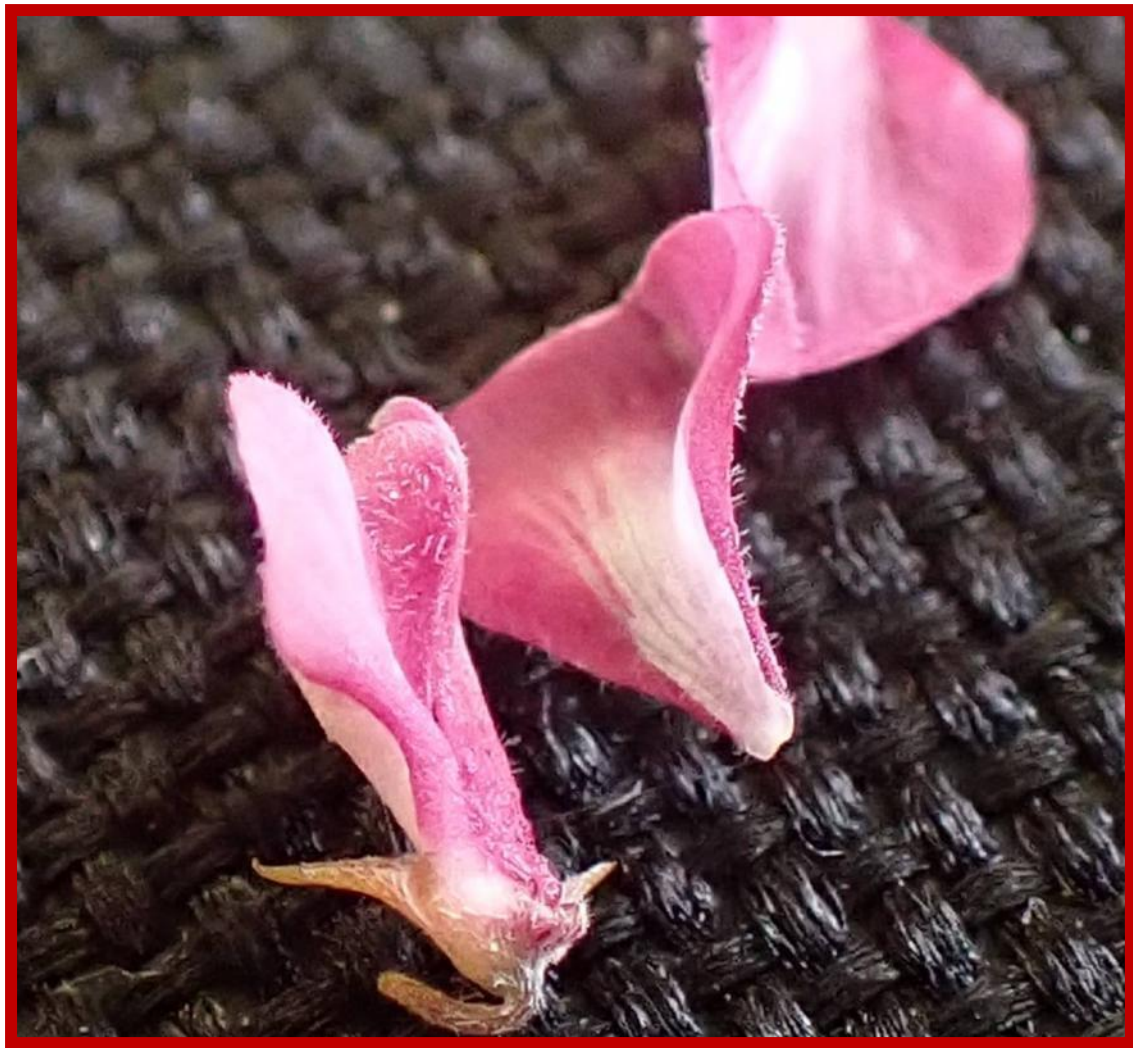


Fig. 316. *Indigofera lidaoiana* S. S. Ying, close-up of petals, calyx and pedicel

long, about 3.5 mm wide, obtuse at apex, hairy all over; stamens diadelphous, 9+1, filaments slender, 2.5-3.5 mm long, pale yellow; anthers uniform, basifixed, apiculate at apex; ovary cylindrical, sessile, 2.5-3.2 mm long, green, glabrous; style linear, green; stigma capitate.

Legumes 4-7 in each infructescence, cylindrical, 3.5-4 cm long, 2-2.5 mm across, with 2 longitudinal ribs on surface, with an awn at apex, glabrous, grayish brown when mature, indehiscent. Seeds 4-6 in each pod, ovoid, 1.5 mm long, 1-1.2 mm wide, glabrous, black when mature.

Diagnosis.



Fig. 317. *Indigofera lidaoiana* S. S. Ying, the holotype TPRCH -113-064

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 318. *Indigofera lidaoiana* S. S. Ying, the isotype TPRCH -113-065

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 319. *Indigofera lidaoiana* S. S. Ying, pods

Indigofera lidaoiana differs from other *Indigofera* species of Taiwan in having 5-9 glabrous leaflets pinnate; standard purplish pink but with a large white plaque at base, 8-12 white veins from it to median, white hairy outside and glabrous inside; wings conspicuous, oblong, 3.9-4.5 mm long, 2.8-3.5 mm wide, obtuse at apex, elongate claw at base; keel conspicuous, duck-spathulate like, elongate, 4.5-5 mm long, about 3.5 mm wide, obtuse at apex, hairy all over and 4-6 black seeds per legume.

Distribution and phenology.

Indigofera lidaoiana S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky montane slopes at elevations of 800-950 meters. Its flowering time is April to May and fruiting times is May to June.



Fig. 320.*Indigofera lidaoiana* S. S. Ying, plants growing in situ



Fig. 321.*Indigofera lidaoiana* S. S. Ying, plants growing in situ

30. Two New Species of Genus *Peperomia* (*Piperaceae*) from Taiwan

A. *Peperomia lidaoensi* S.S. Ying 利稻椒草

Peperomia lidaoensis S.S. Ying, *sp.nov.* 利稻椒草

TYPE: TAIWAN. Taitung county · Haiduan township (海端鄉) · Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 920 m alt. *S. S. Ying*, *s.n.* April 20, 2024 ° (holotype, TPRCH) °



Fig. 322. *Peperomia lidaoensis* S. S. Ying, inflorescences

Morphology : Perennial lithophytic small herbs, rhizome absent, rooting at basal node; roots many, fibrous, slender, 3-6 cm long; stem simple, often 3-5 forming a clump, not branched, 8-11 cm long, erect to ascending; internodes 1.2-1.8 cm long, fleshy, glabrous, green to dark green. Leaves simple, mostly 3-verticillate, rarely 4, oblong to ovate-oblong, 1.5-2.2 cm long, 8-10 cm wide, obtuse and slightly emarginate at apex, attenuate at base, fleshy, entire and slightly wavy at margins, lustrous dark green surface and pale
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green beneath, glabrous on surfaces and scattered with pubescent beneath; midrib impressed surface and slightly elevated beneath, lateral veins not see. Petioles 2-3 mm long, fleshy, groove pubescent, tinged with purple. Young leaves usually brown firstly and then turning to dark green.



Fig. 323. *Peperomia lidaoensis* S. S. Ying, plants growing in situ, mind young leaves

Spike 3-5, cylindrical, terminal or in the axils of the upper leaves, 2-3 cm long, 1-2 mm wide, green somewhat pink at apex, erect to ascending; peduncles 3-4 mm long, fleshy, hairy, green to pale yellow; flowers numerous, remotely arranged, sunken into rachis; bracts minute, rounded, 0.5 mm across, green, obtuse at apex; floral bracts ovate, 0.8-1 mm long, 0.8 mm wide, acute at apex; stamens 2, filament slender, about 0.3-0.5 mm long; anthers rounded, pale yellow, 0.25 mm across, transversely dehiscent; ovary globose, 1-celled, 1-ovule; style short, stigma simple, glabrous.

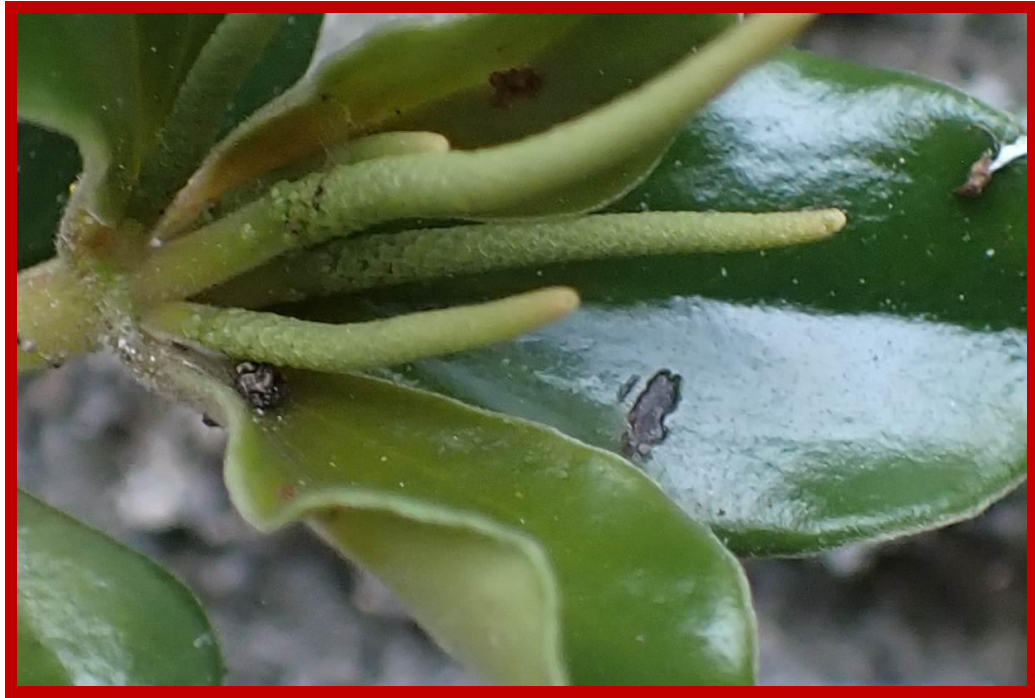


Fig. 324. *Peperomia lidaoensis* S. S. Ying, close-up of spikes



Fig. 325. *Peperomia lidaoensis* S. S. Ying, close-up of partial spikes

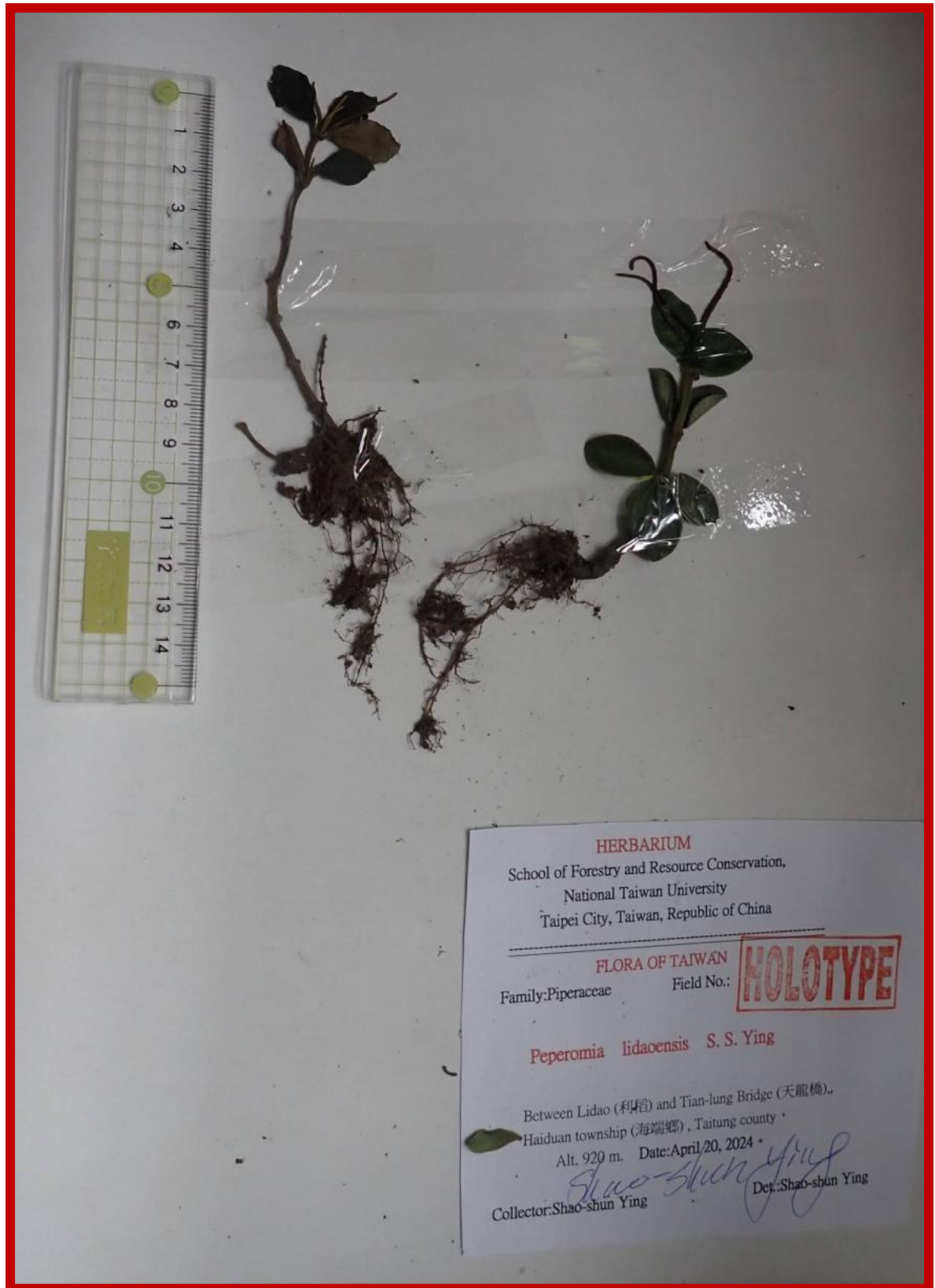


Fig. 326. *Peperomia lidaoensis* S. S. Ying, the holotype, TPRCH -113-066

(this holotype has transferred and deposited at TPRCH herbarium)

Diagnosis.

Peperomia lidaoensis is characterized by its lithophytic small herbs, rhizome absent; leaves simple, mostly 3-verticillate, rarely 4, oblong to ovate-oblong; spike 3-5, cylindrical, terminal or in the axils of the upper leaves, 2-3 cm long, 1-2 mm wide, floral bracts ovate, 0.8-1 mm long, 0.8 mm wide, acute at apex.



Fig. 327. *Peperomia lidaoensis* S. S. Ying, plants growing in situ,

Distribution and phenology.

Peperomia lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky montane slopes at elevations of 850-980 meters. Its flowering time is April to May and fruiting times is May to June.

B.*Peperomia taiwanensis* S.S. Ying 台灣椒草

Peperomia taiwanensis S.S. Ying, *sp.nov.* 台灣椒草

TYPE:TAIWAN. Miaoli County, Taian Townshaip (泰安鄉) , Guanwu (觀霧), Loshan Forest Road (樂山林道), 2130 m alt. S. S. Ying , s.n. August 08, 2024 . (holotype , TPRCH) .



Fig. 328.*Peperomia taiwanensis* S. S. Ying, plants growing in situ,

Morphology : Perennial epiphytic small herbs, rhizome absent, rooting at basal node; roots fibrous, slender, 2-3.5 cm long; stem simple, creeping on tree trunk, elongate, 4-8 cm long,; internodes 1.2-1.8 cm long, fleshy, glabrous, green to pale green. Leaves simple, mostly 3-4-verticillate, rounded to ovate-rounded, 4-5 mm long, 3.5-4.5 mm wide, obtuse and slightly emarginate at apex, obtuse to rounded at base, fleshy, entire at margins, lustrous dark green surface and pale green beneath, glabrous on both surfaces; midrib and lateral veins inconspicuous. Petioles 1.5-2.5 mm long, fleshy, groove, glabrou.

Spike solitary, cylindrical, terminal or in the axils of the upper leaves, very short,



Fig. 329. *Peperomia taiwanensis* S. S. Ying, branches and leaves

9-14 mm long, 1-2 mm wide, green, erect to ascending; peduncles 8-12 mm long, fleshy, glabrous, green to pale yellowish green; flowers numerous, remotely arranged, sunken into rachis; bracts minute, rounded, 0.4 mm across, green, obtuse at apex; floral bracts ovate to ovate-rounded, 0.7-0.9 mm long, 0.7 mm wide, obtuse at apex; stamens 2, filament slender, about 0.4-0.5 mm long; anthers rounded, pale yellow, 0.2 mm across, transversely dehiscent; ovary globose, 1-celled, 1-ovule; style short, stigma simple, glabrous.

Diagnosis.

Peperomia taiwanensis is characterized by its epiphytic small herbs, leaves simple, 3-4-verticillate, rounded to ovate-rounded; spike solitary, cylindrical, very short, terminal or in the axils of the upper leaves, 9-14 mm long, 1-2 mm wide, green, erect to ascending.

Distribution and phenology.

Peperomia taiwanensis S.S. Ying is endemic to Taiwan. It is known from Loshan

Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. ◦ It was discovered the species on the tree trunks at forest at the elevations of 1,950-2,300 meters. Its flowering time is July to August.



Fig. 330. *Peperomia taiwanensis* S. S. Ying, solitary short spike



Fig. 331. *Peperomia taiwanensis* S. S. Ying, sclose-up of spike



Fig. 332. *Peperomia taiwanensis* S. S. Ying, close-up of fruiting spike



Fig. 333. *Peperomia taiwanensis* S. S. Ying, close-up of fruiting spike



Fig. 334. *Peperomia taiwanensis* S. S. Ying, the holotype TPRCH -113-067

31. One New Species of Genus *Alpinia* (*Zingiberaceae*) from Taiwan

Alpinia lidaoensis S.S. Ying 利稻月桃

Alpinia lidaoensis S.S. Ying, *sp. nov.* 利稻月桃

TYPE: TAIWAN. Taitung county · Haiduan township (海端鄉) · Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 920 m alt. *S. S. Ying*, *s.n.* April 20, 2024 ° (holotype, TPRCH) °

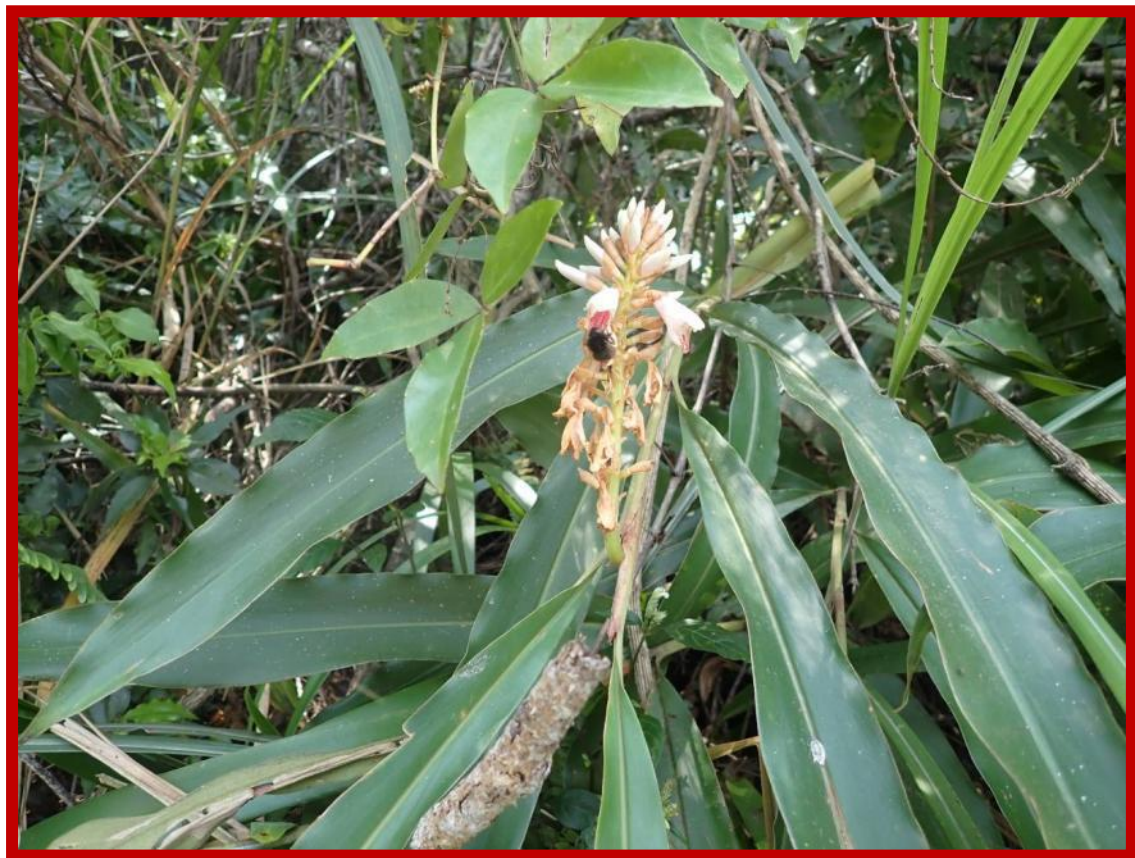


Fig. 335. *Alpinia lidaoensis* S. S. Ying, flowering plant

Morphology : Perennial herbs, Pseudostems 95-150 cm high, 5-7 mm in diameter, ascending to erect, glabrous, greenish; Leaves 10-14 in a pseudostem, remotely distichous, oblong to oblong-lanceolate, 40-55cm long, 2.5-3.2 cm wide, acuminate at apex, attenuate at base, entire and strongly wavy at margins, thinly coriaceous, lustrous green surface

somewhat pale green beneath, glabrous on both surfaces, midrib impressed surface and prominent elevated beneath. Petioles with sheaths 7-8cm long, green tinged with purple upward, glabrous; ligule , 4-6 mm long, entire to 2-lobed, membranous.



Fig. 336. *Alpinia lidaoensis* S. S. Ying, leaves

Flowers 30-45, white, 3.2-3.8 cm in diameter when opened, usually 4-5 verticillate in the node and closely arranged in a terminal elongate raceme, usually only 2-3 flowers opened at a time; inflorescence erect to ascending, 12-18 cm long, green to pale green, densely white hairy; spatulate involucral bract oblong, 8-10 cm long, 3-4 cm wide, acute at apex, truncate at base, glabrous on both surface, brownish; bracts ovate to ovate-oblong, 6-8 mm long, 3-4.5 mm wide, obtuse at apex, membranous, caudex; pedicels 2.5-3.5 mm long, green to pale yellow, hairy; calyx tubular, 7-9 mm long, 3.2-4.2 mm wide, obtuse at apex, entire not lobed, pale brownish, hairy outside and glabrous inside, ciliate at margins; corolla-tube longer than calyx, dorsal lobe broadly ovate to broadly oblong, 1-2.5 mm long,

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Fig. 337. *Alpinia lidaoensis* S. S. Ying, ovary, calyx tube and calyx lobe



Fig. 338. *Alpinia lidaoensis* S. S. Ying, corolla, style, stamen, stigma and stamen appendage

9-12 mm wide, obtuse at apex, white, membranous; lateral lobes oblong to oblong-lanceolate, 17-23 mm long, 4.5-5.5 mm wide, obtuse at apex, white; labellum broadly oblong, 2.8-3.8 cm long, 1.9-2.5 cm wide, slightly convolute at base and expanded upward, red at base and extended with several red stripes to upward at apex, wavy at margins; stamen 1.5-1.8 cm long, anther 10-11 mm long, white cream; staminode inconspicuous, obtuse; stigma expanded head-like,; stylecolumn-like, slender, 1.2-1.5 cm long, upright, white; stamens appendage rounded, slightly 3-lobed ovary globose, 2-3 mm across, hairy, green; epiginous glands 2, at style base, 2.2-2.8 mm long.



Fig. 339. *Alpinia lidaoensis* S. S. Ying, plants growing in situ

Fruits berry-like, smaller, not dehiscent, globose, 5-6 mm in diameter, red when mature, hirsute

Diagnosis.

Alpinia lidaoensis is characterized by its 30-45, white flowers which 3.2-3.8 cm in

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Fig. 340. *Alpinia lidaoensis* S. S. Ying, the holotype TPRCH -113-068

(this holotype has transferred and deposited at TPRCH herbarium)

diameter when opened, usually 4-5 verticillate in the node and closely arranged in a terminal elongate raceme, calyx tubular, obtuse at apex, entire not lobed, pale brownish, hairy outside and glabrous inside, ciliate at margins; corolla-tube longer than calyx and, labellum broadly oblong, 2.8-3.8 cm long, 1.9-2.5 cm wide, slightly convolute at base and expanded upward, red at base and extended with several red stripes to upward at apex, wavy at margins.



Fig. 341. *Alpinia lidaoensis* S. S. Ying, inflorescence

Distribution and phenology.

Alpinia lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the edge of forests of montane slopes at elevations of 850-1080 meters. Its flowering time is April to May and fruiting times is May to June.

32. One New Species of Genus *Polygonatum* (*Asparagaceae*) from Taiwan

Polygonatum lisenmingensis S.S. Ying 李氏黃精

Polygonatum lisenmingensis S.S. Ying, *sp. nov.* 李氏黃精

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Kuishan Forest Road (檜山林道), 2140 m alt. S. S. Ying, s.n. April 30, 2024. (holotype, TPRCH).



Fig. 342. *Polygonatum lisenmingense* S. S. Ying, plants growing in situ

Morphology : Perennial herbs, somewhat epiphytic on dead tree trunk with fern, rhizome creeping, usually mixed with fern rhizomes, white to pale green, 8-9 mm in diameter, moniform, annually elongation to 1 cm often producing 1 aerial stem annually; roots fibrous, 4-5 cm long; stem erect to ascending, 20-28 cm long, glabrous, green to pale green at base, green upward. Leaves 6-9, simple, alternate, oblong to ovate-oblong, 8-10 cm long,

2.8-3.4 cm wide, acuminate at apex, obtuse at base, chartaceous, entire and slightly wavy at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, 5-7 nerved only midrib impressed surface and elevated beneath, others inconspicuous. Petioles 3-4 mm long, glabrous. ;



Fig. 343. *Polygonatum lisenmingense* S. S. Ying, leaves

Flowers 1-2, axillary, 3-4.5 mm in diameter when open, but not widely opened, like a tube, pendulous, greenish yellow to pale yellow, nearly each leaf producing 1-2 flowers; pedicel 6-8 mm long, green, glabrous; perianth tube-like, 6-7 mm long, 3-4 mm wide, 6-lobed; lobes oblong, 5.5-6.5 mm long, 2-3 mm wide, obtuse at apex; stamens 6, included, 4.5-5 mm long; filaments slender, 4-4.3 mm long, glabrous, shortly cottony; anthers 2.5 mm long, yellow; ovary ovoid, 3 mm long; style straight, 3-4.5 mm long, glabrous; stigma capitate.

Fruit a berry, ovoid to globose, 3.5-4 mm long, 3-3.5 mm in diameter, red to dark red when mature.



Fig. 344. *Polygonatum lisenmingense* S. S. Ying, inflorescences



Fig. 345. *Polygonatum lisenmingense* S. S. Ying, flowers



Fig. 346. *Polygonatum lisenmingense* S. S. Ying, the holotype TPRCH -113-069

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 347. *Polygonatum lisenmingense* S. S. Ying, close-up of flowers



Fig. 348. *Polygonatum lisenmingense* S. S. Ying, fruiting plant

Diagnosis.

1.The specific name is after Mr.Li, Sen-ming (李聲銘先生) who discovered the plant.

2.1-2 axillary flowers of the species is somewhat like that of genus *Disporopsis*, but flowers of our species are in *Polygonatum* style and without corona within perianth.

3.The species is characterized by its 1-2 pale yellow to greenish yellow smaller flowers; perianth is not widely opened, 6-lobed; the lobes oblong, obtuse at apex.



Fig. 349. *Polygonatum lisenmingense* S. S. Ying, plants growing in situ

Distribution and phenology.

Polygonatum lisenmingense S.S. Ying is endemic to Taiwan. It is known on under the *Chamaecyparis formosensis* forest at Kuishan Forest Road (檜山林道), Guanwu (觀霧) area, Taian Townshap (泰安鄉), Miaoli County, central Taiwan. It was discovered the species under the *Chamaecyparis formosensis* forest which mixed with other ferns at elevations of 1,900-2,450 meters. Its flowering time is April to May and fruiting time is May to June.

33.Two New Species of Genus *Rhododendron* (Ericaceae) from Taiwan

1.*Rhododendron guanwuense* S.S. Ying 觀霧杜鵑

Rhododendron guanwuense S.S. Ying, *sp.nov.* 觀霧杜鵑

TYPE:TAIWAN. Miaoli County, Taian Townshaip (泰安鄉) , Guanwu (觀霧), Loshan Forest Road (樂山林道), 2140 m alt. S. S. Ying , s.n.April 30, 2024 . (holotype , TPRCH) .



Fig.350.*Rhododendron guanwuense* S. S. Ying, plants growing in situ

Morphology : Shrubs, up to 2.5 m high, trunk short, much branched; branchlets erect to ascending, terete, hairy and reddish when young and then glabrous and grayish brown adult. Leaves simple, alternate, somewhat clustered at branchlet apex, monomorphic, lanceolate to narrowly lanceolate, 1.5-2.2 cm long, 5-6.5 mm wide, acuminate and arista at apex, obtuse at base, thinly coriaceous, entire and ciliate at margins, appressed pubescent

on both surfaces, somewhat densely appressed pubescent beneath ; midrib impressed surface and elevated beneath, lateral veins inconspicuous; Petioles short, terete, 4-6 mm long, scattered appressed pubescent all over.



Fig. 351. *Rhododendron guanwuense* S. S. Ying, leaves and flowers

Flowers 4-7, mostly 4-5- fascicled on the terminal of branchlets, rather smaller, 2.5-3.5 cm in diameter when opened, pink to pale pink and 2-3 corolla-lobes with dark red specks and plaques; pedicels 3-3.5 mm long, reddish pink, scattered pubescent, scaly; scales ovate, 3.5-4.5 mm long, 3-4.5 mm wide, acute at apex, scattered with hairy; calyx smaller, 2.5-3.5 mm long, 1.5-2 mm wide, pale green, pubescent outside, 5-lobed at apex; lobes lanceolate-triangular, 1.5-2.5 mm long, acute at apex, truncate at base, pubescent outside and glabrous inside; corolla widely 5-lobed ; the lobes oblong to broadly oblong , 1.3-1.7 cm long, 4.2-5.2 mm wide, obtuse at apex, glabrous; the upper 1-3 lobes always tinged with dark red specks and plaques ; stamens 5, filaments slender, unequal, 2.5-3.5 cm

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white, glabrous ; anthers 2-celled, oblong, 2-3 mm long, pale brown, opening by terminal pore; style slender, 2.6-3.5 cm long, white to pale pink, villous but glabrous upward; stigma capitate, about 2 mm across, pale pink; ovary globose, densely scattered white pubescent, 2.5 mm across.



Fig. 352. *Rhododendron guanwuense* S. S. Ying, close-up of flowers

Fruits capsules, oblong, 4-5 mm long, about 2 mm across, pubescent, dehiscent from top when mature, septicidal; valves thick, straight; seeds numerous, minute, reniform, pale brown, glabrous.

Diagnosis.

Rhododendron guanwuense is characterized by its 2.5 m high shrub, monomorphic leaves which lanceolate to narrowly lanceolate, densely covered silver white appressed pubescent when young and appressed pubescent on both surfaces adult; Flowers 4-7, mostly 4-5-fascicled on the terminal of branchlets, rather smaller, 2.5-3.5 cm in diameter when opened, pink to pale pink and 2-3 corolla-lobes with dark red specks and plaques.



Fig. 353. *Rhododendron guanwuense* S. S. Ying, the holotype TPRCH -113-070

(this holotype has transferred and deposited at TPRCH herbarium)

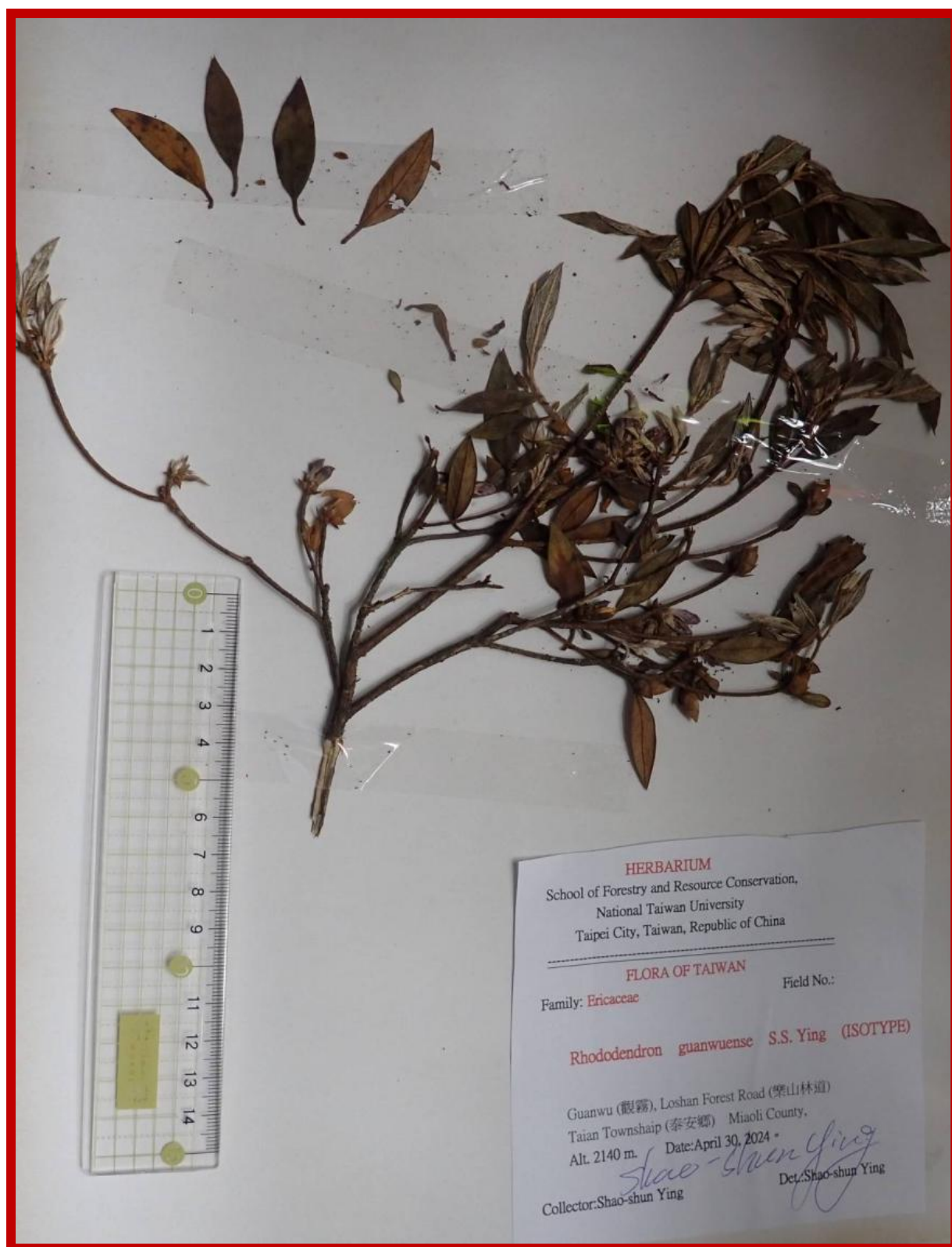


Fig. 354. *Rhododendron guanwuense* S. S. Ying, the isotype TPRCH -113-071
(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 355. *Rhododendron guanwuense* S. S. Ying, close-up of flowers



Fig. 356. *Rhododendron guanwuense* S. S. Ying, plant growing in situ

Distribution and phenology.

Rhododendron guanwuense S.S. Ying is endemic to Taiwan. It is known on the roadsides of Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshap (泰安鄉), Miaoli County, central Taiwan. It was discovered at the edges of forests on mountain slopes at elevations of 1,950-2,550 meters. Its flowering time is April to May and fruiting time is June to July.



Fig. 357. *Rhododendron guanwuense* S. S. Ying, close-up of flowers

2. *Rhododendron costatum* S.S. Ying 粗肋杜鵑

Rhododendron costatum S.S. Ying, *sp.nov.* 粗肋杜鵑

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Chengshan Forest Road (榛山林道), 1980 m alt. S. S. Ying, s.n. April 30, 2024. (holotype, TPRCH).



Fig. 358. *Rhododendron costatum* S. S. Ying, close-up of flowers

Morphology : Shrubs, up to 55 cm high, trunk very short, much branched; branchlets erect to ascending, terete, hairy and brownish when young and then hirsute adult. Leaves simple, alternate, somewhat clustered at branchlet apex, monomorphic, oblong to ovate-oblong, 2.5-3.5 cm long, 1-1.5 cm wide, acuminate and arista at apex, obtuse at base, thinly coriaceous, entire and ciliate at margins, appressed pubescent on both surfaces, midrib impressed surface and elevated beneath, lateral veins 3-5 per side impressed surface and elevated beneath; Petioles short, terete, 5-8 mm long, scattered appressed pubescent all over.



Fig. 359. *Rhododendron costatum* S. S. Ying, branches and young leaves

Flowers 1-3, mostly 1-2- fascicled on the terminal of branchlets, widely opened, 3.2-4.2 cm in diameter when opened, light violet and 1 corolla-lobes with dark red specks and plaques; pedicels 3-3.5 mm long, reddish pink, scattered pubescent, scaly; scales ovate, 2.5-3.5 mm long, 2.2-3.5 mm wide, acute at apex, scattered with hairy; calyx smaller, 1.5-2.5 mm long, 1.5-2 mm wide, brownish green, pubescent outside, 5-lobed at apex; lobes widely spreaded, triangular, 2.6-3.4 mm long, filamentous at margins, truncate at base, white to pink, pubescent outside and glabrous inside; corolla widely 5-lobed ; the lobes oblong to broadly oblong , 1.4-1.7 cm long, 4.5-5.2 mm wide, obtuse at apex, glabrous; the upper lobes always tinged with dark red specks and plaques ; stamens 5, filaments slender, unequal, 2.5-3.5 cm light pink, villous at base and glabrous upward ; anthers 2-celled, oblong, 2-3 mm long, pale brown, opening by terminal pore; style slender, 2.9-3.6 cm long, white to pale pink, glabrous; stigma capitate, about 2.5 mm across, pale pink; ovary ovoid, glabrous, 2.5-3 mm across.



Fig. 360. *Rhododendron costatum* S. S. Ying, close-up of one flower



Fig. 361. *Rhododendron costatum* S. S. Ying, close-up of pedicel, scale and calyx-lobes



Fig. 362. *Rhododendron costatum* S. S. Ying, the holotype TPRCH -113-072
(this holotype has transferred and deposited at TPRCH herbarium)

Diagnosis.

Rhododendron costatum is characterized by its 55 cm high shrub, monomorphic leaves which oblong to ovate-oblong,, scattered white appressed pubescent on both surfaces; flowers 1-3, mostly 1-2- fascicled on the terminal of branchlets, widely opened, 3.2- 4.2 cm in diameter when opened, light violet and 1 corolla-lobes with dark red specks and plaques; calyx smaller, 5-lobed at apex; lobes widely spreaded, triangular, filamentous at margins, corolla widely 5-lobed ; the lobes oblong to broadly oblong , 1.4-1.7 cm long, 4.5-5.2 mm wide, obtuse at apex.



Fig. 363. *Rhododendron costatum* S. S. Ying, plant growing in situ

Distribution and phenology.

Rhododendron costatum S.S. Ying is endemic to Taiwan . It is known on under the roadsides of Chengshan Forest Road (榛山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉) , Miaoli County, central Taiwan. . It was discovered the species edges of forests on mountain slopes at elevations of 1850-2,150 meters. Its flowering time is April to May and fruiting time is June to July.

34. One New Species of Genus *Ophiopogon* (*Asparagaceae*) from Taiwan

Ophiopogon wufengchiwaterfallensis S.S. Ying 五峰旗瀑布沿階草

Ophiopogon wufengchiwaterfallensis S.S. Ying, *sp. nov.* 五峰旗瀑布沿階草

TYPE: TAIWAN. I-Lan County, Chaochi Township (礁溪鄉), Wufengchi Waterfall (五峰旗瀑布) 280 m alt. S. S. Ying, *s.n.* May 16, 2024. (holotype, **TPRCH**).



Fig. 364. *Ophiopogon wufengchiwaterfallensis* S. S. Ying, inflorescence

Morphology : A terrestrial perennial herb, Stemless; rhizome corm-like, tuberous, ellipsoid to ovoid, fleshy, white, 4-5 mm long, 3-3.5 mm wide, closely approximate each other; roots many, fibrous, straight, 4-9 cm long, 2-2.5 mm across, somewhat fleshy. Leaves many, 4-5 in a fascicle from rhizome, linear, 27-35 cm long, 2.8-3.4 mm wide, suberect to arching, acuminate to acute at apex, truncate at base, thinly coriaceous, entire at margins, lustrous green surface, pale green beneath, midrib elevated surface and elevated beneath, other longitudinal veins inconspicuous, glabrous on both surfaces; leaf sheath at



Fig. 365. *Ophiopogon wufengchiwaterfallensis* S. S. Ying, leaves and inflorescence

base, lanceolate, 2.5-4 cm long, 4-4.5 mm wide, acute at apex, membranous, glabrous.

Flowers many, solitary to 2 fascicled on the scape, 28-3.5 mm wide when opened, dark violet, scentless, drooping to horizontal at anthesis, racemose; scape usually from new leaf fascicle with new leaves, suberect to arching, 20-27 cm long, white, glabrous; inflorescence rachis 6-8 cm long; sheath shares with leaf-sheath; pedicels 5-7 mm long, white to pale violet, glabrous, bracts linear, 3-5 mm long, 1-1.5 mm wide, acute at apex, white to pale violet, glabrous; perianth syntepalous at base, funnel-form, 1-2 mm long (syntepalous part), 6-lobed at apex; lobes subsimilar, ovate, 2.5-3.5 mm long, 1.5-2 mm wide, obtuse at apex, dark violet, glabrous; stamens 6, located at base of perianth-lobes; filaments short, 0.6 mm long, white, fleshy; anthers ovoid, slightly flattened, truncate at base, obtuse at apex, introrse, yellowish; pistil 1; ovary inferior, 3-locular; ovules 1-2 per locule, borne on basal part of central axis of ovary; style cylindrical, 2.5-3 mm long, white; stigma small, obtuse.



Fig. 366. *Ophiopogon wufengchiwaterfallensis* S. S. Ying, the holotype
TPRCH -113-073

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 367. *Ophiopogon wufengchiwaterfallensis* S. S. Ying, the isotype
TPRCH -113-074

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 368. *Ophiopogon wufengchiwaterfallensis* S. S. Ying, close-up of inflorescence

Diagnosis.

Ophiopogon wufengchiwaterfallensis is characterized by its leaves 4-5 in a fascicle from rhizome, linear, 27-35 cm long, 2.8-3.4 mm wide, suberect to arching; flowers many, solitary to 2 fascicled on the scape, 28-3.5 mm wide when opened, dark violet, scentless, racemose; scape usually from new leaf fascicle with new leaves; perianth syntepalous at base, funnel-form, 1-2 mm long (syntepalous part), 6-lobed at apex; lobes subsimilar, ovate, obtuse at apex, dark violet, glabrous.

The species confines to 50 meters around third layer waterfall.

Distribution and phenology.

Ophiopogon wufengchiwaterfallensis S.S. Ying is endemic to Taiwan. It is known from Wufengchi Waterfall(五峰旗瀑布) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on cliff leavges around the waterfall at elevations of 250-280 meters. Its flowering time is May to June and fruiting times June to July.



Fig. 369. *Ophiopogon wufengchiwaterfallensis* S. S. Ying, plants growing in situ

35. Two New Species of Genus *Commelina* (*Commelinaceae*) from Taiwan

A. *Commelina shengmushanensis* S.S. Ying 聖母山鴨趾草

Commelina shengwushanensis S.S. Ying, *sp. nov.* 聖母山鴨趾草

TYPE: TAIWAN. I-Lan County, Chaochi Township (礁溪鄉), Shengmushan (聖母山) 464 m alt. S. S. Ying, s.n. May 16, 2024. (holotype, **TPRCH**).



Fig. 370. *Commelina shengmushanensis* S. S. Ying, plants growing in situ

Morphology : An annual terrestrial herb, root fibrous, slender, 5-7 cm long. Stem simple, not branched, fascicled from roots. elongate, 30-50 cm long, creeping to ascending, glabrous, green, usually forming a small size plant colony. Leaves simple, alternate, oblong to broadly oblong, 12.5-15.6 cm long, 4.5-5.5 cm wide, acuminate with caudate at apex, obtuse to a short petiole at base, chartaceous, entire, slightly wavy at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib impressed surface

and elevated beneath, 3-longitudinal lateral veins per side, somewhat inconspicuous. sheath-tube 3.5-5 cm long, green, membranous, glabrous, with elongate brownish filiforms at margins. Petioles 3-3.5 mm long, 2 mm wide, green, glabrous.



Fig. 371. *Commelina shengmushanensis* S. S. Ying, stem and leaves

Flowers 2 in each spathe, 4.5-5.5 mm in diameter when opened, white to pale violet; peduncle terminal, 0.0-0.2 mm long, green; bract one at top of peduncle, somewhat like leaf but much smaller, 8-12 mm long, 6-8 mm wide, acute at apex, green, glabrous or scattered hairy surface; spathe cordate-like, 2.2-2.8 cm long, 12-15 mm wide, acute at apex, glabrous beneath, entire at margins, 2 flowers in each spathe; pedicels 2.4-3.3 mm long, with articulation at middle, below it pale green and hairy, above it white, transparent and glabrous; sepals 3 subequal, ovate, 3.5-4.5 mm long, 1.5-2.5 mm wide, obtuse at apex, pale green to white, glabrous; upper petals 2, with claws; the claws 1.5-2 mm long, green; blade



Fig. 372. *Commelina shengmushanensis* S. S. Ying, spathe nearly sessile,
mind brownish filiforms along sheath margins



Fig. 373. *Commelina shengmushanensis* S. S. Ying, close-up of flowers



Fig. 374..*Commelina shengmushanensis* S. S. Ying,close-up of flowers, mind petal margins

fan-shape, 7-8 mm long, 6-8 mm wide, obtuse at apex, remotely denateto wavy at margins, white to pale violet. glabrous; lower petal smaller, ovate, 1.5-2 mm long, 1-1.6 mm wide, obtuse at apex,white to pale green; staminodes 3, subequal, filaments 3.5-4.5 mm long; antherodes x-hsaped, distinctly 4-lobed, yellowish; median stamen 1, filament 4.5-5.8 mm long, anther saddle-like, 2.0-2.1 mm long, 1.2-1.5 mm wide, yellow; lateral stamens 2, filaments 4-6.5 mm long, curved to upside; anthers ovoid, 1.5-1.8 mm long, 1.2-1.4 mm wide, basifixied, violet to violet blue in colour; ovary superior, globose, 6-8 mm lnog, 7-8.5 mm wide, glabrous, 2-locular; 2 ovules in each locule; style straight, elongate, 8-10 mm long, pale purple to white; stigma 3-lobed; the lobes very short, 0.4 mm long.

Diagnosis.

Commelina shengmushanensis is charactized by its simple, elongate stem which fascicled at roots, creeping to ascending; leaves largest of the genus *Commelina* in Taiwan,



Fig. 375. *Commelina shengmushanensis* S. S. Ying, the holotype TPRCH -113-075

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 376. *Commelina shengmushanensis* S. S. Ying, the isotype TPRCH -113-076

(this isotype has transferred and deposited at TPRCH herbarium)

being 12.5-15.6 cm long, 4.5-5.5 cm wide; sheath-tube with elongate brownish filiforms along margins; spathe solitary, terminal, sessile; flowers 2 in each spathe, 4.5-5.5 mm in diameter when opened, white to pale violet; upper petals 2, with claws; the claws 1.5-2 mm long, green; blade fan-shape, 7-8 mm long, 6-8 mm wide, obtuse at apex, remotely denate to wavy at margins, white to pale violet. glabrous.l



Fig.377. *Commelina shengmushanensis* S. S. Ying, close-up of flower bud

Distribution and phenology.

Commelina shengmushanensis S.S. Ying is endemic to Taiwan ° It is known from Shengmushan(聖母山) area only, Chaochi Township (礁溪鄉) , I-Lan county , northern Taiwan. ° It was discovered the species on shde raodsides of forest edges at elevations of 385-590 meters. Its flowering time is May to Junel and fruiting times May to July.

B. *Commelina songgangensis* S.S. Ying 松崗鴨趾草

Commelina songgangensis S.S. Ying, *sp.nov.* 松崗鴨趾草

TYPE: TAIWAN. Nantou County, Jenai Townshaip (仁愛鄉), Between Songgang (松崗) and Cuifeng (翠峰), Hohuanshan (合歡山), 1850 m alt. S. S. Ying, s.n. July 18, 2024. (holotype, **TPRCH**) .



Fig. 378. *Commelina songgangensis* S. S. Ying, close-up of flower

Morphology : An annual terrestrial herb, root fibrous, slender, 3-5 cm long. Stem elongate, branched, 20-40 cm long, creeping to ascending, shortly pubescent, green, usually forming a small size plant colony; branches 10-18 cm long, from basal and medium part of stem. Leaves simple, alternate, oblong to oblong-lanceolate, 4.5-5.6 cm long, 1.8-2.5 cm wide, acuminate with caudate at apex, truncate and sheathed at base, chartaceous, entire, slightly wavy at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib impressed surface and elevated beneath, 3-longitudinal lateral veins per side, somewhat inconspicuous. sheath-tube 8-12 mm long, green, membranous, glabrous,

7-9 longitudinal rib, pale green, entire at margins.

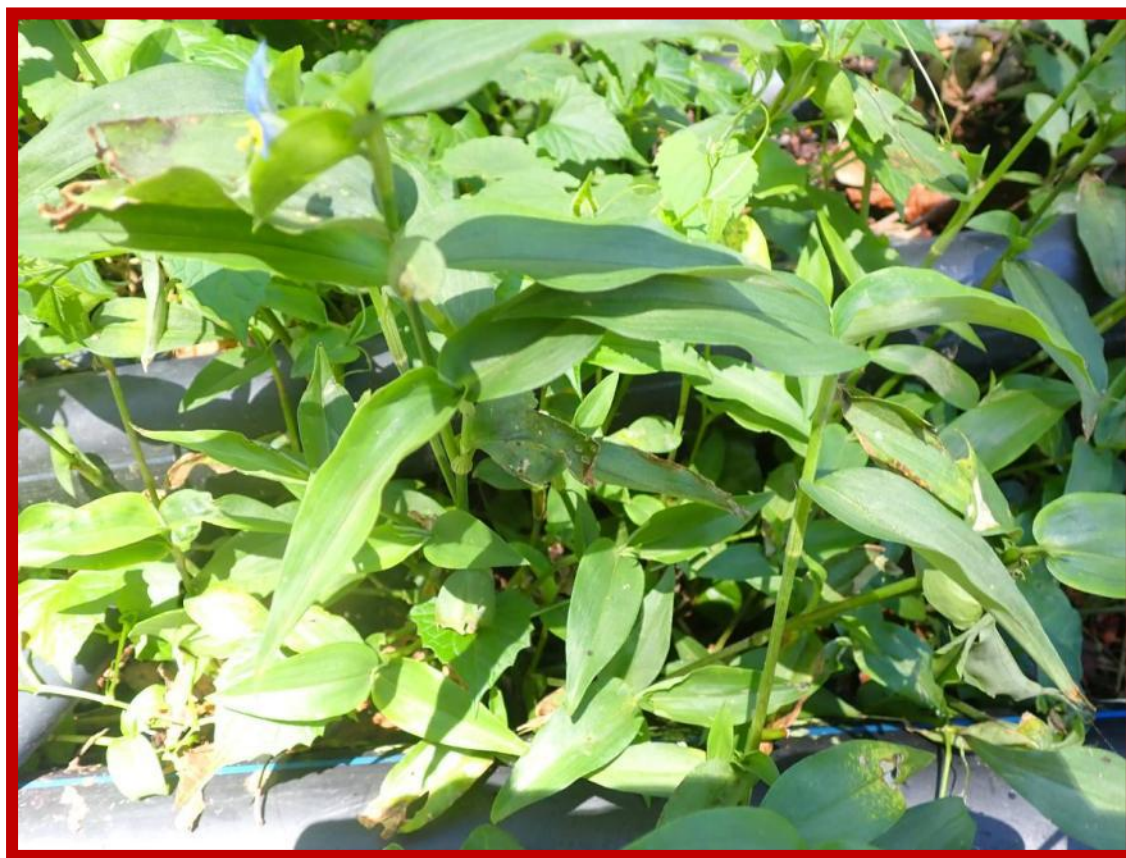


Fig. 379. *Commelina songgangensis* S. S. Ying, branches and leaves

Flowers solitary in each spathe, 3.2-4.1 mm in diameter when opened, dark blue; peduncle terminal, 5-6 mm long, green; bract somewhat like leaf but much smaller, 18-27 mm long, 7-9 mm wide, acute at apex, green, glabrous or scattered hairy surface; spathe cordate-like, 2.0-2.5 cm long, 15-18 mm wide, acute at apex, glabrous, entire at margins, green; pedicels 2.5-3.5 mm long, with articulation at middle, below it green and hairy, above it white, transparent and glabrous; sepals 3 subequal, ovate, 3.2-3.8 mm long, 1.6-2.6 mm wide, obtuse at apex, white, glabrous; upper petals 2, with claws; the claws 2-2.5 mm long, blue; blade ovate-triangular, 7-8 mm long, 6-8 mm wide, acute and slightly 3-lobed at apex, wavy at margins, dark blue, glabrous; lower petal smaller, ovate, 1.5-2 mm long, 1-1.6 mm wide, obtuse at apex, green; staminodes 3, subequal, filaments 3.5-4.5 mm long; antherodes x-shaped, distinctly 4-lobed, yellowish; median stamen 1, filament 4.5-5.5 mm



Fig. 380. *Commelina songgangensis* S. S. Ying, spathe and flower



Fig. 381. *Commelina songgangensis* S. S. Ying, close-up of flower



Fig. 382. *Commelina songgangensis* S. S. Ying, the holotype TPRCH -113-077

long, anther saddle-like, 1.5-2.0 mm long, 1.2-1.5 mm wide, yellow; lateral stamens 2, filaments 10-12.5 mm long, curved to upside; anthers ovoid, 1.5-1.8 mm long, 1.2-1.4 mm wide, basifixied, brown to pale brown in colour; ovary superior, globose, 6-7 mm long, 7-8 mm wide, glabrous, 2-locular; 2 ovules in each locule; style straight, elongate, 14-16 mm long, white; stigma triangular, black, 1.6 mm long, 1.4 mm wide.



Fig. 383. *Commelina songgangensis* S. S. Ying, each spathe with only one flower

Diagnosis.

Commelina songgangensis is characterized by its elongate stem which branched at basal and medium part of stem; leaves simple, alternate, oblong to oblong-lanceolate, 4.5-5.6 cm long, 1.8-2.5 cm wide; flowers solitary in each spathe, 3.2-4.1 mm in diameter when opened, dark blue; lateral stamens 2, filaments 10-12.5 mm long, curved to upside; anthers ovoid, 1.5-1.8 mm long, 1.2-1.4 mm wide, basifixied, brown to pale brown.

Distribution and phenology.

Commelina songgangensis S.S. Ying is endemic to Taiwan. It is known from between Songgang (松崗) and Cuifeng (翠峰), Hohuanshan (合歡山), Jenai Townshaip (仁愛鄉), Namtou county, central Taiwan. It was discovered the species on rocky mountain slope at the elevations of 1,570- 2,350 meters. Its flowering time is July.

36. One New Species of Genus *Isachne* (*Poaceae*) from Taiwan

Isachne taiwanensis S.S. Ying 台灣柳葉箬

Isachne taiwanensis S.S. Ying, *sp. nov.* 台灣柳葉箬

TYPE: TAIWAN. I-Lan County, Chaochi Township (礁溪鄉), Wufengchi Waterfall (五峰旗瀑布) 280 m alt. S. S. Ying, *s.n.* May 16, 2024. (holotype, **TPRCH**).



Fig. 384. *Isachne taiwanensis* S. S. Ying, flowering plant

Morphology : An annual terrestrial herb, root fibrous, slender, 2-3.5 cm long. Culms decumbent to creeping on grounds, 15-20 cm long, branched, green, white hairy on nodes and sometimes extended to the internodes. Leaves, simple, alternate, oblong to oblong-lanceolate, 1-1.5 cm long, 3-4 mm wide, acute at apex, truncate at base, chartaceous, entire and ciliate at margins, glabrous on both surfaces, lustrous green surface and pale green beneath; sheaths 0.4-0.5 mm long, glabrescent or sparsely pilose, ciliate on the external margin with trichomes pectinate, tuberculate; ligule 0.7-1 mm long, setaceous, trichomes pectinate, erect.



Fig. 385. *Isachne taiwanensis* S. S. Ying, plants growing in situ



Fig. 386. *Isachne taiwanensis* S. S. Ying, stem, leaves and spikelets

Spikelets ovoid, 0.8-1 mm long and wide, green to greenish yellow, few, less than 10 in an inflorescence, in a terminal remotely cymose; inflorescence rachis 2-3 cm long, glabrous, green; peduncles 1-1.4 cm long, glabrous; pedicels 7-9 mm long, slender, green, glabrous; glumes elliptic, 0.7-0.9 mm long, 5-6 nerved, the lower glume somewhat similar to upper ones; florets similar, monomorphic, 0.7-0.9 mm long, nearly glabrous, coriaceous to subcoriaceous, scaberulous toward the apex. Caryopsis not seen.

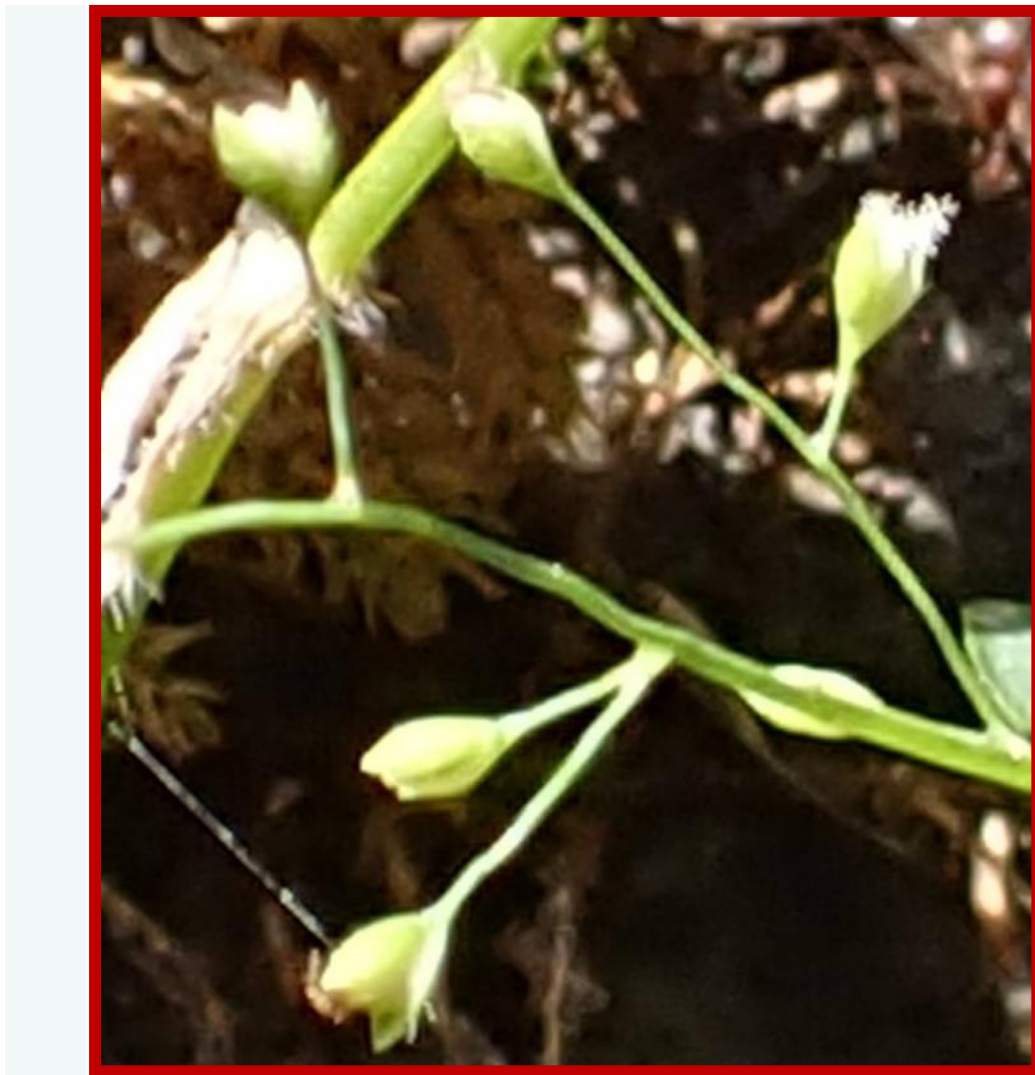


Fig. 387. *Isachne taiwanensis* S. S. Ying close-up of spikelets

Diagnosis.

Isachne taiwanensis is characterized by its decumbent to creeping culms with oblong



Fig. 388. *Isachne taiwanensis* S. S. Ying, the holotype TPRCH -113-078

(this holotype has transferred and deposited at TPRCH herbarium)

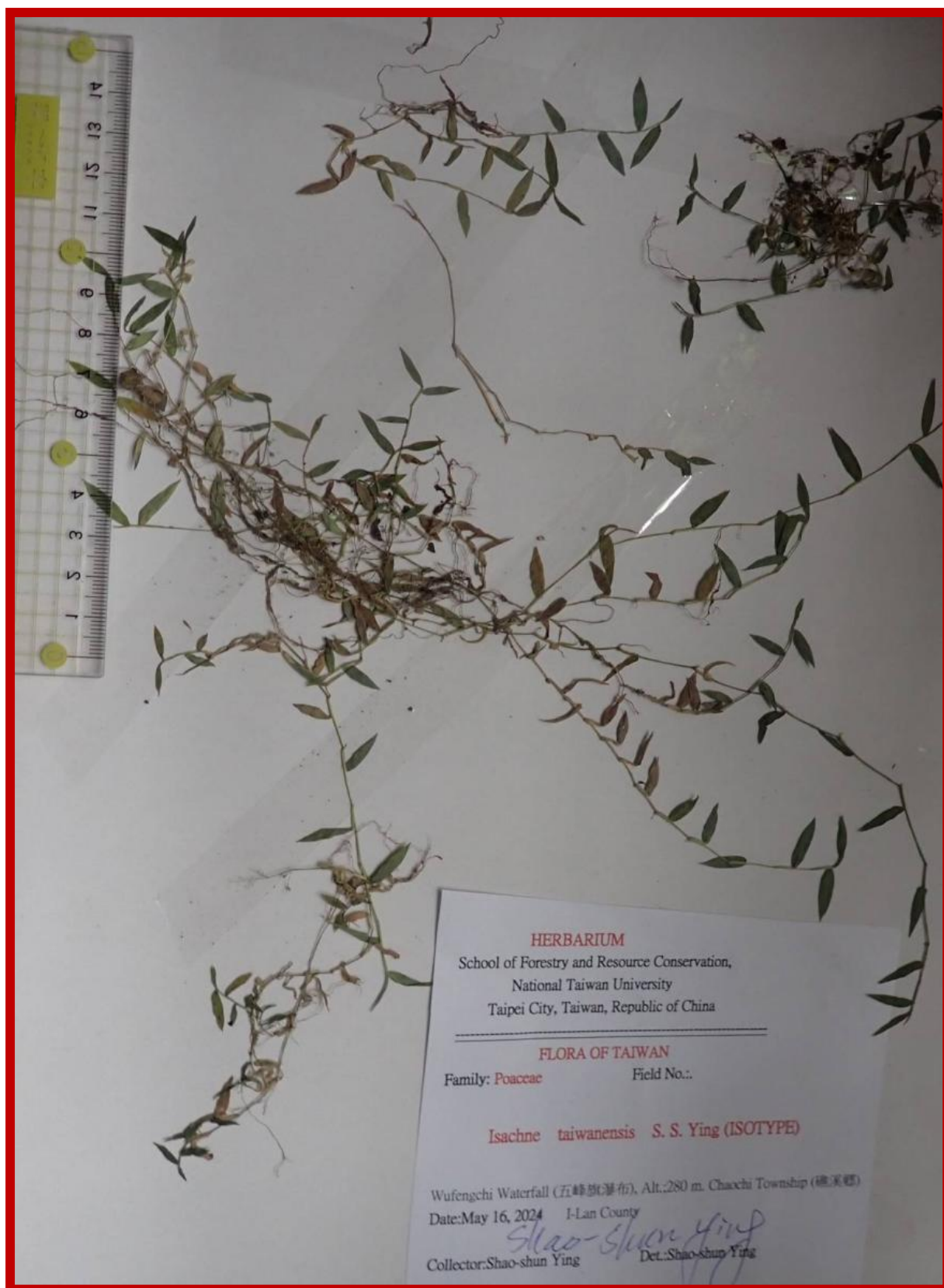


Fig. 389. *Isachne taiwanensis* S. S. Ying, the isotype TPRCH -113-079

(this isotype has transferred and deposited at TPRCH herbarium)

to oblong-lanceolate leaves; spikelets ovoid, 0.8-1 mm long and wide, green to greenish yellow, few, less than 10 in a inflorescence, in a terminal remotely cymose; glumes elliptic, 0.7-0.9 mm long, 5-6 nerved, the lower glume somewhat similar to upper ones; florets similar, monomorphic.



Fig. 390. *Isachne taiwanensis* S. S. Ying, plants growing in situ

, **Distribution and phenology.**

Isachne taiwanensis S.S. Ying is endemic to Taiwan ° It is known from Wufengchi Waterfall(五峰旗瀑布) area only, Chaochi Township (礁溪鄉) , I-Lan county , northern Taiwan. ° It was discovered the species on cliff and wet areas around the waterfall at elevations of 180-250 meters. Its flowering time is May to June.

37. One New Species of Genus *Leptopetalum* (*Rubiaceae*) from Taiwan

Leptopetalum wufengchiwaterfallianum S.S. Ying 五峰旗瀑布擬耳草

Leptopetalum wufengchiwaterfallianum S.S. Ying, *sp. nov.* 五峰旗瀑布擬耳草

TYPE: TAIWAN. I-Lan County, Chaochi Township (礁溪鄉), Wufengchi Waterfall (五峰旗瀑布) 280 m alt. S. S. Ying, *s.n.* May 16, 2024. (holotype, **TPRCH**).



Fig. 391. *Leptopetalum wufengchiwaterfallianum* S. S. Ying, close-up of flowering plant

Morphology : An annual small lithophytic herb, root fibrous, slender, few, 2-3.5 cm long. stem simple, not branched, 3.5-5 cm long, fleshy, green to pale green, glabrous. Leaves simple, opposite, ovate, 1-1.5 cm long, 8-10 mm wide, acute at apex, slightly cordate at base, fleshy, thinly coriaceous, entire and shortly ciliate at margins, lustrous green surfaces and pale green beneath, midrib impressed surface and elevated beneath, lateral veins inconspicuous on both surfaces, scattered white short hairs on both surfaces. Petioles short, 3.5-4.5 mm long, pale green, grooved above, glabrous to few hairy.



Fig. 392. *Lepttpetalum wufengchiwaterfallianum* S. S. Ying, close-up of flowering plant

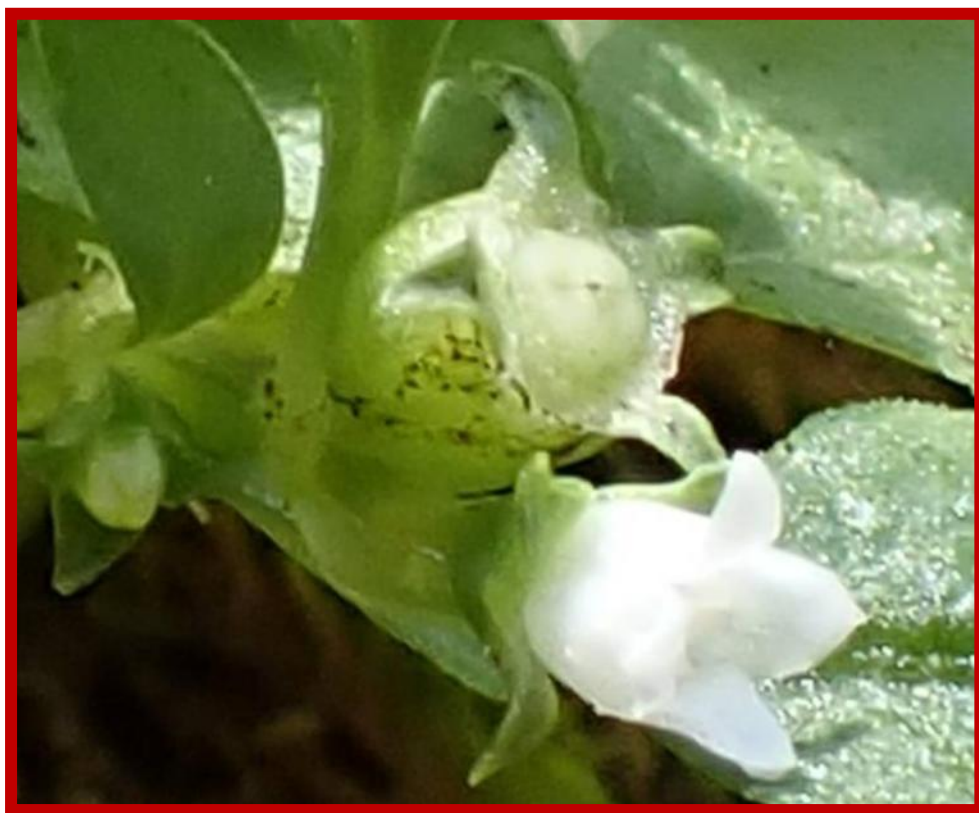


Fig.393. *Lepttpetalum wufengchiwaterfallianum* S. S. Ying, close-up of flower and fruit

Flower(s) solitary to 2, axillary on axil of terminal leaf, white, 4-5 mm in diameter when opened. scentless, usually subtended by 4 small leaf-like bracts at base; bracts ovate, 3-4 mm long, 2.5-3.4 mm wide, acute at apex; hypanthium obovoid, 1.5-2 mm long, 1.5 mm wide; calyx 4-lobed, the lobes ovate-triangular, 1-1.3 mm long, 0.6-0.8 mm wide, acute at apex, entire at margins; corolla tubular, the tube 0.9-1.5 mm long, 0.5 mm wide, 4-lobed at apex; the lobes ovate-triangular, 0.5-0.7 mm long, 0.6 mm wide, obtuse and with an arista at apex; stamens 4, included, filaments 0.4 mm long, inserted on the base of corolla-tube; anthers ovoid, 0.5 mm long, white; style 0.5 mm long, stigma bifid, 0.4 mm long.

Fruit a capsule, ovoid to turbinate globose, 3.5-4 mm long, 3-3.5 mm wide, with a notched apex; calyx-lobes persistent; seeds ellipsoid, 0.3 mm across, pale brownish.



Fig. 394. *Leptopetalum wufengchiwaterfallianum* S. S. Ying, plants growing in situ

Diagnosis.

Leptopetalum wufengchiwaterfallianum is characterized by its small lithophytic annual herb, which usually growing on wet rocks with mosses; leaves ovate, 1-1.5 cm



Fig. 395. *Leptopetalum wufengchiwaterfallianum* S. S. Ying, the holotype TPRCH -113-080

(this holotype has transferred and deposited at TPRCH herbarium)

long, 8-10 mm wide and solitary to 2 white flowers which usually subtended by 4 small leaf-like bracts at base; corolla tubular, the tube 0.9-1.5 mm long, 0.5 mm wide, 4-lobed at apex; the lobes ovate-triangular, 0.5-0.7 mm long, 0.6 mm wide.



Fig. 396. *Leptopetalum wufengchiwaterfallianum* S. S. Ying, plants growing in situ

, Distribution and phenology.

Leptopetalum wufengchiwaterfallianum S.S. Ying is endemic to Taiwan. It is known from Wufengchi Waterfall(五峰旗瀑布) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on cliff and wet areas around the waterfall at elevations of 180-250 meters. Its flowering time is May to June and fruiting times June to July.

Referrance

Chen, Shih-Huei & Ming-Jou Wu (2019). A taxonomic revision of the genus *Leptopetalum* (Rubiaceae) from Taiwan, Journ. Taiwan Mus. 72(1-4):33-53

38. One New Species of Genus *Lonicera* (*Caprifoliaceae*) from Taiwan

Lonicera lidaoensis S.S. Ying 利稻金銀花

Lonicera lidaoensis S.S. Ying, *sp. nov.* 利稻金銀花

TYPE: TAIWAN. Taitung county · Haiduan township (海端鄉) · Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 960 m alt. S. S. Ying, *s.n.* May 25, 2024. (holotype, TPRCH) °



Fig. 397. *Lonicera lidaoensis* S. S. Ying, flowers

Morphology : Climbers, stem elongate, 2.5-4 m long, somewhat lignified, usually entwine other plants or trees, much branched, densely covered brownish pubescent. branches elongate, 40-70 cm long, not hollow, densely scattered with brownish hairs, brownish. Leaves simple, opposite, ovate to ovate-lanceolate, 3.5-5.2 cm long, 1.5-2.5 cm wide, acuminate at apex, obtuse and cordate at base, chartaceous to thin coriaceous, entire and ciliate at margins, lustrous green surface and pale green beneath; glabrous surface and pubescent along midrib and lateral veins beneath; midrib impressed surface and elevated

beneath, lateral veins 2-3 per side, inconspicuous. Petioles 5-6 mm long, terete, scattered with brownish pubescent.



Fig. 398. *Lonicera lidaoensis* S. S. Ying, stem, branches, leaves and flowers

Flowers few, white tinged with pink at base and turned to pale yellow when withering, paired, 1.2-1.6 cm in diameter when opened, axillary, only on terminal leaf-axil with mostly 2, rarely one- paired flowered; peduncles 2.5-3 cm long, densely covered brownish pubescent; bracts opposited, at top of peduncles, ovate, 2.5-3 mm long, about 1.5 mm wide, acute at apex, brownish; pedicels 0.5-1 mm long, pubescent; bractules neighboring 2 ovaries free, globose, 2-2.5 mm across, pubescent; calyx tubular, green, 1-1.5 mm long, 1.5 across, glabrous, 5-lobed at apex; lobes ovate-triangular, 2.5-3 mm long, 1.5



Fig. 399. *Lonicera lidaoensis* S. S. Ying, close-up of bractules, ovaries, calyx and corolla

mm wide, acute at apex, glabrous; corolla bilabiate, white tinged with pink at base, later pale yellow when wither, 1.5-2.2 cm long, densely covered with glandular hairs outside and inside; tube 1-1.2 cm long, 3-3.5 mm in diameter, base not gibbous; upper lip 8-10 mm long, 3.5-4.5 mm wide, 4-lobed at apex; the lobes 0.5-1.5 mm long, obtuse at apex; lower lip spatulate, about 1-1.2 cm long, 2-3 mm wide, obtuse at apex, stamens 5, exserted from corolla tube, 3-4 perfect, 1-2 sterile; filament slender, 1.5-1.7 cm long, white to pale yellow; anthers oblong, 2.5-3.5 mm long, all perfect, yellow, dorsifixed; ovary 5-celled; style as long as the stamens, white to pale yellow; stigma capitate, green.



Fig. 400. *Lonicera lidaoensis* S. S. Ying, close-up of flowers,
mind corolla with glandular hairs all over

Diagnosis.

Lonicera lidaoensis is characterized by its small white tinged with pink at base flowers which only on terminal leaf-axil with mostly 2, rarely one- paired flowered and corolla bilabiate, 1.5-2.2 cm long, densely covered with glandular hairs outside and inside.

Distribution and phenology.

Lonicera lidaoensis S.S. Ying is endemic to Taiwan ° It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. ° It was discovered on the edge of forests at elevations of 950-1500 meters. Its flowering time is May to June and fruiting times is July to August.



Fig. 401. *Lonicera lidaoensis* S. S. Ying, the holotype TPRCH -113-081

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 402. *Lonicera lidaoensis* S. S. Ying, the isotype TPRCH -113-082

(this isotype has transferred and deposited at TPRCH herbarium)



Fig. 403.*Lonicera lidaensis* S. S. Ying, plants growing in situ



Fig. 404.*Lonicera lidaensis* S. S. Ying, plants growing in situ

39. One New Species and One New Name of Genus *Scutellaria* (Limaceae)

from Taiwan

A. One New Species

Scutellaria lidaoensis S.S. Ying 利稻耳挖木

Scutellaria lidaoensis S.S. Ying, *sp. nov.* 利稻耳挖木

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 860 m alt. S. S. Ying, *s.n.* May 25, 2024. (holotype, TPRCH) °

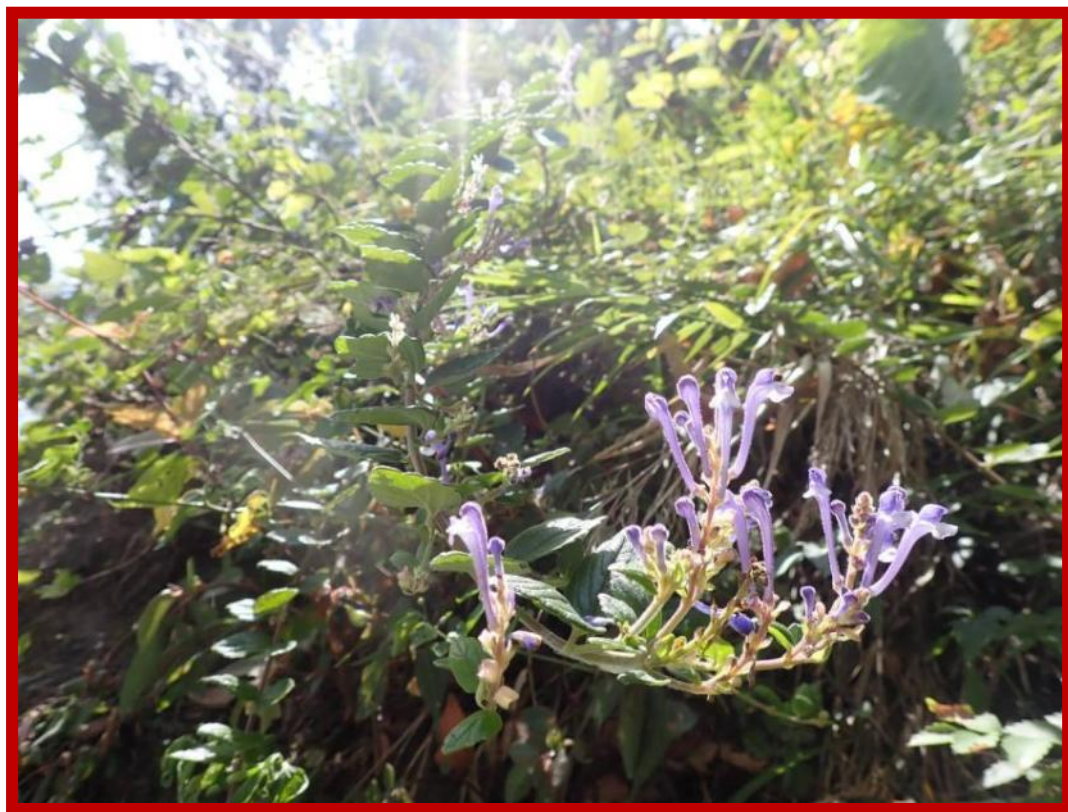


Fig. 405. *Scutellaria lidaoensis* S. S. Ying, plants growing in situ, mind a shrub in habit

Morphology: Shrubs about 2 m high, trunks short, grayish, glabrous, much branched at base; branches erect to ascending, spreading, 1.5–2.5 m long, densely covered with white short hairs,

grashish brown when adult. Leaves simple, opposite, ovate, 2-3 cm long, 1.5-2.2 cm wide, obtuse at apex, slightly cordate at base, chartaceous, dentate and slightly ciliate at margins, scattered hirsute surface and villous beneath, midrib impressed surface and elevated beneath, lateral veins 3-4 per side, lustrous green surface and pale green beneath. Petioles



Fig. 406. *Scutellaria lidaensis* S. S. Ying, branches and leaves

short, 3-5 mm long, grooved above, pubescent, pale purplish in colour.

Flowers 5-12, scentless, 8-10 mm in diameter when opened, bluish violet, in a terminal and axillary raceme; if the axillary one usually from upper ward leaf-axil; inflorescence 4-6 cm long, erect to ascending, spreading, pubescent, pale purplish; pedicels 4-6 mm long, hairy; bracts lanceolate, 3-4 mm long, 1.5-2 mm wide, acute at apex, glandular hairs; calyx bilobed, 1.5 mm long in flower 2.4 mm in fruits, with a purplish red scutellum on upper lobe, 1.5 mm in flower, 3.2 mm in fruits, glandular hairs; corolla tubular, bilabiate, bluish violet, 1.3-1.6 cm long, geniculate at base, covered with spreading glandular hairs; upper lip hood-like, ovate, 0.4-0.5 mm long, obtuse at apex; lower lip broadly ovate, 4-5 mm long, 6-7 mm wide, 3-lobed, the median lobe largest, white tinged



Fig. 407. *Scutellaria lidaoensis* S. S. Ying, inflorescence



Fig. 408. *Scutellaria lidaoensis* S. S. Ying, close-up of flowers



Fig. 409. *Scutellaria lidaoensis* S. S. Ying, the holotype TPRCH -113-083

(this holotype has transferred and deposited at TPRCH herbarium)

with pink at base, glabrous, truncate and emarginate at apex; lateral lobes small; stamens 4, didynamous, included; filaments inserted on corolla tube, hairy at base; anthers ovoid, yellow. Nutlets ellipsoid, grayish brown, 0.8 mm long and wide, short grapping-hook tubercles on surface.

Diagnosis.

1. The species is the sole species in shrub habit of genus *Scutellaria* in Taiwan.

2. *Scutellaria lidaoensis* is characterized by its shrub habit about 2 m high; with simple, opposite, ovate, 2-3 cm long, 1.5-2.2 cm wide, obtuse at apex, slightly cordate at base leaves; flowers many, scentless, 8-10 mm in diameter when opened, bluish violet, in a terminal and axillary raceme; ; lower lip of corolla broadly ovate, 4-5 mm long, 6-7 mm wide, 3-lobed, the median lobe largest, white tinged with pink at base, glabrous, truncate and emarginate at apex; lateral lobes small.



Fig. 410. *Scutellaria lidaoensis* S. S. Ying, calyx, scutellum and corolla

Distribution and phenology.

Scutellaria lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the edge of forests at elevations of 950-1500 meters. Its flowering time is May to June and fruiting times is July to August.

B.One New Name

Scutellaria austrotaiwanensis S.S. Ying 南台耳挖草

Scutellaria austrotaiwanensis S.S.Ying, *name. nov.* 南台耳挖草

Scutellaria taiwanense (-ensis) S.S. Ying in Coll. Agric. Natl. Taiwan Univ. 31(1): 24 (1991), *nom.illeg.non* C.Y. Wu, 1977.



Fig.411. *Scutellaria austrotaiwanensis* S. S. Ying, close-up of inflorescence



Fig. 412. *Scutellaria austrotaiwanensis* S. S. Ying, close-up of flowers and scutelum



Fig. 413. *Scutellaria austrotaiwanensis* S. S. Ying, plants growing in situ

Note: *Scutellaria taiwanense* (-ensis) S.S. Ying was described in 1991, it is an invalid name for its name same as the name which was named by Wu, C.Y. for another plant from Arisan mountain in 1977. I proposed a new name for the species here.

The corolla of *Scutellaria austrotaiwanensis* S.S.Ying is very peculiar, the corolla very small, not widely opened, the lobes of upper and lower lips are very minute.



Fig. 414. *Scutellaria austrotaiwanensis* S. S. Ying, plant growing in situ

40. One New Species of Genus *Smilax* (*Smiliaceae*) from Taiwan

Smilax lidaoensis S.S. Ying 利稻拔葵

Smilax lidaoensis S.S. Ying, sp. nov. 利稻拔葵

TYPE: TAIWAN. Taitung county · Haiduan township (海端鄉) · Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 1060 m alt. S. S. Ying, s.n. May 25, 2024. (holotype, TPRCH) °



Fig. 415. *Smilax lidaoensis* S. S. Ying, flowering plant

Morphology : Lianas, stem elongate, 1.2-1.8 m long, much branches, green, glabrous; branches somewhat hang down to horizontal, rarely ascending, 50-85 cm long, terete, green, short prick, glabrous; prickles 2.5-3.5 mm long, remotely arranged. Leaves simple, alternate, oblong to oblong-lanceolate, 8-12 cm long, 2.2-2.8 cm wide, acuminate to



Fig. 416. *Smilax lidaoensis* S. S. Ying, stem, tendril, leaves (young and adult)

caudate tip at apex, obtuse and slightly cordate at base, coriaceous, entire at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, 3-main veins impressed surface and elevated beneath; the young leaves usually in red color. Petioles 6-10 mm long, terete, glabrous, purplish; stipular tendrils born on the basal portion of petioles, 4-7 cm long, brownish to grayish brown, somewhat lingified.

Flowers dioecious, male flowers: smaller, pale yellow to greenish yellow, 3-3.5 mm in diameter when opened, scentless, usually 15-25 to form a umbel; 1-2 umbels to form an racemose inflorescence; inflorescence peduncles 1-2.5 cm long, slender, pale purple to red, glabrous; bracts lanceolate, 8-10 mm long, 3-4 mm wide, acuminate at apex, truncate and amplexicual at base; umbel peduncles 1.1-1.5 cm long, red, glabrous; rays 7-9 mm long, red, glabrous; umbel bracts lanceolate, 2.5-3.5 mm long, 2-2.5 mm wide, greenish yellow, glabrous; bracteoles minute, 1-1.5 mm long, 0.5-0.7 mm wide, cauduous; tepals 6 in two series, the outer ones oblong, 2.5-3.5 mm long, about 2.5 mm wide, obtuse at apex; inner ones narrowly oblong, 2.6-3.6 mm long, about 1.8-2.2 mm wide, obtuse at apex, stamens 6, filaments shorter than anthers, 0.7-0.8 mm long, white; anthers oblong, 1-1.5 mm long, white basifixied; pistillate flowers unknown.



Fig. 417. *Smilax lidaoensis* S. S. Ying, inflorescences



Fig. 418. *Smilax lidaoensis* S. S. Ying, close-up of inflorescences

Diagnosis.

The species is recognized by its dioecious flowers, usually 15-25 to form a umbel; 1-2 umbels to form an racemose inflorescence; ; tepals 6 in two series, the outer ones oblong, 2.5-3.5 mm long, about 2.5 mm wide, obtuse at apex; inner ones narrowly oblong, 2.6-3.6 mm long, about 1.8-2.2 mm wide, obtuse at apex, stamens 6, filaments shorter than anthers, 0.7-0.8 mm long, white; anthers oblong, 1-1.5 mm long, white basifixied.



Fig. 419. *Smilax lidaoensis* S. S. Ying, plants growing in site



Fig. 420. *Smilax lidaoensis* S. S. Ying, the holotype, TPRCH -113-084

(this holotype has transferred and deposited at TPRCH herbarium)

Distribution and phenology.

Smilax lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky places at elevations of 950-1500 meters. Its flowering time is May to June.



Fig. 421. *Smilax lidaoensis* S. S. Ying, close-up of flowers

41. One New Species of Genus *Osbeckia* (Melastriaceae) from Taiwan

Osbeckia taiwaniana S.S. Ying 台灣金錦香

Osbeckia taiwaniana S.S. Ying, *sp. nov.* 台灣金錦香

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 850 m alt. S. S. Ying, *s.n.* May 25, 2024. (holotype, TPRCH).



Fig. 422. *Osbeckia taiwaniana* S. S. Ying, close-up of flowers

Morphology : Erect low shrubs about 1.5 m high, stem short, terete, branched at base, red to purplish red, densely covered red hirsutes; branches erect to ascending, 45-70 cm long, red hirsutes. Leaves simple, opposite, oblong to ovate-oblong, 3.5-4.5 cm long, 1.5-2 cm wide, acuminate to acute at apex, obtuse to slightly cordate at base, coriaceous, entire and ciliate at margins, densely hirsute on both surfaces, lustrous dark green surface and pale green beneath, 3-5 nerved impressed surface and elevated beneath. Petioles 4-5 mm long, terete, hirsute, red.



Fig. 423. *Osbeckia taiwaniana* S. S. Ying, stem, leaves, flowers and fruits

Flowers solitary to 2, pink, 1.5-1.9 cm in diameter when opened, scentless, fascicled on terminal to secondary pair leaf-axil; pedicels 6-12 mm long, terete, green to red, hirsute; bracts lanceolate, 7-12 mm long, 2-3 mm wide, acuminate at apex, hirsute; hypanthium globose, 5-6 mm long, 4.5-5 mm wide, hirsute, green to red when in fruits; sepals 5, ovate-triangular, 3.5-4 mm long, 3 mm wide at base, acuminate at apex, hirsute outside and glabrous inside; petals 5, ovate, 8-12 mm long, 7-10 mm wide, obtuse at apex, wavy and ciliate at margins, 5-6 nerved from base to middle; stamens 5, uniform, filaments adnate at base of petals, 3.5-4 mm long, white; anthers oblong, yellow. 3-4 mm long, pore apical, connective prolonged in to a small indistinctly lobed collar; ovary 5-6 mm long, 4.5-4.8 mm wide, globose, 5-locular, united with hypanthium; style straight, 3-3 mm long, white; stigma caotiate, green.



Fig. 424. *Osbeckia taiwaniana* S. S. Ying, pedicels, bracts, calyx and petals.



Fig. 425. *Osbeckia taiwaniana* S. S. Ying, pedicels, fruits

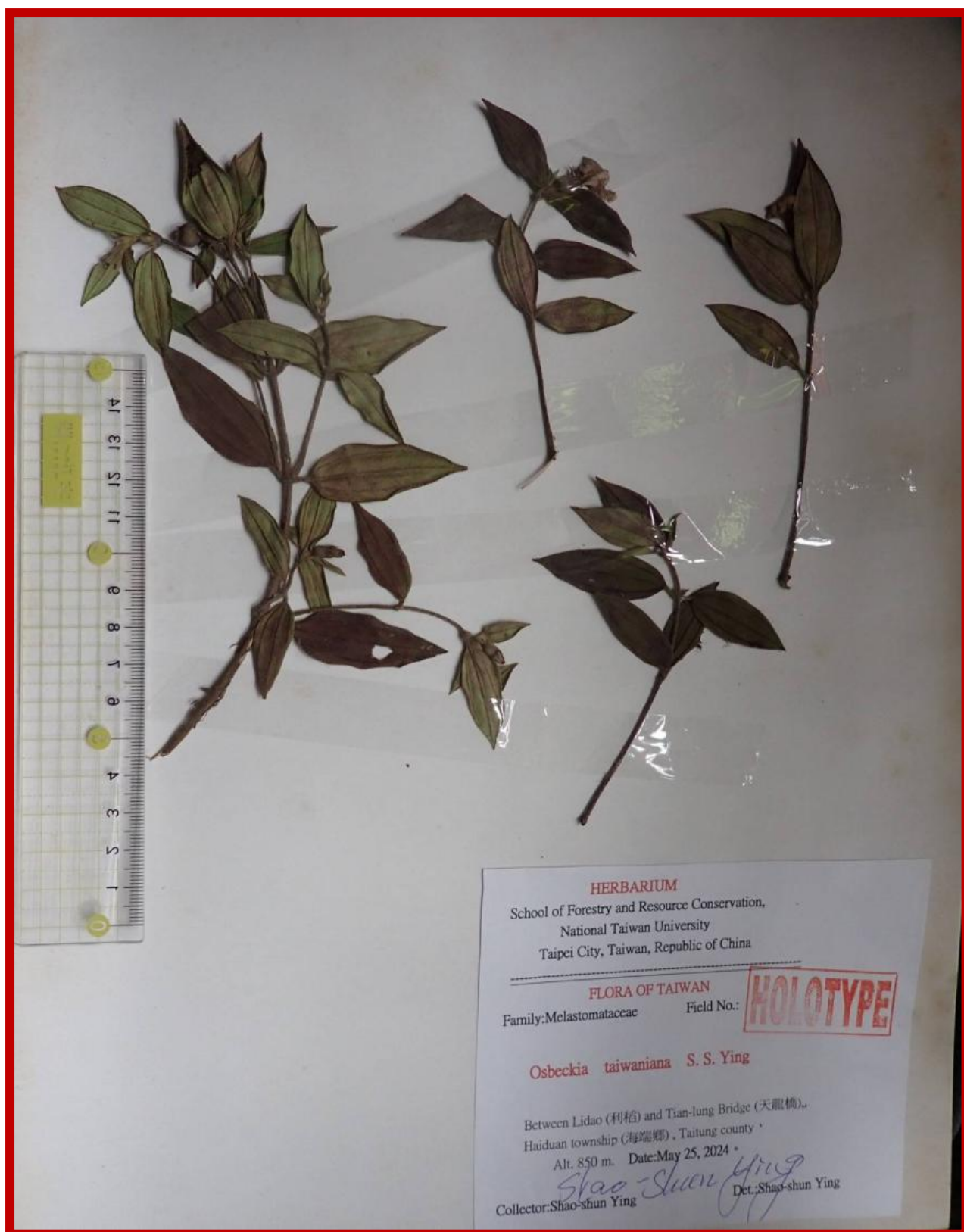


Fig. 426. *Osbeckia taiwaniana* S. S. Ying, the holotype TPRCH -113-085

(this holotype has transferred and deposited at TPRCH herbarium)

Fruit a capsule, globose, 4.5-5 mm in diameter, enclosed by a globose calyx tube with a short neck, reddish when mature; seeds minute, 0.2-0.3 mm long.



Fig. 427. *Osbeckia taiwaniana* S. S. Ying, plants growing in situ

Diagnosis.

The species is recognized by its low shrubs about 1.5 m high, flowers 5-merous, solitary to 2 fascicled on upward leaf-axils and ovate, obtuse at apex, wavy and ciliate at margins, 5-6 nerved from base to middle petals .

Distribution and phenology.

Osbeckia taiwaniana S.S. Ying is endemic to Taiwan . It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉) , Taitung county , eastern Taiwan. . It was discovered on the edge of forests at elevations of 850-1000 meters. Its flowering time is April to June and fruiting time is June to July.

42. Another New Species of Genus *Pilea* (Urticaceae) from Taiwan

Pilea lidaoensis S.S. Ying 利稻冷水麻

Pilea lidaoensis S.S. Ying, sp. nov. 利稻冷水麻

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 920 m alt. S. S. Ying, s.n. May 25, 2024. (holotype, TPRCH).



Fig. 428. *Pilea lidaoensis* S. S. Ying, female inflorescences

Morphology : Flowers dioecious: Annual terrestrial herbs, rootstock somewhat corm-like, elliptica, 6.5-7.5 mm in diameter, fleshy; roots many, slender, fibrous, Stem many, produced from rootstock, slender, branched, ascending to erect, 50-100 cm long, green to pale purplish, fleshy, glabrous, angular; branches ascending to erect, 15-25 cm long, glabrous. Leaves simple, opposite, oblong, 4.5-7.5 cm long, 2.2-3.5 cm wide, acuminate at apex, obtuse at base, chartaceous, remotely dentate at margins, glabrous on both surfaces, 3-nerved impressed surface and elevated beneath, lateral veins 4-6 per side also impressed

-357-

surface and elevated beneath but inconspicuous. Petioles 1.5-3.2 cm long, fleshy, pale purplish, grooved above, glabrous.



Fig. 429. *Pilea lidaoensis* S. S. Ying, branches and leaves

Flowers dioecious: female flowers, white tinged with green at tip, rather small, 2.5-3.5 mm in diameter when opened, but not widely opened, usually 5-20 flowers aggregate into a sessile head-like inflorescence, 3-6 head-like inflorescences to form a spike, 3-4 spikes verticillated on branches-node or leaf-axils; inflorescence rachis short, 8-15 mm long, somewhat robust, pale green to white, glabrous; pedicels 0-0.5 mm long, white, glabrous; bracts ovate, 0.5-1 mm long, 0.4-0.5 mm wide, acute at apex, cauduous; calyx tube globose, 0.4 mm across, white, glabrous, 4-lobed at apex; lobes triangular, 0.25-0.35 mm long, acute at apex, pale green; ovary ovoid to ellipsoid, 0.2-0.3 mm long, glabrous, stigma 1-2 haired, 0.3-0.35 mm long, white, exserted, cauduous. Staminate flowers unknown.



Fig. 430. *Pilea lidaensis* S. S. Ying, close-up of inflorescences



Fig. 431. *Pilea lidaensis* S. S. Ying, close-up of inflorescences



Fig. 432. *Pilea lidaoensis* S. S. Ying, the holotype TPRCH -113-086

(this holotype has transferred and deposited at TPRCH herbarium)

Diagnosis.

The species is recognized by its 50-100 cm high annual herbs with 5-20 flowers aggregate into a sessile head-like inflorescence, 3-6 head-like inflorescences to form a spike, 3-4 spikes verticillated on branches-node or leaf-axils and calyx tube globose, 0.4 mm across, white, glabrous, 4-lobed at apex; lobes triangular, 0.25-0.35 mm long, acute at apex.



Fig. 433. *Pilea lidaoensis* S. S. Ying, plants growing in situ

Distribution and phenology.

Pilea lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the edge of forests at elevations of 900-1100 meters. Its flowering time is May to June.

43. Three New Species of Genus *Sedum* (Crassulaceae) from Taiwan

A. *Sedum emarginatifolium* S.S. Ying 凹頭葉佛甲草

Sedum emarginatifolium S.S. Ying, sp. nov. 凹頭葉佛甲草

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Kuishan Forest Road (檜山林道), 2120 m alt. S. S. Ying, s.n. June 13 2024. (holotype, TPRCH) °



Fig. 434. *Sedum emarginatifolium* S. S. Ying, plants growing in situ

Morphology : Lithophytic, perennial, somewhat creeping herbs, roots fibrous, slender; stems fleshy, purplish red, glabrous, simple to branched upward, decumbent to ascending, 12-15 cm long,. Leaves simple, alternate to subopposite, ovate to ovate-rounded, 5-15 mm long, 4.5-6 mm wide wide, obtuse and emarginate at apex, attenuate to obtuse at base,

fleshy, lustrous green surface and pale green tinged with pale purple beneath, entire, glabrous on both surfaces, midrib and laterals inconspicuous on both surfaces. Petioles 3.2-4.5 mm long, glabrous, fleshy.



Fig.435. *Sedum emarginatifolium* S. S. Ying, branches and leaves, mind emarginate leaf apex

Flowers rather larger, yellow, 8.5-10 mm in diameter when opened, scentless, 3-5 in a terminal spicate, usually 1-2 spicate to form a compound spicate; spike decumben to hortizontal, 1.7-3 cm long, glabrous, purp;ish red; each flower subtended by one large and 2-3 small bracts; large bract linear, 3.5-4 mm long, 1.5-2.1 mm wide, obtuse at apex; smaller bracts 2.5-3.2 mm long, 1.5 mm wide, obtuse at apex; pedicels 0; sepals 5, smaller, spatulate to lanceolate-spathulate, 1.5-2.4 mm long, about 1-1.2 mm wide, obtuse at apex, green, glabrous; petals 5, lanceolate to oblong-lanceolate, 5.5-6.5 mm long, 1.5-2.4 mm wide, acuminate at apex, truncate at base, yellow, glabrous on both surfaces; stamens 10,



Fig. 436. *Sedum emarginatifolium* S. S. Ying, close-up of inflorescences



Fig. 437. *Sedum emarginatifolium* S. S. Ying, close-up offlowers

some without anthers; filaments slender, unequal, 5 long and 5 short, 5-5.5 mm long, 5 alternate to petals (longer ones), and the others opposite to petals (shorter ones), pale yellow; anthers rounded, 0.5 mm long and wide, brownish; connective conspicuous, yellow; nectar scales opposite, 0.3-0.4 mm across, emarginate at apex; carpels 5, pale yellowish green, free, connate at base, oblong, 3.4-4.5 mm long, glabrous; styles needle-like, 0.5-0.7 mm long, pale yellowish; stigma spot to capitate-like, pale green to grayish.

Fruit a follicle, oblong, 2.5-3.2 mm long, pale brown, caudate at apex, opened when mature; seeds numerous, rounded or nearly so, 0.2-0.25 mm across, smooth, glabrous.



Fig. 438. *Sedum emarginatifolium* S. S. Ying, leaves

Diagnosis.

Sedum emarginatifolium is characterized by its smaller rounded to ovate-rounded and emarginate apex leaves, flowers rather larger, yellow, 8.5-10 mm in diameter when opened, scentless, 3-5 in a terminal spicate, usually 1-2 spicate to form a compound spicate; stamens 10, some without anthers; filaments slender, unequal, 5 long and 5 short.

Distribution and phenology.



Fig. 439. *Sedum emarginatifolium* S. S. Ying, the holotype TPRCH -113-087

(this holotype has transferred and deposited at TPRCH herbarium)

Sedum emarginatifolium S.S. Ying is endemic to Taiwan. It is known on under the *Chamaecyparis formosensis* forest at Kuishan Forest Road (檜山林道), Guanwu (觀霧) area, Taian Townshap (泰安鄉), Miaoli County, central Taiwan. It was discovered the species under forests on mountain slopes at elevations of 2,100-2,450 meters. Its flowering time is June to July and fruiting time is July to August



Fig. 440. *Sedum emarginatifolium* S. S. Ying, plants growing in situ

B.Sedum guanwuense S.S. Ying 觀霧佛甲草

Sedum guanwuense S.S. Ying, sp. nov. 觀霧佛甲草

TYPE:TAIWAN. Miaoli County, Taian Townshaip (泰安鄉) , Guanwu (觀霧), Kuishan Forest Road (檜山林道), 2010 m alt. S. S. Ying , s.n. June 13 2024 . (holotype, TPRCH) .



Fig. 441. *Sedum guanwuense* S. S. Ying, plants growing in situ

Morphology : Terrestrial, perennial, erect herbs, roots fibrous, tufted, 2-3 cm long; stems tufted at base, 4-6 from base, 5-6 cm long, fleshy, purplish red, glabrous, simple to branched upward, erect to ascending. Leaves simple, alternate, spatulate to ovate-spatulate, 8-10 mm long, 3.5-4 mm wide wide, obtuse at apex, attenuate at base, fleshy, lustrous green surface and pale green beneath, entire, glabrous on both surfaces, midrib and laterals inconspicuous on both surfaces. Petioles 2.2-2.5 mm long, glabrous, fleshy.



Fig. 442. *Sedum guanwuense* S. S. Ying, flower buds, mined bracts



Fig. 443. *Sedum guanwuense* S. S. Ying, close-up of inflorescences

Flowers rather smaller, yellow, 4.5-5.5 mm in diameter when opened, scentless, solitary on upper most leaf-axil or 2-3 flowers to form a spicate; spike erect, 8-15 mm long, glabrous, purplish red; each flower subtended by one large and 4-5 small bracts; large bract ovate, 2.5-2.8 mm long, 1.5 mm wide, obtuse at apex; smaller bracts 1.6-2.0 mm long, 1.4 mm wide, obtuse at apex; pedicels 0-5 mm long, pale purplish; sepals 5, smaller, spatulate to lanceolate, 1.5-2.3 mm long, about 1-1.2 mm wide, obtuse at apex, green, glabrous; petals 5, lanceolate to oblong-lanceolate, 3.5-4.5 mm long, 1.2-1.8 mm wide, acuminate at



Fig. 444. *Sedum guanwuense* S. S. Ying, close-up of flowers

apex, truncate at base, yellow, glabrous on both surfaces; stamens 10; filaments slender, subequal, 5 alternate to petals and the others opposite to petals pale yellow to greenish; anthers rounded, 0.4 mm long and wide, brownish; connective conspicuous, yellow; nectar scales opposite, 0.3-0.4 mm across, emarginate at apex; carpels 5, green, free, connate at base, oblong, 2.4-3.5 mm long, glabrous; styles needle-like, 0.3-0.5 mm long, pale yellowish green; stigma spot to capitate-like, pale green.

Fruit a follicle, oblong, 2.8-3.8 mm long, pale yellow, shortly caudate at apex, opened when mature; seeds few, rounded or nearly so, 0.2-0.25 mm across, smooth, glabrous.

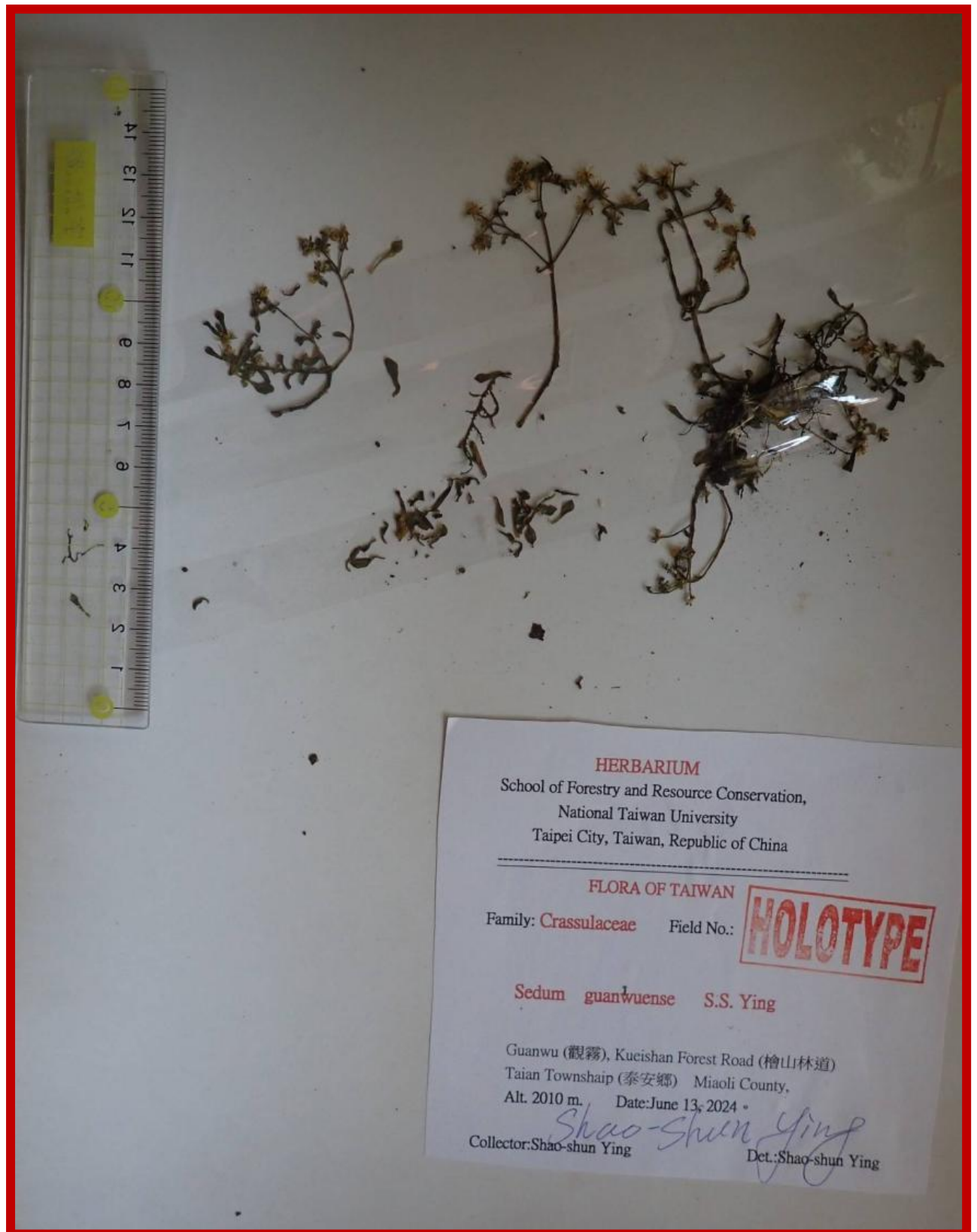


Fig. 445. *Sedum guanwuense* S. S. Ying, the holotype TPRCH -113-088

(this holotype has transfered and deposited at TPRCH herbarium)



Fig. 446. *Sedum guanwuense* S. S. Ying, close-up of fruits, some just opened

Diagnosis.

Sedum guanwuense is characterized by its stems tufted at base, 4-6 from base, 5-6 cm long, fleshy, purplish red, glabrous, simple to branched upward; flowers rather smaller, yellow, 4.5-5.5 mm in diameter when opened, scentless, solitary on upper most leaf-axil or 2-3 flowers to form a spicate and stamens 10; filaments slender, subequal.

Distribution and phenology.

Sedum guanwuense S.S. Ying is endemic to Taiwan. It is known on under the *Chamaecyparis formosensis* forest at Kuishan Forest Road (檜山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species under forests on mountain slopes at elevations of 1,800-2,250 meters. Its flowering time is June to July and fruiting time is June to August

C.*Sedum wulinense* S.S. Ying 武嶺佛甲草

Sedum wulinense S.S. Ying, sp. nov. 武嶺佛甲草

TYPE:TAIWAN.Nantou County, Jenai Townshaip (仁愛鄉) , Between Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan(合歡山)), 3250 m alt. S. S. Ying , s.n. July 18, 2024 。 (holotype , **TPRCH**) 。



Fig. 447. *Sedum wulinense* S. S. Ying, plants growing in situ

Morphology : Lithophytic, perennial, creeping herbs, roots fibrous, slender; stems fleshy, green tinged with purplish red, glabrous, simple to branched upward, decumbent to ascending, 17-25 cm long,. Leaves simple, alternate to subopposite, densely approximate, distichous, oblong, 9-15 mm long, 3.5-4 mm wide wide, obtuse at apex, obtuse at base, fleshy, lustrous green surface and pale green tinged with pale purple beneath, entire, glabrous on both surfaces, midrib and laterals inconspicuous on both surfaces. Petioles 0 mm long.

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Fig. 448. *Sedum wulinense* S. S. Ying, leaves and branches

Flowers rather larger, yellow, 8.5-10 mm in diameter when opened, scentless, 5-7 in a terminal simple spicate on each branch; spike decumbent to horizontal, 1.5-2.5 cm long, glabrous, green; each flower subtended by one bract; bract somewhat leaf-like, but smaller, 5.5-8 mm long, 2.5-3.1 mm wide, obtuse at apex; pedicels 0; sepals 5, smaller, oblong to oblong-spathulate, 2.5-3.5 mm long, about 1.5-1.9 mm wide, obtuse at apex, green, somewhat fleshy, glabrous; petals 5, ovate to oblong-ovate, 6.5-7.5 mm long, 2.5-3.2 mm wide, acute and with an arista at apex, truncate at base, yellow, glabrous on both surfaces; stamens 10; filaments slender, 5 longer which alternate to petals and 5 shorter which opposite to petals, pale yellow to yellow; anthers rounded, 0.5 mm long and wide, yellow; connective conspicuous, purple; nectar scales opposite, 0.3-0.4 mm across, emarginate at apex; carpels 5, pale yellow, free, connate at base, ovoid, 3.2-4.5 mm long, glabrous; styles needle-like, 0.8-0.9 mm long, pale yellowish; stigma spot to capitate-like, pale yellow.



Fig. 449. *Sedum wulinense* S. S. Ying, flowers in bud



Fig. 450. *Sedum wulinense* S. S. Ying, opening flowers

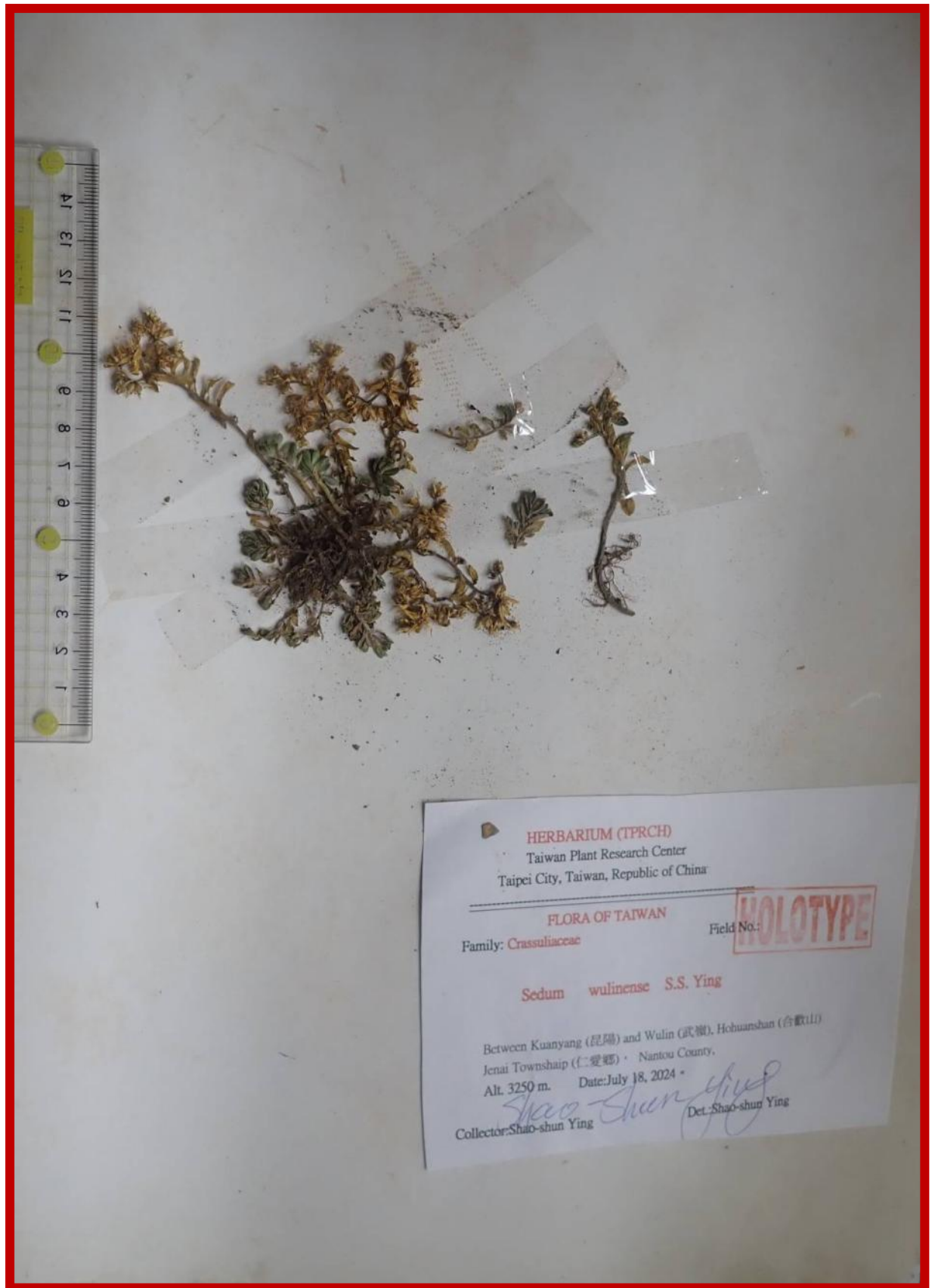


Fig. 451. *Sedum wulinense* S. S. Ying, the holotype TPRCH -113-089

Diagnosis.

Sedum wulinense is characterized by its simple, alternate to subopposite, densely approximate, distichous, oblong, 9-15 mm long, 3.5-4 mm wide leaves, and rather larger flowers which yellow in colour, 8.5-10 mm in diameter when opened, 5-7 in a terminal simple spicate on each branch; sepals 5, smaller, oblong to oblong-spathulate and petals 5, ovate to oblong-ovate, acute and with an arista at apex, truncate at base, yellow, glabrous on both surfaces.



Fig.452. *Sedum morrisonense* Hayata, plants growing in situ

Distribution and phenology.

Sedum wulinense S.S. Ying is endemic to Taiwan. It is known from between Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan(合歡山)), Jenai Townshap (仁愛鄉), Nantou county, central Taiwan. It was discovered the species on rocky and grass mountain slope at the elevations of 3,270- 3,460 meters. Its flowering time is July to August.

44. One New Species of Genus *Ranunculus* (Ranunculaceae) from Taiwan

Ranunculus hydrocotylifolius S.S. Ying 天胡荽葉毛茛

Ranunculus hydrocotylifolius S.S. Ying, sp. nov. 天胡荽葉毛茛

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2320 m alt. S. S. Ying, s.n. June 13 2024. (holotype, TPRCH) °



Fig. 453. *Ranunculus hydrocotylifolius* S. S. Ying, plants growing in situ

Morphology : Terrestrial, perennial, creeping herbs, usually forming a small area plant colony; roots fibrous, tufted, 2-5 cm long; stems erect, 2-3.5 cm long, unbranched, white long-hairy, terete, green; stolon elongate, 5-9 cm long, creeping, green, hairy. Leaves simple, alternate, basal, ovate to ovate-oblong in outline, 3-lobed, 1-1.5 cm long, 1.3-1.5 cm wide, obtuse at apex, cordate at base, thinly fleshy, dentate and ciliate at margins, lustrous green and scattered white spots surface, pale green beneath, glabrous on both surfaces,



Fig. 454. *Ranunculus hydrocotylifolius* S. S. Ying, close-up of leaves

palmately veins inconspicuous on both surfaces; central segment ovate, 5-6 mm long, 4.5-5.5 mm wide, 2-3 dentate at margins; lateral segments 4.5-5 mm long, 5-5.5 mm wide, ovate, 3-4 dentate at margins, acute at apex. Petioles elongate, 2.5-3.2 cm long, grooved above, scattered with elongate white hairs, green.

Flower solitary, rarely 2, 4-5 mm in diameter when opened, yellow, scentless; pedicels 2.5-3.5 cm long, erect, terete, glabrous or nearly so, green; receptacles about 1.5 mm long, clavate, glabrous; sepals 5, elliptic, 2-2.5 mm long, 1.4-1.8 mm wide, acute at apex, pale green, somewhat transparent; petals 5, obovate, 2.8-3.4 mm long, 1.5-1.9 mm wide, obtuse at apex, 5-nerved from base to apex; nectary pit without a scale, claws ca 0.3 mm long; stamens 10-15, filaments 1.2-1.5 mm long, anthers oblong, 0.5 mm long; gynoecium globose; carpels 13-18, ovaries ovoid, 0.8 mm long, laterally flattened, biconvex, glabrous; style 0.6 mm long, glabrous, recurved at apex.

Aggregate fruit subglobose, 2.5-3 mm long, 3-3.5 mm wide, green; achenes obliquely ovoid, 1.5-2 mm long, 1.3-1.5 mm wide, laterally flattened, biconvex, glabrous, style 1.2-1.5 mm long, persistent, white, recurved at apex.



Fig. 455.*Ranunculus hydrocotylifolius* S. S. Ying,close-up of flower



Fig. 456.*Ranunculus hydrocotylifolius* S. S. Ying, close-up of flower



Fig. 457. *Ranunculus hydrocotylifolius* S. S. Ying, close-up of a aggregate fruits



Fig. 458. *Ranunculus hydrocotylifolius* S. S. Ying, plants growing in situ
(mind a *Hydrocotylia* sp. on left corner)



Fig. 459. *Ranunculus hydrocotylifolius* S. S. Ying, the holotype TPRCH -113-090

(this holotype has transfered and deposited at TPRCH herbarium)

Diagnosis.

Ranunculus hydrocotylifolius is characterized by its creeping herbs, usually forming a small area plant colony; stems erect, 2-3.5 cm long, unbranched, white long-hairy; stolon elongate, 5-9 cm long, creeping, green, hairy. Leave basal, ovate to ovate-oblong in outline, 3-lobed, dentate and ciliate at margins and with solitary, rarely 2 flowers.



Fig. 460. *Ranunculus hydrocotylifolius* S. S. Ying, plants growing in situ

Distribution and phenology.

Ranunculus hydrocotylifolius S.S. Ying is endemic to Taiwan. It is known from Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshap (泰安鄉), Miaoli County, central Taiwan. It was discovered the species on edges of the forests at the elevations of 2,100-2,600 meters. Its flowering time is June and fruiting time is June to July..

45. Two New Species of Genus *Lysimachia* (Primulaceae) from Taiwan

A. *Lysimachia xiangyangensis* S.S. Ying 向陽珍珠菜

Lysimachia xiangyangensis S.S. Ying, sp. nov. 向陽珍珠菜

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Xiangyang (向陽) and Lidao (利稻). 1691 m alt. S. S. Ying, s.n. June 22, 2024. (holotype, **TPRCH**).



Fig. 461. *Lysimachia xiangyangensis* S. S. Ying, plants growing in situ

Morphology : Annual lithophytic prostrate herbs about 12-25 cm long; rhizome not seen; roots fibrous, slender, usually penetrate to rocky crevasses. Stem slender, few branched, prostrate on rock, pale purplish, fleshy, scattered with elongate white hairs. Leaves simple, opposite, closely approximate, ovate to ovate-triangular, 0.7-1.3 cm long, 0.5-0.8 cm wide, acute at apex, cordate at base, fleshy, entire at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib impressed surface and elevated beneath, lateral veins inconspicuous; petioles 0-1.5 mm long, white hairy, purplish.



Fig. 462.*Lysimachia xiangyangensis* S. S. Ying, stem and leaves



Fig. 463.*Lysimachia xiangyangensis* S. S. Ying, plants growing in situ
(mind leaves closely approximated)



Fig. 464. *Lysimachia xiangyangensis* S. S. Ying, close-up of flower

Flower yellow to orange-yellow, solitary, rarely 2, terminal on the branches, 6-7 mm in diameter when opened, sessile; bracts ovate, 4-5.5 mm long, 3-3.5 mm wide, obtuse at apex, glabrous; pedicels 0; calyx 5-deeped lobed; the lobes lanceolate, 4-5 mm long, 0.8-1 mm wide, acuminate at apex, elongate white hairy outside, nearly glabrous inside; corolla yellow to orange-yellow, deeply 5-parted; lobes oblong, 5-6 mm long, 2.5-3.5 mm wide, obtuse at apex, sacttered with hairs at throat inside, wavy at margins; stamens 5, lean on style; filaments connate into a ring, 3-4 mm long, yellow; anthers elliptic, 1.5-2.5 mm long, yellow, dorsifixed; ovary globose, 2 mm across, pale green; style straight, slender, 3.5-4 mm long; stigma capitate, smooth, pale green.



Fig. 465. *Lysimachia xiangyangensis* S. S. Ying, wither flowers
(Mind flowers sessile, lanceolate calyx-lobes with elongate white hairs outside)



Fig. 466. *Lysimachia xiangyangensis* S. S. Ying, young fruits



Fig. 467. *Lysimachia xiangyangensis* S. S. Ying, the holotype TPRCH -113-091

(this holotype has transferred and deposited at TPRCH herbarium)

Fruit a capsule, globose, 4-4.5 mm in diameter, glabrous, calyx persistent.

Diagnosis.

Lysimachia xiangyangensis is characterized by its prostrate annual herbs, usually forming a small area plant colony; stems prostrate, few branches; leaves closely approximate, ovate to ovate-triangular and 1-2 sessile flowers.



Fig. 468. *Lysimachia xiangyangensis* S. S. Ying, plants growing in situ

Distribution and phenology.

Lysimachia xiangyangensis S.S. Ying is endemic to Taiwan. It is known from between Xiangyang (向陽) and Li-dao (利稻), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky montane slope at elevations of 1,500-2,110 meters. Its flowering time is June to July and fruiting time is July to August.

B.*Lysimachia humilis* S.S. Ying 小小珍珠菜

Lysimachia humilis S.S. Ying, sp. nov. 小小珍珠菜

TYPE:TAIWAN. I-Lan County,Chaochi Township (礁溪鄉), Wufengchi Waterfall (五峰旗瀑布) 180 m alt. S. S. Ying , s.n. June 29, 2024 . (holotype , **TPRCH**) .



Fig. 469.*Lysimachia humilis* S. S. Ying, close-up of plant

Morphology : Annual lithophytic suberect herbs about 4-8 cm long; rhizome not seen; roots fibrous, slender, usually penetrate to rocky crevasses. Stem slender, few branched at base, suberect, pale purplish, fleshy, scattered with white hairs. Leaves simple, opposite, , rounded to rounded-triangular, 5-7 mm long, 4-5 mm wide, obtuse at apex, obtuse to slightly cordate at base, fleshy, entire and ciliate at margins, scattered short hairy on both surfaces, lustrous green surface and pale green beneath, midrib impressed surface and elevated beneath, lateral veins inconspicuous; petioles 4-5 mm long, slightly winged on both side, white hairy, pale green.



Fig. 470. *Lysimachia humilis* S. S. Ying, close-up of flowers

Flower yellow to bright-yellow, usually 2 on terminal and secondary leaf-axil, 4-5 mm in diameter when opened, sessile; bracts lanceolate, 2.5-3.5 mm long, 1.5-2 mm wide, acute at apex, hairy, caudex; pedicels 0; calyx 5-deeply lobed; the lobes lanceolate, 3-4 mm long, 0.8 -1 mm wide, acuminate at apex, elongate white hairy outside, nearly glabrous inside; corolla yellow to bright-yellow, deeply 5-parted; lobes oblong, 4. 5-5 mm long, 2.5-3.5 mm wide, obtuse at apex, entire at margins; stamens 5, free; filaments slender, 3-4 mm long, pale yellow; anthers elliptic, 0.5-0.8 mm long, yellow, dorsifixed; ovary globose, 2 mm across, pale green, hairy; style straight, slender, shorter than filaments, pale yellow; stigma spot-like, smooth, greenish yellow

Fruit a capsule, globose, 3.5-4.5 mm in diameter, hairy, calyx persistent.

Diagnosis.

Lysimachia xhumilis is characterized by its suberect smaller annual herbs, usually 4-8 cm long; leaves simple, opposite, , rounded to rounded-triangular; flower yellow to

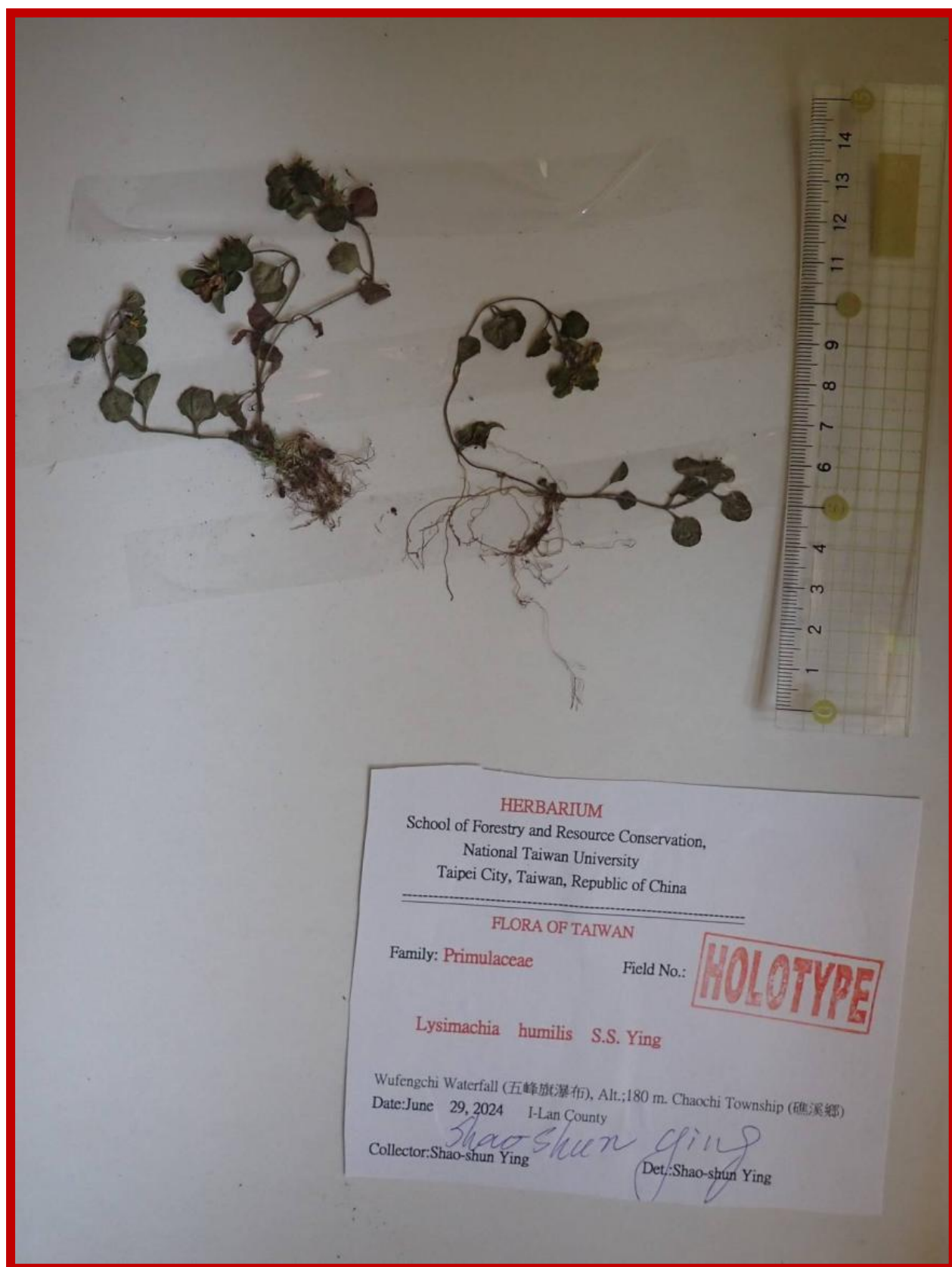


Fig. 471. *Lysimachia humilis* S. S. Ying, the holotype TPRCH -113-092

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 472. *Lysimachia humilis* S. S. Ying, close-up of young fruits



Fig. 473. *Lysimachia humilis* S. S. Ying, plants growing in situ

bright-yellow, usually 2 on terminal and secondary leaf-axil, 4-5 mm in diameter when opened, sessile and fruit a capsule, globose, 3.5-4.5 mm in diameter, hairy, calyx persistent.



Fig. 474. *Lysimachia humilis* S. S. Ying, plants growing in situ

Distribution and phenology.

Lysimachia humilis S.S. Ying is endemic to Taiwan. It is known from Wufengchi Waterfall(五峰旗瀑布) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on rocky cliff around the waterfall at elevations of 150-250 meters. Its flowering time is June and fruiting times July to August.

46. One New Species of Genus *Clinopodium* (Limaceae) from Taiwan

Clinopodium *xiangyangense* S.S. Ying 向陽光風輪

Clinopodium xiangyangense S.S. Ying, sp. nov. 向陽光風輪

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Xiangyang (向陽) and Lida (利稻). 2169 m alt. S. S. Ying, s.n. June 22, 2024. (holotype, TPRCH).



Fig. 475. *Clinopodium xiangyangense* S. S. Ying, plants growing in situ

Morphology: Annual small erect herbs, roots fibrous, slender, 1-3 cm long; stem simple to few branched at base, 8-15 cm long, erect to ascending, angular, pubescent, green; branches 4.5-5.5 cm long, green to green tinged with purple, hairy. Leaves simple, opposite, ovate to ovate-oblong, 0.8-1.5 cm long, 5.5-8.5 mm wide, obtuse to acute at apex, obtuse at base, dentate at margins, chartaceous, lustrous green surface and pale green



Fig. 476. *Clinopodium xiangyangense* S. S. Ying, habit

beneath; glabrous or nearly so on both surfaces; midrib impressed surface and elevated beneath; lateral veins 2-3 per side. Petioles 4-7 mm long, grooved above, hairy.

Flowers small, pink, 2-3 mm in diameter when opened, usually 15-25 flowers forming a terminal very short raceme and like a umbel; inflorescence erect to ascending, 2-3 cm long; peduncles 8-14 mm long, glabrous, green; bracts oblong, 2.5-3 mm long, 1.5-2 mm wide, acute at apex; pedicels 1.5-2 mm long, green, scattered hairs; calyx tubular, 3.5-4 mm long, about 2.5 mm wide, usually scattered hairy outside and glabrous inside, green; limb 2-lipped; upper lip 3-toothed, the teeth equal, triangular, 0.4-0.5 mm long, 0.3 mm wide, acute at apex; lower lip 2-toothed, linear, longer than the upper ones, 1.8-2.6 mm long, 1.5 mm wide, acute at apex, elongate ciliate at margins; corolla pink, 2-3 mm in diameter when opened, 2-lipped; tube slightly exserted, gradually dilated upward to throat, glabrous or nearly so; upper lip straight, 0.3-0.4 mm long, obtuse to slightly emarginate at apex; lower lip 3-lobed, 0.4-0.5 mm long, lateral lobes smaller, obtuse at apex; middle lobe somewhat large, obtuse at apex; stamens 4, anterior 2 longer than posterior 2, included, filaments slender, 0.8-1.6 mm long; anther cells 2, divaricate, \pm obliquely inserted on



Fig. 477. *Clinopodium xiangyangense* S. S. Ying, close-up of a inflorescence



Fig. 478. *Clinopodium xiangyangense* S. S. Ying, close-up of calyx



Fig. 479. *Clinopodium xiangyangense* S. S. Ying, the holotype TPRCH -113-093
(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 480. *Clinopodium xiangyangense* S. S. Ying, close-up of calyx and corolla

dilated connectives; style slender, included, 0.6-1.5 mm long, unequally 2-cleft; ovary globose, 0.5 mm across, glabrous. Fruit a nutlet, cylindrical, 0.5-0.6 mm long,.

Diagnosis.

Clinopodium xiangyangense is characterized by its small erect annual herbs, with simple to few branched at base, 8-15 cm long, erect to ascending stem; flowers small, pink, 2-3 mm in diameter when opened, usually 15-25 flowers forming a terminal very short raceme and like a umbel; corolla 2-lipped; lower lip 3-lobed, 0.4-0.5 mm long, lateral lobes smaller, obtuse at apex; middle lobe somewhat large, obtuse at apex,

Distribution and phenology.

Clinopodium xiangyangense S.S. Ying is endemic to Taiwan . It is known from between Xiangyang (向陽) and Li-dao (利稻), Haiduan township (海端鄉) , Taitung county , eastern Taiwan. . It was discovered on the rocky montane slope at elevations of 1,800-2,300 meters. Its flowering time is June to July and fruiting time is July to August.

47. One New Species of Genus *Rubus* (Rosaceae) from Taiwan

Rubus xiangyangianus S.S. Ying 向陽懸鉤子

Rubus xiangyangianus S.S. Ying, sp. nov. 向陽懸鉤子

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Xiangyang (向陽) and Lidao (利稻). 1769 m alt. S. S. Ying, s.n. June 22, 2024. (holotype, **TPRCH**).



Fig. 481. *Rubus xiangyangianus* S. S. Ying, branches, leaves and inflorescences

Morphology : Woody climbers up to 1.5 m tall, stem lignified, elongate, few-branched; the branches ascending to pendulous, 35-65 cm long, pale brown, without prickles, densely brownish villous. Leaves simple alternate, ovate to oblong in outline, 6-8.5 cm long, 6.5-8.5 cm wide, thinly coriaceous, acute at apex, deeply cordate at base, 3-5 lobed, serrate at margins, lustrous green surface, paler brownish glaucous beneath, 5-nerved, the nerves



Fig. 482. *Rubus xiangyangianus* S. S. Ying, branches, and leaves (without prickles)

slightly impressed surface and elevated beneath, glabrous on both surfaces. Petioles slender, 1.5-2.5 cm long, densely brownish villous.

Flowers 4-8 in a fascicle, white, 6-8 mm in diameter when opened, scentless, terminal and axillary; peduncles 0-10 mm long, brownish villous; pedicels short, 3-5 mm long, brownish villous; bracts ovate 4.8-6.5 mm long, 4-5 mm wide, acute at apex, villous, ciliate along the margins; calyx 5-6 mm long, 4-5 mm wide, 5-lobed; the lobes ovate-triangular, 4-5 mm long, 2.5-3.5 mm wide, acuminate and slightly caudate at apex, villous without and glabrous within, pale green; petals 5, white, broadly ovate, 4.5-5.5 mm long, 3.5-4.5 mm wide, obtuse at apex, shortly clawed at base, dentate to subentire at margins, glabrous; stamens numerous, inserted at mouth of hypanthium, slightly shorter than petals, filaments linear, white, glabrous; anthers didymous; carpels numerous, ovoid, 2.5-3.5 mm long, glabrous; style linear, elongate, 4.5-5.5 mm long; stigma capitate.



Fig. 483. *Rubus xiangyangianus* S. S. Ying, inflorescences on leaf-axils



Fig. 484. *Rubus xiangyangianus* S. S. Ying, inflorescences on terminal



Fig. 485. *Rubus xiangyangianus* S. S. Ying, close-up of flower

Aggregate fruits globose, 4.5-5.5 mm in diameter, persistent calyx usually covered the fruits, exocarps thin, not fleshy, red turn to black when mature.

Diagnosis.

Rubus xiangyangianus is characterized by its woody climbers up to 1.5 m tall, stem lignified, elongate, few-branched; the branches ascending to pendulous, 35-65 cm long, pale brown, without prickles, densely brownish villous. flowers 4-8 in a fascicle, white, terminal and axillary and petals 5, white, broadly ovate, obtuse at apex, shortly clawed at base, dentate to subentire at margins.

Distribution and phenology.

Rubus xiangyangianus S.S. Ying is endemic to Taiwan. It is known from between Xiangyang (向陽) and Li-dao (利稻), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the rocky montane slope at elevations of 1,600-2,100 meters. Its flowering time is June to July and fruiting time is July to August.



Fig. 486. *Rubus xiangyangianus* S. S. Ying, the holotype TPRCH -113-094
 (this holotype has transferred and deposited at TPRCH herbarium)



Fig. 487. *Rubus xiangyangianus* S. S. Ying, the holotype TPRCH -113-095

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 488. *Rubus formosensis* S (Kuntze) Kuntze

48. Three New Species of Genus *Hydrocotyle* (*Arailaceae*) from Taiwan

A. *Hydrocotyle humilis* S.S. Ying 小小天胡荽

Hydrocotyle humilis S.S. Ying, *sp. nov.* 小小天胡荽

TYPE: TAIWAN. I-Lan County, Chaochi Township (礁溪鄉), Wufengchi Waterfall (五峰旗瀑布). 179 m alt. S. S. Ying, *s.n.* June 29, 2024. (holotype, **TPRCH**).



Fig. 489. *Hydrocotyle humilis* S. S. Ying, close-up of plants

Morphology : Lithophytic annual, prostrate smaller herbs, usually rooting at stem nodes; roots slender, 2.5-3 cm long. Stem creeping, elongate, 15-25 cm long, green, glabrous, branched; branches 4-6.5 cm long, green, glabrous. Leaves, simple, alternate, remotely distance, orbicular-cordate or reniform, 4.5-5 mm long, 4-4.5 mm wide, obtuse to rounded at apex, cordate at base, chartaceous, 5-7 shallowly lobed at margins, 5-7-nerved which impressed and elevated beneath, glabrous on both surfaces, lustrous green surface and pale green beneath. Petioles 1-1.5 mm long, green, glabrous; stipules small, cauduous. t



Fig. 490. *Hydrocotyle humilis* S. S. Ying, close-up of leaves

Flowers very smaller, green, 0.5 mm in diameter when opened, green, scentless, 4-5 in an umbell, axillary; peduncles 5.5-6.5 mm long, longer than adjacent petiole, green, glabrous; pedicels lacking at anthesis; bracts minute, 0.3 mm long, cauduous; calyx absent; petals deltate, 0.25-3 mm long, 0.23 mm wide, acute at apex, green to pale green; stamens 5, minute, slightly incurved; filaments. 0.1 mm long; anthers bilobed; ovary minute, ellipsoidal, greenish; style 1, shotr, 0.06mm long persistent; stylopodium slightly elevated.

Fruits elliptic, compresse, 1.3-1.4 mm long, 0.8 mm wide, with obscure dorsal edges, glabrous, 3-ribbed, green; ribs somewhat inconspicuous; gruiting pedicels absent; style divergent, 0.15-0.18 mm lnog. .

Diagnosis.

Hydrocotyle humilis is characterized by its lithophytic annual, smaller, prostrate herbs, leaves, simple, alternate, remotely distance, orbicular-cordate or reniform, 4.5-5 mm long, 4-4.5 mm wide; flowers very smaller, green, 0.5 mm in diameter when opened, green, scentless, 4-5 in an umbell.

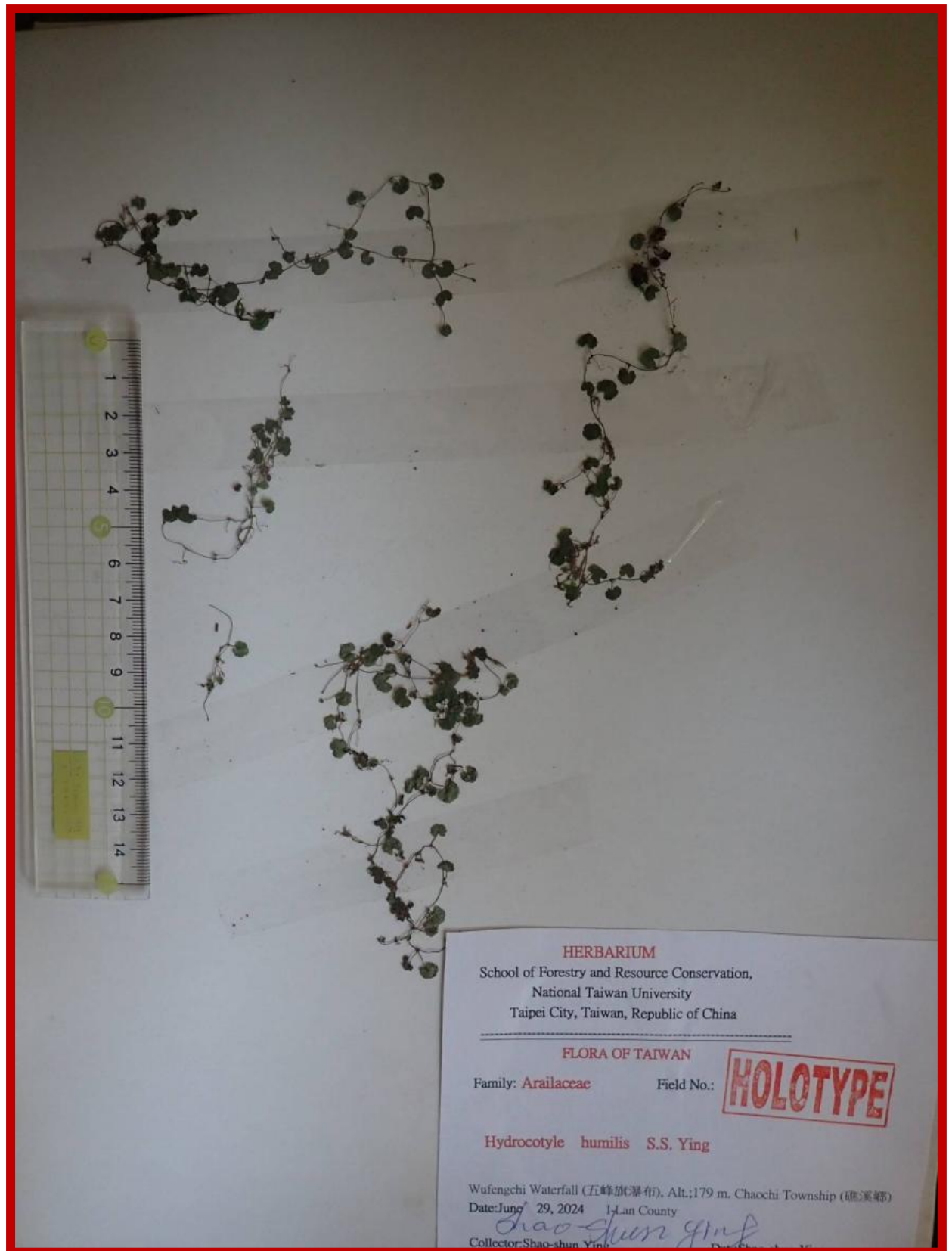


Fig. 491. *Hydrocotyle humilis* S. S. Ying, the holotype TPRCH -113-096

(this holotype has transfered and deposited at TPRCH herbarium)



Fig. 492. *Hydrocotyle humilis* S. S. Ying, close-up of fruits



Fig. 493. *Hydrocotyle humilis* S. S. Ying, plant with fruits

Distribution and phenology.

Hydrocotyle humilis S.S. Ying is endemic to Taiwan. It is known from Wufengchi Waterfall(五峰旗瀑布) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on rocky cliff around the waterfall at elevations of 150-250 meters. Its flowering time is May to June and fruiting times June to July.

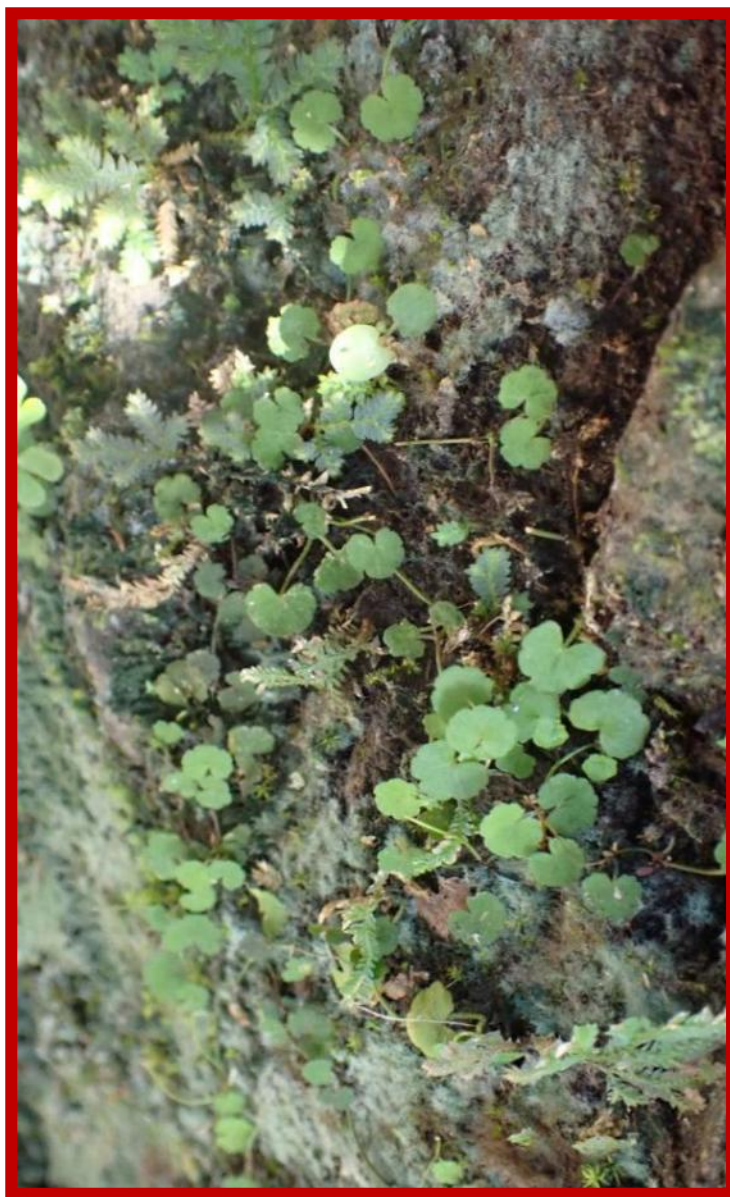


Fig. 494. *Hydrocotyle humilis* S. S. Ying, plants growing in situ

B.Hydrocotyle loshanensis S.S. Ying 樂山天胡荽

Hydrocotyle loshanensis S.S. Ying, sp. nov. 樂山天胡荽

TYPE:TAIWAN. Miaoli County, Taian Townshaip (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2320 m alt. *S. S. Ying, s.n. June 13 2024*. (holotype, **TPRCH**) .



Fig. 495. *Hydrocotyle loshanensis* S. S. Ying, close-up of inflorescence -

Morphology : Terrestrial annual, prostrate smaller herbs, usually rooting at stem nodes; roots slender, 2.5-3 cm long. Stem creeping, elongate, 25-35 cm long, green, white villous, branched; branches 4.5-6.5 cm long, green, white villous. Leaves, simple, alternate, orbicular-cordate or rounded, 1.8-2.5 cm long, 1.6-2.5 cm wide, obtuse to rounded at apex, V-shaped at base, chartaceous, 5-7 lobed at margins, dentate and slightly ciliate at margins, 5-7-nerved which impressed and elevated beneath, glabrous surface and pubescent beneath, lustrous green surface and pale green beneath. Petioles 1.5-2.5 cm long, green, white villous; stipules small, cauduous.



Fig. 496. *Hydrocotyle loshanensis* S. S. Ying, branches and leaves

Flowers very smaller, green, 1.7-2.5 mm in diameter when opened, pale yellowish green, scentless, 24-30 in an umbell, axillary; peduncles slender, 2.5-4.5 cm long, longer than adjacent petiole, green, pubescent; pedicels (rays) 4.5-5.5 mm long, glabrous;; bracts minute, 0.6 mm long, cauduous; calyx absent; petals deltate, 0.5-0.8 mm long, 0.45 mm wide, acute at apex, pale yellowish green; stamens 5, filaments slender, 0.6-0.8 mm long, white, slightly incurved; anthers ovoid, 0.5 mm across, bilobed; ovary minute, ellipsoidal, greenish; style 1, shotr, 0.4 mm long persistent; stylopodium slightly elevated.

Fruits elliptic, compresse, 1.5-3.2 mm long, 1.4 mm wide, with obscure dorsal edges, glabrous, 3-ribbed, green; ribs somewhat inconspicuous; fruiting peduncles 2-3.5 cm long, pubescent; pedicels 2.5-4 mm long, glabrous; style simple, 0.45-0.68 mm long, deciduous. .

Diagnosis.

Hydrocotyle loshanensis is characterized by its terrestrial annual, smaller, prostrate herbs, leaves 1.8-2.5 cm long, 1.6-2.5 cm wide, obtuse to rounded at apex, V-shaped at base, wide, 5-7 lobed at margins, dentate and slightly ciliate at margins;

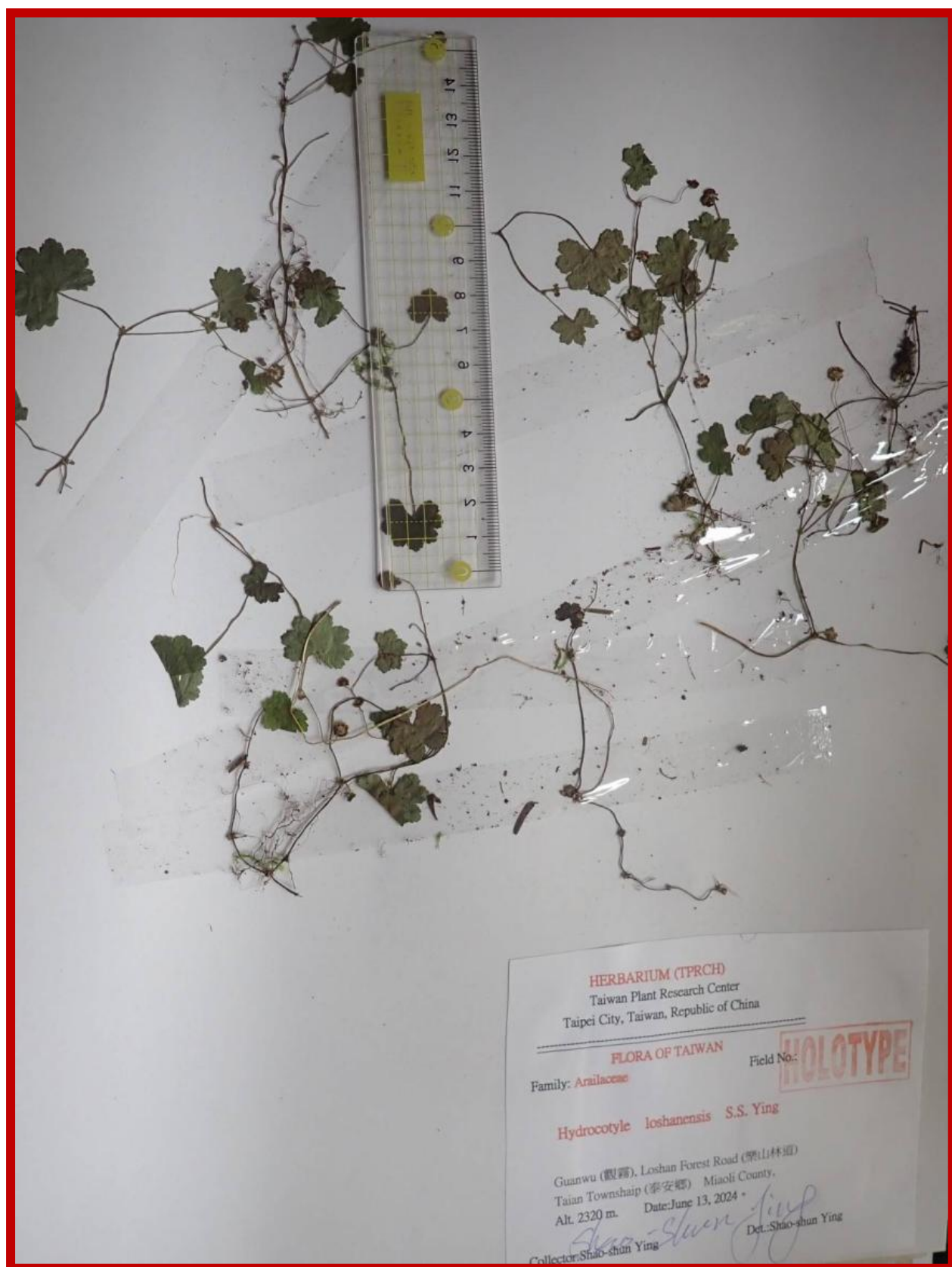


Fig. 497. *Hydrocotyle loshanensis* S. S. Ying, the holotype TPRCH -113-097



Fig. 498. *Hydrocotyle loshanensis* S. S. Ying, close-up of young fruits



Fig. 499. *Hydrocotyle loshanensis* S. S. Ying, plants growing in situ

flowers very smaller, green, 1.7-2.5 mm in diameter when opened, pale yellowish green, scentless, 24-30 in an umbell, axillary; peduncles slender, 2.5-4.5 cm long, green, pubescent; pedicels (rays) 4.5-5.5 mm long, glabrous.



Fig. 500. *Hydrocotyle loshanensis* S. S. Ying, plants growing in situ

Distribution and phenology.

Hydrocotyle loshanensis S.S. Ying is endemic to Taiwan. It is known from Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species on edges of the forests at the elevations of 2,100-2,600 meters. Its flowering time is June to July and fruiting time is July to August..

C. Hydrocotyle lalashanensis S.S. Ying 拉拉山天胡荽

Hydrocotyle lalashanensis S.S. Ying, sp. nov. 拉拉山天胡荽

TYPE: TAIWAN. Taoyuan City · Fuhsin District (復興區) · Lalashan (拉拉山), 2195 m alt.

S. S. Ying · s.n. August 01, 2024 ° (holotype, **TPRCH**) °



Fig. 501. *Hydrocotyle lalashanensis* S. S. Ying, plants with young fruits

Morphology : Terrestrial annual, prostrate, smaller herbs, usually rooting at stem nodes; roots slender, 1.5-2 cm long. Stem creeping, elongate, 15-25 cm long, green, white villous, branched; branches 2.5-4.5 cm long, green, white villous. Leaves, simple, alternate, orbicular-cordate or rounded, 1.2-1.5 cm long, 1.0-1.5 cm wide, obtuse to rounded at apex, narrowly V-shaped at base, chartaceous, 5-6 shallowly lobed at margins, dentate at margins, 5-7-nerved which slightly impressed and elevated beneath, scattered hirsute surface and white villous beneath, especially on veins, lustrous green surface and pale green beneath. Petioles 1.5-3.5 cm long, green, white villous; stipules small, cauduous.



Fig. 502. *Hydrocotyle lalashanensis* S. S. Ying, leaves and petiole, mind hirsute on leaf surface

Flowers very smaller, green, 1.3-1.5 mm in diameter when opened, pale green, scentless, 14-19 in an umbell, axillary; peduncles slender, 3.5-5.5 cm long, longer than adjacent petiole, green, pubescent; pedicels (rays) 0.5-1.5 mm long, glabrous;; bracts minute, 0.4 mm long, cauduous; calyx absent; petals deltate, 0.4-0.5 mm long, 0.4 mm wide, acute at apex, green; stamens 5, filaments slender, 0.3-0.4 mm long, pale green, slightly incurved; anthers ovoid, 0.4 mm across, bilobed; ovary minute, ellipsoidal, greenish; style 2, shotr, 0.5 mm long persistent; stylopodium slightly elevated.

Fruits elliptic, compresse, 1.5-3.5 mm long, 1.5 mm wide, with obscure dorsal edges, glabrous, 3-ribbed, black in mature; ribs somewhat inconspicuous; fruiting peduncles 4.5-5.5 cm long, pubescent; pedicels 0-0.5 mm long, glabrous; style 2, 0.3-0.45 mm long, persistent .

Diagnosis.

Hydrocotyle lalashanensis is characterized by its terrestrial annual, smaller, prostrate herbs, leaves 1.2-1.5 cm long, 1.0-1.5 cm wide, obtuse to rounded at apex, narrowly V-shaped at base, dentate at margins, scattered hirsute surface and white villous benesth, especially on veins; flowers 14-19 in an umbell, axillary; fruits elliptic, compressed, 1.5-3.5 mm long, 1.5 mm wide, black in mature; styles 2, persistent.

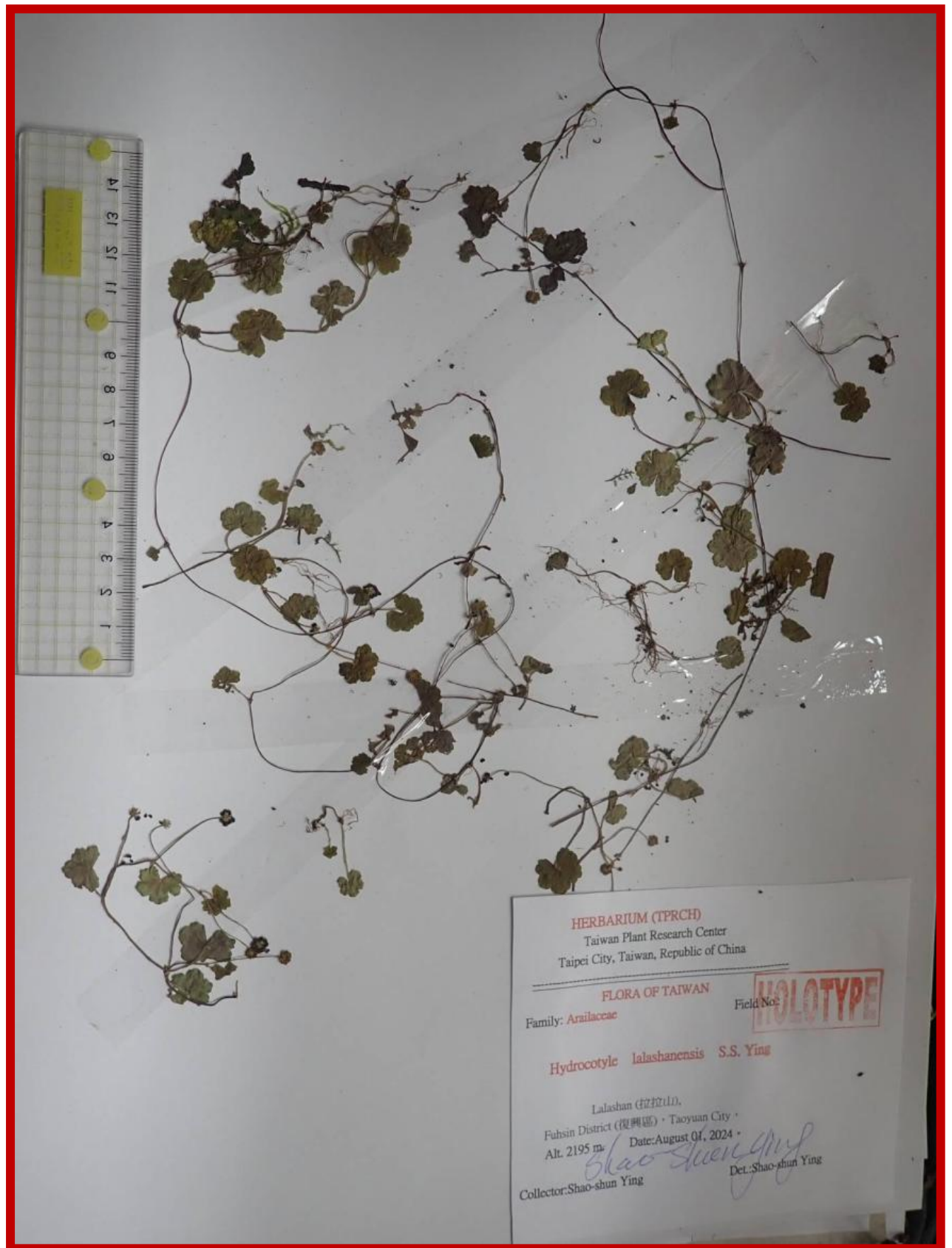


Fig. 503. *Hydrocotyle lalashanensis* S. S. Ying, the holotype TPRCH -113-098



Fig. 504. *Hydrocotyle lalashanensis* S. S. Ying, mature fruits

Distribution and phenology.

Hydrocotyle lalashanensis S.S. Ying is endemic to Taiwan. It is known from Lalashan (拉拉山), Fuhsin District(復興區), Taoyuan city, northern Taiwan. It was collected under the forests of *Chamaecyparis formosensis* between 1,950 and 2,400 m elevation and flowering time from June to July, fruiting time from July to August.



Fig. 505. *Hydrocotyle lalashanensis* S. S. Ying, plants growing in situ

49. One New Species of Genus *Corydalis* (*Papaveraceae*) from Taiwan

Corydalis taiuniflora S.S. Ying 台灣單花黃堇

Corydalis taiuniflora S.S. Ying, *sp. nov.* 台灣單花黃堇

TYPE: TAIWAN. Miaoli County, Taian Townships (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2250 m alt. S. S. Ying, s.n. July 11, 2024. (holotype, TPRCH).



Fig. 506. *Corydalis taiuniflora* S. S. Ying, plants growing in situ

Morphology : Annual or biennial, erect smaller herbs, usually prostrate on ground; roots slender, 3.5-6 cm long, fibrous; stolon absent. Stem simple, creeping, 6-9 cm long, green, glabrous, not branched. Leaves, simple to 2-pinnate, 6-7 cm long; the leaflets, 5-7, oblong, ovate and oblong-lanceolate (upward ones), 5-6 mm long, 3-4 mm wide, obtuse to acute at apex, obtuse at base, chartaceous, dentate at margins, lustrous green surface and pale to glaucous beneath, glabrous on both surfaces, midrib and lateral veins inconspicuous. Petioles 3-4.5 cm long, green, glabrous; petiolules 4-5 mm long, green, glabrous.



Fig. 507. *Corydalis taiuniflora* S. S. Ying, leaflet and flowers

Flowers solitary, on terminal leaf-axil, yellow, 5-6 mm in diameter when opened, 9-12 mm long, irregular, zygomorphic; pedicels 8-13 mm long, green, glabrous; sepals 2 in one whorl, orbicular, 8-9 mm long, 7-8 mm wide, dentate at apex, glabrous, caducous; petals 4, dimorphic, 2-seriate (2+2); outer petals 2: the upper petal oblong, 7-9 mm long, 2.5-3.2 mm wide, dorsally winged, wavy at tip, spurred at base; spur slender, straight, 4-4.5 mm long; lower petal concave, sub-saccate at base; inner petals 2, smaller and narrower, oblong, rounded at apex, winged at margins; stamens 6, diadelphous, 3+3, 6-7 mm long; anthers ovoid, dimorphic, yellow; ovary elongate, linear, 4-5 mm long, green, glabrous; style straight, 3-4 mm long, green, glabrous; stigma solitary, spot-like

fruit a capsule, elongate, torulose, 1.5-2 cm long, 2-3 mm wide, 4-5-seeded, green when young, glabrous; seeds rounded, 1.2-1.5 mm long, about 1.3 mm wide, smooth, depressed at base, arillate; aril minute, 0.5-0.6 mm long, 0.3 mm wide; pedicels 7-9 mm long, green, glabrous; style straight, 3-4 mm long, persistent..

Diagnosis.

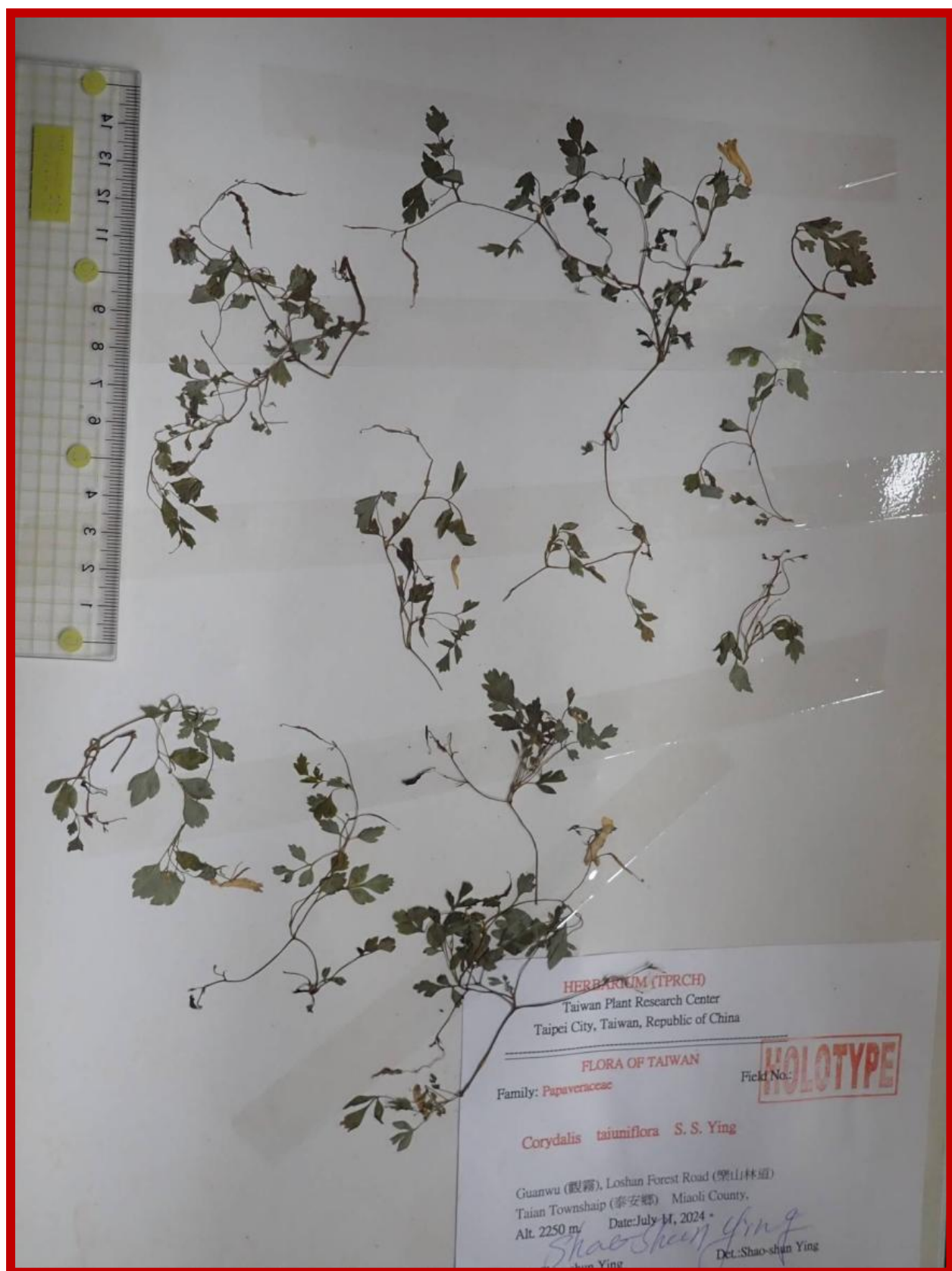


Fig. 508. *Corydalis taiuniflora* S. S. Ying, the holotype TPRCH -113-099



Fig. 509.*Corydalis taiuniflora* S. S. Ying, close-up of a flower



Fig. 510.*Corydalis taiuniflora* S. S. Ying, close-up of fruits

Corydalis taiuniflora is characterized by its smaller prostrate herbs; leaves, simple to 2-pinnate, 6-7 cm long; the leaflets, 5-7; flower solitary, on terminal leaf-axil, yellow, 5-6 mm in diameter when opened, 9-12 mm long, irregular, zygomorphic and elongate, torulose, 1.5-2 cm long, 2-3 mm wide, 4-5 -seeded capsule.



Fig. 511. *Corydalis taiuniflora* S. S. Ying, plantsw growing in situ

Distribution and phenology.

Corydalis taiuniflora S.S. Ying is endemic to Taiwan. It is known from Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species on edges of the forests at the elevations of 2,100-2,500 meters. Its flowering time is July and fruiting time is July to August..

50. One New Species of Genus *Hypericum* (*Hypericaceae*) from Taiwan

Hypericum kuanyangensis S.S. Ying 昆陽金絲桃

Hypericum kuanyangensis S.S. Ying, *sp. nov.* 昆陽金絲桃

TYPE: TAIWAN. Nantou County, Jenai Townshaip (仁愛鄉), Between Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan (合歡山), 3180 m alt. S. S. Ying, s.n. July 18, 2024. (holotype, **TPRCH**).



Fig. 512. *Hypericum kuanyangensis* S. S. Ying, a unopened flower

Morphology : Annual small herbs about 12 cm tall; stem simple, produced from a woody, root system, 10-14 cm long, terete, glabrous, green and somewhat tinged with purplish upper ward. Leaves simple, opposite, oblong to ovate (upper part of stem), 1.2-1.8 cm long, 6-8.5 mm wide, obtuse at apex, obtuse or slightly cordate and amplexual at base, chartaceous to thinly coriaceous, entire and black glands dots at margins, lustrous green



Fig. 513. *Hypericum kuanyangensis* S. S. Ying, stem and leaves

surface and pale green and glaucous beneath, scatters black glands dot all over, glabrous on both surfaces, midrib impressed surface and slightly elevated beneath, lateral veins 2-3 per side and impressed surface and elevated beneath, the surface sometimes forming distinct intramarginal vein; stipules alternate to the leaf, linear, 5-6 mm long, 1-1.5 mm wide, obtuse at apex, caudate. Petioles 0.

Flowers solitary, yellow, 1.2-1.6 cm in diameter when opened, terminal; pedicels 8-10 mm long, erect to ascending, green, glabrous; bracts paired, opposite, linear to lanceolate, 4-6 mm long, 2-4 mm wide, entire and black glands dots at margins, lustrous green surface and pale green beneath, scatters black glands dots all over; sepals 5, free, green, oblong to oblong-lanceolate, 4-5 mm long, 2-3 mm wide, obtuse at apex, truncate at base, gland dots at margins, 3-4 black gland lines outside, scatters black glands dots and glabrous on both surfaces; petals ovate-oblong, 9-16 mm long, 5-8 mm wide, yellow inside, 4-6 black stripes and partial purplish outside, obtuse at apex; stamens many, in 5 fascicles; filaments connate at 1/4 part of length, the free part slender, yellow, about 3-6 mm long; anthers small, 2-celled, yellow, dorsifixed; ovary ovoid, 2-3 mm long, about 1.5 mm wide,



Fig. 514. *Hypericum kuanyangensis* S. S. Ying, flower seen from back



Fig. 515. *Hypericum kuanyangensis* S. S. Ying, flower seen from front



Fig. 516. *Hypericum kuanyangensis* S. S. Ying, flower seen from side

3-celled, glabrous; style 3, slender, 4-6 mm long, stigmas 3, capitate, pale green.



Fig. 517. *Hypericum kuanyangensis* S. S. Ying, young fruits



Fig. 518. *Hypericum kuanyangensis* S. S. Ying, the holotype TPRCH -113-100

Fruit a capsule, the young fruits ovoid, 5-7 mm long, 4-6 mm wide, green tinged with purplish red.



Fig. 519. *Hypericum kuanyangensis* S. S. Ying, plants growing in situ

Diagnosis.

Hypericum kuanyangensis is characterized by its small annual herb, stem usually simple; oblong to ovate (upper part of stem) leaves and solitary, terminal flowers.

Distribution and phenology.

Hypericum kuanyangensis S.S. Ying is endemic to Taiwan. It is known from between Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan(合歡山)), Jenai Townshaip (仁愛鄉), Nantou county, central Taiwan. It was discovered the species on rocky mountain slope at the elevations of 3,070- 3250 meters. Its flowering time is July and fruiting time is July to August.

51. Two New Species of Genus *Bromus* (*Poaceae*) from Taiwan

A. *Bromus hohuanshanensis* S. S. Ying 合歡山雀麥

Bromus hohuanshanensis S.S. Ying, sp. nov. 合歡山雀麥

TYPE: TAIWAN. Nantou County, Jenai Townshaip (仁愛鄉), Between Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan (合歡山), 3240 m alt. S. S. Ying, s.n. July 18, 2024. (holotype, **TPRCH**).



Fig. 520. *Bromus hohuanshanensis* S. S. Ying, close-up of spikelet

Morphology: Annual herbs about 30-35 cm tall; flowering culm simple, erect to ascending, 2-3 noded; internodes smooth, glabrous; nodes glabrous. Leaf-sheath of cauline leaves glabrous; old basal sheath persistent, investing the culm base; blade of basal leaves linear, 17-25 cm long, 4-5 mm wide, acuminate, sheathed at base, glabrous, entire at margins, veins somewhat impressed on surface and elevated beneath; ligule membranous and

glabrous, short, 0.5 – 1 mm, apex truncated or rounded, more or less lacerated. .



Fig. 521. *Bromus hohuanshanensis* S. S. Ying, plants growing in situ

Spikelets 4-5, 2.5-4 cm long, 4-5 mm wide, in a terminal lax raceme, flowering culm erect to ascending, 30-35 cm long, green tinged with purple, glabrous; scale of the lower node leaf-like, 3-4 mm long; pedicels shorter than spikelets. each spikelets with 2 unequal glume and 5-7 fertile florets, imbricate; lower florets bisexual, 1.5-2 cm long, oblong, scaberulous toward the apex, dark purple; upper florets male or sterile, 8-14 mm long, lanceolate, glabrous; lower glume 2-3-veined, 1.4-1.7 cm long; upper glume 2-4-veined, 1.6-1.9 cm long; lemma lanceolate,, 1.6-1.9 cm long, section slightly keeled,

3-5-veined; apex of the lemma slightly emarginate, entire at margins; awn 4-7 mm long, fine and straight, inserted 1-1.5 mm below the apex; rhachilla 2-3 mm long, scabrid with very fine antrorse teeth; callus short, glabrous; pelea linear to lanceolate, similar size or shorter than the lemma, 1.3-1.6 cm long, 3-4 mm wide, with aculeolate keels; lodicules 2, lanceolate to oblong, glabrous, 0.7 – 1.5 mm long. Stamens 3, with anthers 3.5 – 4.5 mm long.

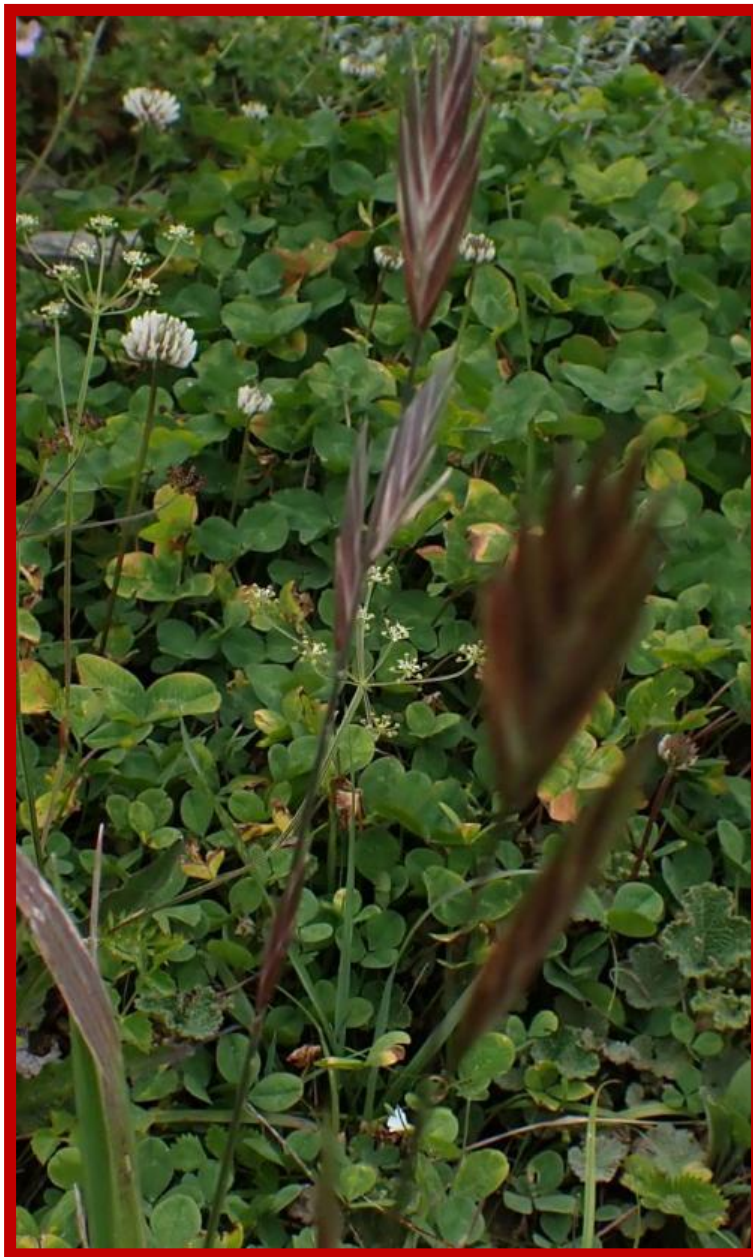


Fig. 522. *Bromus hohuanshanensis* S. S. Ying, inflorescences



Fig. 523. *Bromus hohuanshanensis* S. S. Ying, the holotype TPRCH -113-101

Diagnosis.

Bromus hohuanshanensis is characterized by its annual herbs about 30-35 cm tall (flowering culm); blade of basal leaves linear, 17-25 cm long, 4-5 mm wide, acuminate, sheathed at base, glabrous, entire at margins; spikelets 4-5, 2.5-4 cm long, 4-5 mm wide, in a terminal lax raceme, and each spikelets with 2 unequal glume and 5-7 fertile florets, imbricate; lower florets bisexual,, upper florets male or sterile.



Fig. 524. *Bromus hohuanshanensis* S. S. Ying, close-up of a spikelet

Distribution and phenology.

Bromus hohuanshanensis S.S. Ying is endemic to Taiwan. It is known from between Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan(合歡山)), Jenai Townshaip (仁愛鄉), Nantou county, central Taiwan. It was discovered the species on rocky mountain slope at the elevations of 3,070- 3,450 meters. Its flowering time is July and fruiting time is July to August.

B.Bromus *guanwuensis* S. S. Ying 觀霧雀麥

Bromus *guanwuensis* S.S.Ying, *sp. nov.* 觀霧雀麥

TYPE:TAIWAN. Miaoli County, Taian Townshaip (泰安鄉) , Guanwu (觀霧), Loshan Forest Road (樂山林道), 2320 m alt. S. S. Ying , *s.n.* August 8 2024 ° (holotype, TPRCH) °



Fig. 525. *Bromus guanwuensis* S. S. Ying, close-up of inflorescence

Morphology : Annual herbs about 50-65 cm tall; flowering culm branched, erect to ascending, 3-5 noded; internodes smooth, glabrous; nodes glabrous. Leaf-sheath of cauline leaves glabrous; old basal sheath persistent, investing the culm base; blade of basal leaves usually fascicled a plant colony, somewhat like that of *Miscanthus* species ,linear, 56-75 cm long, 3.5-4 mm wide, acuminate, sheathed at base, glabrous, entire at margins, midrib impressed surface and strongly elevated beneath; ligule membranous and glabrous, short, 0.5 – 1.2 mm, apex truncated or rounded, more or less lacerated. .



Fig. 526. *Bromus guanwuensis* S. S. Ying, plant colony somewhat like *Miscanthus*

Spikelets many, 2.2-2.8 cm long, 4.5-6 mm wide, usually 3-6 spikes to form a raceme, and 10-14 racemes to form a terminal lax panicle; flowering culm erect to ascending, 50-65 cm long, green, glabrous; scale of the lower node leaf-like, 3-4 mm long; floral rachis 15-28 cm long, glabrous, green; racmose peduncles 8-15 cm long, glabrous, green; pedicels 8-28 mm long, green, glabrous; spikeletss with 2 unequal glume and 4-6 fertile florets, imbricate; lower florets bisexual, 1.4-1.9 cm long, oblong, scaberulous toward the apex, whitish green with a purple tip; upper florets male or sterile, 7-12 mm long, lanceolate, glabrous, awn like at apex; lower glume 4-5-veined, 1.5-2.1 cm long; upper glume 3-5-veined, 1.6-1.9 cm long; lemma lanceolate,, 1.3-1.7 cm long, section slightly keeled, 3-5-veined; apex of the lemma slightly emarginate, entire at margins; awn 3-6 mm long, fine and straight, inserted 1-1.5 mm below the apex; rachilla 2-3 mm long, scabrid with very fine antrorse teeth; callus short, glabrous; pelea lanceolate, similar size or shorter then the lemma, 1.3-1.6 cm long, 3-4 mm wide, with aculeolate keels; lodicules 2,



Fig. 527. *Bromus guanwuensis* S. S. Ying, the holotype TPRCH -113-102



Fig. 528. *Bromus guanwuensis* S. S. Ying, the isotype TPRCH -113-103

lanceolate to oblong, glabrous, 0.7 – 1.5 mm long. Stamens 3, with anthers 3.5 – 4.5 mm long.



Fig. 529. *Bromus guanwuensis* S. S. Ying, close-up of spikelets

Diagnosis.

Bromus guanwuensis is characterized by its annual herbs about out 50-65 cm tall; usually fascicled a plant colony, somewhat like that of *Miscanthus* species; spikelets many, 2.2-2.8 cm long, 4.5-6 mm wide, usually 3-6 spikes to form a raceme, and 10-14 racemes to form a terminal lax panicle; spikelets with 2 unequal glume and 4-6 fertile florets, imbricate; lower florets bisexual, 1.4-1.9 cm long, oblong, scaberulous toward the apex, whitish green with a purple tip; upper florets male or sterile.

Distribution and phenology.

Bromus guanwuensis S.S. Ying is endemic to Taiwan. It is known from Loshan

Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. ◦ It was discovered the species on edges of the forests at the elevations of 2,100-2,600 meters. Its flowering time is June to july and fruiting time is July to August..



Fig. 530. *Bromus guanwuensis* S. S. Ying, plants growing in situ

52. One New Species of Genus *Poa* (*Poaceae*) from Taiwan

Poa paucispikelata S. S. Ying 少穗早熟禾

Poa paucispikelata S.S.Ying, sp. nov. 少穗早熟禾

TYPE: TAIWAN. Miaoli County, Taian Townshaip (泰安鄉), Guanwu (觀霧), 1980 m alt. S. S. Ying, s.n. August 8 2024. (holotype, TPRCH).



Fig. 531. *Poa paucispikelata* S. S. Ying, plants growing in situ

Morphology: Annual small herbs, about 10-15 cm tall; without cataphyllous shoots, tufted. tillers ascending, intravaginal. culm 4-6 cm long, terete, erect to ascending, smooth under raceme, green, glabrous; nodes 1-2, uppermost to 1/2 way up culm. Leaves basal, tufted, green; leaf sheath terete, smooth, glabrous, ribbed; collars smooth, glabrous; ligules 1.5-2 mm long, pointed; blade linear, 10-18 cm long, 2.5-3 mm wide, flat, scabrid, point at apex, never naviculate.



Fig. 532. *Poa paucispikelata* S. S. Ying, close-up of spikelets

Spikelets 4-7, smaller, closely approximate at apex of floral culm in racemose arrangement; raceme 7-8 mm long, 2.5-3 mm wide; spikelets 2.5-3 mm long, oblong; florets 2-3; rachillas glabrous, smooth; glumes oblong, 2.3-3 mm long, subequal, 3-nerved, slightly scabrous along keels and on the surfaces distally; lemmas 2-2.5 mm long, 1-3 weakly veined, lanceolate, pale green, distinctly keeled, glabrous, smooth; paleas slightly shorter than lemma, smooth between keels; anthers 0.9-1 mm long. .

Diagnosis.

Poa paucispikelata is characterized by its smaller, annual herbs about 10-15 cm tall; culm 4-6 cm long, terete, erect to ascending; leaves basal, tufted; ligules 1.5-2 mm long, pointed; blade linear, 10-18 cm long, 2.5-3 mm wide, flat, scabrid, point at apex; spikelets 4-7, smaller, closely approximate at apex of floral culm in racemose arrangement; spikelets 2.5-3 mm long, oblong; florets 2-3.

Distribution and phenology.

Poa paucispikelata S.S. Ying is endemic to Taiwan. It is known from under the



Fig. 533. *Poa paucispikelata* S. S. Ying, the holotype TPRCH -113-104

Chamaecyparis forosensis forest. Guanwu (觀霧) area, Taian Townshaip (泰安鄉) , Miaoli County, central Taiwan. ° It was discovered the species under the *Chamaecyparis formosensis* forests at the elevations of 1,800-2,400 meters. Its flowering time is August to September.



Fig. 534. *Poa paucispikelata* S. S. Ying, close-up of spikelets

53. One New Species of Genus *Symplocos* (*Symploaceae*) from Taiwan

Symplocos guanwuensis S. S. Ying 觀霧灰木

Symplocos guanwuensis S.S. Ying, sp. nov. 觀霧灰木

TYPE: TAIWAN. Miaoli County, Taian Townships (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2140 m alt. S. S. Ying, s.n. August 08, 2024. (holotype, TPRCH).



Fig. 535. *Symplocos guanwuensis* S. S. Ying, branches with flowers

Morphology : Evergreen small trees up to 5 m high, trunks straight, smooth, grayish black, much branched upward; branches elongate, 80-185 cm long, erect to ascending, terete, greenish gray, glabrous; young branches terete, glabrous. Leaves simple, alternate, ovate to ovate-oblong, 4.5-5.5 cm long, 1.5-2.5 cm wide, acuminate and caudate at apex, attenuate at base, coriaceous, crenate at margins, glabrous on both surface, lustrous green surface and pale green beneath, midrib and lateral veins (3-5 per side) impressed on surface and

elevated beneath, lateral veins somewhat inconspicuous. Petioles 8-10 mm long, terete, grooved above, glabrous, green.



Fig. 536. *Symplocos guanwuensis* S. S. Ying, branches and leaves

Flowers 4-6 in a fascicle, white, 5-6 mm in diameter when opened, scentless, borne on leaf-axil and branchlets, sessile or nearly so; bracts oblong, 2.2-2.8 mm long, about 2.5 mm wide, obtuse at apex, glabrous; sepals 5, somewhat connated at medium part, ovate, 1.5-2.5 mm long, 1.2-2.2 mm wide, obtuse at apex, greenish yellow, glabrous; corolla deeply 5-lobed, the tube very short, 1.5-2 mm long; the lobes oblong to ovate-oblong, 4.5-5.5 mm long, 3.5-4.7 mm wide, obtuse at apex, glabrous; entire at margins; stamens numerous; filaments slender, 6-9 mm long, white, glabrous; anthers ovoid, 0.5 mm long, yellow; disc intrastaminal, dome-shaped, glabrous; style slender, shorter than filaments, white, glabrous, elongate after anthesis; stigma capitate, about 1 mm across, green; ovary inferior.

Fruit a drupe, not seen in this study.



Fig. 537. *Symplocos guanwuensis* S. S. Ying, the holotype TPRCH -113-105

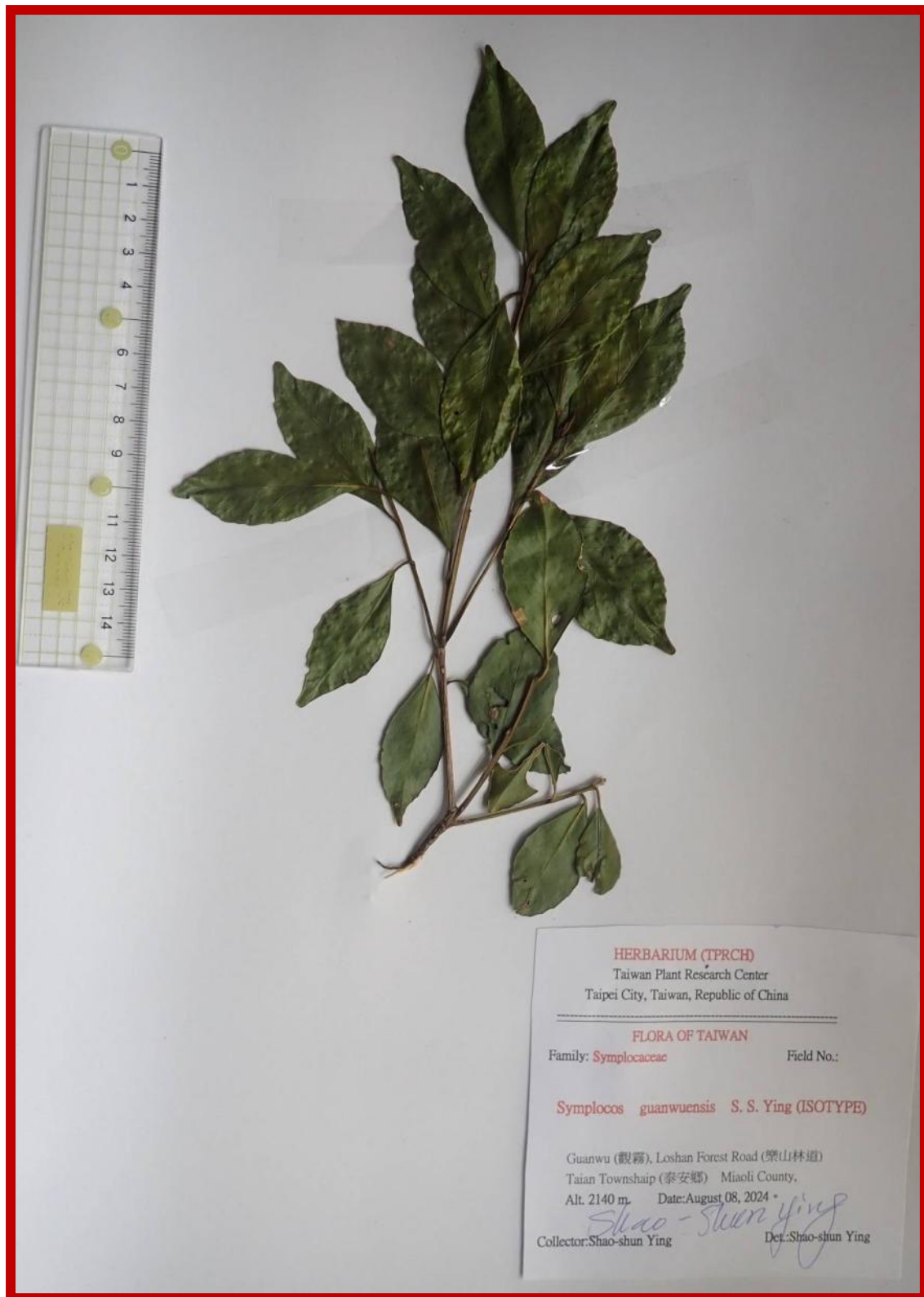


Fig. 538. *Symplocos guanwuensis* S. S. Ying, the isotype TPRCH -113-106



Fig.539. *Symplocos guanwuensis* S. S. Ying, close-up of flowers, calyx also seen

Diagnosis.

Symplocos guanwuensis is characterized by its small tree, leaves ovate to ovate-oblong, 4.5-5.5 cm long, 1.5-2.5 cm wide, acuminate and caudate at apex; flowers 4-6 in a fascicle, white, 5-6 mm in diameter when opened, borne on leaf-axil and branchlets, sessile or nearly so; sepals 5 somewhat connated at medium part, ovate, greenish yellow; corolla deeply 5-lobed, the tube very short, 1.5-2 mm long; the lobes oblong to ovate-oblong, 4.5-5.5 mm long, 3.5-4.7 mm wide, obtuse at apex, glabrous, entire at margins.

Distribution and phenology.

Symplocos guanwuensis S.S. Ying is endemic to Taiwan. It is known on under the roadsides of Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshap (泰安鄉), Miaoli County, central Taiwan. It was discovered the species edges of forests on mountain slopes at elevations of 2,150-2,550 meters. Its flowering time is Augus to September.

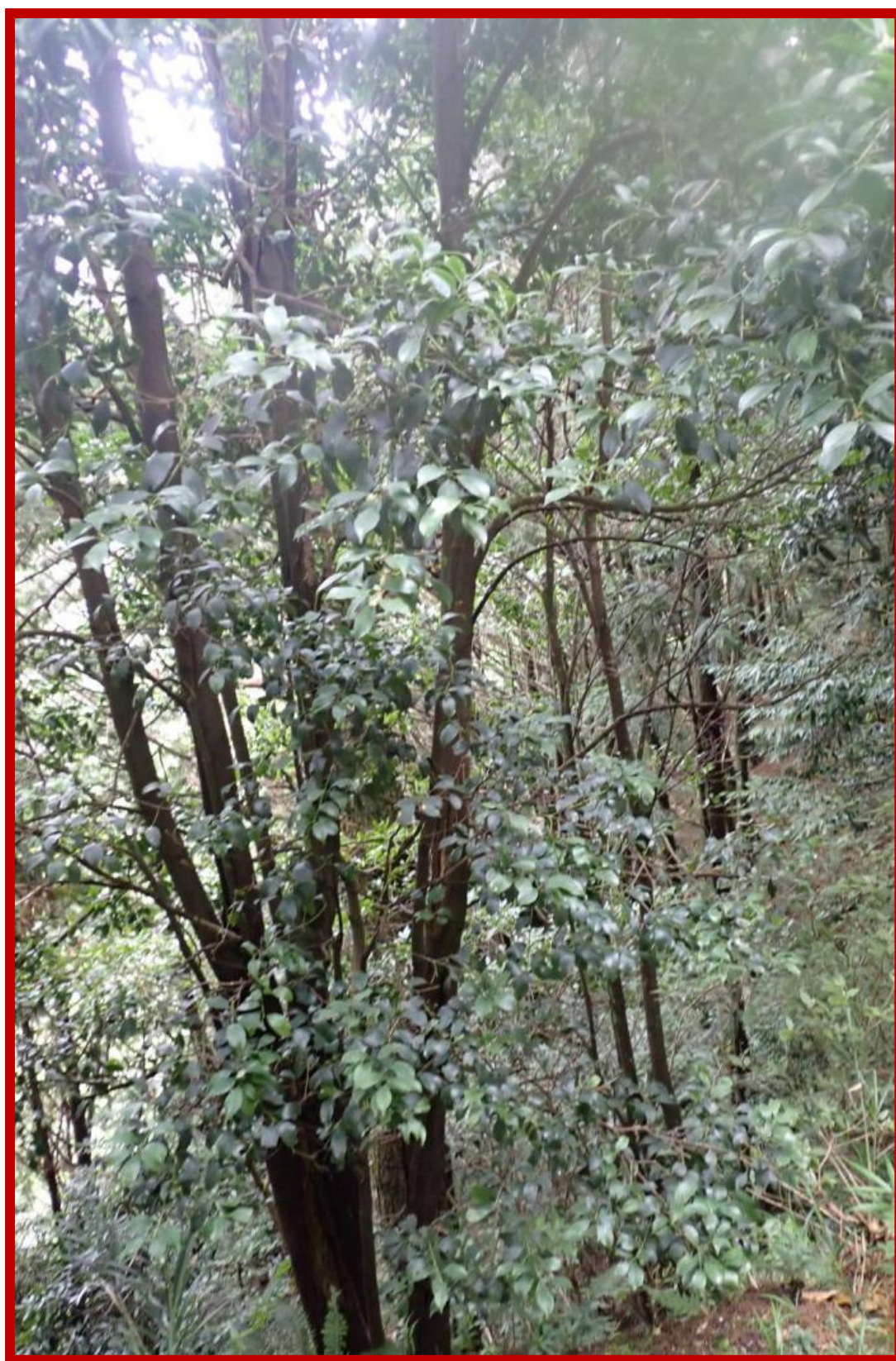


Fig. 540. *Symlocos guanwuensis* S. S. Ying, plants growing in situ
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54. One New Species of Genus *Angelica* (*Apiaceae*) from Taiwan

Angelica alpinohohuanshanensis S. S. Ying 合歡山頂當歸

Angelica alpinohohuanshanensis S.S. Ying, *sp. nov.* 合歡山頂當歸

TYPE: TAIWAN. Nantou County, Jenai Townshaip (仁愛鄉), Summit of Main Peak of Hohuanshan (合歡山主峰山頂), 3410 m alt. S. S. Ying, *s.n.* August 22, 2024° (holotype, TPRCH) °.



Fig. 541. *Angelica alpinohohuanshanensis* S. S. Ying, close-up of inflorescence

Morphology : A perennial herb with a slender plant body about 60-90 cm high, the plant body often wither and fall, reminded rootstock under ground in Winter; rootstock stout, oblong, 5-6.5 cm long, 4-5 cm across, aromatic; stem slender, often branched upward, 50-70 cm long, glabrous, green to purplish green; branches few, erect to ascending, 15-25 cm long, purplish, glabrous, smooth or slightly ribbed. Leaves 2-pinnate, 15-30 cm long, 8-10 cm wide; petioles 6-9 cm long, glabrous, green tinged with purplish; pinules 5-7, opposite, -453-



Fig. 542. *Angelica alpinohohuanshanensis* S. S. Ying, leaves

5-8 cm long, 3-5 cm wide, glabrous, petioles 2.5-4 cm long, glabrous; leaflets 5-7, blade ovate to ovate-oblong in outline, 2.5-3.5 cm long, 2-3 cm wide, chartaceous, incised to pinnatisect at margins, acute at apex, truncate at base, glabrous on both surfaces, midrib impressed surface and elevated beneath, with 2-4 mm long petioles; the terminal leaflet often 3-lobed at base.

Flowers many, small, white, 3.5-4.5 mm in diameter when open, about 18-26 flowers to form a umbel, nearly 8-10 umbels to form a compound umbel; 2-4 compound umbels produced from a plant, compound umbels 8-12 cm in diameter, peduncles 12-18 cm long, erect to ascending, green, glabrous; umbels 4.5-6.5 cm in diameter, terminal; peduncles 5.5-6.5 cm long, glabrous, green to pale purplish; involucral bracts ovate, 3.5-5 cm long, 3-4.5 cm wide, acute at apex, amplexicual at base, green, glabrous, cauduous; ray green tinged purplish, 8-12 mm long, glabrous; bracts cauduous; calyx teeth-like, obsolete; petals oblong to ovate-oblong, 2.2-3.5 mm long, about 1.5 mm wide, obtuse and slightly emarginate at apex, truncate at apex, wavy at margins, glabrous; stamens 5, filaments slender, filiform, white, longer than petals; anthers basifixed, black; ovary globose or



Fig. 543. *Angelica alpinohohuanshanensis* S. S. Ying, one compound umbel

nearly so, 2-3 mm across, white; stylopodium conic, white; style 1, elongate, erect, 4-5.5 mm long, white, stigma head-like.

Diagnosis.

The species is characterized by its slender plant volume, with 2-pinnate leaves, pinules 5-7, opposite; leadlets 5-7, blade ovate to ovate-oblong in outline, 2.5-3.5 cm long, 2-3 cm wide, chartaceous, incised to pinnatisect at margins; flowers many, small, white, 3.5-4.5 mm in diameter when open, about 18-26 flowers to form a umbel, nearly 8-10 umbels to form a compound umbel; 2-4 compound umbels produced from a plant; petals oblong to ovate-oblong, obtuse and slightly emarginate at apex, truncate at apex, wavy at margins.



Fig. 544. *Angelica alpinohohuanshanensis* S. S. Ying, the holotype TPRCH -113-107



Fig. 545. *Angelica alpinohohuanshanensis* S. S. Ying, the isotype TPRCH -113-108



Fig. 546. *Angelica alpinohohuanshanensis* S. S. Ying, the isotype TPRCH -113-109



Fig. 547. *Angelica alpinohohuanshanensis* S. S. Ying, one simple umbel



Fig. 548. *Angelica alpinohohuanshanensis* S. S. Ying, plants growing in situ
(with *Reynoutria japonica* Houtt.)



Fig. 549. *Angelica alpinohohuanshanensis* S. S. Ying, plants growing in situ
(with *Artemisia niitakayamensis* Hayata)

Distribution and phenology.

The species is endemic in Taiwan, It is known from summit of Main peak of Hohuanshan , Nantou county , central Taiwan ° It was found at opened rocky places usually mixed growing with *Artemisia niitakayamensis* Hayata and *Reynoutria japonica* Houtt. at elevations of 3,410-3,417 meters of Mt. Hohuanshan. Its flowering time is late of August °



Fig. 550.*Angelica alpinohohuanshanensis* S. S. Ying, inlorescences in bud

55. One New Species of Genus *Epilobium* (*Onagraceae*) from Taiwan

Epilobium alpinohohuanshanense S. S. Ying 合歡山頂柳葉菜

Epilobium alpinohohuanshanense S.S.Ying, sp. nov. 合歡山頂柳葉菜

TYPE: TAIWAN. Nantou County, Jenai Townshap (仁愛鄉), Summit of Main Peak of Hohuanshan (合歡山主峰山頂), 3407 m alt. S. S. Ying, s.n. August 22, 2024° (holotype, TPRCH) °.



Fig. 551. *Epilobium alpinohohuanshanense* S. S. Ying, plants growing in situ

Morphology : Annual erect to decumbent small herbs, about 18-28 cm high, stem erect, short, smooth, purplish green, branched at base, scattered short pubescent; branches 12-15 cm long, erect or ascending, green, scattered short pubescent. Leaves simple, opposite, oblong to oblong-lanceolate, 3.5-4.5 cm long, 8-10.5 mm wide, acuminate at pex, obtuse to

slightly cordate at base, chartaceous, acute-serrate at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib and lateral veins (3-5 per side) impressed surface and elevated beneath. Petioles very short, 1-2 mm long, glabrous or nearly so.



Fig. 552. *Epilobium alpinohuanshanense* S. S. Ying, branches and leaves

Flowers pink to purplish red, protandrous, 4.5-5.5 mm in diameter when opened, solitary on the each 3-5 leaf-axil upward of stem, and forming a simple raceme; the inflorescence 4.5-5.5 cm long, 6.7-7.5 cm in infructescence, greenish sometimes tinged with purple, glabrous or nearly so; bracts ovate to lanceolate, 2.5-3 mm long, 1.5-2.5 mm wide, acuminate at apex; sepals 4, adnate to ovary, purplish red, oblong-lanceolate, 3.5-4.5 mm long, 1.5-1.8 mm wide, obtuse at apex, glandular white hairs outside and glabrous inside; petals 4, pink to purplish red, ovate to oblong, 5.5-6.5 mm long, 2.5-3.2 mm wide, bilobed at apex; the lobes 0.35 mm long, obtuse at apex, veins inconspicuous, glabrous;

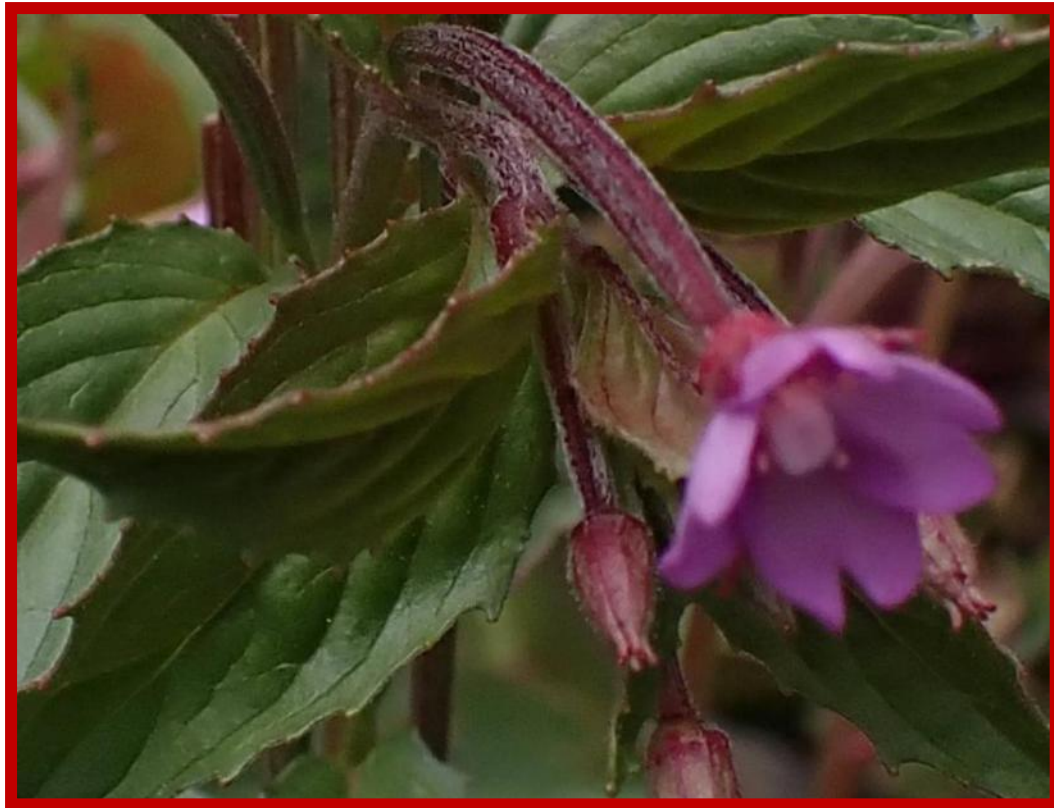


Fig. 553. *Epilobium alpinohohuanshanense* S. S. Ying, close-up of flowers
mind the ovaried densely covered with white villous hairs

stamens 8 in two series; filaments 1-2 mm long, white; anthers white, 0.5 mm long; ovary cylindrical, 3.2-4.5 cm long, 2-3 mm across, densely covered with white villous hairs, more or less 4-angular; style erect, shorter than petals.

Fruits capsule, cylindrical, 5.2-6.5 cm long, 2-3 mm across, erect to ascending, green tinged with purplish, pubescent, 4-celled, loculidical when mature. Seeds numerous, small, ellipsoid, 1.5-2.2 mm long, with terminal white coma; coma 2-3 mm long, detaching readily.

Diagnosis.

The species is characterized by its erect to decumbent small herbs; leaves oblong to oblong-lanceolate, 3.5-4.5 cm long, 8-10.5 mm wide; flowers pink to purplish red, solitary on the each 3-5 leaf-axil upward of stem, and forming a simple raceme; petals 4, ovate to oblong, 5.5-6.5 mm long, 2.5-3.2 mm wide, bilobed at apex; ovary cylindrical, 3.2-4.5 cm



Fig. 554. *Epilobium alpinohohuanshanense* S. S. Ying, the holotype TPRCH -113-110

long, 2-3 mm across, densely covered with white villous hairs; fruits elongate, cylindrical, 5.2-6.5 cm long, 2-3 mm across.



Fig. 555. *Epilobium alpinohohuanshanense* S. S. Ying, flowering plants

Distribution and phenology.

The species is endemic in Taiwan, It is known from summit of Main peak of Hohuanshan , Nantou county , central Taiwan ° It was found at opened rocky places at elevations of 3,400-3,417 meters of Mt. Hohuanshan. Its flowering time is late of August and fruiting time in September. °

56. A New combination of Genus *Aristolochia* (Aristolochiaceae) from China

Aristolochia cangyuanense (X.D.Ma &J.Y. Shen) S.S. Ying,

滄源馬兜鈴

Aristolochia cangyuanense (X.D.Ma &J.Y. Shen) S.S. Ying, *comb. nov.* 滄源馬

兜鈴

Isotrema cangyuanense X.D. Ma & J Y. Shen in Taiwania 68(3):323 (2023).

Since the genus *Aristolochia* Linn. is a valid generic name, and *Isotrema* is a synonym of *Aristolochia*, I transferred the species of *Isotrema cangyuanense* to the genus *Aristolochia* as above.

Type: CHINA, Yunnan Province, Cangyuan County, Menglai Township, Sigangli, limestone forest, twining around branches in the thickets, 23°19′ N, 99°19′ E, alt. 1204 m, the vouchers from a cultivated plant at Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, 10 October 2022, Xing-da Ma & Jian-yong Shen 1255 (holotype: HITBC; isotype: KUN).

Distribution and habitat:

Aristolochia cangyuanense (X.D.Ma &J.Y. Shen) S.S. Ying is currently known only from Sigangli Village, Menglai Township, Cangyuan County, Yunnan Province, China, grows in limestone forest at ca. 1200 m high elevation, on the southern slope, and the soil type is red soil. The dominant species in the area included *Castanopsis echidnocarpa* Miq., *Sterculia villosa* Roxb..

57. One New Species of Genus *Begonia* (*Begoniaceae*) from Taiwan

Begonia chingguoliaoensis S. S. Ying 金瓜寮秋海棠

Begonia chingguoliaoensis S.S. Ying, sp. nov. 金瓜寮秋海棠

TYPE: TAIWAN. New Taipei City, Pinglin District (坪林區), Chingguoliao (金瓜寮), 340 m alt. S. S. Ying, s.n. September 14, 2024. (holotype, **TPRCH**).



Fig. 556. *Begonia chingguoliaoensis* S. S. Ying, plants growing in situ

Morphology : Lithophytic and shade-loving perennial herbs, rhizome slightly robust, horizontal, fleshy, 3-6 cm long, 4-6 mm across, pale brownish, branched; fibrous roots few, slender, short, 2.5-3.5 cm long; stolon absent. Stemless. Leaves simple, medium-sized, with elongate petioles, ovate, 8-10 cm long, 5-6.5 cm wide, acuminate at apex, cordate and asymmetric at base, fleshy to thinly coriaceous, entire to slightly wavy and dentate at margins, lustrous green surface and pale green beneath, shortly white hairs scattered on both surfaces, especially on beneath veins, palmate-nerved usually impressed and slightly



Fig. 557. *Begonia chingguoliaensis* S. S. Ying, rhizomes



Fig. 558. *Begonia chingguoliaensis* S. S. Ying, leaves



Fig. 559. *Begonia chingguoliaensis* S. S. Ying, leaf-beneaths abd petioles

elevated beneath, the nerves on leaf-beneath usually purplish red in colour.. Petioles elongate, terete, 10-15 cm long, fleshy, purplish red, scattered with white hairs, Stipules smaller, usually cauduous.

Flowers solitary to 3-4 in a raceme, momoecious to dioecious, (usually when solirary flower) , rather smaller, pale pink to pink, 1.2-1.5 cm in diameter when opened; scape from the rhizome, 8-13 cm long, erect to ascending, green to pale purple, hairy, usually with 2 leaves on the top, and flower or inflorence growing between the leaves; bracts 2, opposite, ovate, 5-6 mm long, 3-4.5 mm wide, pale brownish, acute at apex, hairy, ciliate at maegins, cauduous; peduncles 3-4 cm long, purple red, hairy *with racemose inflorescence); pedicels slender, 15-24 mm long, white to pale pink, hairy; staminate flowers: tepal 4, unequal, 2 larger and 2 smaller; the large ones broadly ovate, 7-9 mm long, 4-6.5 mm wide, pale pink topink, obtuse at apex, entire and slightly wavy at margins, glabrous; the smaller ones ovate, 4.5-5.5 mm long, 3-4.5 mm wide, obtuse at apex, entire at margins, white; stamens numerous, filaments slender, 2.5-3 mm long, yellow, shortly fused at base; anthers 2-celled, rounded, 0.7 mm across, yellow; pistillate flowers: tepals 4



Fig. 560. *Begonia chingguoliaensis* S. S. Ying, 3-flowered inflorescence, monoecious



Fig. 561. *Begonia chingguoliaensis* S. S. Ying, solitary flower, dioecious



Fig. 562. *Begonia chingguoliaensis* S. S. Ying, male flower



Fig. 563. *Begonia chingguoliaensis* S. S. Ying, female flower



Fig. 564. *Begonia chingguoliaensis* S. S. Ying, the holotype TPRCH -113-111



Fig. 565. *Begonia chingguoliaensis* S. S. Ying, the isotype TPRCH -113-112

in 2 series, subequal, ovate, 5-6.5 mm long, 4.5-5 mm wide, obtuse at apex, white to pale pink, hairy; ovary trigonous-sub spherical, body 6.5-7.5 mm long, 4.5-5.5 mm wide, pink, 3-winged; wings subequal, triangular, 5.5-7 mm long, 4-5 mm wide, entire and wavy at margins. hairy; locules 3, placenta one per locule; styles 3, fused at base, 2.5 mm long, stigmas in a spiral and papillose.

Diagnosis.

The species is characterized by its entire to slightly wavy and dentated leaves and small solitary to 3-4 flowers, which usually monoecious (racemose inflorescence) to dioecious (solitary flower).



Fig. 566. *Begonia chingguoliaensis* S. S. Ying, plants growing in situ

Distribution and phenology.

The species is endemic in Taiwan, It is known from rocky mountain slope of Chingguolian (金瓜寮), Pinglin District (坪林區), New Taipei City, northern Taiwan. It was found at opened rocky places at elevations of 300-340 meters. Its flowering time is late of September.

58. One New Species of Genus *Melissa* (*Lamiaceae*) from Taiwan

Melissa taiwanensis S. S. Ying 台灣蜜蜂草

Melissa taiwanensis S.S. Ying, sp. nov. 台灣蜜蜂草

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2230 m alt. S. S. Ying, s.n. September 19, 2024. (holotype, TPRCH).



Fig. 567. *Melissa taiwanensis* S. S. Ying, flowering plant

Morphology: Terrestrial perennial herbs, about 30-50 cm high, stem short, much-branched; branches 20-25 cm long, glabrous, green, angular; branchlets 10-17 cm long, erect to ascending, grooved, glabrous, green. Leaves simple, opposite, ovate-lanceolate to ovate, 1.5-2.5 cm long, 8-15 mm wide, acuminate to acute at apex, attenuate at base, chartaceous, dentate at margins, glabrous on both surfaces, lustrous green surface, pale green beneath, midrib and lateral veins (2-3 per side) impressed surface and elevated beneath. Petioles 6-8



Fig. 568. *Melissa taiwanensis* S. S. Ying, branches, branchlets and leaves



Fig. 569. *Melissa taiwanensis* S. S. Ying, inflorescence, mind solitary to racemes

mm long, grooved above, green, glabrous.

Flowers few, solitary to short few-flowered racemes (not verticillated), 3-4 mm in diameter when opened, pink, on terminal or upward leaf-axils; peduncles 1-1.6 cm long, erect to ascending, green tinged with purplish, grooved, glabrous; pedicels 3-5 mm long, pink to purplish red, glabrous; bracts lanceolate, 3-4.5 mm long, 1.5-2.3 mm wide, acuminate at apex, glabrous; calyx campanulate, pubescent outside and glabrous inside, tube very short, about 2 mm long, 2-lipped at apex; upper lip shallowly 3-toothed, about 1.5 mm long; lower lip strongly 3-toothed, 2-2.5 mm long, obtuse at apex; corolla 2-lipped, slightly dilated at throat, glabrous; tube 3-4 mm long, upper lip straight, 1.5-2.5 mm long, slightly 2-lobed at apex; lower lip spreading, 3-4 mm long, 3-lobed, the lateral lobes rounded, obtuse at apex; middle slightly exserted, rounded at apex, wavy at margins;



Fig. 570. *Melissa taiwanensis* S. S. Ying, close-up of inflorescence

stamens 4, anterior 2 longer, clinging to upper corolla lip, slightly exserted, white; filaments arcuate, short; anthers 2-celled, initially divergent at nearly a right angle, becoming divaricate; style short, stigmas 2, subulate, revolute.

Nutlets small, ovoid, 2.5 mm long, 1.5-2 mm wide, usually hide in the calyx.



Fig. 571. *Melissa taiwanensis* S. S. Ying, close-up of flowers

Diagnosis.

The species is characterized by its small perennial herbs, about 30-50 cm high, stem short, much-branched; branches erect to ascending, green glabrous; flowers few, solitary to short few-flowered racemes (**not verticillated**), 3-4 mm in diameter when opened, pink, on terminal or upward leaf-axils and lower lip of corolla is spreading, 3-4 mm long, 3-lobed, the lateral lobes rounded, obtuse at apex; middle slightly exserted, rounded at apex, wavy at margins.



Fig. 572. *Melissa taiwanensis* S. S. Ying, the holotype TPRCH -113-113



Fig. 573. *Melissa taiwanensis* S. S. Ying, the isotype TPRCH -113-114

distribution and phenology.

Melissa taiwanensis S.S. Ying is endemic to Taiwan ° It is known along the roadsides of Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshap (泰安鄉), Miaoli County, central Taiwan. ° It was discovered the species edges of forests on mountain slopes at elevations of 2,050-2,450 meters. Its flowering time is September to October and fruiting time is October. .

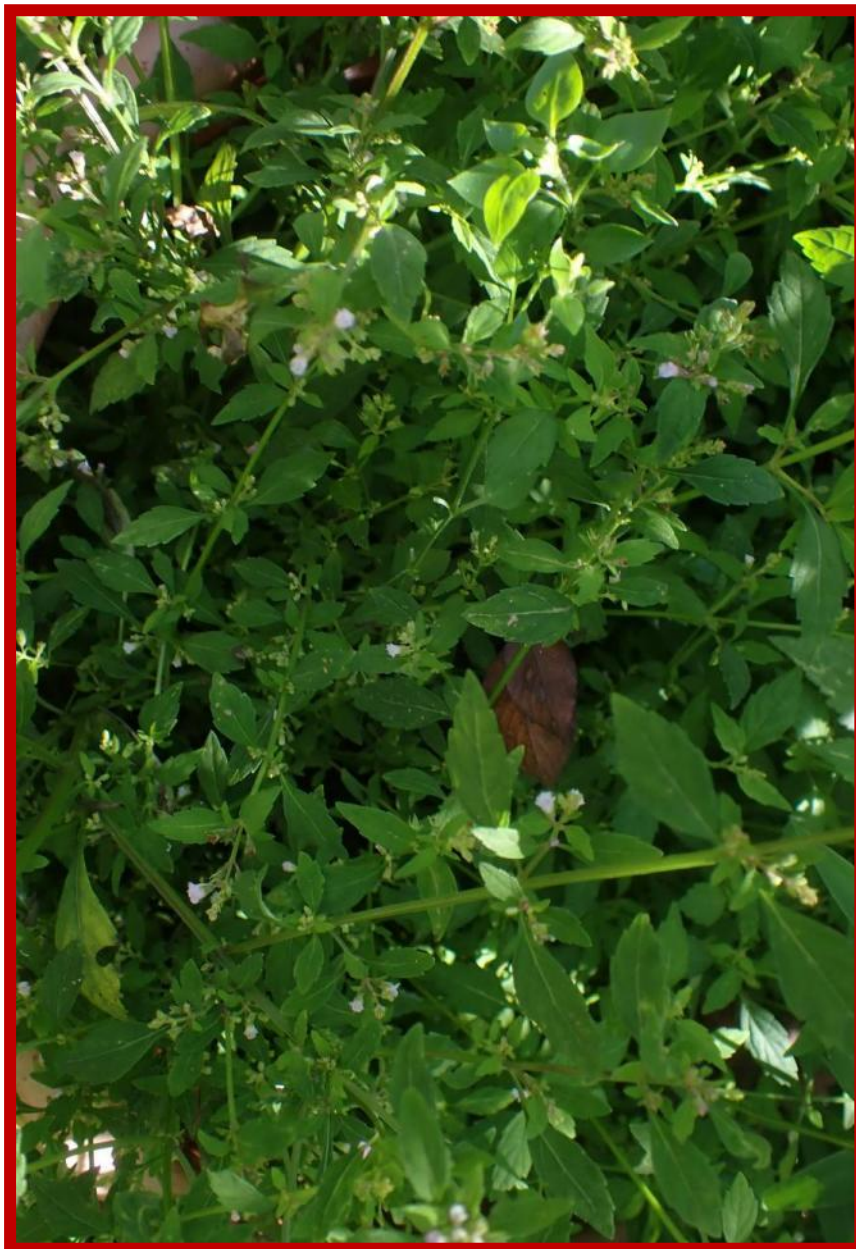


Fig. 574. *Melissa taiwanensis* S. S. Ying, plants growing in situ

59. One New Species of Genus *Balanophora* (*Balanophoraceae*) from Taiwan

Balanophora lalashanensis S. S. Ying 拉拉山蛇菰

Balanophora lalashanensis S.S. Ying, sp. nov. 拉拉山蛇菰

TYPE: TAIWAN. Taoyuan City, Fuhsin District (復興區), Lalashan (拉拉山), 2295 m alt.

S. S. Ying, s.n. September 26, 2024. (holotype, **TPRCH**).



Fig. 575. *Balanophora lalashanensis* S. S. Ying, plants growing in situ

Morphology : Parasitic perennial herbs, the host plant is *Chamaecyperis formosensis* and parasitic on its roots. the roots usually very robust and lignified, brownish, glabrous. Tubers above to below ground, 4-6, usually fuse each other and forming a complex body which 6-8 cm long, 5-8 cm wide, brownish, fleshy, glabrous to very fine villous hairs; each tuber ovoid to globose, 3-4.5 cm across, smooth, brownish, fine hairs, 4-5 lobed at apex; the lobes ovate to ovate-triangular, 5-5.5 mm long, about 4.5 mm wide, obtuse at apex. Leaves 5-6, basal, ovate to ovate-oblong, 8-16 mm long, 7-16 cm wide, fleshy, acute at



Fig. 576. *Balanophora lalashanensis* S. S. Ying, tubers fused each other

apex, truncate at base, pink to pale purplish.

Flowers dioecious, male plant unknown; female inflorescence in a terminal spike; peduncles 1-4 cm long, 3-4 mm across, erect to ascending, robust, red, fleshy, glabrous; spike globose, 2.5-3 cm in diamere; female numerous, minute, subsessile to short-pedicels, mostly arranged on the main axis among claviform bodies, occasionally attached to the lower part of claviform bodies; ovary 0.24-0.4 mm across; style 0.7-0.9 mm long. Fruit unknown.

Diagnosis.

The species is characterized by its dioecious parasitic perennial herbs; tubers 4-6, usually fuse each other and forming a complex body; each tuber ovoid to globose, 3-4.5 cm across, smooth, brownish, fine hairs, 4-5 lobed at apex; female inflorescence in a terminal spike; peduncles 1-4 cm long, 3-4 mm across; female numerous, minute, subsessile to short-pedicels, mostly arranged on the main axis among claviform bodies.

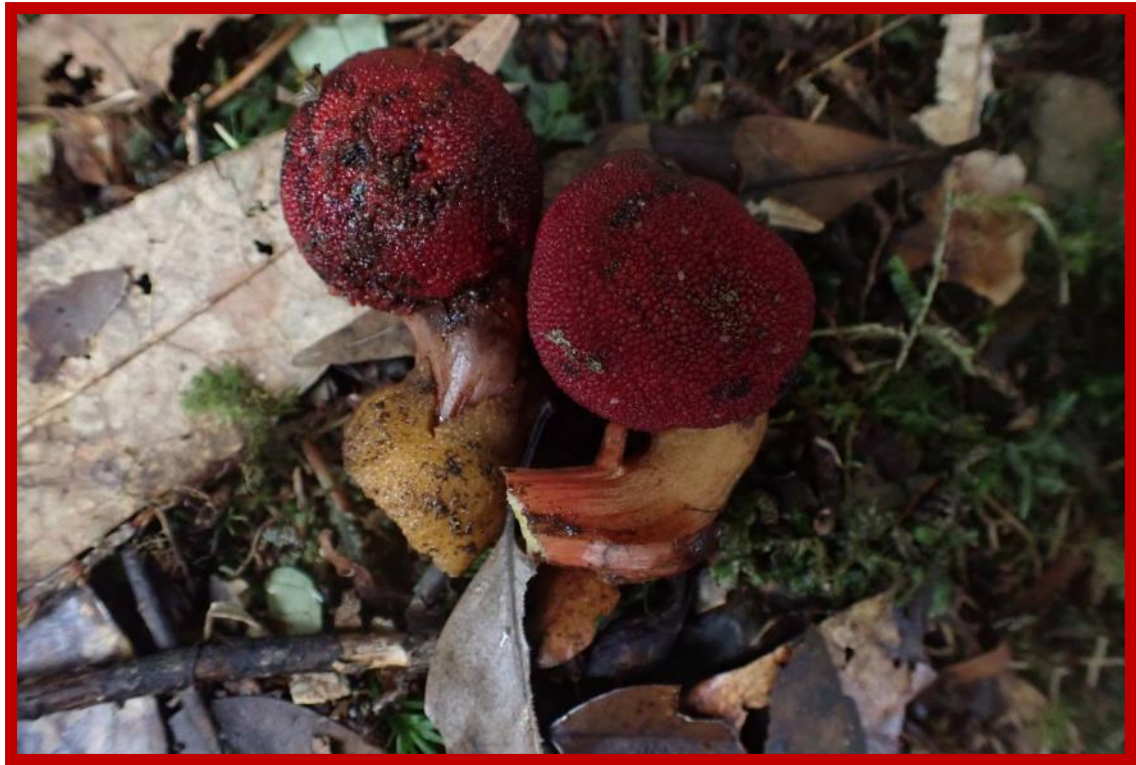


Fig. 577. *Balanophora lalashanensis* S. S. Ying, mind globose in shape
two spikes were taken from type plant for holotype



Fig. 578. *Balanophora lalashanensis* S. S. Ying, claviform and female flowers



Fig. 579. *Balanophora lalashanensis* S. S. Ying, the holotype TPRCH -113-115



Fig. 580. *Balanophora lalashanensis* S. S. Ying, the young plants



Fig. 581. *Balanophora lalashanensis* S. S. Ying, the young plants with fruits

Distribution and phenology.

Balanophora lalashanensis S.S. Ying is endemic to Taiwan ° It is known from Lalashan (拉拉山), Fuhsin District(復興區), Taoyuan city, northern Taiwan ° It was collected under the forests of *Chamaecyparis formosensis* between 1,950 and 2,400 m elevation and flowering time from September to October.



Fig. 582. *Balanophora lalashanensis* S. S. Ying, plants growing in situ
(showing the root to host plant)

60. One New Species of Genus *Tripterospermum* (*Gentianaceae*) from Taiwan

Tripterospermum *lalashanense* S. S. Ying 拉拉山肺形草

Tripterospermum lalashanense S.S.Ying, sp. nov. 拉拉山肺形草

TYPE: TAIWAN. Taoyuan City, Fuhsin District (復興區), Lalashan (拉拉山), 1995 m alt.

S. S. Ying, s.n. September 26, 2024. (holotype, **TPRCH**).



Fig. 583. *Tripterospermum lalashanense* S. S. Ying, flowers

Morphology : Perennial prostrate on ground herbs, not climbing other plants or trees, stems slender, twisted, terete, up to 45-60 cm long, purplish red to pale purple, glabrous, commonly with few secondary branches. Leaves simple, opposite, ovate to cordate-ovate, 5.5-6.5 cm long, 3.2-4.5 cm wide, acuminate to acute at apex, cordate at base, thinly fleshy, crenulate and slightly wavy at margins, green surface and pale green beneath, glabrous on both surfaces; 3-nerved at base, nerves impressed surface and elevated beneath, sometimes purplish red on nerves. Petioles 9-18 mm long, green, grooved above, glabrous, slightly winged on both sides.



Fig. 584. *Tripterospermum lalashanense* S. S. Ying, leaves

Flowers pale purple and white interval outside and white inside, sometimes pure white, 13-19 mm in diameter when opened, solitary to 2-5 in axillary fascicled; bracts pairs, lanceolate to ovate-lanceolate, 1-1.5 cm long, 4-4.5 mm wide, acuminate at apex, glabrous; pedicel 3-5 mm long, glabrous; calyx campanulate; tube 5-6 mm, with 5-slightly elevated ribs, 5-lobed at apex, glabrous; lobes linear to linear-lanceolate, 8-12 mm long, 1.5-2 mm wide, acute to acuminate at apex; corolla narrowly campanulate, not widely



Fig. 585. *Tripterospermum lalashanense* S. S. Ying, plants growing in situ



Fig. 586. *Tripterospermum lalashanense* S. S. Ying, plants growing in situ

opened, 3.2-3.6 cm long, 9-15 mm wide, 5-lobed at apex; lobes triangular, 3-5 mm long, acute at apex; plicae obliquely triangular, 2.5-3.5 mm long, white; stamens 5, included, filaments slender, linear, 1.8-2.5 cm long; anthers ovoid, ca. 1.5 mm long, yellow; disc 1.5-2.5 mm long; ovary cylindrical, 7-8 mm long; gynophore somewhat elongate, 3-4 mm long; style elongate, linear, 2.5-3.2 cm long, green, glabrous.



Fig. 587. *Tripterospermum lalashanense* S. S. Ying, calyx, corolla, stamens and style

Fruit a berry, ellipsoid, 1.5-1.9 cm long, 9-13 mm across, red-purple when mature, lustrous, glabrous, rounded at apex; fruit gynophore slender, 2.5-3 cm long, red-purple, glabrous. Seeds many in each fruit, ellipsoid to ovoid, triquetrous, 0.8-1 mm long, wingless, black to dark brown in color.

Diagnosis.

The species is recognized by its completely prostrate on ground perennial herbs; leaves simple, opposite, ovate to cordate-ovate; flowers pale purple and white interval outside and white inside, sometimes pure white, 13-19 mm in diameter when opened,



Fig. 588. *Tripterospermum lalashanense* S. S. Ying, the holotype TPRCH -113-116

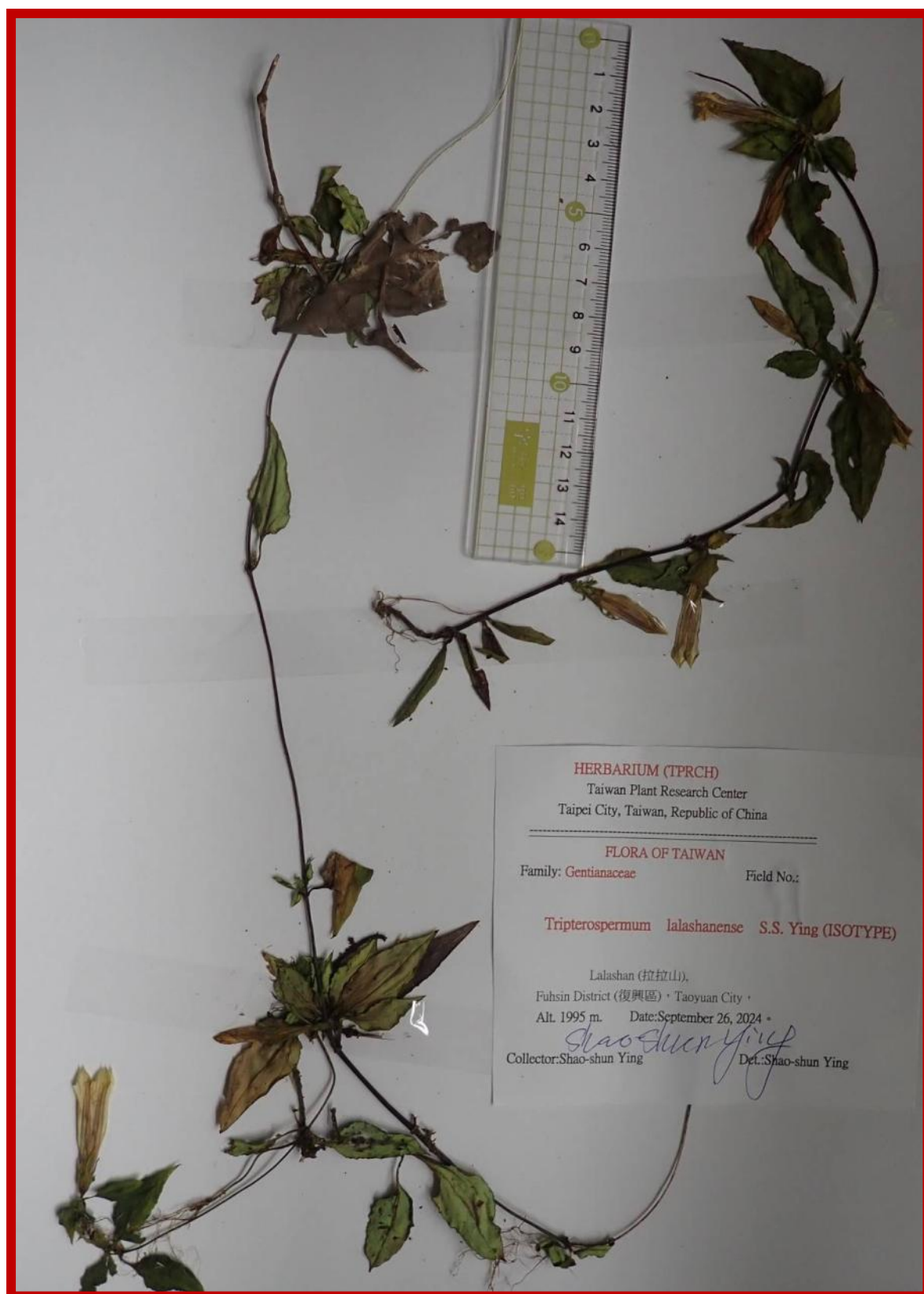


Fig. 589. *Tripterospermum lalashanense* S. S. Ying, the isotype TPRCH -113-117



Fig. 590. *Tripterospermum lalashanense* S. S. Ying, fruits

solitary to 2-5 in axillary fascicled and fruits ellipsoid, 1.5-1.9 cm long, 9-13 mm across, red-purple when mature,

Distribution and phenology.

Tripterospermum lalashanense S.S. Ying is endemic to Taiwan. It is known from Lalashan (拉拉山), Fuhsin District(復興區), Taoyuan city, northern Taiwan. It was collected on opened rocky montane slope between 1,850 and 2,100 m elevation and flowering time from September to October and fruiting time from December to January. r.

61. Another New Species of Genus *Boehmeria* (*Urticaceae*) from Taiwan

Boehmeria lalashanensis S. S. Ying 拉拉山苧麻草

Boehmeria lalashanensis S.S.Ying, sp. nov. 拉拉山苧麻

TYPE: TAIWAN. Taoyuan City, Fuhsin District (復興區), Lalashan (拉拉山), 2009 m alt.

S. S. Ying, s.n. September 26, 2024. (holotype, **TPRCH**)



Fig. 591. *Boehmeria lalashanensis* S. S. Ying, male inflorescences

Morphology : Small lithophytic annual herbs about 15-25 cm tall, stem short, few branched upward, smooth; branches 10-15 cm long, erect to ascending, shortly hairy, green to pale green. Leaves simple, opposite, ovate, broadly ovate to rounded-ovate, 5.5-9 cm long, 4.5-6.5 cm wide, acute at apex, obtuse to slightly cordate at base, chartaceous, dentate at margins, lustrous green surface and pale green slightly glaucous beneath, pubescent on both surfaces, 3 nerved impressed surface and elevated beneath, lateral veins conspicuous. Petioles 2.5-3.5 cm long, terete, grooved above, greenish purple, fleshy, pubescent.



Fig. 592. *Boehmeria lalashanensis* S. S. Ying, male plant growing in situ



Fig. 593. *Boehmeria lalashanensis* S. S. Ying, close-up of male inflorescences

Flowers dioecious, the male flowers 0.5-1 mm in diameter when opened, sessile, green, 4-merous, usually 1-4 flowers in a cluster; 14-18 clusters in a inflorescence; inflorescence 5-7 cm long (peduncles 1.2-1.8 cm long, flowering rachis 4.8-6.2 cm long), solitary to 2-3 clustered, terminal to axillary at upward leaf-axils, pubescent; clusters 3.5-5 mm in diameter, pubescent; bracts subtending flowers, triangular, 0.2-0.3 mm long, inconspicuous; perianth lobes minute, triangular, 0.15-2 mm long, acute at apex; filaments slender, 1.5-2 mm long, pale brownish; anthers ovoid, 0.4 mm across.



Fig. 594. *Boehmeria lalashanensis* S. S. Ying, female plant growing in situ

Female flowers numerous, small, 1.5-2.5 mm in diameter when opened, green, usually many flowers to form a cluster, 15-25 clusters to form a spike; the spike 5-7 cm long, usually 1-4 clustered, terminal to axillary at upward leaf-axils, green, pubescent; peduncles 1.5-1.8 cm long, green, pubescent; bracts subtending flowers narrowly triangular, 0.4-0.5 mm long, 0.4 mm wide, acute at apex, soon caducous; clusters spaces 0-10mm mm apart; clusters 2.5-3.5 mm in diameter; perianth lobes 4, ovate, 1.5-2 mm long, about 1 mm wide,



Fig. 595. *Boehmeria lalashanensis* S. S. Ying, close-up of female flowers

acute and caudate at apex, ovary ovoid, 0.4 mm long, style elongate, 2-2.5 mm long, stigma small.

Achenes usually with persistent pubescent perianth which fused with the pericarp, ovoid, 1-1.5 mm long, about 1.4 mm wide, compressed, glabrous; seeds obovoid, 0.4 mm long, 0.5 mm wide, with short wing along margins, style persistent at apex.

Diagnosis.

The species is recognized by its dioecious annual lower herb, leaves simple, opposite, ovate, broadly ovate to rounded-ovate, pubescent on both surfaces; the male flowers sessile, green, 4-merous, usually 1-4 flowers in a cluster; 14-18 clusters in a inflorescence; female flowers numerous, small, 1.5-2.5 mm in diameter when opened, green, usually many flowers to form a cluster, 15-25 clusters to form a spike; achenes usually with persistent pubescent perianth which fused with the pericarp, ovoid.



Fig. 596. *Boehmeria lalashanensis* S. S. Ying, the holotype TPRCH -113-118



Fig. 597. *Boehmeria lalashanensis* S. S. Ying, the isotype TPRCH -113-119

Distribution and phenology.

Boehmeria lalashanensis S.S. Ying is endemic to Taiwan ° It is known from Lalashan (拉拉山), Fuhsin District(復興區), Taoyuan city, northern Taiwan ° It was collected on opened rocky montane slope between 1,750 and 1,950 m elevation and flowering time from September to October and fruiting time from October to November.



Fig. 598. *Boehmeria lalashanensis* S. S. Ying, female plant

62. Taxonomic Notes on the Family Orchidaceae in Taiwan (4)

A. One New species of genus *Odontochilus* (Orchidaceae) from Taiwan

Odontochilus shaolinchianus S.S. Ying 邵氏齒唇蘭

Odontochilus shaolinchianus S.S. Ying, sp. nov. 邵氏齒唇蘭

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Xiangyang (向陽) and Lida (利稻). 1691 m alt. S. S. Ying, s.n. June 22, 2024. (holotype, **TPRCH**).



Fig. 599. *Odontochilus shaolinchianus* S. S. Ying, plant growing in situ

Morphology : Evergreen smaller perennial lithophytic herbs, Rhizome creeping, fleshy, 2-3 cm long, 2.8-3.5 mm in diameter, pale purplish, glabrous; internodes 7-9 mm long; roots hair-like, in row along rhizome internodes. Stem erect, simple, 3-5 cm long, reddish purplish, covered with glandular hairs. Leaves 2, simple, alternate, at base of stem, blade ovate, 5-6mm long, 3-4.5 mm wide, acute at apex, cordate at base, fleshy, entire at margins, dark green and tinged with pale purplish surface and dark to pale green beneath, glabrous on both surfaces. Petioles short, 0-0.5 mm long, glabrous, amplexicaul at base.



Fig. 600. *Odontochilus shaolinchianus* S. S. Ying, rhizome

Flowers 3-4, smaller, white to grayish white, 3-3.5 mm in diameter when opened, in a terminal spike; inflorescence rachis 0.8-1.2 cm long, densely covered glandular hairs; bracts oblong, 2.5-3.5 mm long, about 1.5 mm wide, acuminate at apex; pedicels 0; ovaries 3-3.5 mm long, glandular hairy, pale green; sepals 3, oblong, 3-3.5 mm long, 1.5-1.7 mm wide, pale green, with elongate hairs outside, glabrous inside, jointed for 2/3 of their



Fig. 601. *Odontochilus shaolinchianus* S. S. Ying, stem and leaves



Fig. 602. *Odontochilus shaolinchianus* S. S. Ying, close-up of inflorescence

length, acute at apex; 0.5-0.7mm long, white spur at base; petals oblanceolate, included, 2.8-3.2 mm long, 1.2 mm wide, falcate-like, acute at apex; lip white, exserted, rectangular, 3.5-4.5 mm long, 3.2-3.9 mm wide, with a middle groove from base to apex and divide it to two part, acute at apex, wavy at margins, extending beyond sepal tube;

column short, 2-3 mm long, with a long and bifid rostellum; stigma 2, located on both side of column; pollinia 2, yellow, attached to a transparent disc.



Fig. 603. *Odontochilus shaolinchianus* S. S. Ying, close-up of lip

Diagnosis.

Odontochilus shaolinchianus is readily recognized by its pale purplish fleshy and rhizome; reddish purpleish stem and smaller dark green ovate leaves; with 3-4 smaller flower, 0.5-0.7mm long, white spur at sepal base; lip white, exserted, rectangular, 3.5-4.5 mm long, 3.2-3.9 mm wide, with a middle groove from base to apex and divideg it to two part, acute at apex, wavy at margins.

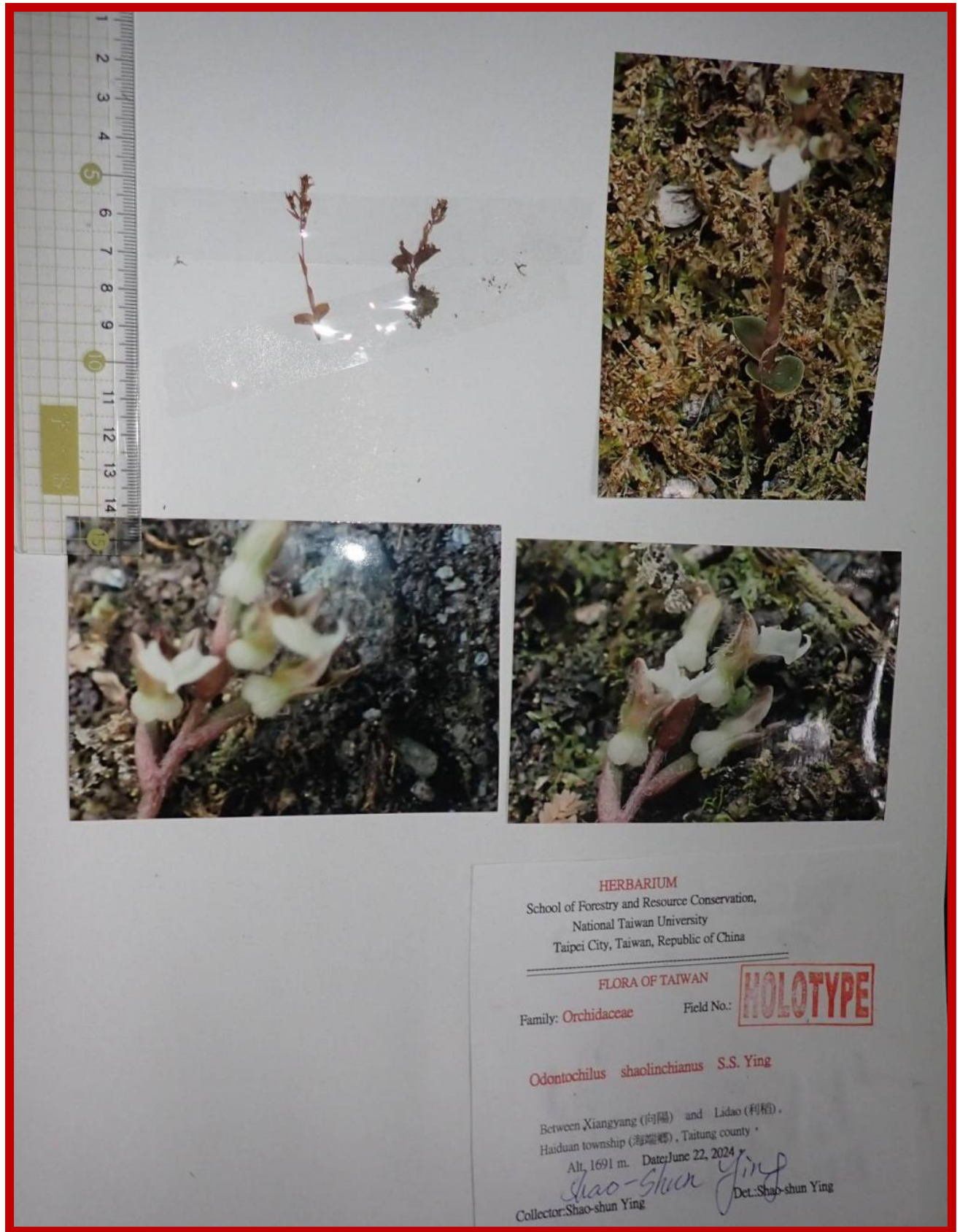


Fig. 604. *Odontochilus shaolinchianus* S. S. Ying, the holotype TPRCH -113-120



Fig. 605. *Odontochilus shaolinchianus* S. S. Ying, another plant at same place

Distribution and phenology.

Odontochilus shaolinchianus S.S. Ying is endemic to Taiwan. It is known from between Xiangyang (向陽) and Li-dao (利稻), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the montane slope and the rhizome often mixed with mosses at elevations of 1,500-2,010 meters. Its flowering time is June to July and fruiting time is July to August.

B. One New species of genus *Cheirostylis* (Orchidaceae) from Taiwan

Cheirostylis lidaoensis S.S. Ying 利稻指柱蘭

Cheirostylis lidaoensis S.S. Ying, sp. nov. 利稻指柱蘭

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 910 m alt. S. S. Ying, s.n. January 27, 2024. (holotype, TPRCH).



Fig. 606. *Cheirostylis lidaoensis* S. S. Ying, the plant

Morphology : Evergreen perennial lithophytic herbs, Rhizome creeping, fleshy, 4-6 cm long, 4-4.5 mm in diameter, somewhat like coral in general appearance, with 4-6 nodes, green, shortly pubescent; internodes 8-12 mm long; roots hair-like, in row along rhizome internodes. Stem erect, simple, 11-14 cm long, pale green, covered with glandular hairs. Leaves 2-3, simple, alternate, at base of stem, blade ovate, 9-12 mm long, 6-7 mm wide, acute at apex, cordate at base, slightly fleshy, entire and slightly wavy at margins, pale green on both surfaces, glabrous on both surfaces. Petioles short, 2.5-3 mm long, glabrous, amplexicaul at base.



Fig. 607. *Cheirostylis lidaoensis* S. S. Ying, close-up of rhizome



Fig. 608. *Cheirostylis lidaoensis* S. S. Ying, close-up of leaves

Flowers 3-5, smaller, white to grayish white, 3-4 mm in diameter when opened, in a terminal racemose; inflorescence rachis 1.5-2 cm long, densely covered glandular hairs; bracts lanceolate, 2.5-3.5 mm long, about 1.5 mm wide, acuminate at apex; pedicels 1.5-2 mm long, glandular hairy; ovaries 8-9 mm long, glandular hairy; sepals 3, 4-4.5 mm long, 1.2-1.5 mm wide, jointed for 2/3 of their length, acute at apex, glandular hairy; petals oblanceolate, 3.5-4 mm long, 1.5 mm wide, falcate-like, acute at apex; lip white, 3.5-4.2 mm long, 1.5-1.7 mm wide, acuminate at apex, entire at margins, extending slightly beyond sepal tube; column short, 2-3 mm long, with a long and bifid rostellum; stigma 2, located on both side of column; pollinia 2, yellow, attached to a transparent disc.



Fig. 609. *Cheirostylis lidaoensis* S. S. Ying, close-up of inflorescence

Diagnosis.

Cheirostylis lidaoensis is readily recognized by its green fleshy and coral-like rhizome; leaves ovate, glabrous with 3-5 smaller flower with entire lip.



Fig. 610. *Cheirostylis lidaoensis* S. S. Ying, the holotype TPRCH -113-121

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 611. *Cheirostylis lidaoensis* S. S. Ying, plant growing in situ

Distribution and phenology.

Cheirostylis lidaoensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the montane slope and the rhizome often mixed with mosses at elevations of 890-1010 meters. Its flowering time is January.

C. One New species of genus *Calanthe* (Orchidaceae) from Taiwan

Calanthe tungyuanshanensis S.S. Ying 東眼山根節蘭

Calanthe tungyuanshanensis S.S. Ying, sp. nov. 東眼山根節蘭

TYPE: TAIWAN. Taoyuan city, Fuhsin District (復興區), Tungyuanshan (東眼山), 1355 m alt. S. S. Ying, s.n. November 23, 2023. (holotype, **TPRCH**).



Fig. 612. *Calanthe tungyuanshanensis* S. S. Ying, plant growing in situ

Morphology : Evergreen perennial herbs usually growing on rotten fallen trunk, somewhat epiphytic in habit. Stem simple to branched at base, up to 45 cm long, about 4-4.5 mm in diameter, erect to ascending, green to pale green, glabrous, upper part of stem usually

covered by leaf sheath. Leaves alternate, sessile, oblong to ovate-oblong, 13-19 cm long, 3-4.5 cm wide, acuminate and caudate at apex, sheathed at base, chartaceous, smooth, many-veined, without any color spots, glabrous; sheathes 3.5-5 cm long, tubular-like, green, glabrous.



Fig. 613. *Calanthe tungyuanshanensis* S. S. Ying, inflorescences

Flowers 9-14, scentless, orange yellowish, 6-8 mm in diameter when opened, nodding, racemose; inflorescence 15-28 cm long, erect to ascending, green, glabrous to pubescent on upper part; floral rachis (peduncles) 5-9 cm long, green, pubescent, without spots; floral bracts linear, 5-6 mm long, acute at apex, cauduous; pedicel 6-9 mm long, pubescent; ovary cylindrical, 1.5-1.8 cm long, pubescent, pale green; sepals equal, lanceolate, 6-8 mm long, 2.5-3.2 mm wide, acuminate to acute at apex, pubescent outside



Fig.614 *Calanthe tungyuanshanensis* S. S. Ying, close-up of flowers

and glabrous inside, ciliate at margins, orange-yellow; petals ovate to ovate-oblong, 5-6 mm long, 3-3.5 mm wide, acute at apex; lip rather smaller than sepals and petals, 4.5-5.3 mm long, 3.5-4.5 mm wide, 3-lobed, spurless, adnate to column at 1/4 length of column from base; lateral lobes rectangular, 2.5-3 mm long, acute at apex, wavy at margins; midlobe elongate claw and widening abruptly into a triangular limb; limb acute at apex, entire at margins; disc with 2-3 ridges; column 4-5 mm long, slightly winged; pollinia 8 in 2 groups, white, each with 4 unequal pollinia, powdery, clavate.



Fig.615. *Calanthe tungyuanshanensis* S. S. Ying, close-up of flower
Mind sepals pubescent outside and lip smaller than sepal and petals



Fig. 616. *Calanthe tungyuanshanensis* S. S. Ying, close-up of flower, mind apex of lip



Fig. 617. *Calanthe tungyuanshanensis* S. S. Ying, the holotype TPRCH -113-122

(this holotype has transferred and deposited at TPRCH herbarium)

Diagnosis.

Calanthe tungyuanshanensis is a distinctive new species of Taiwan *Calanthe*. It is readily recognized by its orange-yellow, nodding, not widely opened flowers; lanceolate, equal sepals and lip rather smaller than sepals and petals, which the midlobe with elongate claw and widening abruptly into a triangular limb.



Fig. 618. *Calanthe tungyuanshanensis* S. S. Ying, young plant

Distribution and phenology.

Calanthe tungyuanshanensis S.S. Ying is endemic to Taiwan. It is known from Tungyuanshan (東眼山), Fuhsin District (復興區), Taoyuan city, northern Taiwan. It was discovered the species under the *Cryptomeria japonica* forest at elevations of 1100-1450 meters. Its flowering time is November to December.

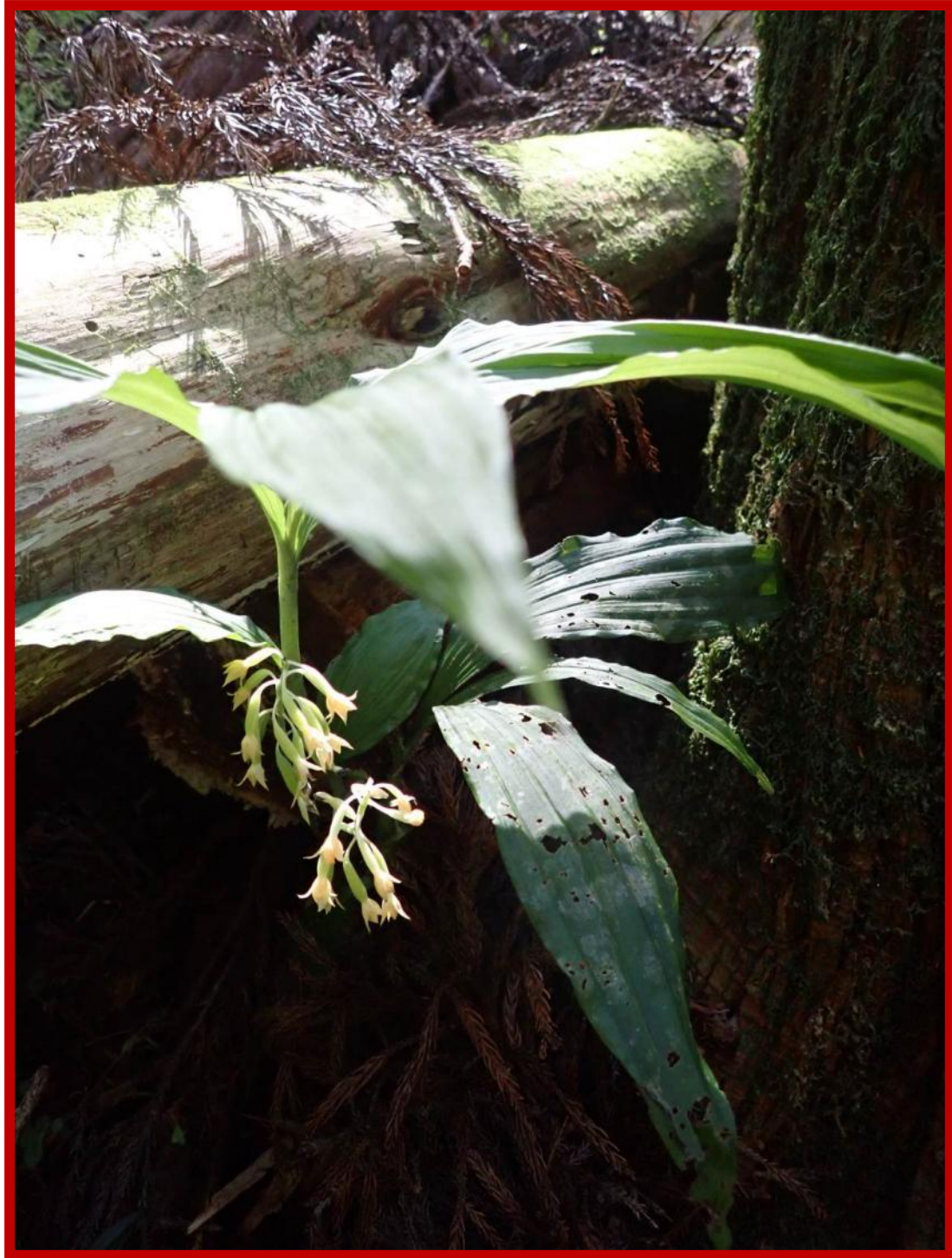


Fig. 619. *Calanthe tungyuanshanensis* S. S. Ying, plants growing in situ

Reference

Chase, Mark W.; Maarten J. M. & Christenhusz A. Schutteman. (2020). Expansion of *Calanthe* to include the species of *Cephalantheropsis*, *Gastrochis* and *Phaius* (Collabieae; Orchidaceae) in Phytotax 472(2):159-168.

D. Three New species of genus *Gastrochilus* (Orchidaceae) from Taiwan

1. *Gastrochilus loshanensis* S.S. Ying 樂山松蘭, 樂山囊唇蘭

Gastrochilus loshanensis S.S. Ying, sp. nov. 樂山松蘭, 樂山囊唇蘭

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Loshan Forest Road (樂山林道), 2340 m alt. S. S. Ying, s.n. March 14, 2024. (holotype, **TPRCH**).



Fig. 620. *Gastrochilus loshanensis* S. S. Ying, plant growing in situ

Morphology : Evergreen perennial epiphytic herbs, stem simple, not branched, up to 8 cm long, about 1.5 mm in diameter, pendulous, green tinged with purple, glabrous, covered by leaf-sheath. Roots few, often from leaf-axil, slender, epiphytic on tree-bark, 3-4.5 cm long, 2 mm in diameter, grayish white to pale grayish with a green tip. Leaves alternate, not distichous, sessile, oblong, 8-11 mm long, 4-5 mm wide, obtuse to acute at apex, obtuse

at base, fleshy, smooth, with few red spot spots, glabrous, persistent sheath.

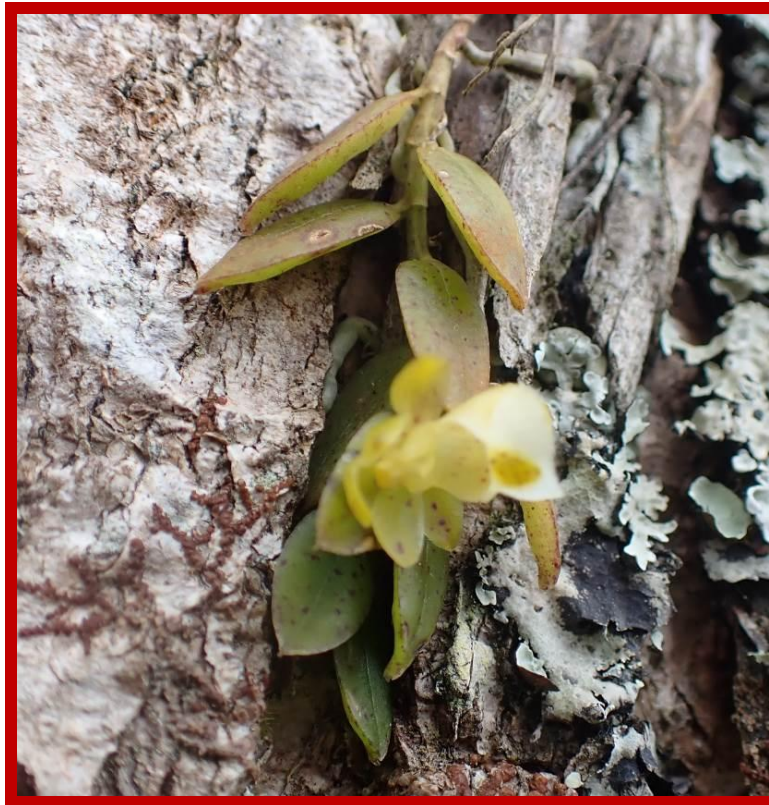


Fig. 621. *Gastrochilus loshanensis* S. S. Ying, leaves not distichous, with few red spots

Flower solitary, scentless, yellowish, 1-1.2 cm in diameter when opened; pedicel with ovary 4-5 mm long, fleshy, pale yellow, without spots, glabrous; floral bracts ovate-triangular, 2-2.4 mm long, acute at apex;; dorsal sepal ovate-oblong, 4.5-5 mm long, 3.2-4.5 mm wide, obtuse at apex, yellow with purplish red spots, slightly concave; lateral sepals oblong, 3.5-4.5 mm long, 3-4 mm wide, acute at apex, yellow with few purplish red spots, spreading; petals ovate to ovate-oblong, 3-4.5 mm long, 2.8-3.2 mm wide, yellow with few purplish red spots; lip distinctly divided into hypochile and epichile; hypochile saccate, 4.5-4.9 mm long, about 4 mm wide, rounded at apex, scattered with purple spot outside, glabrous but hairy at the orifice connected with epichile; epichile cuneate-rectangular, 5.5-6.5 mm long, 4-5 mm wide, emarginate at apex, with a large yellow with red spots, 2.5-3 mm long, 2.5 mm wide large hairy plaque in center, ciliate to irregularly



Fig.622. *Gastrochilus loshanensis* S. S. Ying, close-up of flower



Fig. 623. *Gastrochilus loshanensis* S. S. Ying, close-up of flower

dentate at margins, white; column short, stout, 1.4 mm long; rostellum 0.6 mm long, acute at apex; stigma transversely elliptic, about 1.5 mm long, 1.4 mm wide; anther cap helmet-like, 1.2 mm long, 1.4 mm wide, with a truncate beak at apex; pollinia 2, globose or nearly so, about 0.6 mm long and wide; stipe slender 2-2.2 mm long; viscidium elliptic, about 0.8-1 mm long.



Fig.624. *Gastrochilus loshanensis* S. S. Ying, close-up of flower,
showing hypochile and epichile

Diagnosis.

Gastrochilus loshanensis is readily recognized by its 8 cm long stem, alternate, not distichous, fleshy, oblong leaves and solitary flower with cuneate-rectangular, 5.5-6.5 mm long, 4-5 mm wide, emarginate at apex, with a large yellow with red spots, 2.5-3 mm long, 2.5 mm wide large hairy plaque in in center, ciliate to irregularly dentate at margins epichile

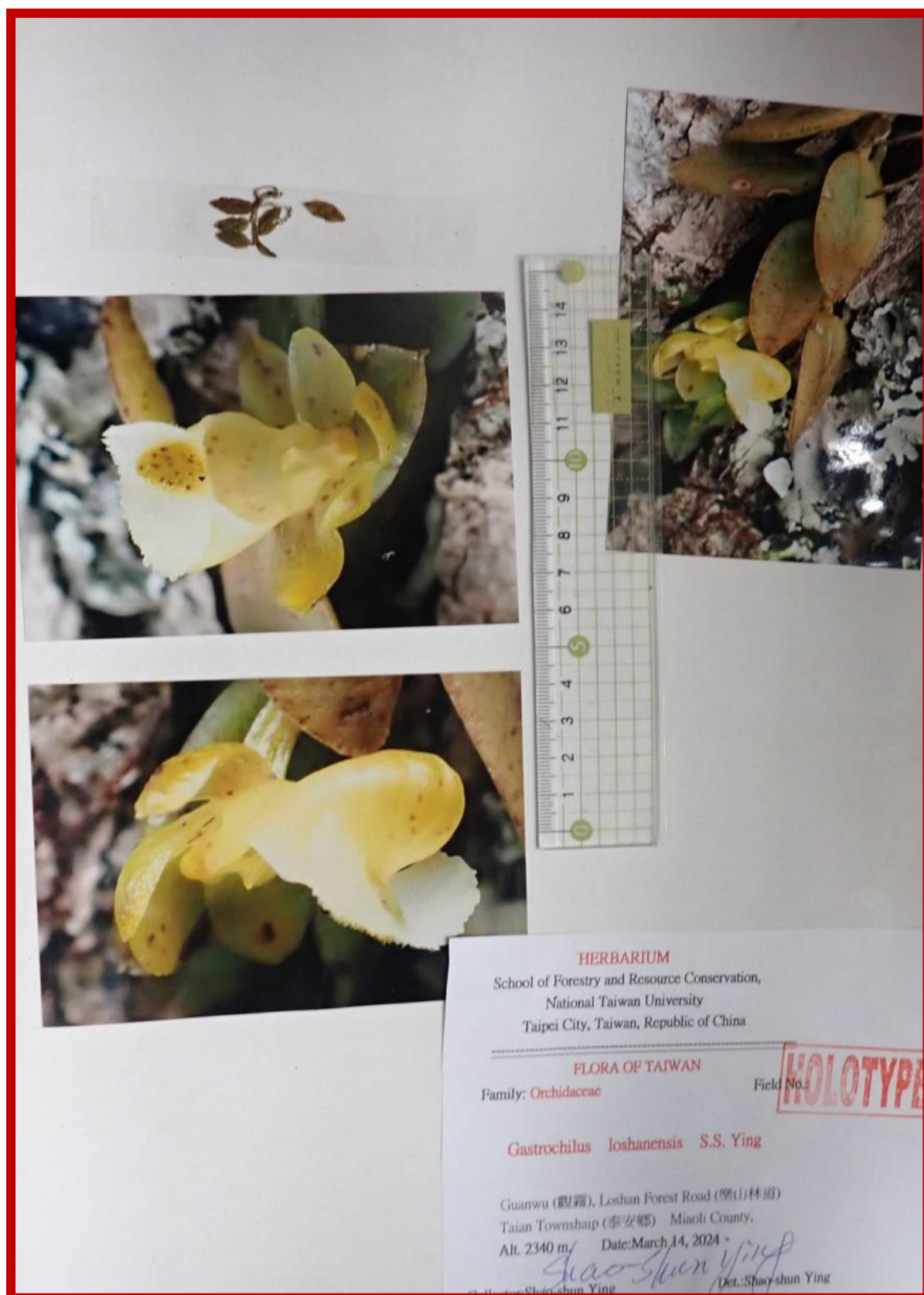


Fig. 625. *Gastrochilus loshanensis* S. S. Ying, yhe holotype, TPRCH -113-123

(this holotype has transfered and deposited at TPRCH herbarium)

Distribution and phenology.

Gastrochilus loshanensis S.S. Ying is endemic to Taiwan. It is known from Loshan Forest Road (樂山林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species on tree trunks at the elevations of 2,300-2,600 meters. Its flowering time is March to April.



Fig. 626. *Gastrochilus loshanensis* S. S. Ying, close-up of flower, showing hypochile and epichile

2. *Gastrochilus rotundifolius* S.S. Ying 圓葉松蘭, 圓葉囊唇蘭

Gastrochilus rotundifolius S.S. Ying, sp. nov. 圓葉松蘭, 圓葉囊唇蘭

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), Talu Forest Road (大鹿林道), 2440 m alt. S. S. Ying, s.n. March 14, 2024. (holotype, TPRCH).



Fig. 627. *Gastrochilus rotundifolius* S. S. Ying, planting growing in situ

Morphology : Evergreen perennial epiphytic herbs, stem simple, not branched, up to 16 cm long, about 1.5 mm in diameter, pendulous, green, glabrous, covered by leaf- sheath. Roots few, often from leaf-axil, slender, epiphytic on tree-bark, 3-5.5 cm long, 2 mm in diameter, grayish white to pale grayish with a green tip. Leaves alternate, distichous, sessile, rounded to ovate-rounded, 7-9 mm long, 5-6 mm wide, obtuse and slightly

emarginate at apex, obtuse at base, thickly fleshy, smooth, without any coloured spot spots, glabrous, midrib impressed surface and elevated beneath, lustrous green surface and pale green beneath, persistent sheath.

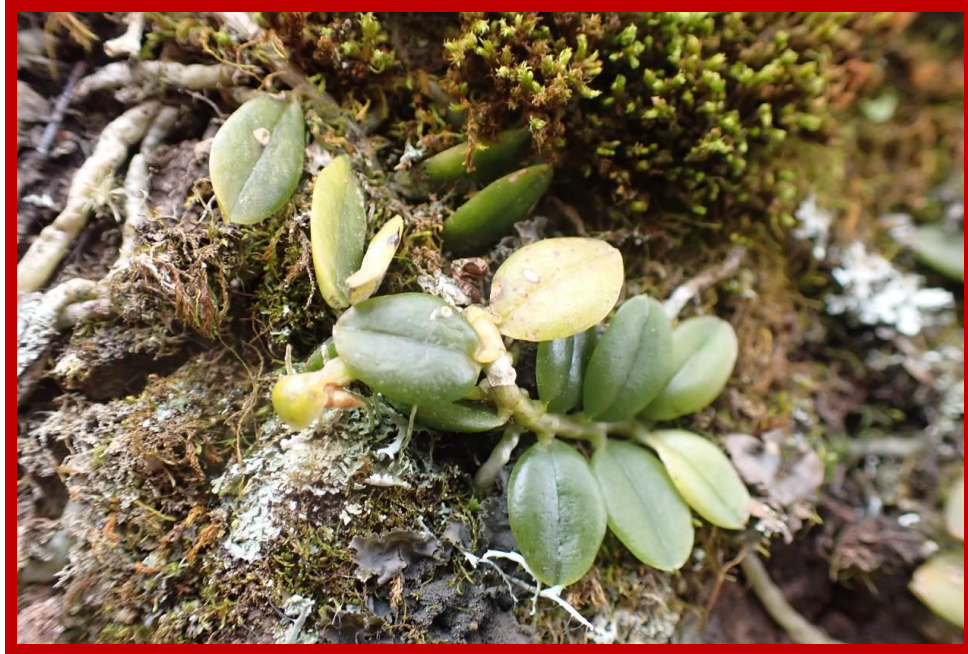


Fig. 628. *Gastrochilus rotundifolius* S. S. Ying, roots, stem and leaves

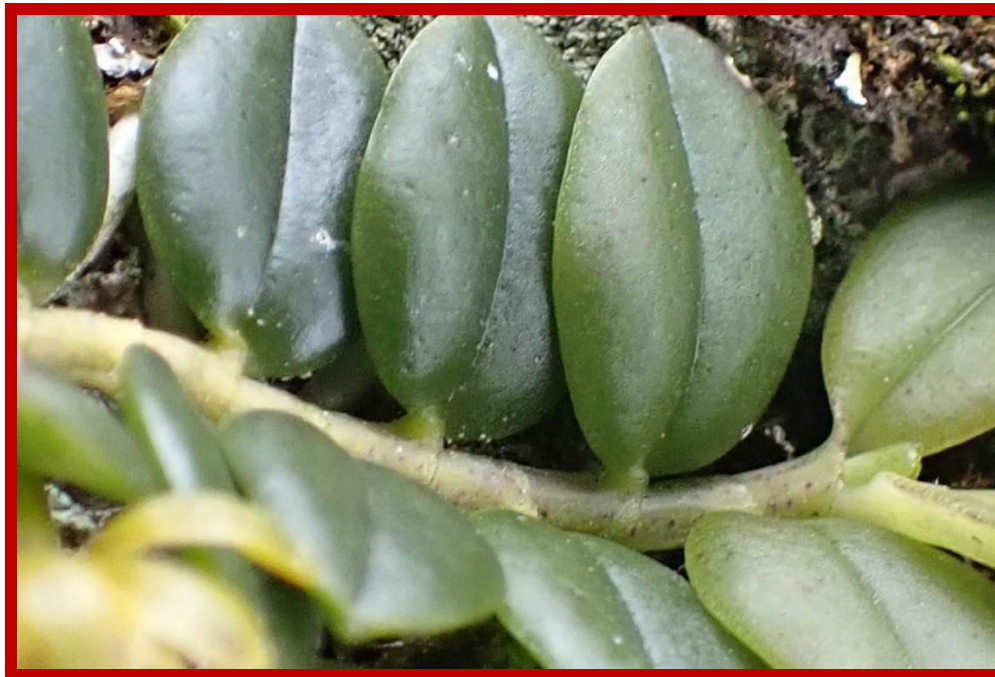


Fig. 629. *Gastrochilus rotundifolius* S. S. Ying, stem and leaves



Fig. 630. *Gastrochilus rotundifolius* S. S. Ying, close-up of flowers

Flower solitary, scentless, yellowish, 8-9 mm in diameter when opened; pedicel with ovary 4-5 mm long, fleshy, pale yellow, without spots, glabrous; floral bracts ovate-triangular, 2-2.6 mm long, acute at apex;; dorsal sepal ovate-oblong, 4.5-5.5 mm long, 3.5-4.5 mm wide, obtuse at apex, yellow with purplish red spots inside, yellowish green outside, concave; lateral sepals oblong, 4.5-5.5 mm long, 3.5-4.5 mm wide, obtuse at apex, yellow with purplish red spots inside and yellowish green outside, spreading; petals ovate to ovate-oblong, 4-4.8 mm long, 3.3-3.9 mm wide, yellow with few purplish red spots inside and yellowish green outside; lip distinctly divided into hypochile and epichile; hypochile saccate, 4.7-5.6 mm long, about 4-5 mm wide, rounded at apex, scattered with purple spot outside and inside, glabrous but hairy at the orifice connected with epichile; epichile cuneate-rectangular, 5.6-6.8 mm long, 5-6 mm wide, emarginate at apex, white with a large dark green with red spots, 2.8-3.2 mm long, 2.6 mm wide large hairy plaque in center, irregularly dentate at margins; column short, stout, 1.5 mm long; rostellum 0.5 mm long, obtuse at apex; stigma transversely elliptic, about 1.5 mm long, 1.2 mm

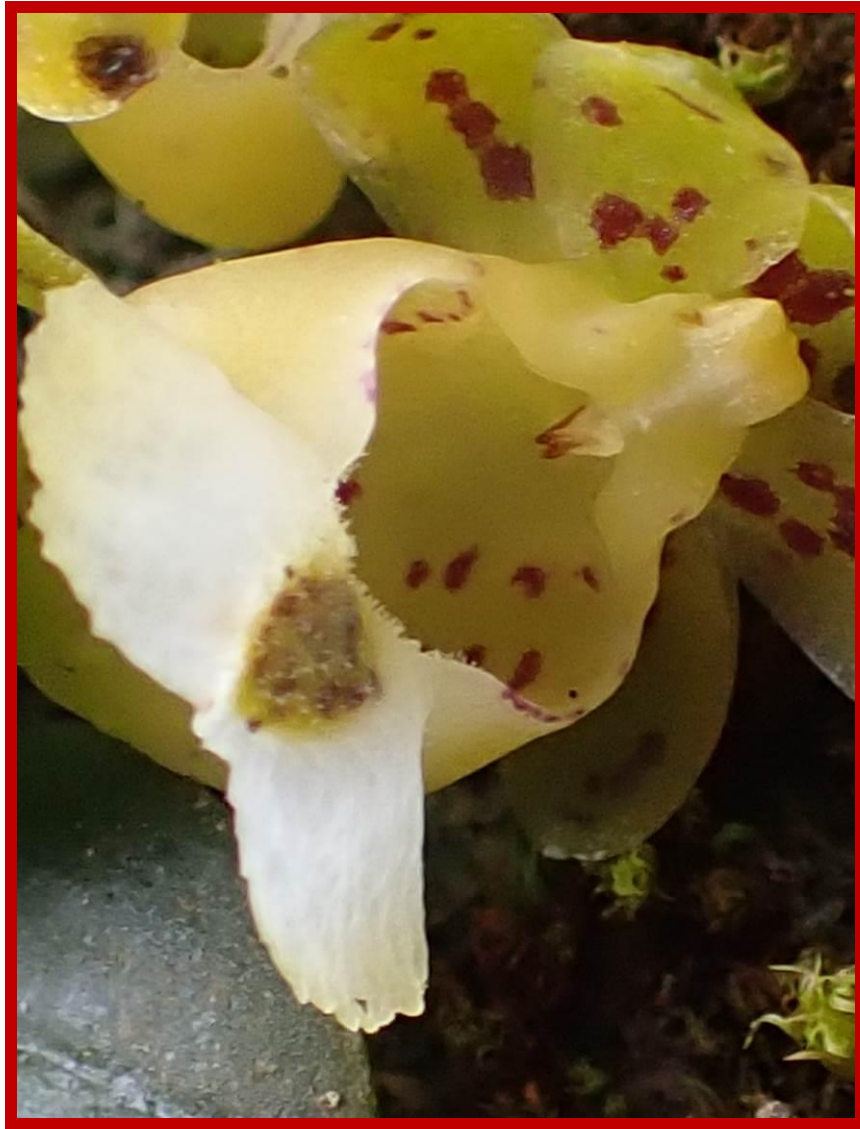


Fig. 631. *Gastrochilus rotundifolius* S. S. Ying, close-up of lip

wide; anther cap helmet-like, 1.4 mm long, 1.2 mm wide, with a truncate beak at apex; pollinia 2, globose or nearly so, about 0.5 mm long and wide; stipe slender 2-2.2 mm long; viscidium elliptic, about 0.7-0.9 mm long.

Diagnosis.

Gastrochilus rotundifolius is readily recognized by its 16 cm long stem, alternate, distichous, thickly fleshy, rounded to ovate-rounded leaves and solitary flower with a epichile which cuneate-rectangular in shape, 5.6-6.8 mm long, 5-6 mm wide, emarginate at



Fig. 632. *Gastrochilus rotundifolius* S. S. Ying, the holotype, TPRCH -113-124

(this holotype has transferred and deposited at TPRCH herbarium)

apex, white with a large dark green with red spots, 2.8-3.2 mm long, 2.6 mm wide large hairy plaque in center, irregularly dentate at margins



Fig.633. *Gastrochilus rotundifolius* S. S. Ying, plant growing in situ

Distribution and phenology.

Gastrochilus rotundifolius S.S. Ying is endemic to Taiwan. It is known from Talu Forest Road (大鹿林道), Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species on tree trunks at the elevations of 2,400-2,600 meters. Its flowering time is March to April.

3. *Gastrochilus integrilabellus* S.S. Ying 全唇松蘭, 全唇囊唇蘭

Gastrochilus integriellus S.S. Ying, sp. nov. 全唇松蘭, 全唇囊唇蘭

TYPE: TAIWAN. Miaoli County, Taian Townshap (泰安鄉), Guanwu (觀霧), 2140 m alt. S. S. Ying, s.n. April 30, 2024. (holotype, **TPRCH**).



Fig. 634. *Gastrochilus integrilabellus* S. S. Ying, mind the lip entire

Morphology : Evergreen perennial epiphytic herbs, stem simple, not branched, up to 2-3.5 cm long, about 1.5 mm in diameter, pendulous, green scattered with red to reddish purple spots, glabrous, covered by leaf-sheath. Roots few, often from leaf-axil, slender, epiphytic on tree-bark, 2.5-4.5 cm long, 1.5 mm in diameter, grayish white to pale grayish with a green tip. Leaves alternate, distichous, sessile, lanceolate to lanceolate-oblong, 10-15 mm long, 3.5-4 mm wide, obtuse and slightly emarginate at apex, obtuse at base, thickly fleshy, smooth, densely scattered with red spot spots on both surfaces, glabrous, midrib impressed

surface and elevated beneath, lustrous green surface and pale green beneath, persistent sheath.



Fig. 635. *Gastrochilus integrilabellus* S. S. Ying, plants growing in situ



Fig. 636. *Gastrochilus integrilabellus* S. S. Ying, leaf beneath, pedicel and ovary

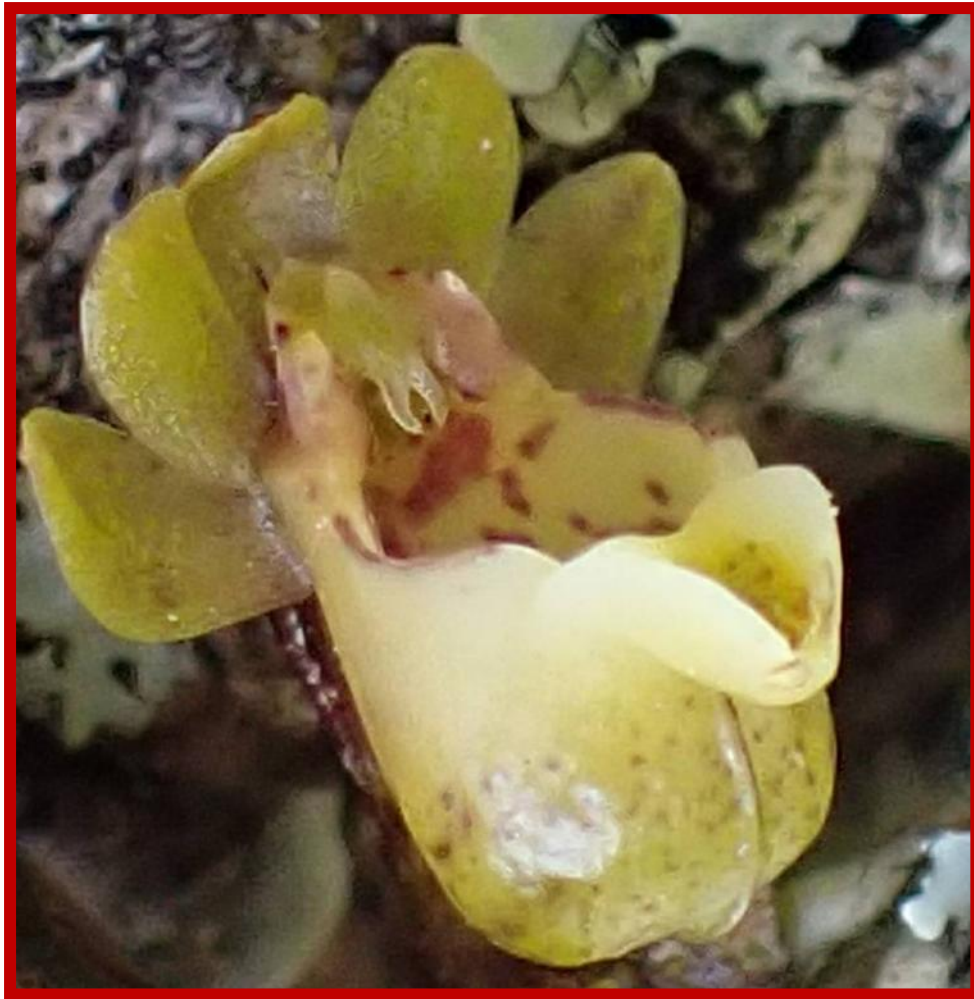


Fig. 637. *Gastrochilus integrilabellus* S. S. Ying, close-up of flower

Flower solitary rarely 2, scentless, yellowish and scattered red spots, 5-6 mm in diameter when opened; pedicel with ovary 3.5-4 mm long, fleshy, green with red spots, angular, glabrous; floral bracts ovate- triangular, 2-2.5 mm long, acute at apex;; dorsal sepal oblong, 3.5-4.5 mm long, 2.6-3.4 mm wide, obtuse at apex, yellow with few purplish red spots outside, yellow, concave; lateral sepals oblong, 3.3-4.5 mm long, 2.6-3.3 mm wide, obtuse at apex, yellow with purplish red spots outside and yellowish green inside, spreading; petals ovate to ovate-oblong, 3.4-4.4 mm long, 2.8-3.5 mm wide, yellow with few purplish red spots outside and yellowish green inside; lip distinctly divided into hypochile and epichile; hypochile saccate, 4.4-5.6 mm long, about 4.2-5 mm wide, rounded at apex, scattered with reddish purple spots outside and inside, glabrous; epichile rectangular, 4.8-5.4 mm long, 4.5-5.2 mm wide, pure white but with a large light

green with red spots plaque in the central region, which 2.5-3.2 mm long, 2.8 mm wide , entire and somewhat erect at margins; column short, stout, 1.5 mm long; rostellum 0.5 mm long, obtuse at apex; stigma transversely elliptic, about 1.6 mm long, 1.3 mm



Fig. 638. *Gastrochilus integrilabellus* S. S. Ying, close-up of epichile

Diagnosis.

1. The species, I observed it about one year, the flower bud usually produced in November, through the cold Winter, sometimes snow covered it but it is not wither and growing very well, until late of April, it is blooming.

2. *Gastrochilus integrilabellus* is readily recognized by its 2-3.5 cm long stem, alternate, distichous, thickly fleshy, lanceolate to lanceolate-oblong leaves and 1-2 flower(s) with a epichile which rectangular, 4.8-5.4 mm long, 4.5-5.2 mm wide, pure white but with a large light green with red spots plaque in the central region, which 2.5-3.2 mm long, 2.8 mm wide , entire and somewhat erect at margins

Distribution and phenology.

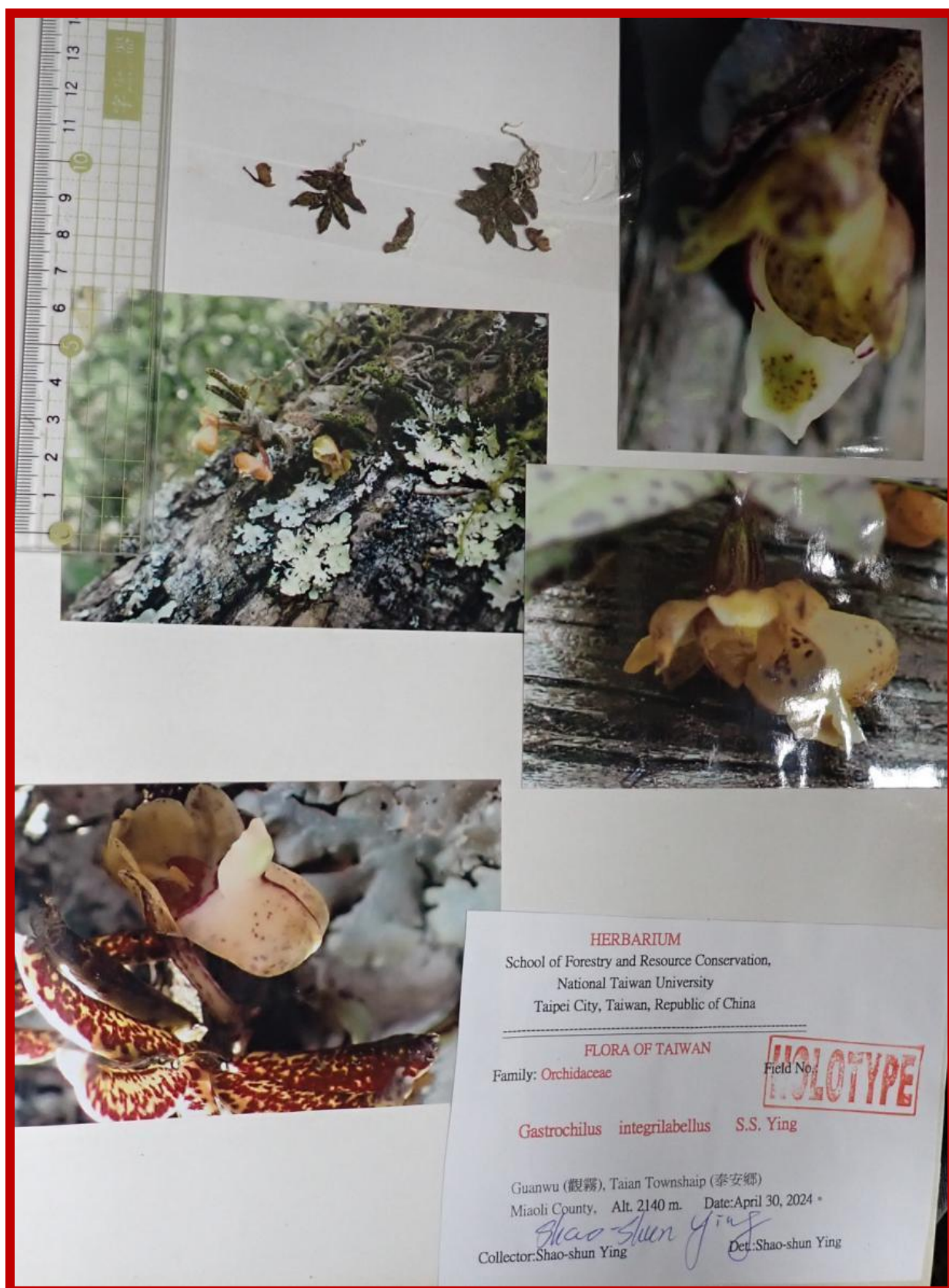


Fig. 639. *Gastrochilus integrilabellus* S. S. Ying, the holotype, TPRCH -113-125

(this holotype has transferred and deposited at TPRCH herbarium)

Gastrochilus integrilabellus S.S. Ying is endemic to Taiwan. It is known from Guanwu (觀霧) area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species on tree trunks at the elevations of 2,100-2,500 meters. Its flowering time is April to May, and fruiting time May to June. .



Fig. 640. *Gastrochilus integrilabellus* S. S. Ying, plants growing in situ

E. One New species of genus *Platanthera* (Orchidaceae) from Taiwan

Platanthera wulinensis S.S. Ying 武嶺粉蝶蘭

Platanthera wulinensis S.S. Ying, sp. nov. 武嶺粉蝶蘭

TYPE: TAIWAN. Nantou County, Jenai Townshaip (仁愛鄉), Between Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan (合歡山), 3220 m alt. S. S. Ying, s.n. July 18, 2024. (holotype, **TPRCH**).



Fig. 641. *Platanthera wulinensis* S. S. Ying, flowers in buds

Morphology : Terrestrials, usually grows on alpine grassland with moss and other herbs, about less than 15 cm high; rhizomes short, cylindrical, fleshy, 1.5-2.5 cm long, 6-7 mm across; stem with inflorescence 12-14 cm long, erect to ascending, slender, glabrous to few pubescent, slightly angular, tubular sheath not appear or inconspicuous. Leaf two, on the basal of stem, lanceolate to narrow-lanceolate, 7.5-8 cm long, 8.2-8.5 mm wide, acute at
-540-

apex, attenuate and amplexicaul and forming a short tubular at base, entire at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib impressed surface and elevated beneath, lateral veins inconspicuous.



Fig. 642. *Platanthera wulinensis* S. S. Ying close-up of unopened flowers

Flowers smaller, usually 10-12, yellow in bud but turning to pale yellow when opened, scentless, 2.5-3 mm in diameter when opened, spicate; the inflorescence 8-9 cm long, erect to ascending, with 1 bracts from basal to medium; floral rachis 4-5 cm long, green, glabrous; floral bracts ovate-lanceolate, 6-8 mm long, 2.5-3.5 mm wide, acute at apex; pedicel and ovary cylindric, 4.5-5.6 mm long, glabrous, green; dorsal sepal connivent with petals forming a 2.2-2.5 mm wide hood; the dorsal sepal ovate, 2.0-2.5 mm long, 1.7-2.2 mm wide, obtuse at apex, pale yellow with a green tip; lateral sepals spreading, ovate, 3.5-4.5 mm long, 2.5-3.5 mm wide, obtuse at apex, pale yellow with a green tip; petals ovate to ovate-oblong, 2.2-3 mm long, 2.5-3.2 mm wide, obtuse at apex; lip pendulous, ovate, pale yellow, entire, not lobed, 2.8-3.5 mm long, 2.4-3 mm wide, obtuse at apex; spur pendulous, cylindric, 5-6 mm long, obtuse at apex, transparent; column short,

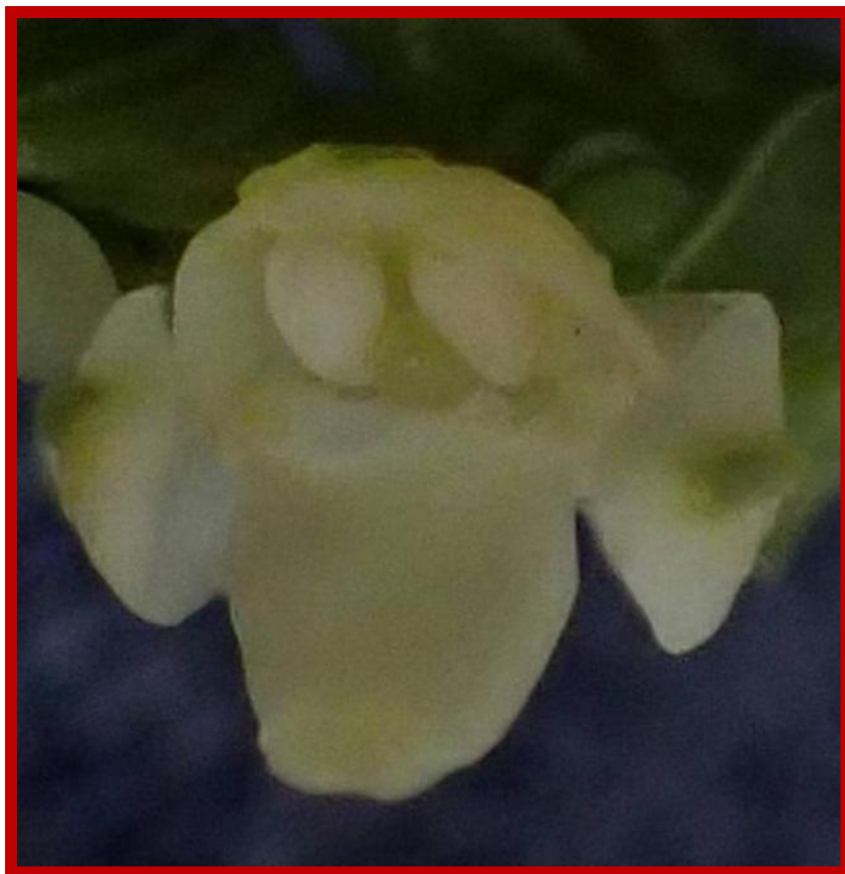


Fig. 643. *Platanthera wulinensis* S. S. Ying close-up of a flowers



Fig. 644. *Platanthera wulinensis* S. S. Ying, close-up of a flowers

2-3 mm lnog.



Fig.645. *Platanthera wulinensis* S. S. Yingcplant growing in situ

Diagnosis.

The species is characterized by its 1-2 leaf (leaves) and few yellow to pale yellow flowers (ca 10-12), sepals ovate , yellow to pale yellow with a green tip, obtuse at pex; petals ovate, pale yellow, obtuse at apex and an entire lip. **the only species which the flowers yellow to pale yellow in color.**



Fig. 646. *Platanthera wulinensis* S. S. Ying, the holotype TPRCH -113-126



Fig. 647. *Platanthera wulinensis* S. S. Yingcplant growing in situ

Distribution and phenology.

Platanthera wulinensis S.S. Ying is endemic to Taiwan ° It is known from between Kuanyang (昆陽) and Wulin (武嶺), Hohuanshan(合歡山)), Jenai Townshaip (仁愛鄉) , Namtou county, central Taiwan. ° It was discovered the species on rocky and grass mountain slope at the elevations of 3,270- 3260 meters. Its flowering time is July to August.

F.A New Combination of genus *Silvorchis* (Orchidaceae) from Vietnam

Silvorchis *proboscidea* (Aver., Vuong & V.C. Nguyen) S.S. Ying

Silvorchis *proboscidea* (Aver., Vuong & V.C. Nguyen) S.S. Ying , *comb. nov.*

Vietorchis proboscidea Aver., Vuong & V.C.Nguyen in Phytotaxa 619: 269 (2023).

Type:— VIETNAM. Lam Dong Province: Dam Rong District, Lien Srong Commune, mycoheterotrophic orchid, near the stream in primary broad-leaved forest, 28 April 2023, Truong Ba Vuong , Nguyen Van Canh, BV 1716 (holotype VNM00063991 , photos LE01124200 <https://en.herbariumle.ru/?t=occ&id=170352>) .

Distribution:—Endemic to Vietnam (Lam Dong Province: Dam Rong District).

63. Taxonomic Notes on the Family Asteraceae in Taiwan (4)

A. A New Genus *Pseudoajania* S. S. Ying (Asteraceae) and A New Species

Pseudoajania taiwanensis S.S. Ying in Taiwan

Pseudoajania S.S. Ying, gen. nov. 類亞菊屬



Fig. 648. *Pseudoajania* S. S. Ying, gen. nov.

Mind the inflorescences somewhat like the genus *ajania*

Morphology : Annual to biennial tall herbs ° taproot none , fibrous roots slender, from stem base ; stem erect to ascending, somewhat fleshy, green to pale purple, glabrous ° Leaves simple, opposite, ovate-triangular to widely triangular; stipules minute , petioles elongate ° Capitula disciform, heterogamous, white, 6-7 mm in diameter when opened, usually 5-7

-547-

capitula to form a corymbose, 3-5 corymbose to form a compounded corymbose; phyllaries 4 series, hairy; receptacle conical, naked; marginal florets female shortly ligulate at apex, with filiform corolla tube; disc florets bisexual, tubular, 5-toothed. Achenes obovoid-cylindrical, with 4-5 indistinct longitudinal ribs, blackish; pappi numerous, elongate, white.



Fig. 649. *Pseudoajania* S. S. Ying, gen. nov. mind elongate pappi

Type species : *Pseudoajania taiwanensis* S.S. Ying °

TYPE:TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 870 m alt. S. S. Ying, s.n. March 02, 2024 ° (holotype,

TPRCH)

The generic name *Pseudoajania* means that the plant somewhat like the genus *Ajania*

Diagnosis. The genus is somewhat like the genus *Ajania* Poljakov, but our plant is a tall robust perennial herb; with different habit, especially in leaves and achenes (with elongate white pappi in our genus).



Fig.650. *Pseudoajania taiwanensis* S. S. Ying, plants growing in situ

Pseudoajania taiwanensis S.S. Ying, 台灣類亞菊

Pseudoajania taiwanensis S.S. Ying, sp. nov. 台灣類亞菊

TYPE:TAIWAN. Taitung county·Haiduan township (海端鄉)·Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 870 m alt. *S. S. Ying*, *s.n. March 02, 2024* ° (holotype, **TPRCH**) °

Morphology : Evergreen perennial terrestrial herbs about 1.5 m high, arbotica, stem erect, usually simple, pale purple to green, pubescent, usually branched with inflorescences at upper part of stem. Leaves simple, opposite, ovate-triangular to widely triangular, 4.5-6.5 cm long, 3-4.5 cm wide, acuminate to acute at apex, truncate at base, thinly coriaceous to



Fig. 651. *Pseudoajania taiwanensis* S. S. Ying, close-up of capitula



Fig. 652. *Pseudoajania taiwanensis* S. S. Ying, brnches and leaves



Fig.653. *Pseudoajania taiwanensis* S. S. Ying, opened inflorescences



Fig. 654. *Pseudoajania taiwanensis* S. S. Ying, some marginal florets just opened

chartaceous, serrulate to dentate at margins, glabrous on both surfaces, 3-nerved impressed surface and elevated beneath; lateral veins also impressed surface and elevated beneath.

Petioles slender, 2-3.5 cm long, terete, pale purple to green, pubescent.

Capitula disciform, heterogamous, white, 6-7 mm in diameter when opened, usually 5-7 capitula to form a corymbose, 3-5 corymbose to form a compounded corymbose, terminal to axillary on upper part of stem; inflorescences rachis 3.5-5.5 cm long, purplish red, pubescent; peduncles 1.5-3 cm long, pubescent; pedicels 4-7 mm long, green, hairy; involucre cylindrical, 4-5 mm long, 6-7 mm diameter; the phyllaries 4 series, hairy; the outer ones lanceolate, 1.5-2.2 mm long, 1-1.2 mm wide, above the middle hyaline-scarious, acuminate at apex; median ones 2.3-2.8 mm long, 1.5 mm wide, green, with scarious margins; inner ones linear, 2-2.5 mm long, somewhat with hyaline to light brown scarious apex; receptacle conical, naked; marginal florets female, 1.5-2 mm long, shortly ligulate at apex, with filiform corolla tube; disc florets bisexual, tuber, 1.4-1.8 mm long, 5-toothed; teeth deltoid, 0.6 mm long, spreading or curved; filament of stamens thickened in upperpart, 1.2 mm long; anthers 0.8 mm long, with a triangular acute apical appendage.

Achenes obovoid-cylindrical, 3.2-4.5 mm long, 0.6-0.9 mm wide, with 4-5 indistinct longitudinal ribs, black; pappi numerous, elongate, 5-7 mm long, white.



Fig. 655. *Pseudoajania taiwanensis* S. S. Ying, close-up of achenes and pappi

Diagnosis.

The genus is a new record for Taiwan flora

Pseudoajania taiwanensis is readily recognized by its tall robust perennial herb with simple, opposite, ovate-triangular to widely triangular leaves; capitula disciform, heterogamous, white, 6-7 mm in diameter when opened, usually 5-7 capitula to form a corymbose, 3-5 corymbose to form a compounded corymbose, terminal to axillary on upper part of stem; obovoid-cylindrical, 3.2-4.5 mm long, 0.6-0.9 mm wide, with 4-5 indistinct longitudinal ribs, black achene and ; numerous, elongate, 5-7 mm long, white pappi.



Fig. 656. *Pseudoajania taiwanensis* S. S. Ying, plants growing in situ

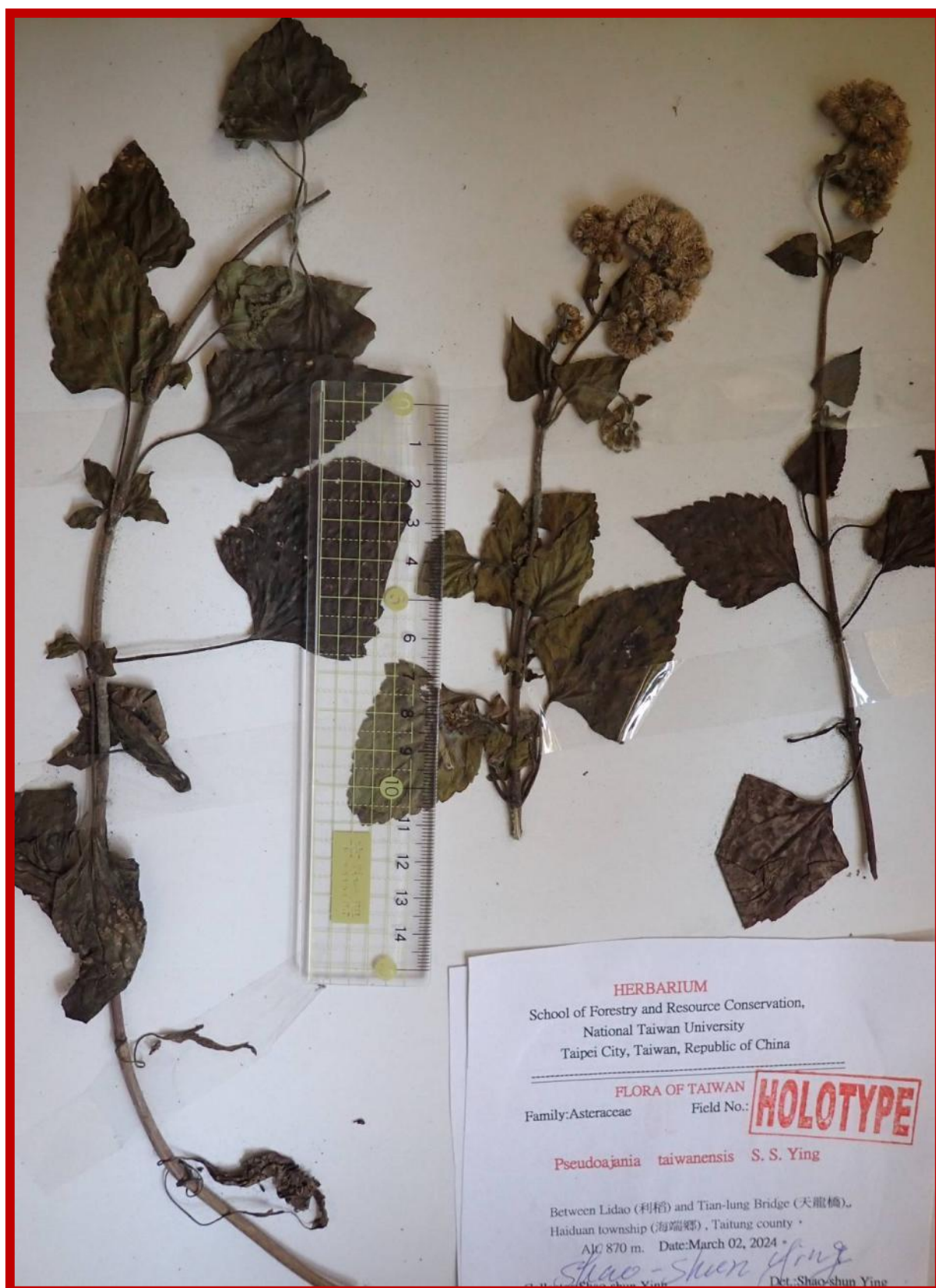


Fig. 657. *Pseudoajania taiwanensis* S. S. Ying, the holotype TPRCH -113-127

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 658. *Pseudoajania taiwanensis* S. S. Ying, the isotype TPRCH -113-128

(this isotype has transferred and deposited at TPRCH herbarium)

Distribution and phenology.

pseudoajania taiwanensis S.S. Ying is endemic to Taiwan. It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. It was discovered on the montane slope and the at elevations of 800-1010 meters. Its flowering time is March to April; and fruiting times April to June.



Fig. 659. *Pseudoajania taiwanensis* S. S. Ying, plants growing in situ

B.Five New Species of Asteraceae in Taiwan

1.One New species of genus *Lactuca* from Taiwan

Lactuca songmaoensis S.S. Ying 松茂翅果菊

Lactuca songmaoensis S.S. Ying, sp. nov. 松茂翅果菊

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Between Songmao (松茂) and Chingchuan bridge (清泉橋), 1950 m alt. *S. S. Ying* , *s.n. February 22, 2024* ° (holotype , **TPRCH**) °



Fig. 660. *Lactuca songmaoensis* S. S. Ying, plant growing in situ

Morphology : Evergreen perennial terrestrial herbs about 2.5 m high, stem erect, somewhat robust, simple, purple, pubescent, usually much branched in inflorescences. Leaves radical and cauline; the radical ones basal, rosette, oblong in outline, 22-28 cm long, 7-9 cm wide, -557-

obtuse at apex, attenuate at base, thinly coriaceous, pinnatisect at margins, glabrous surface and glabrous to few pubescent along veins beneath, lustrous green surface and pale green and slightly glaucous beneath, midrib and lateral veins impressed surface and elevated beneath; pinnae 4-6 per side, ovate to rounded, 3-4.5 cm long, 2.5-3.2 cm wide, obtuse to rounded at apex; cauline leaves like the radical ones but smaller. Petioles 4-6 cm long, glabrous, winged at both sides, pale purple.

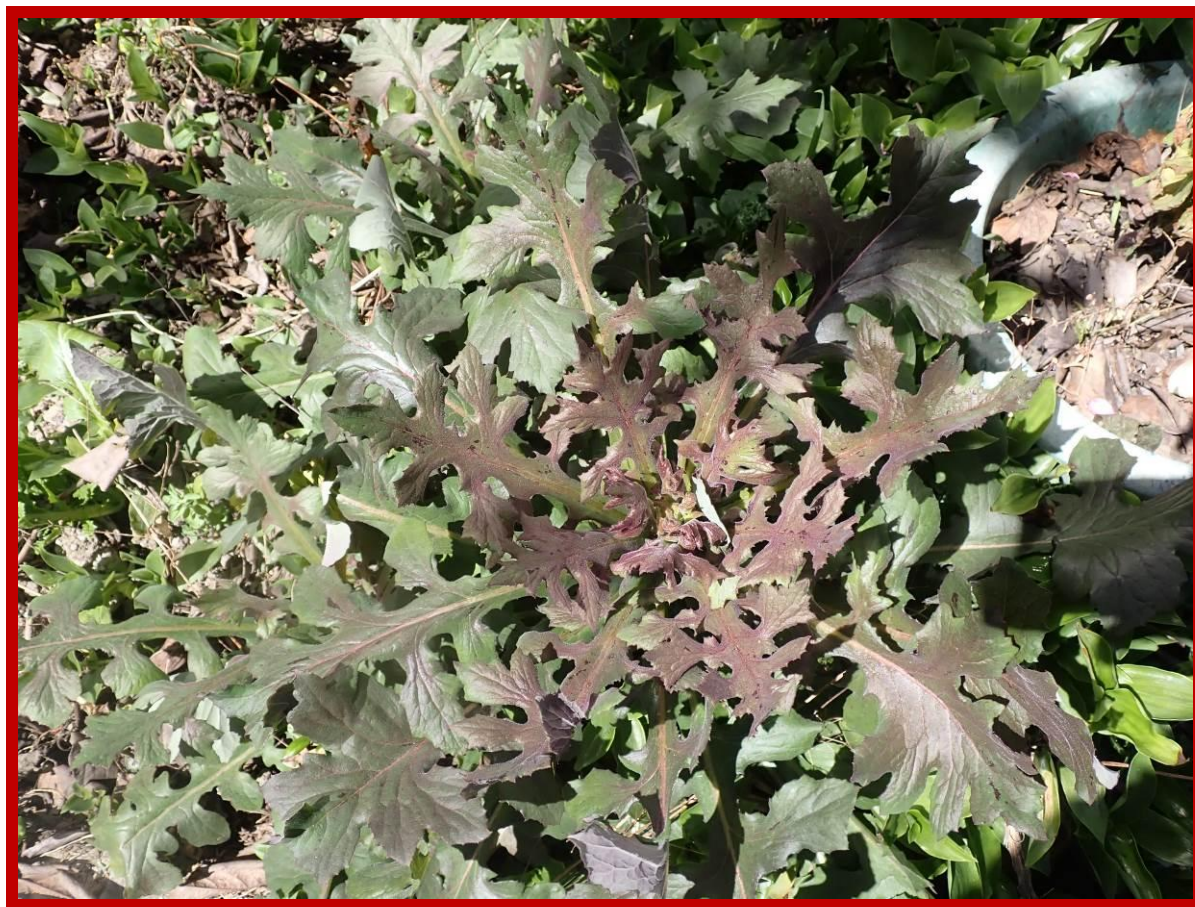


Fig.661. *Lactuca songmaoensis* S. S. Ying, radical leaves

Capitula numerous, pale purple to purple, 1.2-1.7 cm in diameter when opened, in terminal panicle which consist of 15-20 or more racemes; the inflorescence rachis (panicle) 45-60 cm long, erect, purple, pubescent; bracts oblong, 1.5-2 cm long, 8-9 mm wide, acute at apex; racemose rachis 20-28 cm long, erect to ascending, purple, pubescent; bracteoles lanceolate, 4-5 mm long, 2-2.5 mm wide, acute at apex, dentate at margins; each



Fig. 662. *Lactuca songmaoensis* S. S. Ying, cauline leaves and inflorescences

raceme consist of 8-12 capitula; pedicels 8-15 mm long, pubescent, involucre cylindrical, 8-10 mm long, green tinged with purple, glabrous or nearly so; phyaries 5-6 series, the outer ones triangular, 4.5-5.5 mm long, 2.5-3 mm wide, green tinged with purple at apex, glabrous; medial phyllaries lanceolate, 5-6.5 mm long, 2-2.5 mm wide, acute at apex, glabrous, pale green tinged purple at apex ; inner phyllaries lanceolate, 5.4-6.5 mm long, 2.5-2.8 mm wide, acute at apex, glabrous or nearly so; 15-23 florets in each capitula, bisexual; corolla ligulate, 8-11 mm long, 2.8- 3.2 mm wide, yellow, 5-toothed at apex; tube distally glabrous externally; anthers yellow; style branches barbellate on shaft and branched, glabrous, lustrous yellow, with short stigmatic lines.

Achenes ellipsoid, compressed, 5.5-7 mm long, 3-3.5 mm wide, brownish; lateral ribs winged; wings scabrous, with one facial rib on each side; beak 2-2.5 mm long; pappus simple, white, 4.5-6 mm long, persistent, bristles smooth.

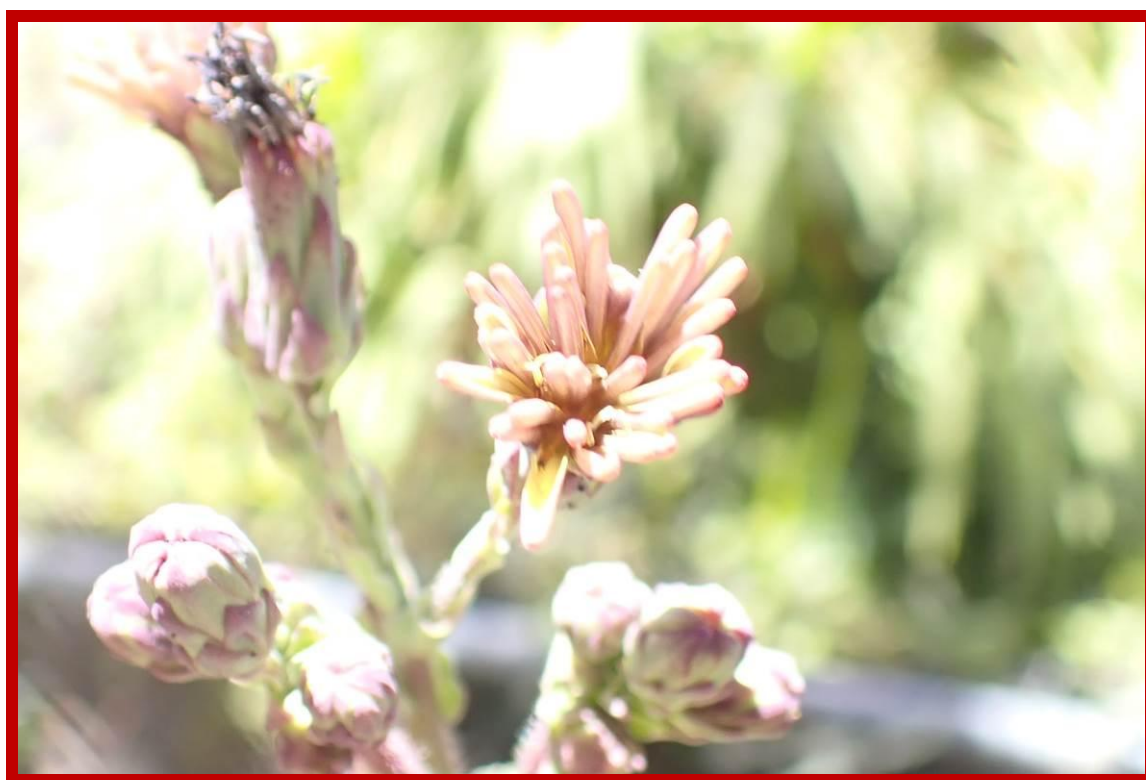


Fig. 663. *Lactuca songmaoensis* S. S. Ying, phyllaries anf florets



Fig.663. *Lactuca songmaoensis* S. S. Ying, close-up of inflorescence

Diagnosis.

Lactuca songmaoensis is readily recognized by its larger perennial herb with robust erect, simple, purple stem, radical leaves usually rosette, oblong in outline, 22-28 cm long, 7-9 cm wide, pinnatisect at margins; pinnae 4-6 per side, ovate to rounded, 3-4.5 cm long, 2.5-3.2 cm wide; cauline leaves like the radical ones but smaller; capitula numerous, pale purple to purple, 1.2-1.7 cm in diameter when opened, in terminal panicle which consist of 15-20 or more racemes; pappus 5-6 series; 15-23 florets in each capitula, bisexual; corolla ligulate, yellow, 5-toothed at apex; tube distally glabrous externally; achenes ellipsoid, compressed, 5.5-7 mm long, 3-3.5 mm wide, brownish.

Distribution and phenology.

Lactuca songmaoensis S.S. Ying is endemic to Taiwan. ° It is known from between Songmao (松茂) and Chingchuan Bridge (清泉橋), Hoping District (和平區), Taichung City, central Taiwan. ° It was discovered on the montane slope and edge



Fig. 665. *Lactuca songmaoensis* S. S. Ying, the holotype TPRCH -113-129

(this holotype has transferred and deposited at TPRCH herbarium)

of forests at elevations of 1690-1950 meters. Its flowering time is February to March and fruiting time is March to April.



Fig. 666. *Lactuca songmaoensis* S. S. Ying, plant growing in situ

2. One New species of genus *Cirsium* from Taiwan

Cirsium lidaoense S.S. Ying 利稻薊

Cirsium lidaoense S.S. Ying, sp. nov. 利稻薊

TYPE: TAIWAN. Taitung county, Haiduan township (海端鄉), Between Lidao (利稻) and Tian-lung Bridge (天龍橋), 975 m alt. *S. S. Ying*, s.n. March 02, 2024. (holotype, TPRCH).



Fig. 667. *Cirsium lidaoense* S. S. Ying, capitula

Morphology : Annual herbs, stems erect or ascending, simple, 130-180 cm long, unwinged, glabrous to few hairy, somewhat angular, hollow, smooth, without prickles, green to pale green. Leaves simple, alternate, oblong in outline, 14-18 cm long, 3.8-4.6 cm wide, pinnatisect at margins, lustrous green surface and pale green beneath, midrib



Fig. 668. *Cirsium lidaoense* S. S. Ying, leaves

impressed surface and elevated beneath, glabrous on both surfaces; pinna 4-6 pairs, ovate-triangular, 2.5-34.5 cm long, 1.6-2.8 cm wide, spinulate-serrated at margins; spines 4.5-6.5 mm long; upper cauline leaves gradually smaller.

Capitula 1-2 in an inflorescence, 3-4 inflorescences in terminal and on leaf-axil of upper part of stem, 3.2-4.5 cm in diameter; inflorescence (peduncles) 3-4.5 cm long, erect to ascending, green, glabrous to few pubescent; bract 1-2, leaf-like, at base of capitula, lanceolate, 2.5-3 cm long, 3-3.5 mm wide, acuminate at apex; bracteoles 1-2, smaller, at top of pedicels; pedicels 0; involucre campanulate, 1.5-2.5 cm long, 1.2-1.8 cm wide, contracted at apex; phyllaries 4-5 series, imbricate, uniform, the inner ones smaller, lanceolate, 1.1-1.4 cm long, 2.2-2.8 mm wide, green tinged with purple at apex, acute and needle-like at apex, obtuse at base, glabrous, the basal ones often scarious along margins; some white linear appendages from top phyllaries; corolla purplish red, 5-9 mm long,



Fig. 669. *Cirsium lidaoense* S. S. Ying, inflorescences

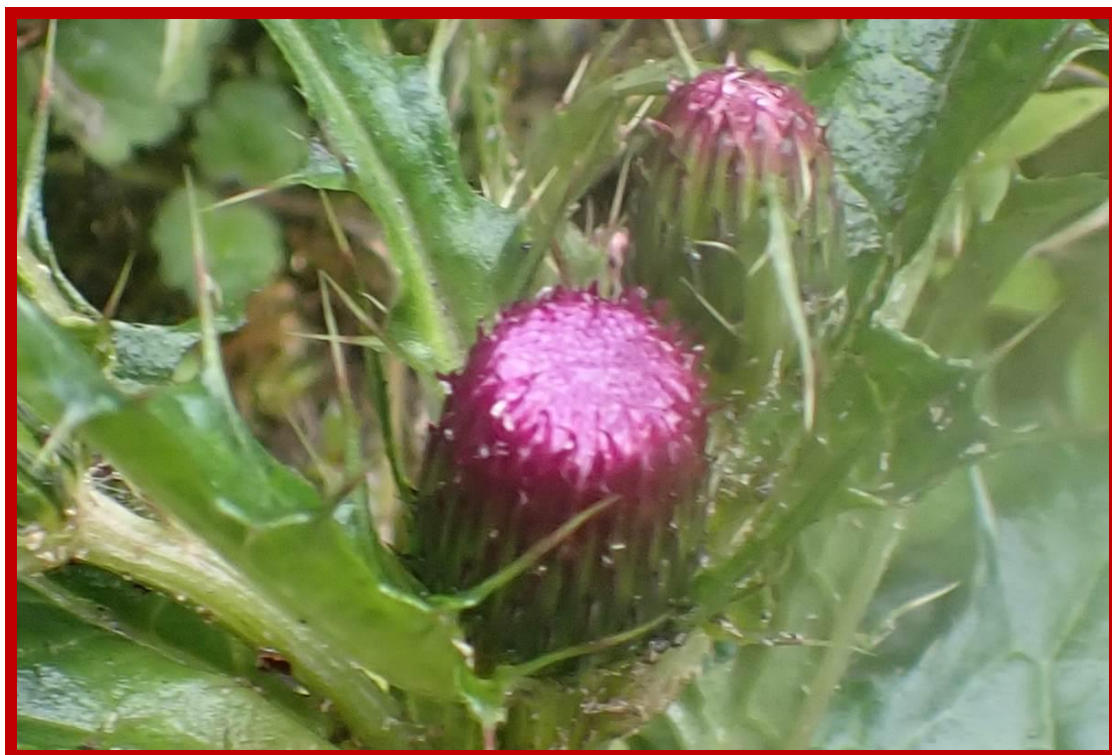


Fig. 670. *Cirsium lidaoense* S. S. Ying, capitula (mind it sessile) and phyllaries

1.5mm wide, 5-toothed at apex; the teeth minute, 0.3-0.4 mm long, acute at apex; ovary spindle-like, 1-1.5 mm long, glabrous; pappus numerous, 5-6 mm long, slender, glabrous; style elongate, red, 6-8 mm long, glabrous; stigma 2, minute, 0.2 mm long. anthers tube 2.5-3 mm long, 5-toothed at apex, included the corolla tube, anther cylindrical, about 2 mm long, opened on terminal.



Fig. 671. *Cirsium lidaoense* S. S. Ying, inflorescences

Achenes obovoid, 2-3 mm long, about 1.4 mm wide, laterally compressed, smooth, sometime with 1 longitudinal ribs; apical rim forming a smooth-margined upright crown; pappus 6-10 mm long, with plumose bristles, usually forming basal ring, often shed.

Diagnosis.

Cirsium lidaoense is readily recognized by its few capitula which usually 1-2 in an inflorescence, 3-4 inflorescences in terminal and on leaf-axil of upper part of stem; The capitulum usually on the inflorescence and pink red corolla.



Fig.672. *Cirsium lidaoense* S. S. Ying, the holotype TPRCH -113-130

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 673. *Cirsium lidaoense* S. S. Ying, achenes



Fig. 674. *Cirsium lidaoense* S. S. Ying, close-up of achenes



Fig. 675. *Cirsium lidaoense* S. S. Ying, plant growing in situ

Distribution and phenology.

Cirsium lidaoense S.S. Ying is endemic to Taiwan ° It is known from between Li-dao (利稻) and Tian-Lung Bridge (天龍橋), Haiduan township (海端鄉), Taitung county, eastern Taiwan. ° It was discovered on the montane slope at elevations of 900-1310 meters. Its flowering time is March to April; and fruiting times April to May.

3. One New species of genus *Emilia* from Taiwan

Emilia shengwushanensis S.S. Ying 聖母山絨纓菊

Emilia shengmushanensis S.S. Ying, sp. nov. 聖母山絨纓菊

TYPE: TAIWAN. I-Lan County, Chaochi Township (礁溪鄉), Shengmushan (聖母山) 264 m alt. S. S. Ying, s.n. March 28, 2024. (holotype, **TPRCH**).



Fig. 676. *Emilia shengwushanensis* S. S. Ying, plants growing in situ

Morphology : Annual herbs, stems erect or ascending, simple, 15-30 cm long, densely villous, terete, solid, smooth, without prickles, green to purplish red. Leaves simple, alternate, oblong to ovate-oblong, 5-7 cm long, 2.5-3.5 cm wide, obtuse at apex, obtuse to attenuate at base, dentate at margins, lustrous green surface and pale green beneath, midrib and lateral veins (3-5 per side) impressed surface and elevated beneath, glabrous



Fig. 677. *Emilia shengwushanensis* S. S. Ying, leaves



Fig. 678. *Emilia shengwushanensis* S. S. Ying, inflorescence

on both surfaces; upper cauline leaves gradually smaller. Petioles 1.5-2 cm long, terete, grooved above, glabrous to hairy; stipules ovate, 8-11 mm long, 3-3.5 mm wide, obtuse at apex.

Capitula numerous, 3-4 mm in diameter when opened, 4.5-5.5 mm long, scentless, pink to purplish red, 5-8 to form a corymbose, 4-8 corymboses to form a panicle-like inflorescence; inflorescence rachis 12-16 cm long, erect to ascending, villous, purplish red;



Fig. 679. *Emilia shengwushanensis* S. S. Ying, 4-8 corymboses to form a panicle-like inflorescence

peduncles 3.5-4.5 cm long, villous, ascending, purplish red; pedicels 6-10 mm long, villous; bracts linear, 8-9 mm long, 2-3 mm wide, acuminate at apex, villous; receptacle 4.5-5.5 mm long, villous; phyllaris 10-12, lanceolate to linear-lanceolate, 3.5-4.5 mm long, 2.5 mm wide, acuminate at apex, pink to purplish red, villous; disk florets numerous, pink; corolla lobes oblong, obtuse at apex; style elongate, 5.5-6 mm long, exserted from corolla,

pink; style arms not opened, white, stigma capitate.

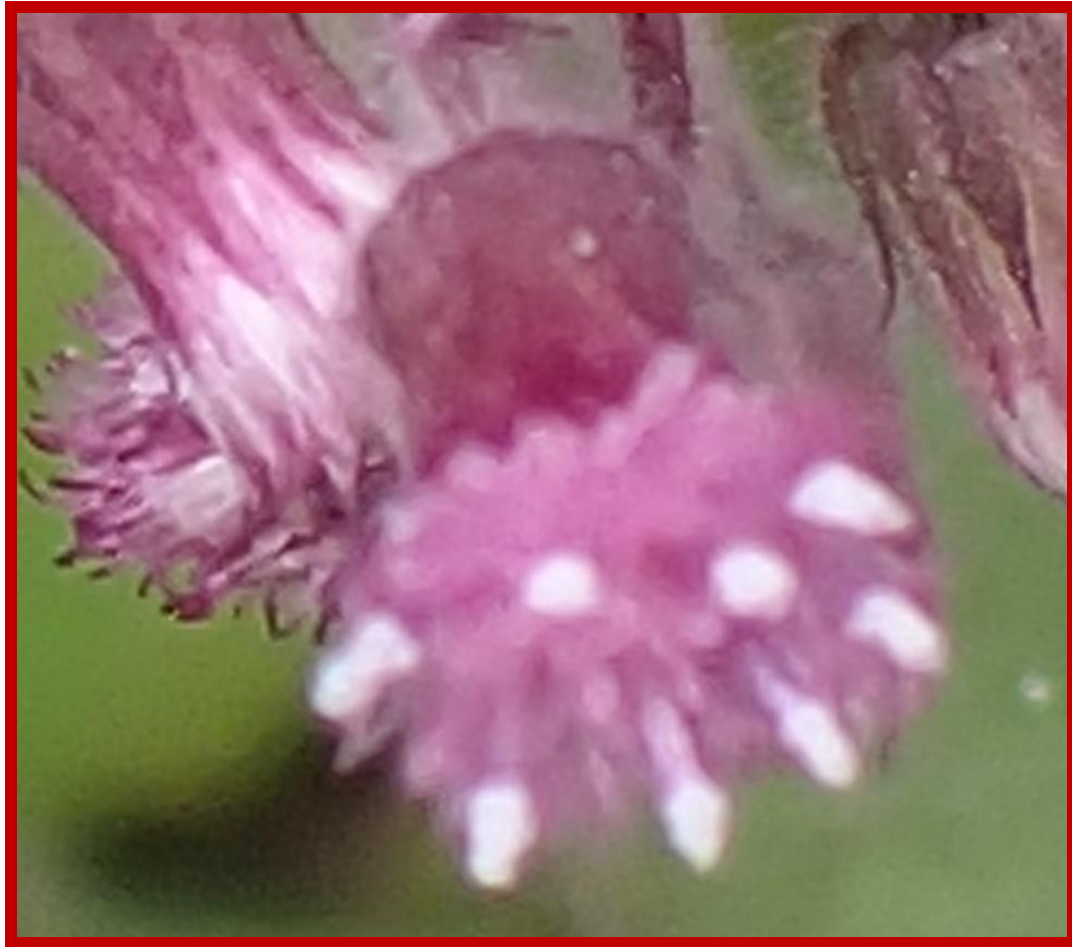


Fig. 680. *Emilia shengwushanensis* S. S. Ying, close-up of a capitulum

Achenes 2.8-3.2 mm long 0.5 mm wide, 5-ribbed, pale brown. Densely white hairy on ridges; pappus numerous, white, 5-6.5 mm long.

Diagnosis.

Emilia shengwushanensis is readily recognized by its small herb with simple, 15-30 cm long stem; oblong to ovate-oblong, 5-7 cm long, 2.5-3.5 cm wide leaves and numerous pink to purplish red capitula which 5-8 to form a corymbose and 4-8 corymboses to form a panicle-like inflorescence.

Distribution and phenology.

-574-



Fig. 681. *Emilia shengwushanensis* S. S. Ying, the holotype, TPRCH -113-131

(this holotype has transferred and deposited at TPRCH herbarium)

Emilia shengmushanensis S.S. Ying is endemic to Taiwan. It is known from Shengmushan(聖母山) area only, Chaochi Township (礁溪鄉), I-Lan county, northern Taiwan. It was discovered the species on sunny roadsides of forest edges at elevations of 185-290 meters. Its flowering time is March to April and fruiting times April to May.



Fig. 682. *Emilia shengwushanensis* S. S. Ying, close-up of a fruit



Fig. 683. *Emilia shengwushanensis* S. S. Ying, a panicle-like inflorescence



Fig. 684. *Emilia shengwushanensis* S. S. Ying, plants growing in situ



Fig. 685. *Emilia shengwushanensis* S. S. Ying, plants growing in situ

4. One New species of genus *Youngia* from Taiwan

Youngia songmaoensis S.S. Ying 松茂黃鵪菜

Youngia songmaoensis S.S. Ying, sp. nov. 松茂黃鵪菜

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Songmao Forest Road (松茂林道), 1650 m alt. S. S. Ying, s.n. April 11, 2024. (holotype, **TPRCH**).



Fig. 686. *Youngia songmaoensis* S. S. Ying, plants growing in situ

Morphology : Annual terrestrial herbs, stems absent. Leaves simple, many in a rosette, radial arrangement, oblong to ovate-oblong in outline, 8-12 cm long, 3.1-3.8 cm wide, obtuse at apex, attenuate at base, membranous, dentate at margins, pubescent on both surfaces, especially on midrib and lateral veins, green surface and pale purple beneath,

midrib impressed surface and elevated beneath, lateral veins 4-6 per side impressed surface and elevated beneath. Petioles elongate, 5.5-8.5 cm long, hirsute, with thinly winged, pale purple.



Fig. 687. *Youngia songmaoensis* S. S. Ying, leaves with elongate petioles



Fig. 688. *Youngia songmaoensis* S. S. Ying, leaf beneaths

Capitula numerous, rather smaller, dark-yellow to brownish yellow, 4-5 mm in diameter, in a terminal compound cymose; scape 1-3, green, from leaf-fascicled, 20-35 cm long, erected to ascending, leafless, glabrous, terete, dark purple; 6-10 cymose to form a compound cymose; each cymose with 15-20 capitula; peduncles slender, 7-11 cm long, glabrous, purple; pedicels 1-2.5 cm long, slender, glabrous; capitula with 12-21 florets; involucre campanulate, 6-7 mm long, 2.5-3.2 mm across; glabrous or nearly so, green tinged with purple at apex; outer phyllaries 5-7, ovate-triangular, 1.5-2.4 mm long, 0.6-1.2 mm wide, acute at apex; inner phyllaries 8-10, lanceolate, subequal, 7-9 mm long, 1.5-2.5 mm wide, purplish red, scarious- margined, acute at apex; ligules 10-12 mm long, 3.5-4.5 mm wide, 5-toothed; teeth 0.1-0.2 mm long, tube 2.5-3.5 mm long; anther tube 3-4.5 mm long; style branches ca 1.5 mm long.



Fig.689. *Youngia songmaoensis* S. S. Ying, inflorescences



Fig. 690. *Youngia songmaoensis* S. S. Ying, the holotype, TPRCH -113-132

(this holotype has transferred and deposited at TPRCH herbarium)



Fig. 691. *Youngia songmaoensis* S. S. Ying, close-up of capitula

Achenes 11-15 in each capitulum, cylindric, brown to dark brown, 2.2-2.5 mm long, 0.25 mm wide, compressed, attenuate to the narrow neck, with a conical summit, 4-5-ribbed. Pappus white, many, 4.5-5.2 mm long, 1-seriate.

Diagnosis: *Youngia songmaoensis* is characterized by its terrestrial habitat, entire leaves with dentate margins; capitula numerous, small, dark yellow, in a terminal compound cymose; scape 1-3, green, from leaf-fascicled; 6-10 cymose to form a compound cymose; each cymose with 15-20 capitula; capitula with 12-21 florets; involucre campanulate, 6-7 mm long, 2.5-3.2 mm across; achenes 11-15 in each capitulum, cylindric, brown to dark brown, 2.2-2.5 mm long, 0.25 mm wide, compressed, attenuate to the narrow neck; pappus white, many, 4.5-5.2 mm long, 1-seriate.,



Fig. 692. *Youngia songmaoensis* S. S. Ying, close-up of infructescence



Fig. 693. *Youngia songmaoensis* S. S. Ying, close-up of achenes

Distribution and phenology.

Youngia songmaoensis S.S. Ying is endemic to Taiwan. It is known from Songmao Forest Road (松茂林道), Hoping District (和平區), Taichung City, central Taiwan. It was discovered on the roadsides and edge of forests at elevations of 1550-1950 meters. Its flowering time is April to May and fruiting time is April to May.



Fig. 694. *Youngia songmaoensis* S. S. Ying, close-up of inflorescences

5. One New species of genus *Ainsliaea* from Taiwan

Ainsliaea rotundifolia S.S. Ying 圓葉鬼督郵

Ainsliaea rotundifolia S.S. Ying, *sp. nov.* 圓葉鬼督郵

TYPE: TAIWAN. Taoyuan City · Fuhsin District (復興區) · Lalashan (拉拉山), 2290 m alt.

S. S. Ying, *s.n.* October 26, 2024. (holotype, **TPRCH**).



Fig. 695. *Ainsliaea rotundifolia* S. S. Ying, plants growing in situ

Morphology : A annual herb, with scape about 9-15 cm high; Stem absent to very short, 0.5-1 cm long, green to greenish brown. Leaves 4-6 in a rosette, rounded to cordate-rounded, 2-3 cm long, 1.5-2.5 cm wide, obtuse at apex, obtuse to slightly cordate at base, thinly coriaceous, subentire to few aristate-serrulate at margins, lustrous green surface, pale green beneath, midrib and lateral veins impressed surface and elevated beneath, lateral veins somewhat inconspicuous, glabrous on both surfaces; petioles 8-15 mm long, terete, winged on both sides, green, glabrous.

Scape from leaf-clusterous, erect or ascending, 10-18 cm long, erect to ascending,



Fig. 696. *Ainsliaea rotundifolia* S. S. Ying, leaves



Fig. 697. *Ainsliaea rotundifolia* S. S. Ying, inflorescence



Fig. 698. *Ainsliaea rotundifolia* S. S. Ying, close-up of flowers, corolla absent

green, glabrous to pubescent, with 7-10 capitula in a racemose arrangement; pedicels 2-3 mm long, glabrous or nearly so, without bracts; involucre cylindrical, 5-7 mm long; phyllaries many in 3-seriate, green, green, glabrous, the lowest one smaller, lanceolate, 1-1.5 mm long, acute at apex, the upper ones lanceolate, 4-5 mm long, acuminate at apex; Florets 3-4, hermaphrodite; corolla not seen in this study; stamens extend, 3-4 mm long, anthers rounded, yellow, 1.5-2.2 mm long, apical anther appendages ovoid, obtuse at apex, about 0.5 mm long; style 7-9 mm long, 2-branched at apex.

Achenes cylindrical, 5-6 mm long, pale brownish, 9-10 nerved, hirsute; pappus bristles, ca. 23-30, 8-12 mm long, pale brownish.

Diagnosis.

The species is characterized by its smaller plant with rounded leaves, 7-10 capitula on a scape; florets 3-4, corolla absent and achenes cylindrical, 5-6 mm long, pale brownish, 9-10 nerved, hirsute; pappus bristles, ca. 23-30, 8-12 mm long, pale brownish.



Fig. 699. *Ainsliaea rotundifolia* S. S. Ying, the holotype TPRCH -113-133



Fig. 700. *Ainsliaea rotundifolia* S. S. Ying, close-up of achenes

Distribution and phenology.

Ainsliaea rotundifolia S.S. Ying is endemic to Taiwan. It is known from under the forests of *Chamaecyparis formosensis*, Fuhsin District (復興區), Taoyuan city, northern Taiwan. It was collected under the forests between 2,000 and 2,350 m elevation and flowering time from October to November, fruiting time is November.



-589- Fig. 701. *Ainsliaea rotundifolia* S. S. Ying, plants growing in situ

64..A New Species of Genus *Valeriana* (Caprifoliaceae) from Taiwan

Valeriana taiwaniana S.S. Ying 台灣纈草

Valeriana taiwaniana S.S. Ying, *sp. nov.* 台灣纈草

TYPE:TAIWAN. Miaoli County, Taian Townshap (泰安鄉) , Guanwu (觀霧), Between Guanwu (觀霧) and Shi-Pa Leisure Farm (雪霸休閒農場),1856 m alt. S. S. Ying , s.n. October 17, 2024 . (holotype , **TPRCH**) .



Fig. 702. *Valeriana taiwaniana* S. S. Ying, inflorescences

Morphology : An annual small herb, about 25-45 cm tall, rhizome short, 6-15 mm , somewhat fleshy, glabrous; roots fibrous, slender. Stem solitary, simple, 25-45 cm long, suberect to scending, 4-angular, green to pale purple, glabrous to slightly pubescent upward. Leaves pinnate, opposite, the basal one 10-14 cm long, 4-5 cm wide in outline; leaflets 7-9, the terminal one largest, ovate, 4.5-5.5 cm long, 3-3.5 cm wide, obtuse at base, -590-

slightly fleshy, dwntrate at margins, midrib impressed surface and slightly elevated beneath, glabrous on both surface, lustrous green surface and plae green beneath; lateral leaflets 3-4 pairs, much smaller, ovate, 0.7-1.5 cm long, 5-10mm wide, Petioles 1.5-2.5 cm long, green, grooved above, glabrous; petioles shorter, 2-4mm long. gradually smaller for upward pinnate leaves.



Fig. 703. *Valeriana taiwaniana* S. S. Ying, stem and leaves

Flowers white, rather small, 2-3 mm in diameter when opened, in a terminal cymose; the inflorescence 6-11 cm long, suberect to scending, branched upward, slightly 4-angulared, glabrous; bracts 1-3 at base of each flowers and subtended the flower, lanceolate to ovate-lanceolate, 5-7 mm long, 1.5-2.5 mm wide, obtuse at apex, ciliate at margins, green, slightly pubescent on both surfaces; pedicels short, 1.5-3 mm long, pubescent; calyx a ring at anthersis, green to pale green, 2-3 mm in diameter, unfurting into 10-12 pale green plumose segments, 9--11 mm long in mature fruit; corolla rotate, 4-5-lobed, 2.5-3.5 mm long, white, slightly gibbous at base, the lobes rounded, obtuse at apex; stamens 3, included, ovary cylindrical, 4-5 mm long, green, slightly hairy. Immature

achenes ovoid, 3-4.5 mm long, glabrous, crowned by persistent, plumose calyx.



Fig. 704. *Valeriana taiwaniana* S. S. Ying, close-up of inflorescence,
calyx plumose segments can be seen

Diagnosis.

Diagnosis: *Valeriana taiwaniana* is characterized by its annual herbs, stem suberect to scending; leaves opposite, pinnate; flowers white, rather small, 2-3 mm in diameter when opened, in a terminal cymose; bracts 1-3 at base of each flowers and subtended the flower, lanceolate to ovate-lanceolate, 5-7 mm long, 1.5-2.5 mm wide, obtuse at apex, ciliate at margins, green, slightly pubescent on both surfaces.



Fig.705. *Valeriana taiwaniana* S. S. Ying, the holotype TPRCH -113-134



Fig. 706. *Valeriana taiwaniana* S. S. Ying, habit

Distribution and phenology.

Valeriana taiwaniana S.S. Ying is endemic to Taiwan. It is known on forest edge along the roadsides between Guanwu (觀霧) and Sheipa Lesiaure Farm (雪霸休閒農場), Guanwu area, Taian Townshaip (泰安鄉), Miaoli County, central Taiwan. It was discovered the species under the forest edge and the roadsides at elevations of 1,800-1,950 meters. Its flowering time is October and fruiting time is November.



Fig. 707. *Valeriana taiwaniana* S. S. Ying, plant in situ

新植物及新名稱 (第七卷)

(NEW TAXA AND NEW NAMES)

(VOLUME Seven)

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