

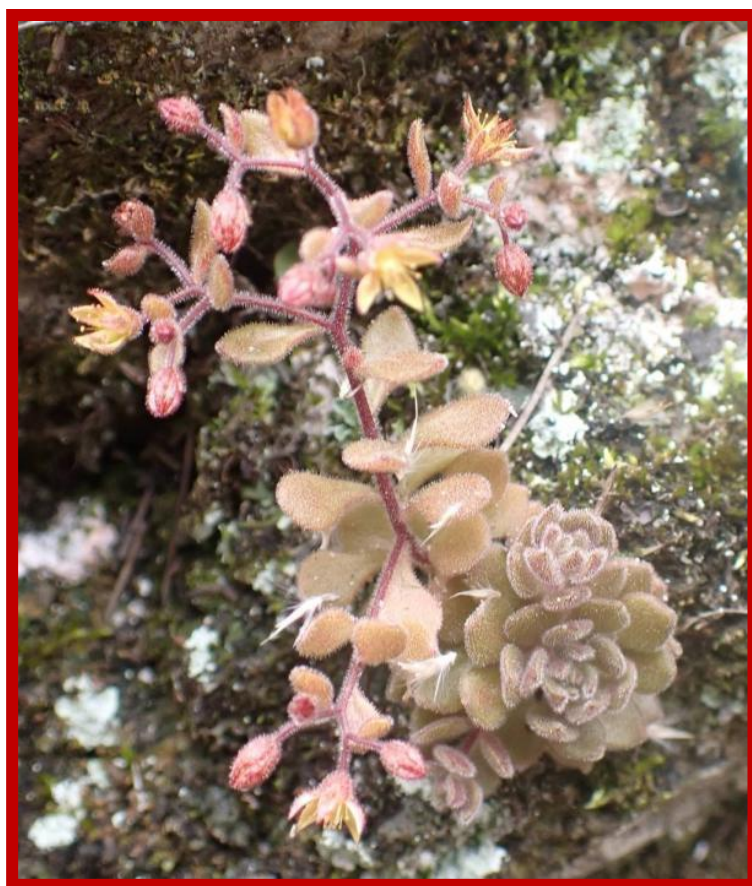
植物分類著作電子叢書 (e-books)

新植物及新名稱

(NEW TAXA & NEW NAMES)

(第五卷, Volume Five)

應紹舜 (Shao-shun Ying) 著



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新植物及新名稱

(NEW TAXA & NEW NAMES)

(第五卷, Volume Five)

應紹舜著

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Ilex rubroantheriana S.S. Ying, *sp.nov.*



Scorzonera taiwanensis S. S. Ying, *sp. nov.*



Quercus taiwanensis S. S. Ying, *sp. nov.*

Preface

I am luck , after 《New Taxa and New Names Volume 4》 was published on 30, November 2021, I visited Wulin Farm (武陵農場) for another field collected and studied on 02, December last year, I thought I couldn't find any new matter of plant taxonomy for its over development of agriculture and tourism, but I am wrong, accidentally I found a plant colony grows on mossy limestone cliff, examined it, it is a species of genus *Sinocrassula*, the genus is a new recorded of flora of Taiwan. I am so happy and excited, I transplanted it to my house garden in Taipei city, and it is flowering in February 2022, it is a distinctive new species of Taiwan flora, I described this new species and nominated it as *S. taiwaneniana*. *Sinocrassula shaolinchiana*, another new species of the genus, I described in this e-book, the specific name, *shaolinchiana*, is in honor of Mrs. Shaolinch (邵令淇女士), my mother. I collected the specimens of the species between Jenhsingang (日新崗) and Songchuangang (松泉崗), 2450-2570 m in elevations of central Taiwan. *Sinocrassula parvifolia*, the third species was described of the genus in this e-book, two localities where I collected the species. 1. Between 121 Km and Pilushenmu (碧綠神木) Central Cross-island Highway, 2310-2400 m in elevations. on exposed rocks, and 2. Between Chiliang Police Station (志良派出所) and Huapu (花圃), 1500-1750m in elevations, which grows on mossy limestones of montane slope. each species has its own characteristics.

Ilex rubroantheriana, an extraordinary species of genus *Ilex* of the world which was collected at Wulin Farm (武陵農場) too, it's characterized by its solitary to 2-4 male flowers fasciculate at branches and leaf-axils, attached with 4 conspicuous bright red, oblong anthers in each flower, grows on montane cliffs just on opposited side of the river to the first bridge at farm entrance (農場入口第一座橋河流對面山坡的峭壁), between 1700 and 2000 m altitudes.

Euonymus wulinensis, another extraordinary species of family Celastraceae at this farm, it is characterized by its evergreen medium sized tree, and ovate to rounded, smooth young and honeycomb-like adult petals, when it is full blooming, very spectacular.

-X-

Lalashan (拉拉山), the mountain locates at the junction between Fuhsin District, Taoyuan City and Wurai District, New Taipei City, the highest peak is 2031 meters above sea level. La-la Mountain Nature Reserve (拉拉山自然保護區) was designated by Forestry Bureau, Council of Agriculture, Executive Yuan in 1985. This luxuriant forest here with various of rare, precious and valuable species, the most famous tree is *Chamaecyparis formosensis*, there are 24 ancient and huge trees interspersal the area, each of them are numbered and described in the signs. It's a paradise for botanical researchers. I visited the Reserve nearly once a month this year.

Shaolinchiana is a new genus of Rubiaceae which I proposed it in this e-book, the type species *Shaolinchiana lalashaniana* was collected under the *Chamaecyparis formosensis* forest at elevations of 1900 to 2010 meters of this area, it mixed with moss and other shade-loved herbs, and is recognized by its tubular, not widely opened, somewhat like a hand windmill, 5-lobed at apex of corolla and somewhat like a gold ingot (金元寶) capsule. Other new species which I described and collected here are *Mazus lalashanensis*, *Elatostema lalashanense*, *Alpinia lalashanense*, *Lonicera taiwanensis*, *Epipogium lalashanense*, *Ainsliaea lalashanensis*, *Youngia lalashanensis*, etc.

Siyanwukou (思源埡口), another paradise for botanical researchers in Taiwan, the sole evergreen broadleaved cloud forest of Taiwan, occurs between 1550 and 1940m elevation of northern Taiwan, and on the saddles between Central mountain range (中央山脈) and Sylvia mountain range (雪山山脈), the forests which receive a substantial amount of additional precipitation from fog drip on a regular basis in the fall and winter seasons. the forest is a rich biodiversity area rich in flora that some cases are unique to the ecosystem.

Hedera siyanwukouensis is a climber which I collected at this forests about 1920 in elevations, it is similar to *H. rhombea* var. *formosana* (Nakai) H.L.Li in habit, but it differs in having monomorphical leaves, elongate petioles, 2-6 flowers in an umbel, 1-4 umbels to form a raceme and pear-like rather larger purplish red fruits.

Mazus uniflorus, another new species which I collected montane slopes at this forest, it recognized by its solitary flower in a very short pedicel and several pedicels from fascicled

leaves.

Other new species from this cloud forest are *Lonicera tulinensis* for its 3-4 paired terminal flowers usually subtended by 2 leaf-like bracts; *Traxhelospermum tulinense* is for its scentless, smaller, 1.0-1.3 cm in diameter when opened flowers; *Epilobium tulinianum* for its annual erect small and dwarf herbs and white, protandrous, solitary flowers, etc.

Oxalis taitastricta is a distinctive new species of Taiwan *Oxalis*, readily recognised by its without bulb; horizontal, branched rhizomes; leaves 4-6 on the nodules of rhizome-branches; leaflets purplish red and densely villose beneath and rather larger, white with purplish red or violet veins flowers; prefix word *taita* is an abbreviation of National Taiwan University in Chinese, the species, I think, it is a potential species for ornamental purpose.

Thanks to professor Fang-hua Chu (曲芳華教授) and senior specialist. Wen-tung Wu (吳文統技正) School of Forestry and Resource Conservation, National Taiwan University, for their administrative support.

Total together with 556 pages and 721 pictures of this e-book to discuss, explain and describe of one new genus, 73 new species, 3 new varieties and 3 new combinations; among those, the genera *Shaolinchiana*, *Sinocrassula*, *Crassula* and *Scorzonera* are 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

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Sinocrassula parvifolia S.S. Ying , *sp. nov.*

1.A New Genus *Shaolinchiana* S. S. Ying (Rubiaceae) and A New Species

Shaolinchiana lalashaniana S.S. Ying in Taiwan)

Shaolinchiana S.S. Ying, gen.nov. 邵氏草屬



Fig. 1. *Shaolinchiana* S. S. Ying, gen. nov.

The above picture with 4 flowers and one fruit to express the characters of the genus

From right, flower 1 and flower 4 are just opened (not widely opened), flower 2, the corolla had dropped, flower 3 in a bud status. the fruit somewhat fleshy, opened when mature, seeds few.

Morphology : Annual to biennial small herbs ◦ taproot none , fibrous roots slender, from creeping stem ; stem creeping, somewhat fleshy ◦ Leaves simple, opposited, small; stipules minute , petioles conspicuous ◦ Flowers small, few in axillary cyme; peduncles erect or ascending, pubescent; bracts lanceolate, cauduous or not; pedicels slender ; calyx lobes 5 ; corolla tubular, not widely opened, somewhat like a hand windmill, 5 lobed at apex; the

lobes minute and obtuse at apex ; stamens 5 , included ; filaments slender, glabrous; anthers oblong; style slender, included; stigma capitate; ovary globose , glabrous ° Fruits fleshy capsules, dehiscent when mature; seed few in each fruit °

Type species : *Shaolinchiana lalashaniana* S.S. Ying °

TYPE:TAIWAN. Taoyuan City , Fuhsin District (復興區) , Lalashan (拉拉山), 1995 m alt.

S. S. Ying , *s.n.* May 29, 2022 ° (holotype, NTUF) °

The generic name *Shaolinchiana* is honour for late Mrs. Shaolinchi , my mother.

Diagnosis. The genus is somewhat like the genus *Ophiorrhiza* Linn., especially in fruit, but our plant much smaller, corolla tubular, not widely opened, greenish yellow in colour and fleshy opened fruit with fewer seeds.



Fig. 2. *Shaolinchiana lalashaniana* S. S. Ying, habit

Shaolinchiana lalashaniana S.S. Ying, 拉拉山邵氏草

Shaolinchiana lalashaniana S.S. Ying, *sp.nov.* 拉拉山邵氏草

TYPE:TAIWAN. Taoyuan City , Fuhsin District(復興區) , Lalashan (拉拉山), 1995 m alt.
S. S. Ying , s.n. May 29, 2022 ° (holotype, NTUF) °



Fig. 3. *Shaolinchiana lalashaniana* S. S. Ying, stem and leaves

Morphology : Annual to biennial small herbs ° taproot none , fibrous roots slender, from creeping stem ; stem creeping to ascending, 5-11 cm long, somewhat fleshy, pale purplish, pubescent when young and glabrous adult ° Leaves simple, opposited, ovate to ovate-oblong, 1.5-2 cm long, 7-10 mm wide, acuminate to obtuse at apex, obtuse at base, thinly coriaceous, entire and ciliate at margins, lustrous green surface and pale green beneath, scattered short-hirsute surface, glabrous to few hirsute beneath, midrib impressed surface and elevated beneath, lateral veins 3-5 per side, somewhat inconspicuous. Petioles 4-8 mm long, fleshy, purplish, groove, pubescent.

Flowers 5-8, greenish yellow, not widely opened, 3-4 mm in diameter when opened, somewhat like a handle wind-mill, in an axillary cyme; peduncles 8-12 mm long, pale purplish, fleshy, pubescent, erect to ascending; bracts lanceolate, 2.5-3.5 mm long, about 1.5 mm wide, acuminate at apex, purplish; pedicels 1.5-2.5 mm long, fleshy, pale purplish,



Fig. 4. *Shaolinchiana lalashaniana* S. S. Ying, close-up of leaves



-4- Fig. 5. *Shaolinchiana lalashaniana* S. S. Ying, inflorescence

pubescent; calyx lobes 5, attached with apex of ovary, ovate to ovate-lanceolate, 1.8-2.2 mm long, 1 mm wide, acuminate at apex, pubescent; corolla tubular, 4-5 mm long, 3-4 mm in diameter, somewhat like a hand wind-mill, greenish yellow in colour, glabrous or nearly so, 5-lobed at apex; lobes minute, 0.3 mm long, obtuse at apex; stamens 5, included, filaments slender, 2-3.5 mm long; anthers ovoid, 0.5 mm long; ovary inferior, globose, 2.5 mm across, nearly glabrous, yellowish green; style slender, 3.5 mm long; stigma capitate.



Fig. 6. *Shaolinchiana lalashaniana* S. S. Ying, close-up of fruits

From left to express maturity of fruits, the right one is a mature fruit
mind the calyx lobes are persistent

Fruits a capsule, somewhat like a gold ingot (金元寶), 6-8 mm long, 4-5 mm wide, fleshy, pale green, glabrous; exocarp larger, obtuse at both ends, calyx lobes persistent at apex; endocarp extended, subtend by exocarp, smaller, obtuse at apex, opened when mature; calyx lobes minute, 0.5-0.7 mm long, acute at apex, purple. Seeds few, compressed ovoid, 0.2-0.3 mm across, brownish; pedicels 7-15 mm long, fleshy, pubescent, pale purplish green.



Fig. 7. *Shaolinchiana lalashaniana* S. S. Ying, close-up of an opened fruits



Fig. 8. *Shaolinchiana lalashaniana* S. S. Ying, inflorescence and fruit

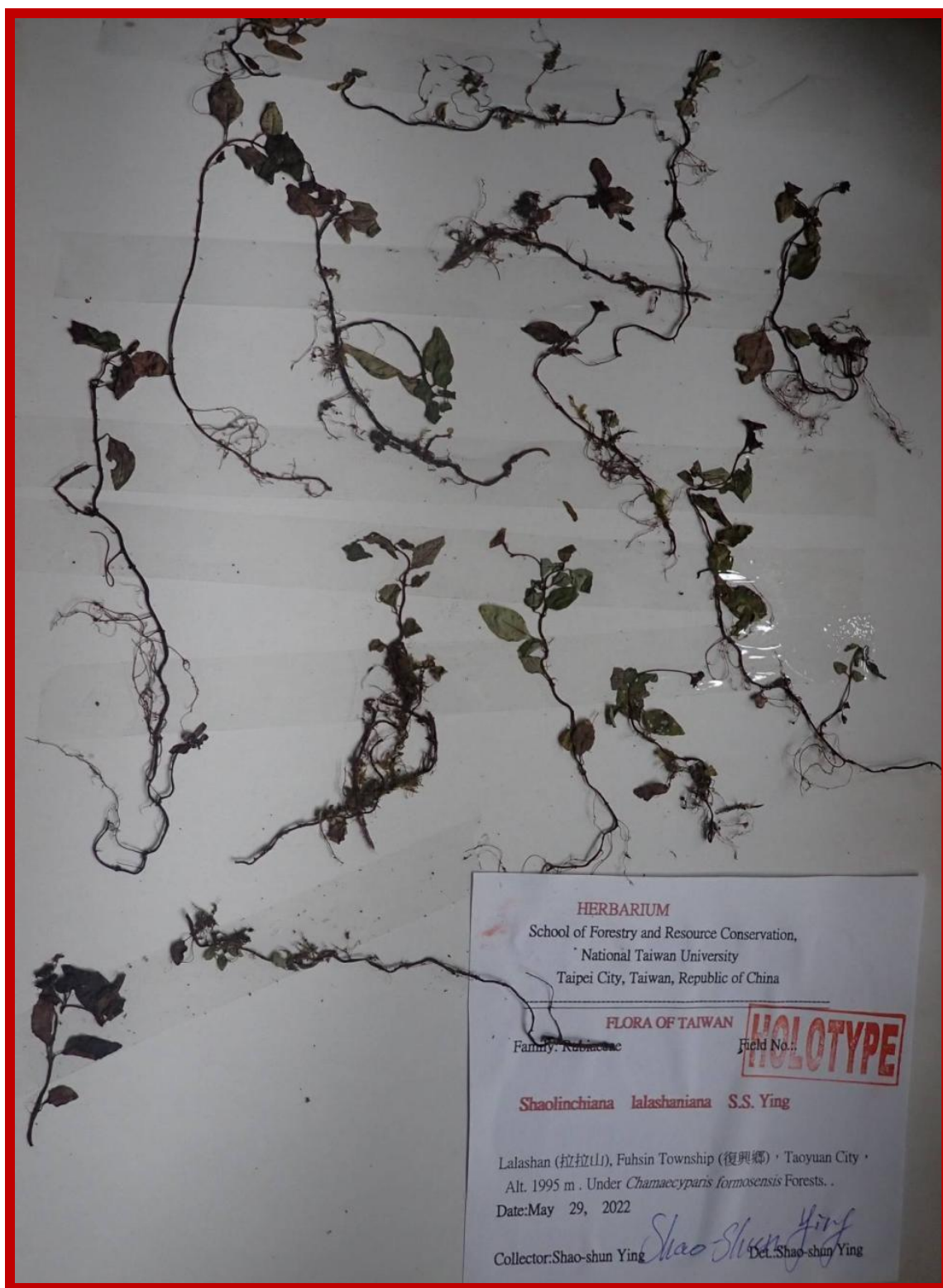


Fig. 9. *Shaolinchiana lalashaniana* S. S. Ying, the holotype NTUF-111-001

Diagnosis.

1.The genus *Shaolinchiana* is a new genus of Flora of the world.

2.The species is recognized by its tubular, not widely opened, somewhat like a hand windmill, 5 lobed at apex corolla and somewhat like a gold ingot (金元寶) capsule which exocarp larger, obtuse at both ends, calyx lobes persistent at apex; endocarp extended, subtend by exocarp, smaller, obtuse at apex, opened when mature.

Distribution and phenology.

Shaolinchiana lalashaniana 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 discovered the species under *Chamaecyparis formosensis* forest at elevations of 1900-2100 meters, mixed with moss and other shade-loved herbs. Its flowering time is May to June; and fruying time is May to July. .



Fig. 10. *Shaolinchiana lalashaniana* S. S. Ying, fruits

2.Three New Species of Genus *Sinocrassula* (Crassulaceae) from Taiwan

A.Sinocrassula taiwaniana S.S. Ying

Sinocrassula taiwaniana S.S. Ying , *sp. nov.* 台灣石蓮

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Wulin Farm (武陵農場) 1870 m alt. cultivated in Taipei *S. S. Ying* , *s.n. February 22, 2022* ° (holotype , NTUF) °



Fig. 11. *Sinocrassula taiwaniana* S. S. Ying,
(origin habitat at Wulin Farm, 1870 m alt. December, 2021)

Morphology : Lithophytic pubescent perennial herbs, usually forming rosettes colony . rosettes usually 1.5 – 2.5 cm in diameter, sterile stems absent. Leaves basal, closely approximate each other, imbricate, sessile, succulent, pale green, fleshy, spatulate to



Fig. 12. *Sinocrassula taiwaniana* S. S. Ying, close-up of leaves
(origin habitat at Wulin Farm, 1870 m alt. December, 2021)

ovate-triangular, 8-15mm long, 5-8 mm wide, about 2 mm thick, acute at apex, attenuate at base, densely scattered white hairs all over, entire and ciliate at margins, midrib and lateral veins inconspicuous. Petioles flat, 3-4 mm long, 1.5 mm wide, scattered white hairs, pale green in color.

Flowers many, smaller, yellow, 4-5 mm in diameter when opened, in terminal and

axillary cymes; floriferous stem basal, produced in February to March, erect to ascending, 8-12 cm long, green, pubescent; leaves of floriferous stem like radical leaves but somewhat larger, 9-15 mm long, 7-10 mm wide; 5-9 cymes from leaf-axils and one cymes terminal, 4-6 mm long, pubescent, green; bracts 2-3, lanceolate, 3.5-4.5 mm long, about 1.5 mm wide, pubescent; pedicels slender, 4-15 mm long, pubescent, green; calyx subglobose, 3-4 mm in diameter, 5-deeply lobed; sepals lanceolate, 3.5-4 mm long, 2-2.5 mm wide, acute at apex, green, pubescent outside and glabrous inside; petals 5, ovate, 4-5 mm long, 2-2.5 mm wide, obtuse at apex, concave at base, glabrous; stamens 5, alternate at



Fig.13. *Sinocrassula taiwaniana* S. S. Ying, flowering plants on February, 2022)

(Cultivated in Taipei, alt.15m)

petals, inserted on sepals, slightly shorter than petals; filaments slender, white to pale yellow; anthers ovoid, white, basifixed, 0.6 mm long and wide; nectar scales entire, slightly rectangular, 0.25-0.3 mm long, 0.3-0.4 mm wide, dentate at apex; carpels 5, erect, oblong, 1-1.5 mm long, glabrous, style short, 0.6 mm long, stigma capitate.



Fig.14. *Sinocrassula taiwaniana* S. S. Ying, flowering plants on February, 2022)

Fruit a follicle, oblong, connate at base, 2.6-3.1 mm long, 1 mm wide, pale brownish when mature, apically with recurved beak, dehiscent from the apex by lateral split. Seeds many, rounded, 0.3 mm across, smooth, glabrous, brownish.



Fig.15. *Sinocrassula taiwaniana* S. S. Ying, a withered fructescence in the middle
(origin habitat at Wulin Farm, 1870 m alt. December, 2021)



Fig 16. *Sinocrassula taiwaniana* S. S. Ying, a withered fructescence in the middle
-13- (origin habitat at Wulin Farm, 1870 m alt. December, 2021)



Fig.17. *Sinocrassula taiwaniana* S. S. Ying, flowering plants on February, 2022)

(Cultivated in Taipei, alt.15m)



Fig.18 *Sinocrassula taiwaniana* S. S. Ying, close-up of flowers, February, 2022)



Fig.19 *Sinocrassula taiwaniana* S. S. Ying, the holotype, NTUF-111-002

Diagnosis.

1.The genus *Sinocrassula* is a new record genus of Flora of Taiwan.

2.It is a distinctive new species of Taiwan, it is recognized by its 1.5 – 2.5 cm in diameter rosettes, sterile stems absent, closely approximate, imbricate, sessile, succulent, pale green leaves, smaller, yellow, 4-5 mm in diameter when opened, in terminal and axillary cymes flowers.



Fig.20. *Sinocrassula taiwaniana* S. S. Ying, flowering plants on February, 2022)

(Cultivated in Taipei, alt.15m)

Distribution and phenology.

Sinocrassula taiwaniana S.S. Ying is endemic to Taiwan. It is known from Wulin Farm (武陵農場) Hoping District (和平區), Taichung City, Central Taiwan. It was collected on the mossy cliff of mountain slope, 1870-2100 altitudes, and flowering time is February to March and fruiting time March to May. somewhat rare.



Fig.21. *Sinocrassula taiwaniana* S. S. Ying, flowering plants on February, 2022)
(Cultivated in Taipei, alt.15m)



Fig.22. *Sinocrassula taiwaniana* S. S. Ying, flowering plants on February, 2022)
(Cultivated in Taipei, alt.15m)



Fig.25. *Sinocrassula taiwaniana* S. S. Ying, habitat, (origin habitat at Wulin Farm, 1870 m alt. June 2, 2022)



Fig.26. *Sinocrassula taiwaniana* S. S. Ying, habitat, (origin habitat at Wulin Farm, 1870 m alt. June 2, 2022)

B.Sinocrassula shaolinchiana S.S. Ying

Sinocrassula shaolinchiana S.S. Ying , *sp. nov.* 邵氏石蓮

TYPE:TAIWAN. Taichung City , Hoping District (和平區) , Between Jenhsingang (日新崗) and Songchuangang (松泉崗), 2540 m alt. *S. S. Ying* , *s.n. February 17, 2022* .
(holotype , NTUF) .



Fig.27. *Sinocrassula shaolinchiana* S. S. Ying, plants colony

Morphology : Lithophytic perennial herbs, usually forming rosettes colony,. rosettes usually 1.2 – 2.3 cm in diameter, sterile stems absent. Leaves basal, closely approximate each other, imbricate, sessile, succulent, pink to greenish pink, fleshy, ovate to ovate-triangular, 5-7 mm long, 4-6 mm wide, about 2.5 mm thick, obtuse at apex, attenuate at base, densely scattered glandular hairs all over, entire and glandular-ciliate at margins, midrib and lateral veins inconspicuous. Petioles flat, 2.5-3.5 mm long, 1.5 mm wide, scattered glandular hairs, pink to greenish pink in color.



Fig.28. *Sinocrassula shaolinchiana* S. S. Ying, plant colony



Fig.29. *Sinocrassula shaolinchiana* S. S. Ying, habit

Flowers yellow, many, rather larger, 5-6.5 mm in diameter when opened, in base compound cymes, inflorescence erect to ascending, 5-8 cm long, purple red, densely scattered with glandular hairs; cymes 3-5, 2.5-4.5 cm long, erect to ascending, purple red, densely scattered with glandular hairs; bracts none; pedicels slender, 4-17 mm long, densely scattered with glandular hairs, purple red; calyx globose, 3-4 mm in diameter, 5-deeply lobed; sepals ovate-lanceolate, 2.5-5 mm long, 2.5-3.2 mm wide, acute at apex, green tinged with purple red at top, densely scattered with glandular hairs outside and glabrous inside; petals 5, oblong, 5-6.5 mm long, 2.5-3.5 mm wide, acute at apex, concave at base, glabrous; stamens 5, alternate at petals, inserted on sepals, shorter than petals; filaments slender, 3-3.5 mm long, pale yellow; anthers kidney-shape, pale brown, basifixed, 0.6 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, conical, 2.5-3.5 mm long, glabrous, style short, 0.6 mm long, purple red; stigma capitate, 0.2 mm across, white.

Fruit a follicle, oblong, connate at base, 4.5-5.2 mm long, 2.2-3.0 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.30. *Sinocrassula shaolinchiana* S. S. Ying, habitat



Fig.31. *Sinocrassula shaolinchiana* S. S. Ying, the inflorescence



Fig.32. *Sinocrassula shaolinchiana* S. S. Ying, close-up of inflorescence



Fig.33. *Sinocrassula shaolinchiana* S. S. Ying, close-up of flowers



Fig.34. *Sinocrassula shaolinchiana* S. S. Ying, close-up of dehiscent follicles

Diagnosis.

- 1.The genus *Sinocrassula* is a new record genus of Flora of Taiwan.
- 2.It is a distinctive new species of Taiwan, it is recognized by its 1.2 – 2.3 cm in diameter rosettes, sterile stems absent, closely approximate, imbricate, sessile, succulent, pink to greenish pink, fleshy, ovate to ovate-triangular leaves and rather larger, yellow, 5-6.5 mm in diameter when opened, in terminal compound cymes flowers.
- 3.The whole plant densely scattered with white glandular hairs.



Fig.35. *Sinocrassula shaolinchiana* S. S. Ying, close-up of fruits



-25- Fig.36 *Sinocrassula shaolinchiana* S. S. Ying, flower buds

Distribution and phenology.

Sinocrassula shaolinchiana S.S. Ying is endemic to Taiwan ° It is known from the area between Jenhsingang (日新崗) and Songchuangang (松泉崗), 2450-2570 m in elevations, Taichung City, Central Taiwan, usually grows on mossy limestones of montane slope ° and flowering time is February to May and fruiting time March to November. somewhat rare.



Fig.37. *Sinocrassula shaolinchiana* S. S. Ying, habitat



Fig.38. *Sinocrassula shaolinchiana* S. S. Ying, habitat



-27- Fig.39. *Sinocrassula shaolinchiana* S. S. Ying, the holotype, NTUF-111-003



Fig.40. *Sinocrassula shaolinchiana* S. S. Ying, habit



Fig.41. *Sinocrassula shaolinchiana* S. S. Ying, plant colony

C.Sinocrassula parvifoliana S.S. Ying

Sinocrassula parvifoliana S.S. Ying , *sp. nov.* 小葉石蓮

TYPE:TAIWAN. Taichung City , Hoping District (和平區) , Between Chiliang Police Sttion (志良派出所) and Huapu (花圃), 1540 m alt. *S. S. Ying* , *s.n. April 14, 2022* . (holotype , NTUF) .



Fig.42. *Sinocrassula parvifoliana* S. S. Ying, plant colony

Morphology : Lithophytic perennial herbs, usually forming rosettes colony, rosettes usually 1.0 – 1.5 cm in diameter, sterile stems absent. Leaves basal, closely approximate each other, laxly imbricate, sessile, succulent, green, greenish pink to pink, fleshy, ovate, rounded to spatulate, 5-6 mm long, 4-5 mm wide, about 2.2 mm thick, obtuse at apex, attenuate at base, densely scattered glandular hairs all over, entire and glandular-ciliate at margins, midrib and lateral veins inconspicuous. Petioles flat, 1.5-2.5 mm long, 1.5 mm wide, scattered glandular hairs, pink to greenish pink in color.



Fig.43. *Sinocrassula parvifolia* S. S. Ying, habitat



Fig.44. *Sinocrassula parvifolia* S. S. Ying, habitat



Fig.45. *Sinocrassula parvifolia* S. S. Ying, plant colony



Fig.46. *Sinocrassula parvifolia* S. S. Ying, close-up of rosettes



Fig.47. *Sinocrassula parvifolia* S. S. Ying, close-up of leaves



-32- Fig.48. *Sinocrassula parvifolia* S. S. Ying, flowering stems

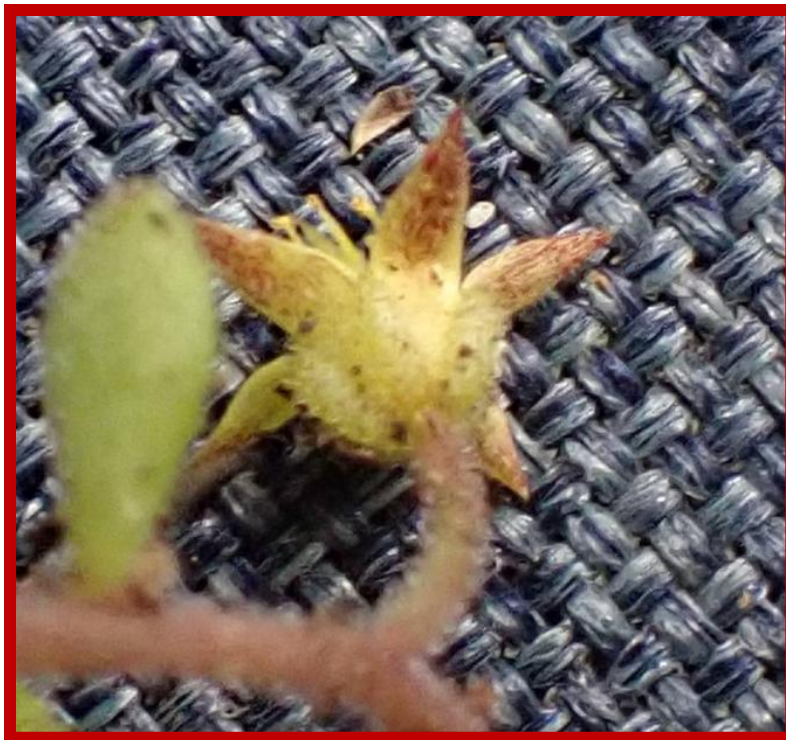
Flowers yellow, many, rather smaller, 4.5-5.5 mm in diameter when opened, in basal and terminal compound cymes, flowering stem erect to ascending, 2.5-8 cm long, purple red, densely scattered with glandular hairs; leaves somewhat like the rosette leaves but smaller, cymes 3-5, 2.5-4.5 cm long, erect to ascending, purple red, densely scattered with glandular hairs; bracts none; pedicels slender, 3.4-12 mm long, densely scattered with glandular hairs, purple red; calyx 5-deeply lobed; sepals lanceolate, 2.5-3 mm long, 1.5-1.8 mm wide, acute at apex, green t, densely scattered with glandular hairs outside and glabrous inside; petals 5, oblong, 4-4.9 mm long, 1.6-2.5 mm wide, acute at apex, purplish outside and yellow inside, glabrous; stamens 5, alternate at petals, inserted on sepals, shorter than petals; filaments slender, 2-2.5 mm long, pale yellow; anthers kidney- shape, pale pale yellow, basifixed, 0.4 mm long and wide; nectar scales entire, slightly rectangular, 0.25-0.3 mm long, 0.25-0.35 mm wide, dentate at apex; carpels 5, erect, conical, 2.5-3.5 mm long, glabrous, green; style short, 0.5 mm long, purplish to pale yellow; stigma capitate, 0.2 mm across, white.



Fig.49. *Sinocrassula parvifolia* S. S. Ying, inflorescences



Fig.50. *Sinocrassula parvifolia* S. S. Ying, close-up of flowers



-34- Fig.51 *Sinocrassula parvifolia* S. S. Ying, close-up of flower, see from back side

Fruit a follicle, oblong, connate at base, 2.7-4.2 mm long, 2.0-2.8 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.52. *Sinocrassula parvifolia* S. S. Ying, habitat

Diagnosis.

- 1.The genus *Sinocrassula* is a new record genus of Flora of Taiwan.
- 2.It is a distinctive new species of Taiwan, it is recognized by its 1.0 – 1.5 cm in diameter rosettes, sterile stems absent, closely approximate, laxly imbricate, sessile, succulent, green, greenish pink to pink, fleshy, ovate, rounded to spatulate leaves and rather smaller, yellow, 4.5-5.5 mm in diameter when opened, in basal and terminal compound cymes flowers.
- 3.Calyx 5-deeply lobed; sepals lanceolate, 2.5-3 mm long, 1.5-1.8 mm wide, acute at apex, green t, densely scattered with glandular hairs outside and glabrous inside.

Distribution and phenology.

Sinocrassula parvifolia S.S. Ying is endemic to Taiwan. It is known from the area between Chiliang Police Station (志良派出所) and Huapu (花圃), 1500-1750 m



Fig.53. *Sinocrassula parvifolia* S. S. Ying, the holotype NTUF-111-004



Fig.54. *Sinocrassula parvifolia* S. S. Ying, the isotype

NTUF-111-005

elevations, Hoping District (和平區), Taichung City; it is also seen at the area between 121 Km and Pilushenmu (碧綠神木) Central Cross-island Highway, 2310-2400 m in elevations, usually grows on mossy limestones of montane slope. and flowering time is April to May and fruiting time March to November. somewhat rare.



Fig.55. *Sinocrassula parvifolia* S. S. Ying, habitat



Fig.56. *Sinocrassula parvifolia* S. S. Ying, habitat

3. Two New Species of Genus *Sedum* (Crassulaceae) from Taiwan

A. Sedum parviflorum S.S. Ying

Sedum parviflorum S.S. Ying, *sp. nov.* 小花佛甲草

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Between Piluchi (碧綠溪) and Lishan (梨山), 2100 m alt. S. S. Ying, *s.n.* January 20, 2022. (holotype, NTUF).



Fig.57. *Sedum parviflorum* S. S. Ying, habit

Morphology : Annual smaller, erect herbs, roots fibrous, slender; stems simple to branched upward, erect to ascending, 3-6 cm long, fleshy, green, glabrous. Leaves simple, alternate (basal), opposite (middle) and verticillate (set off the flower), spatulate, 3-7 mm long, 2-4.5 mm 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 1.2-1.5 mm long, glabrous, fleshy.

Flowers solitary, yellow, 3-5 mm in diameter when opened, scentless, terminal on branchlets, usually subtended by several smaller leaves; pedicels 0; bracts ovate, 1.5-2 mm long, about 1 mm wide; obtuse at apex, glabrous; sepals 5, smaller, ovate, 1.5-2.2 mm long, about 1.1-1.8 mm wide, obtuse at apex, green, glabrous; petals 5, lanceolate, 3-4 mm long, 1.5-2.3 mm wide, acuminate at apex, truncate at base, yellow, glabrous on both surfaces; stamens 10, 5 long and 5 short, all fertilized; filaments slender, the longer ones 3-3.5 mm long, alternate to petals, and the short ones 2.5-2.8 mm long, opposite to petals, pale yellow; anthers rounded, 0.3 mm long and wide, pale yellow; connective conspicuous, brownish; nectar scales opposite, 0.3-0.4 mm across, emarginate at apex; carpels 5, pale green, free, connate at base, cylindrical, 2.4-3.5 mm long, glabrous; styles short, slender, 0.3-0.4 mm long, yellowish; stigma disc-like, pale green to pale white.



Fig.58. *Sedum parviflorum* S. S. Ying, close-up of flowers and immature fruits

Fruit a follicle, cylindrical, 3.2-3.5 mm long, pale brown, mucro tip at apex, opened when mature; seeds numerous, rounded or nearly so, 0.2-0.25 mm across, smooth, glabrous.

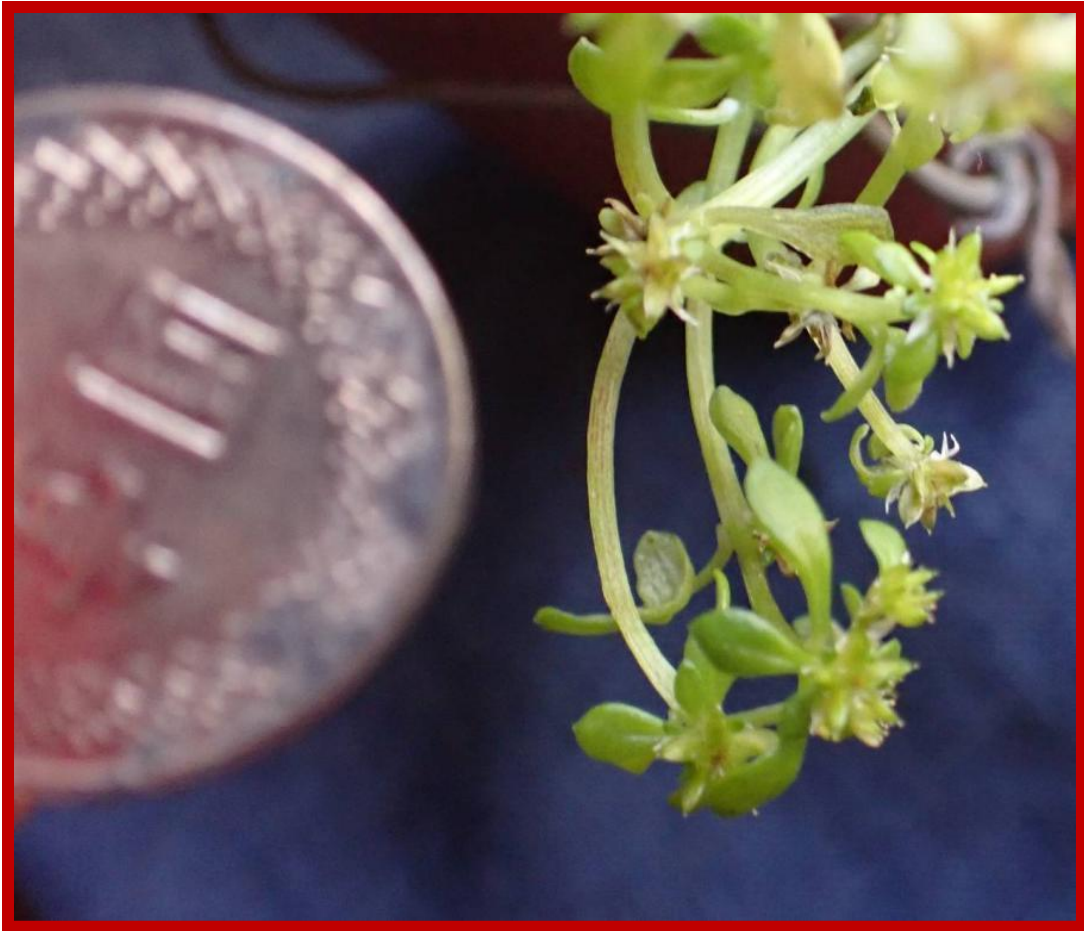


Fig.59. *Sedum parviflorum* S. S. Ying, close-up of immature fruits

Diagnosis.

Sedum parviflorum is characterized by its smaller flowers, alternate, opposite and verticillate leaves and 10 stamens which usually filaments 5 longer alternate to petals and 5 shorter opposited to petals.

Distribution and phenology.

Sedum parviflorum S.S. Ying is endemic to Taiwan ° Two localities where I collected the specimens of the species . 1. Between Jenhsingang (日新崗) and



Fig.60. *Sedum parviflorum* S. S. Ying, the holotype, NTUF-111-006



Fig.61. *Sedum parviflorum* S. S. Ying, habit

Songchuangang (松泉崗), 2450-2570 m in elevations, and 2. between Piluchi (碧綠溪) and Lishan (梨山), 2200-2100 m alt. Taichung City, Hoping District (和平區), Central Taiwan. and flowering time is March to May and fruiting time April to June. somewhat rare.



Fig.62. *Sedum parviflorum* S. S. Ying, close-up of flowers

B.Sedum tachingshuianum S.S. Ying

Sedum tachingshuianum S.S. Ying, *sp. nov.* 大清水佛甲草

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Tachingshui (大清水), 87 m alt. cultivated in Taipei S. S. Ying, *s.n. April 17, 2022*. (holotype, NTUF).



Fig.63. *Sedum tachingshuianum* S. S. Ying, close-up of flowers

Morphology : Lithophytic, perennial, erect herbs, roots fibrous, slender; stems fleshy, pale green, glabrous, simple to branched upward, erect to ascending, 12-18 cm long,. Leaves simple, opposite (basal), alternate (middle) and simple (set off the flower), ovate to ovate-spathulate, 1.5-2.1 cm long, 6-10 mm wide (basal and middle), 4-7 mm long, 1.5-2.5 mm wide (upward), 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 3.2-4.5 mm long, glabrous, fleshy.

Flowers smaller, yellow, 5.5-7 mm in diameter when opened, scentless, 3-5 in a terminal spicate, usually 3-5 spicate to form a compound spicate; spike erect to ascending,



Fig.64. *Sedum tachingshuianum* S. S. Ying, spicate inflorescences



Fig.65. *Sedum tachingshuianum* S. S. Ying, spicate inflorescences

3-5 cm long, glabrous, pale green; each flower subtended by one large and 3-5 small bracts; large bract 8-10mm long, 3-4.5 mm wide, obtuse at apex; smaller bracts 4-5 mm long, 1.5-2 mm wide, obtuse at apex; pedicels 0; sepals 5, smaller, spatulate, 1.5-2.4 mm long, about 1.1-1.4 mm wide, obtuse at apex, green, glabrous; petals 5, lanceolate, 3-4.5 mm long, 1.5-2.4 mm wide, short-caudate at apex, truncate at base, yellow, glabrous on both surfaces; stamens 10, all fertilized; filaments slender, nearly equal, 3-3.5 mm long, 5 alternate to petals, and the others opposite to petals, pale yellow; anthers rounded, 0.4 mm long and wide, yellow; connective conspicuous, yellow; nectar scales opposite, 0.3-0.4 mm across, emarginate at apex; carpels 5, pale green, free, connate at base, oblong, 2.4-3.5 mm long, glabrous; styles needle-like, 0.4-0.6 mm long, yellowish; stigma spot to capitate-like, pale green to grayish.



Fig.66. *Sedum tachingshuianum* S. S. Ying, close-up of flowers

Fruit a follicle, oblong, 2.2-2.8 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.67. *Sedum tachingshuianum* S. S. Ying, close-up of flowers



Fig.68. *Sedum tachingshuianum* S. S. Ying, young plants at Tachingshui original habitat

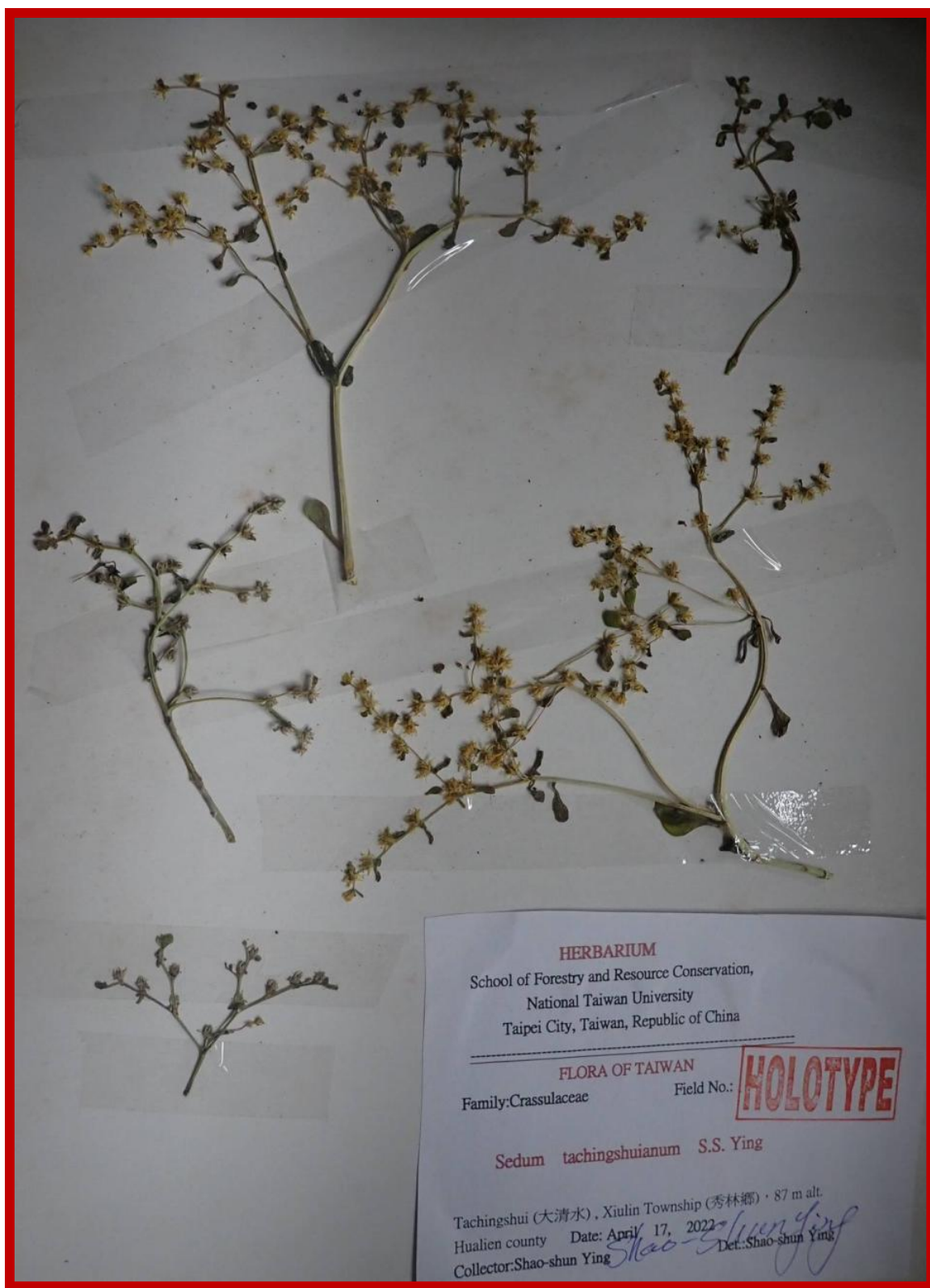


Fig.68. *Sedum tachingshuianum* S. S. Ying, the holotype NTUF-111-007

Diagnosis.

Sedum tachingshuiana is characterized by its smaller flowers, each flower subtended by one large and 3-5 small bracts; leaves alternate, opposite and verticillate; 10 stamens which filaments usually equal length and oblong, glabrous carpels and smaller fruits with caudate apex.

Distribution and phenology.

Sedum parviflorum S.S. Ying is endemic to Taiwan. It is known from the Tachingshui (大清水), Xiulin Township (秀林鄉), Hualien county, 70-85 m in elevations, eastern Taiwan, usually grows on mossy limestones of montane slope. and flowering time is April to June and fruiting time April to August. somewhat rare.



Fig.69. *Sedum tachingshuianum* S. S. Ying, fruits

4.A New Combination of Genus *Crassula* (Crassulaceae) from Taiwan

Crassula nanshanchunensis (S.S. Ying) S.S. Ying, *comb. nov.*

(南山村肉葉景天)

Sedum nanshanchunense S.S. Ying, New Taxa & New Name 4:92, figs 108-121
(2022) (2021).

The species somewhat like *C. expansa* Aiton, but our species with ovate to rounded leaves and densely scattered short white hairs on both surfaces, with white spots (small waxy matters) surface and elongate capsules.



Fig.70. *Crassula nanshanchunense* (S. S. Ying) S.S. Ying



-50- Fig.71. *Crassula nanshanchunense* (S. S. Ying) S.S. Ying

5.A New Species of Genus *Kalanchoe* (Crassulaceae) from Taiwan

Kalanchoe tachingshuii S.S. Ying

Kalanchoe tachingshuii S.S. Ying, *sp. nov.* 大清水伽藍菜

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Tachingshui (大清水) 92 m alt. S. S. Ying, *s.n.* December 09, 2021. (holotype, NTUF).

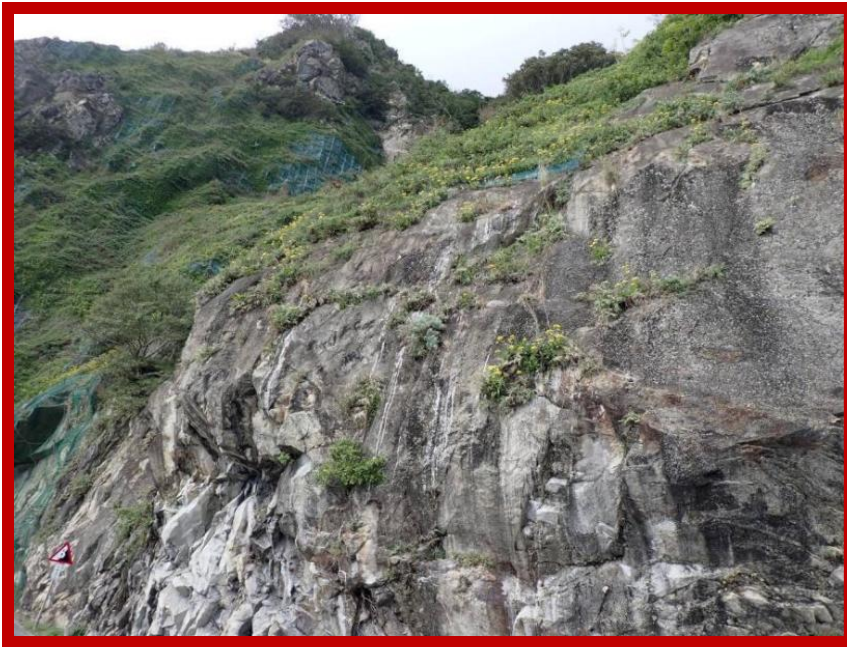


Fig. 72. *Kalanchoe tachingshuii* S. S. Ying, the habitat

Morphology : Perennial herbs up to 120 cm high with scape,; taproot fleshy, somewhat woody, 8-12 cm long, 3-5 mm across; fibrous root slender, few. Stem erect to ascending, 5-12 cm long, terete, fleshy, glabrous, grey green. Leaves opposite, obovate to oblong-ovate, 6-14 cm long, 3-5 cm wide, 1-1.5 mm thickness, obtuse at apex, attenuate at base, thickly fleshy, green to yellowish green surface, pale green beneath, glabrous, serrate at margins, midrib slightly elevated surface and prominently elevated beneath; lateral 3-5



Fig. 73. *Kalanchoe tachingshuii* S. S. Ying, the young plants



Fig. 74. *Kalanchoe tachingshuii* S. S. Ying, close-up of a young plants

per side, inconspicuous. Petioles 8-15 mm long, somewhat fleshy, glabrous, pale green.



Fig. 75. *Kalanchoe tachingshuii* S. S. Ying, flowering plants, facing Pacific Ocean



-53- Fig. 76. *Kalanchoe tachingshuii* S. S. Ying, the inflorescence

Flowers 40-55, yellow to brightly yellow, 1.5-1.8 cm in diameter when opened, in a terminal short, compacted and compound cymes (polychasial cymes); scape terminal 20-50 cm long, erect to ascending, green, glabrous; bracts 2-3 pairs, linear-lanceolate to lanceolate, 4-6 cm long, 4-6 mm wide, acuminate at apex, truncate at base, fleshy, glabrous; inflorescence 4-6 cm long, comprises 4-5 cymes; each cymes 4-6 cm long, consist of 8-10 flowers; pedicels 6-8 mm long, slender, green, glabrous; bractlets linear, 2-3 mm long, 0.5-0.7 mm wide, acuminate; sepals 4, free at base, ovate-triangular, 8-10 mm long, 2-3 mm wide, acute at apex, truncate at base, green, glabrous; corolla salverform, 1.8-2.4 cm long, 4-lobed at apex; the lobes shorter than corolla-tube, ovate to oblong, 7-9 mm long, 4-5 mm wide, obtuse and mucro at apex, obtuse at base, glabrous; stamens 4, opposite to lobes, attached on corolla-throat, filaments short, slender, 3-5 mm long, pale yellow; anthers rounded, 0.5 mm long, black; ovary cylindrical, 3-4 mm long, pale green, glabrous; style short, 0.3 mm long, 2-4-lobed at apex; stigma spot-like; nectar scales minute, pale yellow.



Fig. 77. *Kalanchoe tachingshuii* S. S. Ying, the flowers

Diagnosis.



Fig. 78. *Kalanchoe tachingshuii* S. S. Ying, the holotype NTUF-111-008

Near to *K. integra* (Medikus) Kuntze, but differs from it by obovate to oblong-ovate, 6-14 cm long, 3-5 cm wide, 1-1.5 mm thickness leaves, short, compacted and compound cymes and corolla lobes shorter than corolla-tube, stamens 4, opposite to lobes, attached on corolla-throat; the flowering times is November to December, the ecological habitat of the species is that growing at limestone cliffs, usually form a dominant community, it facing Pacific Ocean, bear typhoon damage in summer to Autumn and heavy rainfall around whole year, but it grows in place very well. .



Fig. 79. *Kalanchoe tachingshuii* S. S. Ying, close-up of flowers, mind stamens is 4

Distribution and phenology.

The species is endemic in Taiwan, It is known from low altitude of 30-120 m. Between Horen (和仁) and Tachingshui (大清水), along old Suhwa Highway (舊蘇花公路), Xiulin Township (秀林鄉), Hualien county. Its flowering time is November to December, and fruiting time from December to January..



Fig. 80. *Kalanchoe tachingshuii* S. S. Ying, the habitat



-57- Fig. 81. *Kalanchoe tachingshuii* S. S. Ying, habit

6. Two New species of Genus *Arabis* (Brassicaceae) in Taiwan

A. Arabis piluchi ensis S.S. Ying 畢祿溪筷子芥

Arabis piluchiensis S.S. Ying, *sp.nov.* 畢祿溪筷子芥

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Piluchi (畢祿溪) 2300 m alt. *S. S. Ying* , *s.n.* December 16, 2021 ° (holotype , NTUF) °



Fig. 82. *Arabis piluchiensis* S. S. Ying, the plants

Morphology : Perennial herbs usually forming a rosette habit, stemless. Leaves many, 15-25 in a rosette, simple, radial arrangement, spatulate in outline, 4-6 cm long, 0.3-1.5 cm wide, obtuse at apex, attenuate at base, chartaceous, pinnatisect at margins, glabrous on both surfaces, lustrous dark green surface and pale green beneath, midrib and lateral veins inconspicuous on both surfaces; the terminal lobe largest, rounded to ovate, 1.5-2 cm long, 1-1.5 cm wide, lateral lobes 3-4 per side, alternate to nearly opposite, irregular

square, 4-6 mm long, 3-4 mm wide, obtuse at apex, gradually smaller at lower part; petioles 8-17 mm long, terete, dark purple, glabrous.



Fig. 83. *Arabis piluchiensis* S. S. Ying, the pinnatisected leaves

Flowers few, usually 8-12, white, in a terminal raceme, 4-6 mm in diameter when opened; the scape produced from base of leaf-tufts, 15-20 cm long, erect to ascending, green, glabrous; bracts spatulate-like at base, 3-3.5 cm long, 6-9 mm wide, obtuse at apex, dentate at margins; linear at upper part, 1-1.5 cm long, 2 mm wide; pedicels short, 1.5-2.2 cm long, glabrous; sepals erect, ovate-oblong, 2.3-3.6 mm long, about 2.0-2.5 mm wide, obtuse at base, entire and membranous at margins; petals white, oblong, 5-7 mm long, about 3.5-4 mm wide, obtuse at apex, slightly clawed at base, glabrous; stamens 6, tetradynamous, included; filaments 2.2-4.5 mm long, anthers dotted, minute, ovule many per ovary; ovary linear 9.5-12.5 mm long, glabrous.



Fig. 84. *Arabis piluchiensis* S. S. Ying, the flowering plant



Fig.85. *Arabis piluchiensis* S. S. Ying, tclose-up of flowers

Siliques elongate, cylindrical, 3.5-4.5 cm long, about 1.6 mm across, slender, cylindrical, with a articulation at the base; seeds many, rounded, 0.5-0.7 mm across.



Fig. 86. *Arabis piluchiensis* S. S. Ying, the siliques



Fig. 87. *Arabis piluchiensis* S. S. Ying, another plant



Fig. 88. *Arabis piluchiensis* S. S. Ying, the holotype, NTUF-111-009

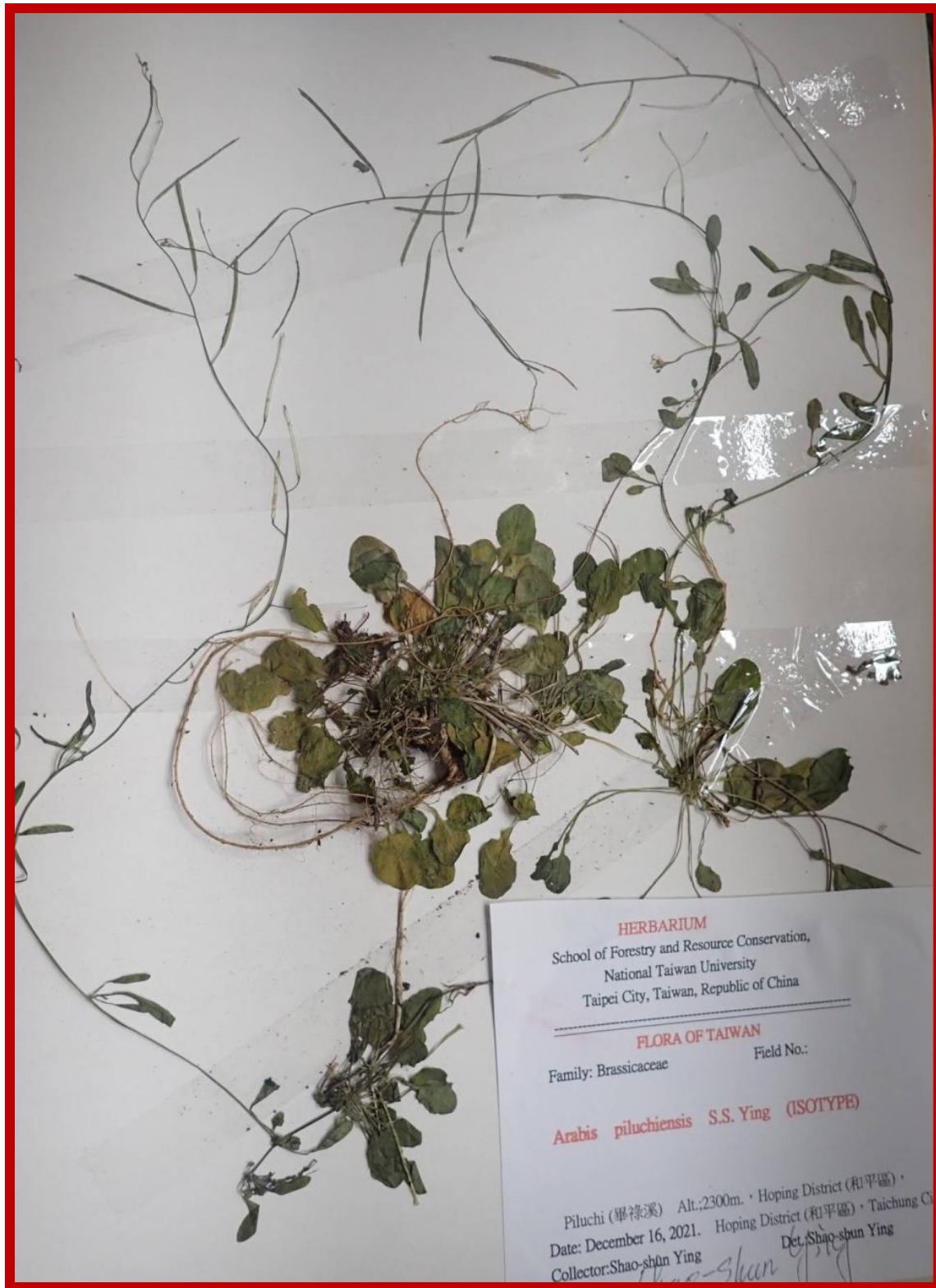


Fig. 89. *Arabis piluchiensis* S. S. Ying, the isotype, NTUF-111-010

Diagnosis.

Aarbis piluchiensis is characterized by its rosette habit, spatulate, pinnatisected simple leaves, Flowers 8-12, white, in a terminal raceme, 4-6 mm in diameter when opened and elongate siliques.

Distribution and phenology.

Aarbis piluchiensis S.S. Ying is endemic to Taiwan ° It is known from Piluchi (畢祿溪) Hoping District (和平區), Taichung City, Central Taiwan ° It was collected on the mountain slope, 2000-2400 altitudes, and flowering time is December to January and fruiting time December to January. somewhat rare.



Fig. 90. *Arabis piluchiensis* S. S. Ying, plant colony

B. Arabis taihumilis S.S. Ying 台灣矮筷子芥

Arabis taihumilis S.S. Ying, *sp.nov.* 台灣矮筷子芥

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Shaoakou (小埡口) 1850 m alt.
S. S. Ying , *s.n. February 20, 2022* ° (holotype , NTUF) °



Fig. 91. *Arabis taihumilis* S. S. Ying, the habitat, often grows with moss colony

Morphology : Small annual herbs usually forming a rosette habit, stemless. Leaves many, 6-12 in a rosette, simple, radial arrangement, oblong in outline, 2-2.6 cm long, 0.5-0.8 cm wide, obtuse at apex, obtuse at base, chartaceous, pinnatisect at margins, scattered white hairs on both surfaces, lustrous pale green surface and pale green beneath, midrib and lateral veins inconspicuous on both surfaces; the terminal lobe largest, rounded to ovate, 5-6.5 mm long, 5-5.5 mm wide, entire at margins; lateral lobes 3-4 per side, alternate to nearly opposite, ovate, 2.5-3.5 mm long, 2.5-3 mm wide, obtuse at apex, gradually smaller at lower part; petioles 6-7.5 mm long, flat, groove, scattered with white hairs, ciliate at margins, pale green .

Flowers few, usually 2-6, white, in a terminal raceme, 2.5-3.5 mm in diameter when opened; the scape produced from apex of leaf-tufts, 2-5 cm long, erect to ascending, purplish red, glabrous; bracts oblong, 3-5.5 mm long, 2.3-2.8 mm wide, obtuse and with



Fig. 92. *Arabis taihumilis* S. S. Ying, close-up of leaves



Fig. 93. *Arabis taihumilis* S. S. Ying, close-up of leaves



Fig. 94. *Arabis taihumilis* S. S. Ying, close-up of inflorescence

an arista at apex, scattered with white hairs, purplish red; pedicels short, 2.5-4.2 mm long, glabrous, purplish red; sepals erect, oblong, 1.8-2.6 mm long, about 1.3-1.6 mm wide, obtuse at apex, entire and membranous at margins, purplish red outside and pale green inside, glabrous; petals white, oblong, 3.5-5.2 mm long, 2.5-3 mm wide, obtuse at apex, slightly clawed at base, glabrous; stamens 6, tetradynamous, included; filaments 2.0-3.1 mm long, anthers dotted, minute, ovule many per ovary; ovary cylindrical, 3.5-4.5 mm long, green, glabrous.

Siliques elongate, cylindrical, 2.5-3.2 cm long, about 1.3 mm across, slender, with a articulation at the base; seeds many, rounded, 0.3-0.5 mm across, smooth.

Diagnosis.

Arabis taihumilis is characterized by its dwarf rosette habit, often grows with mossy colony, and with a very short scape, flower very few, 2-6 in a very short purplish red racemes, sepals erect, oblong, obtuse at apex, entire and membranous at margins, purplish red outside and pale green inside, and elongate, cylindrical, 2.5-3.2 cm long siliques.



Fig. 95. *Arabis taihumilis* S. S. Ying, the holotype NTUF-111-011



Fig. 96. *Arabis taihumilis* S. S. Ying, close-up of inflorescence



Fig.97. *Arabis taihumilis* S. S. Ying, fruiting plant



Fig. 98. *Arabis taihumilis* S. S. Ying, another plant

Distribution and phenology.

Arabis taihumilis S.S. Ying is endemic to Taiwan. It is known from Shaoakou(小埤口) Hoping District (和平區), Taichung City, Central Taiwan. It was collected on the mountain slope, 1900-2300 altitudes, and flowering time is February to March and fruiting time February to May. somewhat rare.

7.A New Natural Hybrid of Genus *Tricyrtis* (Liliaceae) from Taiwan

Tricyrtis x tachingshuii S.S. Ying

Tricyrtis x tachingshuii S.S. Ying, *sp. nov.* 大清水油點草

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Tachingshui (大清水) 43m alt. S. S. Ying, *s.n.* December 09, 2021. (holotype, NTUF).

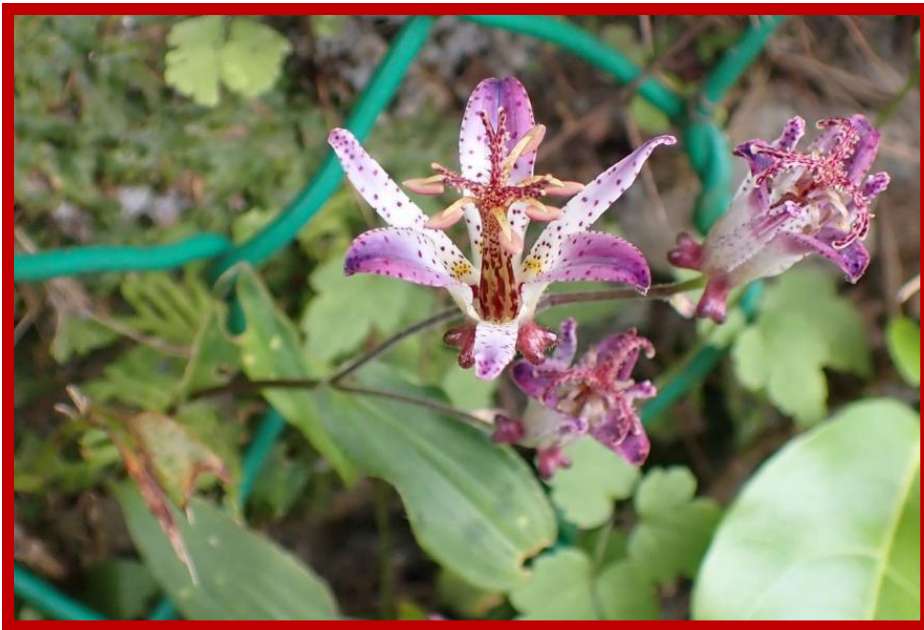


Fig. 99. *Tricyrtis x tachingshuii* S. S. Ying, flowering plant

Morphology : *Tricyrtis suzukii* Masamune X *Tricyrtis formosana* Baker

Perennial herbs about 30-50 cm tall; rhizome creeping, horizontal, 2-3.5 cm long, somewhat fleshy; roots fibrous, many, slender. Stem simple, erect to ascending, 20-25 cm long, green to dark purple, glabrous. Leaves simple, alternate, lanceolate, 4.5-6.5 cm long, 1.5-2.5 cm wide, acuminate at apex, attenuate to perfoliate at base, chartaceous, entire and very short white ciliate at margins, glabrous surface and short hirsute beneath, especially on midrib and veins, lustrous green and pale green beneath, palmate veins 5-6, impressed surface and elevated beneath.



Fig. 100. *Tricyrtis x tachingshuii* S. S. Ying, leaves, somewhat like *T.suzukii* Masam.

Flowers 3-5, white with pink apex, scattered with red spots inside, medium sized, 2.5-3.5 cm in diameter when opened, usually opening simultaneously, in a terminal cyme; the inflorescence 8-12 cm long, scattered covered white glandular hairs; bracts ovate, 1-1.5 cm long, 3-4 mm wide, acuminate at apex, glabrous on both surface, entire at margins; bractlets linear, 3-4.5 mm long, about 1.5 mm wide, acute at apex, cauduous; pedicels slender, 2-4.5 mm long, covered whit short white hairs, green to green-purplish; tepals 6, 2-series; the outer ones oblong, 1.8-2.4 cm, long, 5-5.5 mm wide, obtuse at apex, 2-lobed saccate at base, white and pink to red at apex, scattered red spots inside and white outside, glabrous inside and covered with white hairs outside; inner ones linear, 2-2.2 cm long, 2-2.5 mm wide, obtuse at apex, without sac at base, white covered with red spots inside and white outside, glabrous inside and covered with white hairs outside; stamens 6,



Fig. 101. *Tricyrtis x tachingshuii* S. S. Ying, flowering plants



Fig. 102. *Tricyrtis x tachingshuii* S. S. Ying, close-up of flower,
somewhat like *T. formosana*

inserted at base of tepals; filaments slender, 1.9-2.5 cm long, pale yellow scattered with red spots and specks; anther oblong, 2.5-3 mm long, about 1.5 mm wide, dorsifixed; ovary cylindric, 8-10 mm long, 3-celled, green, glabrous; ovules many in each cell; style column-like, 8-12 mm long, pale yellow, scattered with white transparent glands; stigmatic lobes 3, spreading, 7-8 mm long, 1-2 mm wide, pale yellow scattered with dark red spots and white transparent glands, 2-clefted apex, often reflexed.

Fruit a capsule, cylindric, 2.5-3.5 cm long, 3-4 mm wide, 3-angled, septicidal open when mature; seeds many, orbicular, flattened, brownish.



Fig. 103. *Tricyrtis x tachingshuii* S. S. Ying, close-up of flower, mind stigmatic lobes

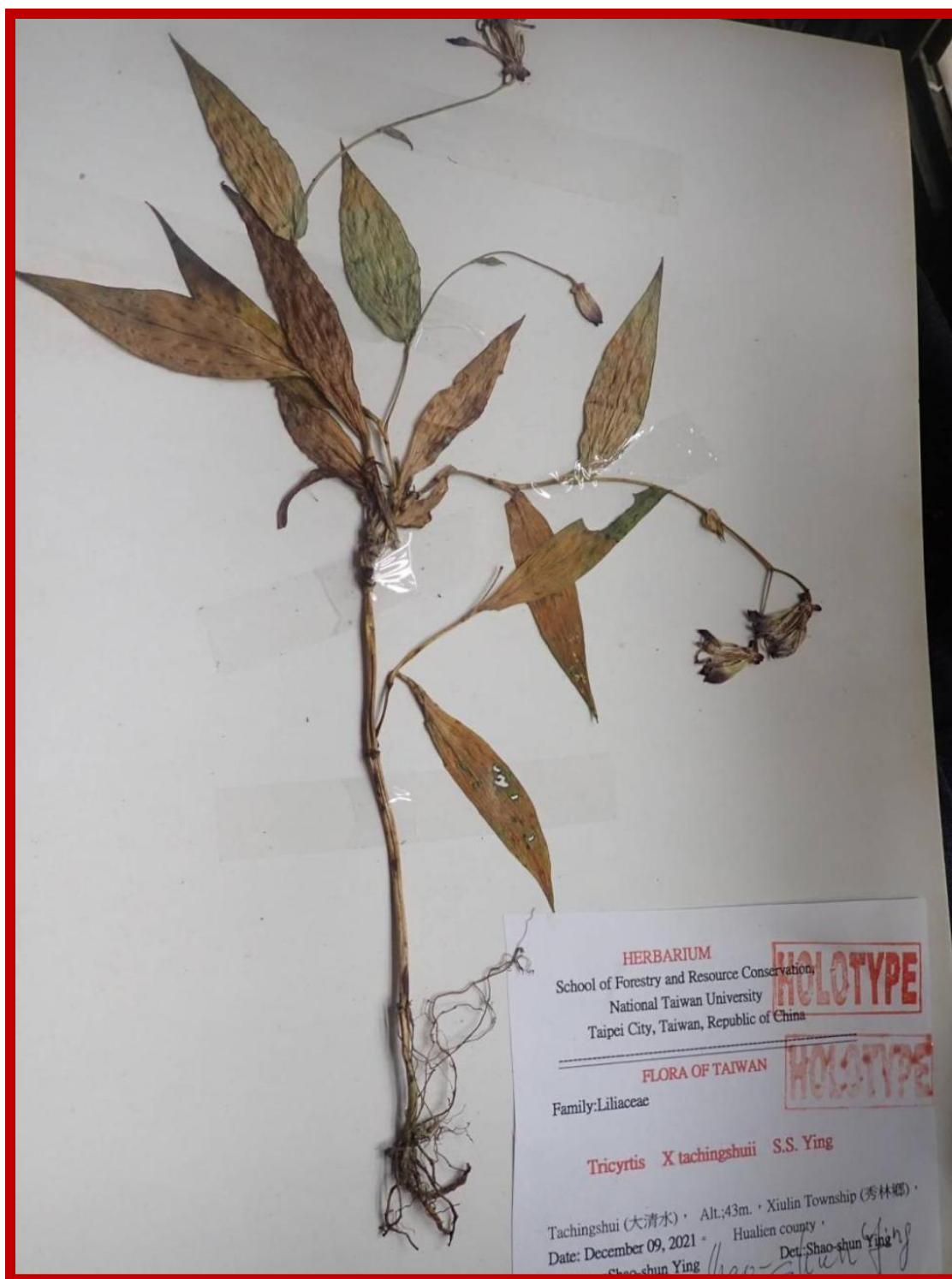


Fig. 104. *Tricyrtis x tachingshui* S. S. Ying, the holotype, NTUF-111-012

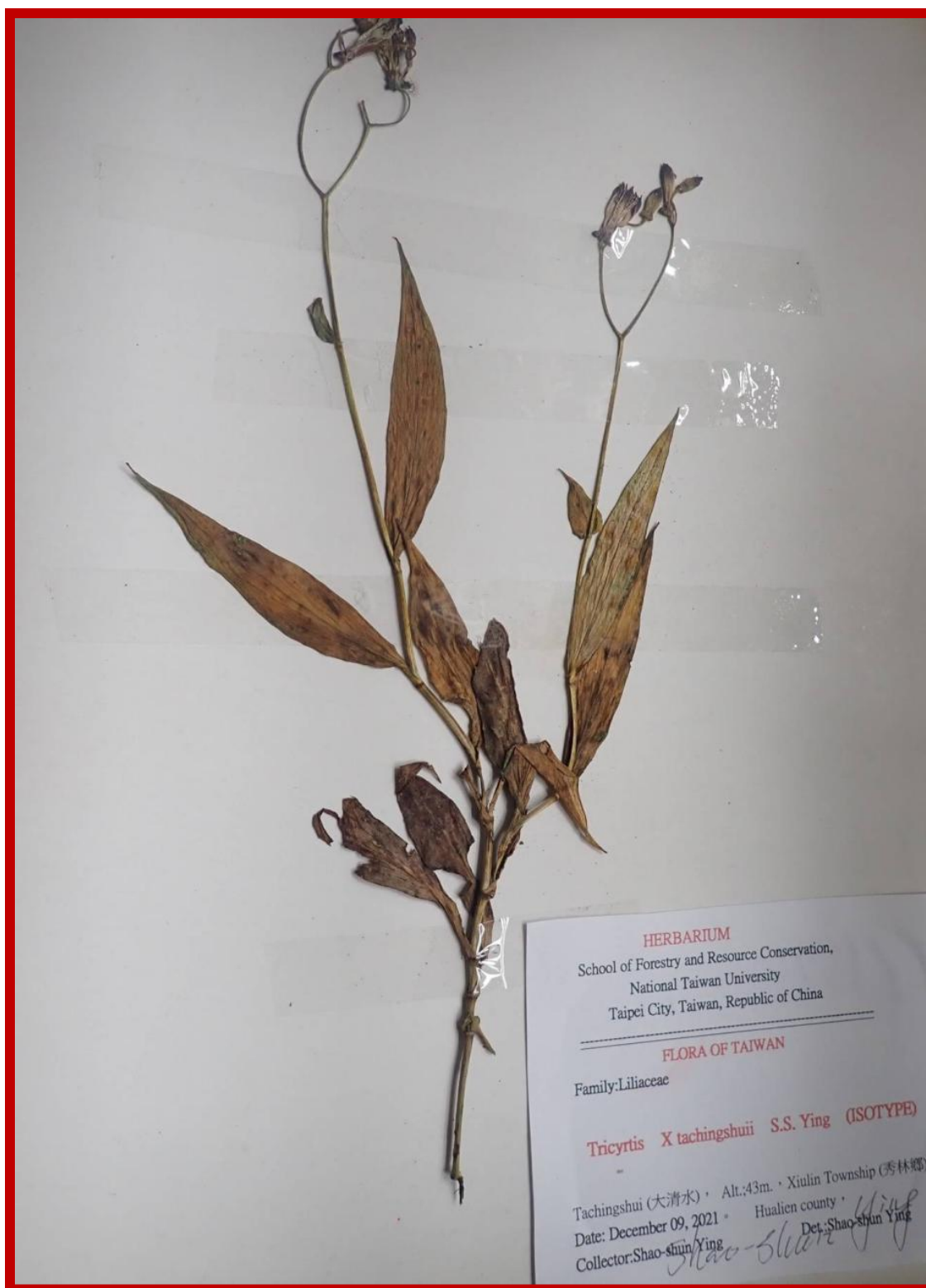


Fig. 105. *Tricyrtis x tachingshuii* S. S. Ying, the isotype, NTUF-111-013

Diagnosis.

Tricyrtis x tachingshuii is a natural hybrid between *T. suxukii* and *T. formosana*, the leaves somewhat like those of *T. Suzukii*, but much narrowed in width, acuminate at apex; flowers like those of *T. formosana*, but somewhat few in number and larger in size; tepals white pink at apex scattered red to pink spots.



Fig. 106. *Tricyrtis x tachingshuii* S. S. Ying, close-up of flower

Distribution and phenology.

The species is endemic in Taiwan, It is known from Tachingshui (大清水), Xiulin Township (秀林鄉), Hualien county, eastern Taiwan. ° It was discovered at mountain slopes at elevations of 40-120 meters. Its flowering time is December and fruiting December to January.

8.A New Species of Genus *Viburnum* (Adoxaceae) from Taiwan

Viburnum pilushanicum S.S. Ying

Viburnum pilushanicum S.S. Ying, *sp. nov.* 畢祿山英蒨

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Pilushan(畢祿山) 2400 m alt. *S. Ying* , *s.n.* December 16, 2021 ° (holotype , NTUF) °



Fig. 107. *Viburnum pilushanicum* S. S. Ying, branchlet with inflorescences

Morphology : Evengreen large shrub to small tree up to 3.5 m high; trunk short, much branched; bark gray-brownish, lenticels inconspicuous; branches erect to ascending, sometimes pending, brownish; branchlets brownish, terete, glabrous, with dispersed, small, rounded, lenticels; buds naked, glabrous. Leaves opposite, oblong-lanceolate to lanceolate, 6-12 cm long, 1.5-2.5 cm wide, acuminate at apex, cuneate att base, chartaceous, serrate at margins, lustrous green surface and pale green beneath, midrib and lateral veins (3-6 per



Fig. 108. *Viburnum pilushanicum* S. S. Ying, branchlet and leaves

side) impressed surface and elevated beneath, glabrous on both surfaces. Petioles 1.5-2.5 cm long, terete, glabrous.

Flowers many, in a terminal paniculate cymose, white, elongate-tubular, 3-4 mm in diameter when opened; inflorescences 6-12 cm long, densely grayish to brownish pubescent all over, bracts linear, 5-6 mm long, about 1 mm wide, acute at apex; 5-8 cymes opposite to alternate arranged; cymes 3-5 cm long, grayish to brownish pubescent, bracts linear, 3-4 mm long, 1 mm wide, acute at apex; 4-8 flowers in each cyme; bracteoles linear, 1.5-2.2 mm long, 0.5 mm wide, persistent; calyx purplish red first and then turn to green, tube tubular, 5-lobed at apex, about 2.5-3 mm long, pubescent; the lobes triangular, 0.3-0.4

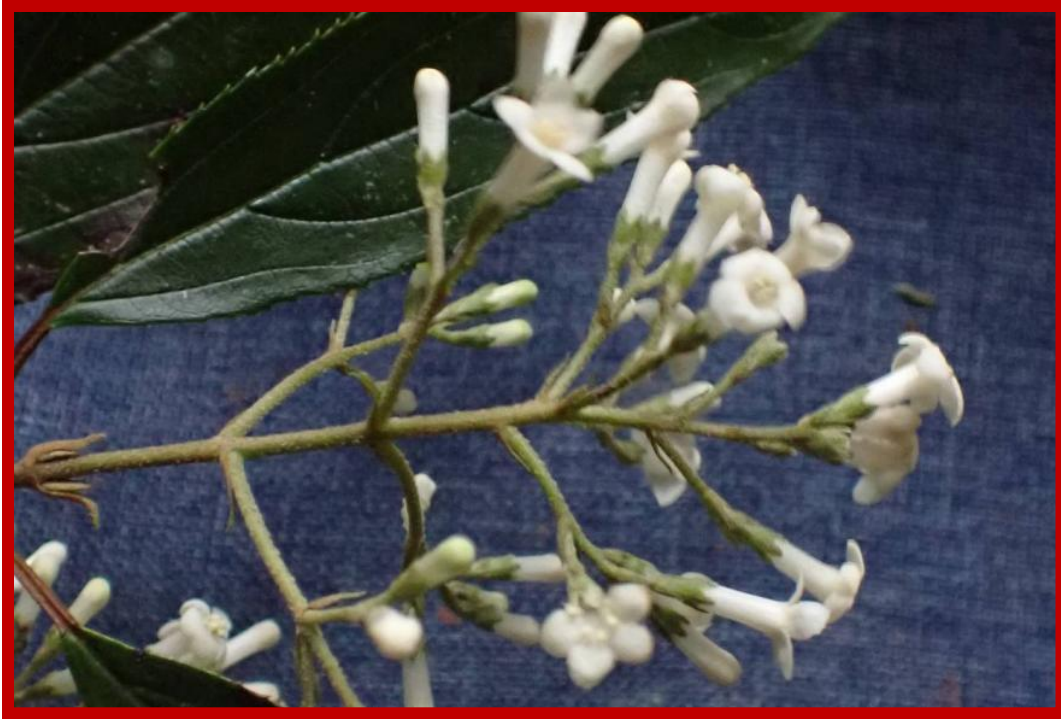


Fig. 109. *Viburnum pilushanicum* S. S. Ying, the inflorescence



Fig. 110. *Viburnum pilushanicum* S. S. Ying, flowers, showing calyx and corolla



Fig. 111. *Viburnum pilushanicum* S. S. Ying, flowers, showing calyx and corolla-lobe



Fig. 112. *Viburnum pilushanicum* S. S. Ying, a corolla, longitudinal section

mm long, 0.25 mm wide, acute at apex; corolla tubular, 6-9 mm long, 3-4 mm wide, 5-lobed at apex; the lobes rounded, 1.5-2.5 mm across, obtuse at apex, glabrous, entire at margins; stamens 5, attached on the apex of corolla-throat, filaments 0; anthers oblong, 1.6-2 mm long, 0.6 mm wide, opened by slit; style slender, included, as half-long as the corolla-tube; ovary ovoid to rounded, 0.5 mm across; stigma capitate, minute.



Fig. 113. *Viburnum pilushanicum* S. S. Ying, corollas

Fruits rounded, 2-3 mm in diameter, bright red when mature, 1-seeded drupe with a more or less compressed pyrene.

Diagnosis.

The species is near to *Viburnum taitoense* Hayata in tubular corolla, but it differs in leaves shape and size, stamens attached on apex of corolla-throat apex, without filament and brightly red globose fruits.



Fig. 114. *Viburnum pilushanicum* S. S. Ying, the holotype NTUF-111-014



Fig. 115. *Viburnum pilushanicum* S. S. Ying, the isotype NTUF-111-015



Fig. 116. *Viburnum pilushanicum* S. S. Ying, plants with fruits



Fig. 117. *Viburnum pilushanicum* S. S. Ying, frutescences

Distribution and phenology.

Viburnum pilushanicum S.S. Ying is endemic to Taiwan ° It is known from Pilushan(畢祿山) Hoping District (和平區) , Taichung City, Central Taiwan ° It was collected in thickets on the mountain slope , 2200-2500 altitudes, and flowering time is December to March and fruiting time June to November.



Fig. 118. *Viburnum pilushanicum* S. S. Ying, inflorescence

9.A New Species of Genus *Ipomoea* (Convolvulaceae) from Taiwan

Ipomoea taiwanensis S. S. Ying

Ipomoea taiwanensis S.S. Ying, *sp. nov.* 台灣牽牛花

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Between Tunnel Ao-hua (澳花隧道) and Hanben (漢本) Old Suhua Highway (舊蘇花公路), 43m alt. *S. S. Ying*, *s.n. January 06, 2022* ° (holotype, NTUF) °



Fig. 119. *Ipomoea taiwanensis* S. S. Ying, flowering plants

Morphology : Perennial herbs, roots without tubers, 5-8 cm long, fiber roots slender, 2-5 cm long. Stem twining, elongate, 1-3 m long, densely scattered brownish long hairs, much branched, usually forming a colony; branchlets many, twining, 20-50 cm long, densely scattered brownish long hairs. Leaves simple, alternate, ovate in outline, 4-6.5 cm long, 5-8



Fig. 120. *Ipomoea taiwanensis* S. S. Ying, long brownish hairs on stem

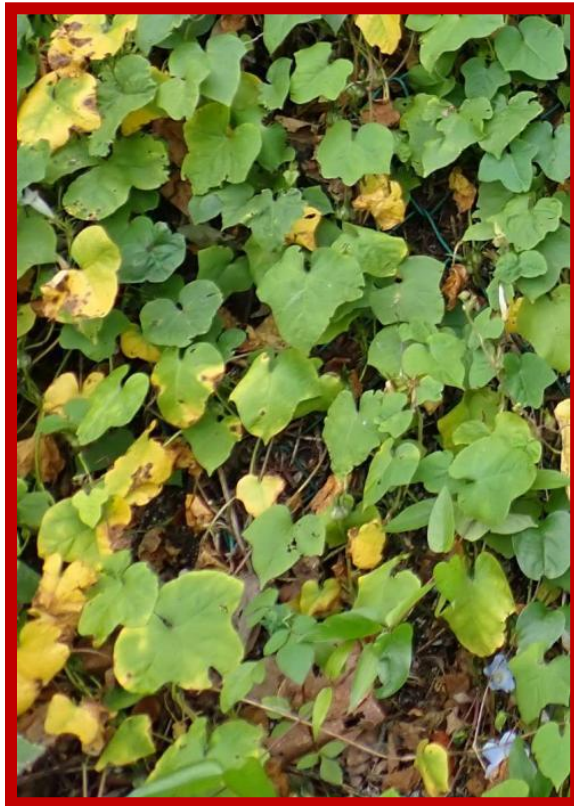


Fig. 121. *Ipomoea taiwanensis* S. S. Ying, leaves

cm wide, 3-lobed at middle, acuminate to caudate at apex, cordate at base, chartaceous, scattered pubescent surface and glabrous, lustrous green surface and pale green beneath, entire and ciliate at margins, palmate veins impressed surface and elevated beneath; lateral lobes triangular, 3-3.5 cm long, 2.5-3.2 cm wide, acute at apex. Petioles terete, 1-1.8 cm long, green, pubescent.



Fig. 122. *Ipomoea taiwanensis* S. S. Ying, A flower, mind hairs on the calyx

Flowers rather larger, 3.4-4.5 cm in diameter, cobalt blue for corolla-lobe, pure white for corolla-tube, mostly solitary, rare pairs to 3 in a short racmose; if a racemose the peduncle 1.5-2.2 cm long, erect to ascending, densely brownish hairs; bracts linear, 5-7 mm long, about 1 mm wide, pubescent; pedicels terete, 1-2.5cm long, covered with brownish long-hairs; sepals 5, the outer 3, ovate to lanceolate, 1.5-2.5 cm long, 8-10 mm wide, long-caudate apex

(1-1.5 cm long), truncate at base, covered with brownish long-hairs outside and glabrous inside, green but sometime purplish at apex, ciliate at margins; inner 2 linear to lanceolate, 1-1.8 cm long, 3-5 mm wide,



Fig. 123. *Ipomoea taiwanensis* S. S. Ying, A flower, the calyx



Fig. 124. *Ipomoea taiwanensis* S. S. Ying, longitudinal section of a corolla

acuminate at apex, covered with brownish long-hairs outside and glabrous inside, green; corolla cobalt blue for corolla-lobe, pure white for corolla-tube, funnelform, 3.4-4.5 cm in diameter, 4-4.5 cm long, glabrous, 5-lobed at apex; the lobes rounded to broadly ovate, 1.5-1.8 cm wide and long, obtuse and arista at apex; stamens 5, included, filament slender, white, 3.5-4 cm long, dilated and pubescent basally; anthers ovoid, white, 1.5 mm long; disc ring-like; ovary globose, 2-3 mm across, 3-locular, 2-ovule in each cell; style slender, included, 3.8-4.5 cm long, white; stigma capitate.



Fig. 125. *Ipomoea taiwanensis* S. S. Ying, immature fruits, a wither corolla aside

Fruit a capsule, globose, 8-10 mm in diameter, subtended by persistent sepals, smooth, glabrous, light brownish in color, dehiscent 3-valved when mature; 1-2 seeds in each valve ; seeds fusiform, 6-7 mm long, 4-5 mm wide, glabrous, lustrous black when mature.

Diagnosis.

A characteristics species for having covered with brownish long-hairs outside and

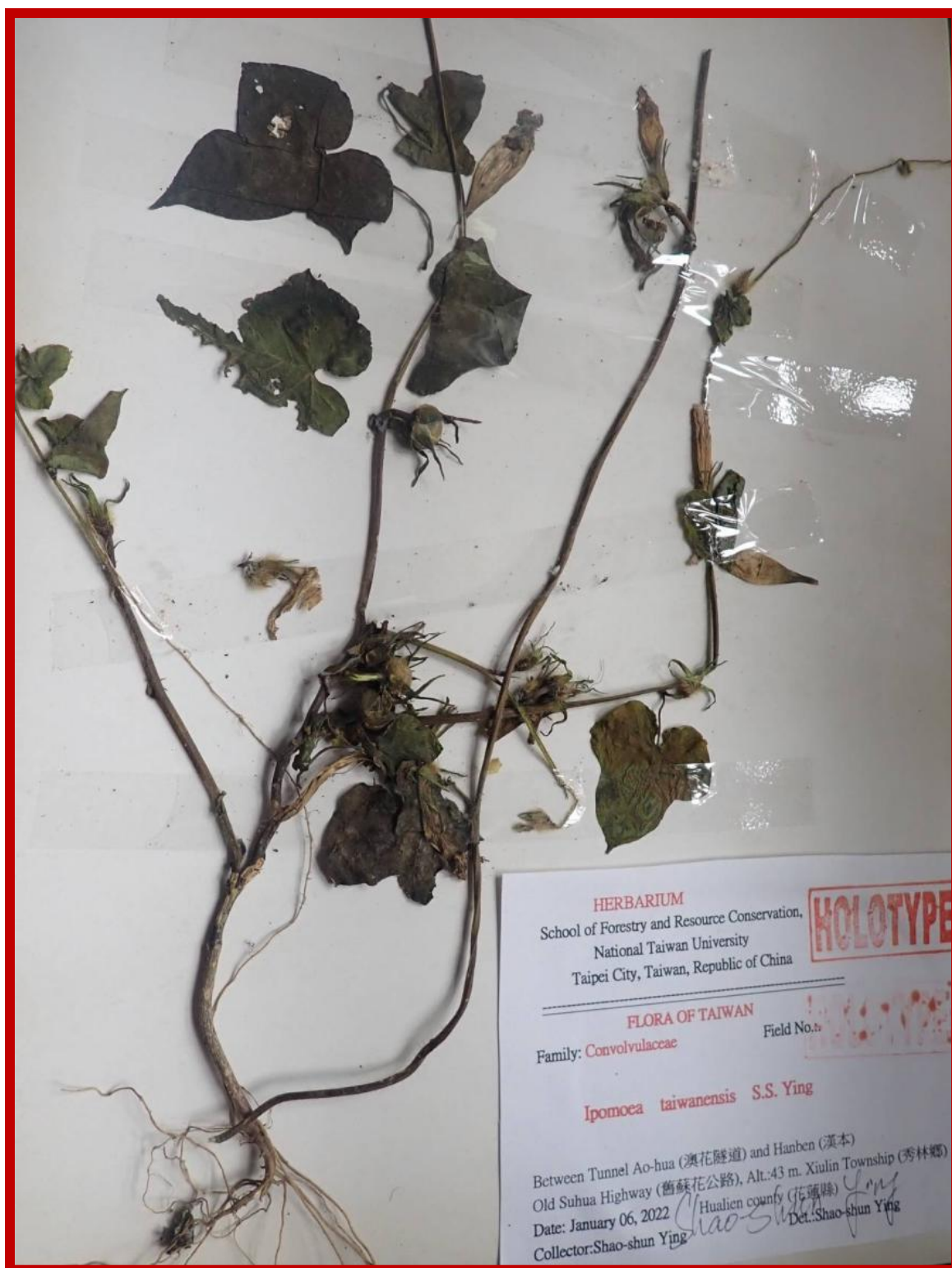


Fig. 126. *Ipomoea taiwanensis* S. S. Ying., the holotype, NTUF-111-016



Fig. 127. *Ipomoea taiwanensis* S. S. Ying., the isotype NTUF-111-017



Fig. 128. *Ipomoea taiwanensis* S. S. Ying, fruits and seeds



Fig. 129. *Ipomoea taiwanensis* S. S. Ying, seeds

glabrous inside sepals, cobalt blue corolla lobes, 3-locular, 2-ovule in each cell ovary and lustrous black fusiform seeds.

Distribution and phenology.

Ipomoea taiwanensis S.S. Ying is endemic to Taiwan ° It is known Between Tunnel Ao-hua (澳花隧道) and Hanben (漢本) Old Suhua Highway (舊蘇花公路), eastern Taiwan ° It was collected on the mountain slope , 35-50 altitudes, facing to Pacific Ocean, and flowering time is November to January and fruiting time December to February.



Fig. 130. *Ipomoea taiwanensis* S. S. Ying, the habitat

10.A New Species of Genus *Hedera* (Araliaceae) from Taiwan

Hedera siyuanwukouensis S. S. Ying

Hedera siyuanwukouensis S.S. Ying, *sp. nov.* 思源埡口常春藤

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉) , Siyuanywukou (思源埡口)
1920 m alt. S. S. Ying , *s.n.* January 13, 2022 ° (holotype , NTUF) °



Fig. 131. *Hedera siyuanwukouensis* S. S. Ying, fruiting plant

Morphology : Shrub scandent, stem elongate, 2-4 m long, much-branched, grayish brown, glabrous; branches erect to ascending, 20-70 cm long, glabrous, greenish. Leaves simple, alternate, monomorphic, oblong-lanceolate, 5.5-8.5 cm long, 1.8-3.2 cm wide, acuminate at apex, cuneate at base, coriaceous, entire at margins, glabrous on both surfaces, midrib and lateral veins (2-4 per side) impressed and elevated beneath, lustrous green surface and pale green beneath. Petioles terete, 4-6 cm long, green, glabrous.



Fig. 132. *Hedera siyuanwukouensis* S. S. Ying, leaves, mind the elongate petioles



Fig. 133. *Hedera siyuanwukouensis* S. S. Ying, the habitat, mind surface of leaves

Flowers yellowish green, rather large, 3-3,5 mm in diameter when opened, 4-6 in a umbel, 1-4 umbels forming a terminal raceme; the peduncles 2.5-3.5 cm long, glabrous, green; pedicels 8-12 mm long, green tinged with purple, glabrous; ; bracts cauduous, calyx minute, 5-toothed, 0.5-0.7 mm long, acute at apex; petals 5, ovate, 5-7 mm long, 4-5 mm wide, obtuse at apex, glabrous; stamens 5, filaments slender, slightly longer than petals; anthers oblong, 0.5 mm long, dorsifixed; ovary disc-like, 0.4 mm across at base, greenish, glabrous; style short, 0.2 mm long, pale green.



Fig. 134. *Hedera siyuanwukouensis* S. S. Ying, the infructescence

Fruits 2-6 in a umbel, somewhat like a pear, 8-12 mm long, 4-6 mm wide, obtuse at apex, narrowed to pedicels at base, glabrous, purplish red when mature; pedicels slender, 7-11 mm long, glabrous, green tinged purplish red. Seeds 2, rarely one in each fruit, ovoid, 0.6 mm long, pale yellow, smooth. ,



Fig. 135. *Hedera siyuanwukouensis* S. S. Ying, fruits and seeds



Fig. 136. *Hedera siyuanwukouensis* S. S. Ying, close-up of seeds

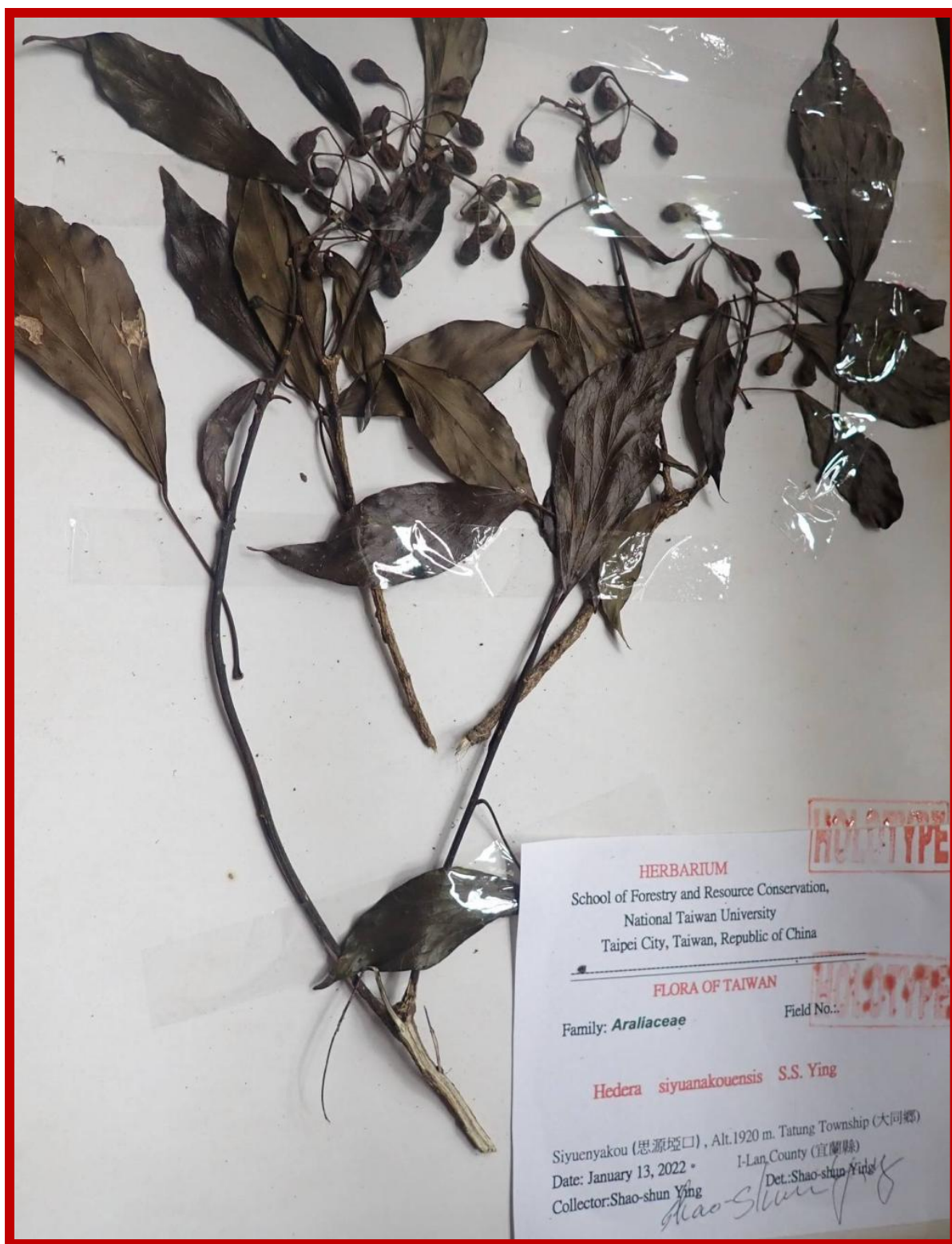


Fig. 137. *Hedera siyuanwukouensis* S. S. Ying, the holotype NTUF-111-018

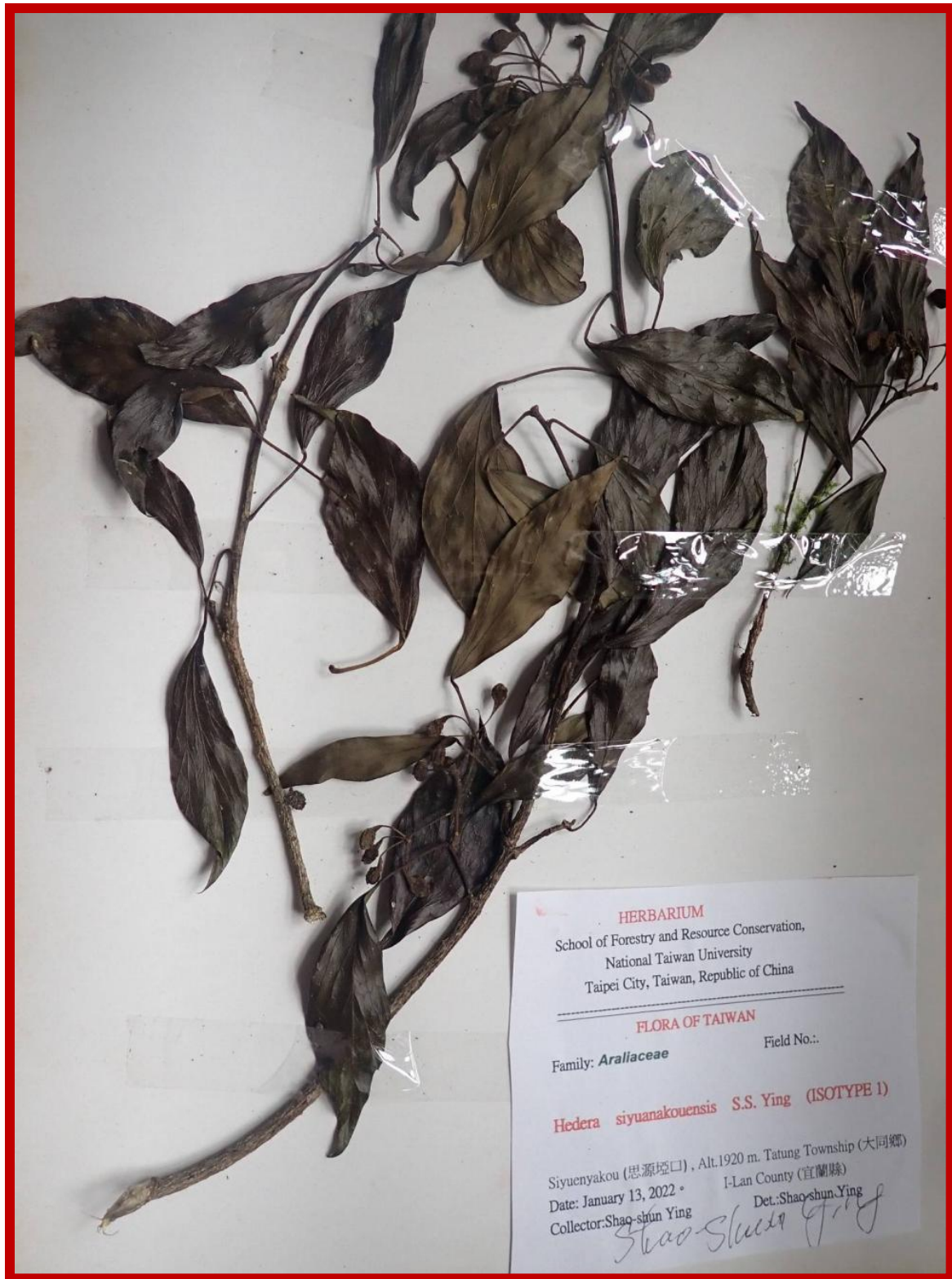


Fig. 138. *Hedera siyuanwukouensis* S. S. Ying, isotype, 1 NTUF-111-019



Fig. 139. *Hedera siyuanwukouensis* S. S. Ying, isotype, 2 NTUF-111-020

Diagnosis.

Hedera siyuanwukouensis is a distinctive species recognized by its monomorphical leaves, elongate petioles, 2-6 flowers in a umbel, 1-4 umbels to form a raceme and pear-like rather larger purplish red fruits.



Fig. 140. *Hedera siyuanwukouensis* S. S. Ying, the habitat

Distribution and phenology.

Hedera siyuanwukouensis S.S. Ying is endemic to Taiwan ° It is known from Siyuanyakou (思源埡口), Tatung Township (大同鄉), I-Lan County, northern Taiwan ° It was collected in the thickets, 1900-2000 altitudes, and flowering time is April to June and fruiting time December to February.



Fig. 141. *Hedera rhombea* var. *formosana* (Nakai) H.L.Li, the infructescence



Fig. 142. *Hedera siyuanwukouensis* S. S. Ying, the infructescence



Fig. 143. *Hedera siyuanwukouensis* S. S. Ying, fruits turn to red in late September



Fig. 144. *Hedera siyuanwukouensis* S. S. Ying, fruits turn to red in late September

11. Two New Species of Genus *Mazus* (Mazaceae) from Taiwan

A. Mazus uniflorus S. S. Ying

Mazus uniflorus S.S. Ying, *sp. nov.* 單花通泉草

TYPE: TAIWAN. I-Lan County, Tatung Township (大同鄉), Siyuanyakou (思源埡口) 1920 m alt. S. S. Ying, *s.n. January 13, 2022* ° (holotype, NTUF) °



Fig. 145. *Mazus uniflorus* S. S. Ying, the flowers

Morphology : Perennial herbs , stem absent , without stolon ° Leaves radical , rosulate, tufted , oblong to spatulate , 3.5-6.5 cm long , 1.2-1.8 cm wide , obtuse at apex , cuneate at base , chartaceous , lustrous green surface , pale green beneath , crenate at margins , scattered hirsute surface, glabrous to scattered hirsute upper part beneath , midrib and lateral veins impressed on surface and elevated beneath ° Petioles inconspicuous , extended from blade base , 5-8 mm long , pubescent °

Flowers solitary , rather large, 6-9 mm in diameter when opened, white ; scape 2-5 from central of leaf-fascicled , short, erect to ascending , 1.5-2.5 cm long , somewhat robust, purplish red, with white pubescent ; bracts linear to narrow lanceolate, 6-9 mm long about



Fig. 146. *Mazus uniflorus* S. S. Ying, the leaves



Fig. 147. *Mazus uniflorus* S. S. Ying, several one-flowered scapes
from leaf-fascicled



Fig. 148. *Mazus uniflorus* S. S. Ying, several one-flowered scapes
from leaf-fascicled

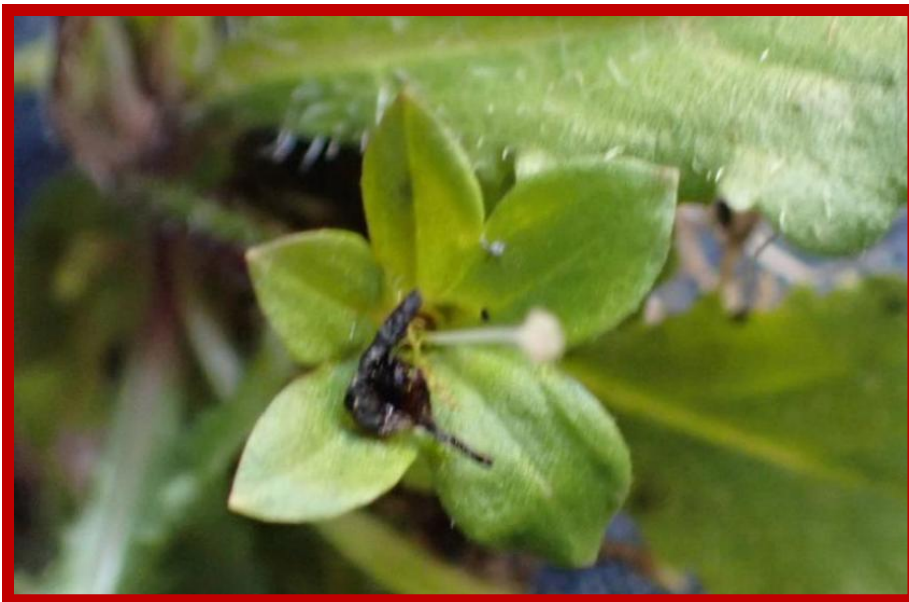


Fig. 149. *Mazus uniflorus* S. S. Ying, calyx and style, stigma, see from inside



Fig. 150. *Mazus uniflorus* S. S. Ying, calyx and corolla, see from outside

1.5 mm wide, acuminate at apex; calyx campanulate, 6-9 mm long, 7-10 mm wide, green tinged with purplish red and scattered hirsute outside, green and glabrous inside, 5-lobed at apex; lobes ovate, somewhat unequal in length, 4-6.5 mm long, 3.5-5 mm wide, obtuse and arista at apex; corolla bilabiate, 9-13 mm long, 6-9 mm in diameter, purplish red outside and white inside; upper lobe short, obtuse and 2-lobulate at apex; lower lobe extend, larger, white, 5-6 mm long, 3.5-5.5 mm wide, 3-lobed at apex, with 2 yellow and pubescent keels in the middle, glandular hairs in throat; lateral lobules rounded, 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.

Diagnosis.

Mazus uniflorus is a distinctive species recognized by its solitary flower in a very



Fig. 151. *Mazus uniflorus* S. S. Ying, the holotype, NTUF-111-021



Fig. 152. *Mazus uniflorus* S. S. Ying, close-up of corolla, see from lateral



Fig. 153. *Mazus uniflorus* S. S. Ying, close-up of corolla, see from front

pedicel and several pedicels from fascicled leaves ; corolla bilabiated, purplish red outside and white inside ; upper lobe short , obtuse and 2-lobulated at apex; lower lobe extend , larger , white , 3-lobed at apex, with 2 yellow and pubescent keels in the middle, glandular hairs in throat.



Fig. 154. *Mazus uniflorus* S. S. Ying, the habitat

Distribution and phenology.

Mazus uniflorus S.S. Ying is endemic to Taiwan . It is known from Siyuanyakou (思源埡口), Tatung Township (大同鄉) , I-Lan County, northern Taiwan . It was collected in the mossy mountain slopes , between 1800 and 1920m altitudes; and flowering time is January to February and fruiting time March to June.

B.Mazus lalashanensis S. S. Ying

Mazus lalashanensis S.S. Ying, *sp. nov.* 拉拉山通泉草

TYPE:TAIWAN. Taoyuan City , Fuhsin District (復興區) , Lalashan (拉拉山), 1953 m alt.
S. S. Ying , *s.n.* May 29, 2022 ° (holotype, NTUF) °



Fig. 155. *Mazus lalashanensis* S. S. Ying, the habit

Morphology : Annual to biennial herbs , stem absent , without stolon ° Leaves radical , rosulate, tufted , **ovate**, oblong to ovate-spathulate , 2.5-3.5 cm long , 8-15 mm wide , obtuse at apex , attenuate at base , chartaceous , green surface , pale green beneath , crenate at margins , nearly glabrous to scattered few villous surface, glabrous to scattered hirsute upper part beneath , midrib and lateral veins impressed on surface and elevated beneath ° Petioles conspicuous , 7-10mm long, winged at margins , ciliate on margins, pubescent °

Flowers 2-5 , rather smaller, 2.5-3.5 mm in diameter when opened, white tinged with purple on upper lobe base, racemose; scape 1-2 from central of leaf-fascicled , elongate, erect to ascending , 3.5-6.5 cm long , slender, greenish, densely scattered with white



Fig. 156. *Mazus lalashanensis* S. S. Ying, leaves



-114- Fig. 157. *Mazus lalashanensis* S. S. Ying, the habit

pubescent ; bracts 1-2 at base of scape, smaller, ovate to ovate-lanceolate, 3-5 mm long about 2.5 mm wide, obtuse at apex; pedicels 4-5 mm long, pubescent; calyx campanulate, 4-5 mm long, 3-4 mm wide, green and scattered hirsute outside, green and glabrous inside, 5-lobed at apex; lobes ovate, somewhat unequal in length, 2-2.5 mm long, 1.5-1.9 mm wide, obtuse and arista at apex; corolla bilabiate, 5.5-6.5 mm long, 2.5-3.5 mm in diameter, glabrous, white and tinged with purple on upper lobe base; upper lobe short, obtuse and 2-lobulate at apex; lower lobe extend, larger, white, 2.5-3 mm long, 2.5-3.2 mm wide, 3-lobed at apex, with 2 yellow and pubescent keels in the middle, glandular hairs in throat; lateral lobules oblong, obtuse at apex; middle lobules semicircular, obtuse at apex; stamens 4, didynamous, included; ovary ovoid, emarginate at apex nearly glabrous; style slender, included, green; stigma capitate.



Fig. 158. *Mazus lalashanensis* S. S. Ying, calyx

Diagnosis.

Mazus lalashanensis is a distinctive species recognized by its smaller plant, 2-5 smaller flowers in a slender scape, glabrous corolla.



-116- Fig. 159. *Mazus lalashanensis* S. S. Ying, the holotype NTUF-111-022



Fig. 160. *Mazus lalashanensis* S. S. Ying, close-up of corolla



Fig. 161. *Mazus lalashanensis* S. S. Ying, habitat



Fig. 162. *Mazus lalashanensis* S. S. Ying, habitat

Distribution and phenology.

Mazus lalashanensis S.S. Ying is endemic in Taiwan, It is known from Lalashan (拉拉山), Fuhsin District (復興區), Taoyuan county, northern Taiwan. ° It was discovered the species on mountane slopet at elevations of 1500-1950 meters. Its flowering time is April to June.



-118- Fig. 163. *Mazus lalashanensis* S. S. Ying, pedicels, calyx and corolla

12.A New Species of Genus *Galium* (Rubiaceae) from Taiwan

Galium lishanense S. S. Ying

Galium lishanense S.S. Ying , *sp. nov.* 梨山猪殃殃

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Between Piluchi (碧綠溪) and Lishan (梨山), 2100 m alt. *S. S. Ying* , *s.n. January 20, 2022* ° (holotype , NTUF) °



Fig. 164. *Galium lishanense* S. S. Ying, the plants

Morphology : A small annual herb, stems short, usually prostrate to ascending, 4-10 cm long, 0.8-1 mm in diameter, branched, 4-angled, grooved, green to purplish red, scattered hirsute. Leaves 4, verticillate, narrowly oblong to oblong ,6-9 mm long, 2.5-3.5 mm wide, obtuse at apex, narrowed at base, chartaceous, entire and ciliate at margins, midrib impressed surface

and slightly elevated beneath, lateral veins inconspicuous, green to dark green surface, pale purplish red beneath, scattered hirsute surface and hirsute along midrib beneath . Petioles 0.9-1.5 mm long, purplish red, hirsute. .



Fig. 165. *Galium lishanense* S. S. Ying, stem and leaves

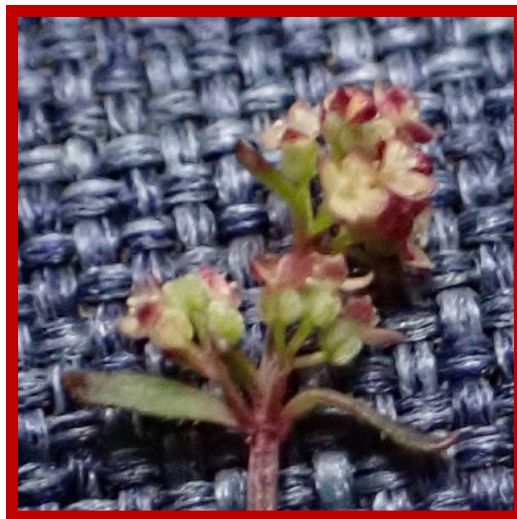
Flowers pale yellow tinged pink at apex, 3-5 in a simple umbel, terminal on the branched and axillary on the leaf-axils, smaller, 1.2-1.6 mm in diameter when opened; peduncles 8-10 mm long, slender, green to purplish red, glabrous; bracts leaf-like but smaller ; pedicels 2-3 mm long, slender, green tinged with purplish red, nearly glabrous; calyx 4-lobed, terminal on the ovary, the lobes triangular, 0.8-1.0 mm long, acute at apex, pale yellow, glabrous; corolla 1.3-1.6 mm long, 4-lobed at apex; the lobes ovate, 0.7-1.0 mm long, 0.6 mm wide, pale yellow inside and purplish red outside, acute at apex, glabrous; stamens 4, alternate to the corolla-lobed, included ; filaments shorter than lobed; anthers dorsifixed, white; ovary

inferior, didymous, compressed ovoid, pale green, glabrous, green; style short, stigma 2-lobed, short, cauduous.

Fruits green when mature, smooth surfaces, with 2 mericarps, the mericarps compressed ovoid, 0.5-0.8 mm long, 0.4-0.5 mm wide, without any hairy or trichomes, glabrous; pedicels slender, 0.5-0.9 mm long, green, glabrous or nearly so.



Fig. 166. *Galium lishanense* S. S. Ying, the inflorescences



-121- Fig. 167. *Galium lishanense* S. S. Ying, close-up of inflorescences



Fig. 168. *Galium lishanense* S. S. Ying, close-up of flowers, mind glabrous ovaries



Fig. 169. *Galium lishanense* S. S. Ying, close-up of flowers, mind glabrous ovaries

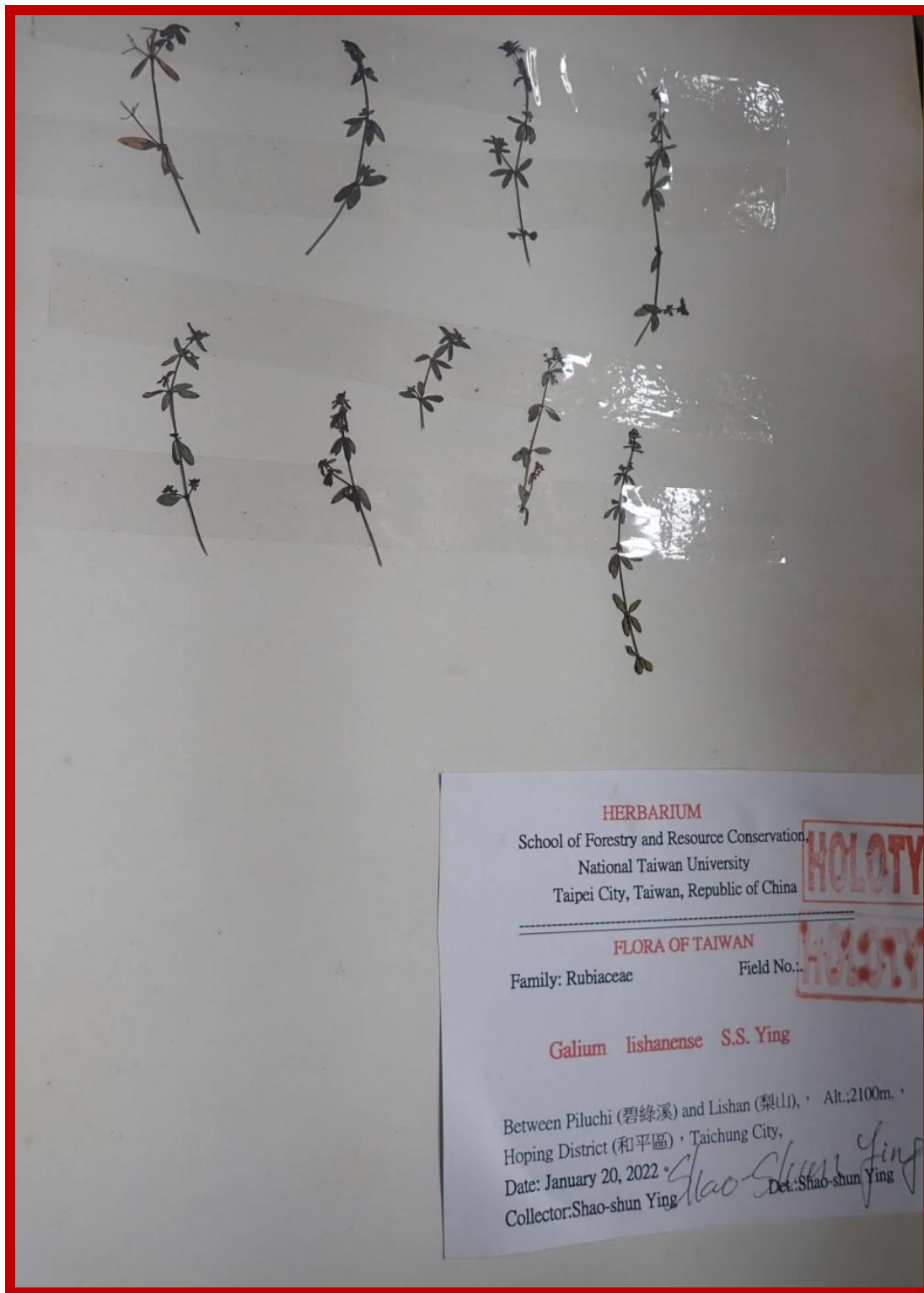


Fig. 170. *Galium lishanense* S. S. Ying, the holotype, NTUF-111-023

Diagnosis.

Galium lishanense is a most distinctive species of all the Taiwan *Galium* species, It is characterized by its small leaves, short simple 3-5 flowered umbel, flowers 1.2-1.6 mm in diameter when opened, corolla lobes pale yellow inside and purplish red outside and green when mature, smooth surfaces fruits:

Distribution and phenology.

Galium lishanense S.S. Ying is endemic to Taiwan ° It is known between Piluchi (碧綠溪) and Lishan (梨山), Hoping District (和平區), Taichung City, central Taiwan ° It was collected in the mossy mountain slopes, between 2200 and 2120m altitudes; and flowering time is January to February and fruiting time March to June.



Fig. 171. *Galium lishanense* S. S. Ying, the plants

13.A New Species of Genus *Ajuga* (Lamiaceae) from Taiwan

Ajuga rubrobracteosa S. S. Ying

Ajuga rubrobracteosa S.S. Ying, *sp. nov.* 紅苞筋骨草

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉) , Between Ciren (慈恩) and Hsinbaiyang (新白楊) , 1850 m alt. *S. S. Ying* , *s.n. January 20, 2022* ° (holotype, NTUF) °



Fig. 172. *Ajuga rubrobracteosa* S. S. Ying, flowers, and bracts of flowers

Morphology : A perennial herb, stem absent. Leaves many, radical rosulate, tufted, oblong to spatulate, 3.5-5.5 cm long, 8-18 mm wide, obtuse at apex, attenuate at base, thinly chartaceous, dentate and ciliate at margins, scattered white hairs surface, short hairy along midrib and lateral veins, midrib and lateral veins (3-4 per side) impressed and elevated



Fig. 173. *Ajuga rubrobracteosa* S. S. Ying, the plants, mind leaf colour



Fig. 174. *Ajuga rubrobracteosa* S. S. Ying, leaves



Fig. 175. *Ajuga rubrobracteosa* S. S. Ying, fascicled flowers

beneath, green tinged purplish red surface, (young leaves usually purplish red first and then turn to green tinged purplish red), glaucous beneath. Petioles flat, 6-8 mm long, slightly winged, long-hairy at margins.

Flowers several, white to light violet, 6-8 mm in diameter when opened, fascicled on central of leaf-tufted; bracts 2, opposite, rather larger, ovate, 7-11 mm long, 4.5-6 mm wide, acute at apex, truncate at base, purplish red to greenish red, elongate white hairs scattered outside and glabrous inside, elongate white hairs at margins; pedicels 0.7-2 mm long, purplish red, hairy; calyx campanulate, 5-6.5 mm long, purplish red, with inconspicuous accessory veins, 5-lobed at apex; lobes triangular, 1.5-2.5 mm long, subequal, acute at apex; corolla light violet to white, elongate, 9-14 mm long, 6-8 mm in diameter when opened; upper lip short, 3.6-4.5 mm long, straight, 2-lobed at apex; lower lip 8-12 mm long, 3-lobed at apex; lateral lobes oblong, 3-4 mm long, obtuse at apex; middle lobe elongate, 5-6.5 mm long, emarginate and with a arista at sinus at apex, glabrous; corolla tube 5-6 mm long, villose inside and glabrous outside; stamens 4, didynamous, slightly exserted from upper lip, anterior 2 longer; filaments slender, white; anthers ovoid, 2-celled, apically confluent; slender, 2-cleft at apex .



Fig. 176. *Ajuga rubrobracteosa* S. S. Ying, close-up of bracts



Fig. 177. *Ajuga rubrobracteosa* S. S. Ying, fascicled flowers



Fig. 178. *Ajuga rubrobracteosa* S. S. Ying, close-up of a flower

Fruit a nutlet, ovoid, triquetrous, 1-1.3 mm long, netted on back, with an elaiosome, glabrous.



Fig. 179. *Ajuga rubrobracteosa* S. S. Ying, the habitat



Fig. 180. *Ajuga rubrobracteosa* S. S. Ying, the holotype NTUF-111-024

Diagnosis.

Ajuga rubrobracteosa is a distinctive species of Taiwan *Ajuga* species, It is characterized by its rosulate leaves, stemless, flowers several fascicled in central of leaf-tufted, bracts red with elongate white hairy and lower lip 3-lobed.

Distribution and phenology.

Ajuga rubrobracteosa S.S. Ying is endemic to Taiwan ° It is known between Between Ciren (慈恩) and Hsinbaiyang (新白楊), Xiulin Township (秀林鄉), Hualien county, eastern Taiwan ° It was collected in the mossy mountain slopes, between 1750 and 2100m altitudes; and flowering time is January to March and fruiting time March to June.



Fig. 181. *Ajuga taiwanensis* Nakai ex Murata

14.A New Species of Genus *Melochia* (Malvaceae) from Taiwan

Melochia taiwaniana S. S. Ying

Melochia taiwaniana S.S. Ying , *sp. nov.* 台灣野路葵

TYPE:TAIWAN. Taichung City, Hoping District (和平區) , Between Piluchi (碧綠溪) 2250 m alt. S. S. Ying , *s.n. January 20, 2022* ° (holotype , NTUF) °



Fig. 182. *Melochia taiwaniana* S. S. Ying, the plants

Morphology : A erect subshrub about 30-60 cm high; stem short, much branched from base; branches erect to ascending, purplish red, glabrous to few white short hairy. Leaves simple, alternate, ovate to ovate-triangular in outline, 2.5-3.5 cm long, 1.8-2.5 cm wide, obtuse at apex, truncate at base, 3-5 shallow-lobed and dentate at margins, chartaceous, glabrous on both surfaces, lustrous surface and pale green beneath, palmate nerved impressed surface and elevated beneath; the lobes somewhat triangular, 7-9 mm long, 8-12 mm wide, obtuse at apex; Petioles, slender, terete. 1.5-3 cm long, groove, glabrous or nearly so.



Fig. 183. *Melochia taiwaniana* S. S. Ying, stem, branches and leaves

Flowers pink, 8-10 mm in diameter when opened, several glomerule on branches, terminal and axillary, often opened one by one, not opened simultaneously. without



Fig. 184. *Melochia taiwaniana* S. S. Ying, inflorescence

pedicels; epicalyx absent; calyx campanulate, 4=6 mm wide, deeply 5-lobed at apex; the lobes ovate-triangular, 5-7 mm long, 4-5 mm wide, acute at apex, villose outside and glabrous inside, purple red, somewhat ciliate at margins; petals 5, pink and white at base, with 3 dark purple veins from base to middle, ovate-cuneate, 5-7 mm long, 4-5.5 mm wide, emarginate and wavy at margins at apex, clawed at base, hairy along margins at base; stamens 5, includes, connate at middle, opposite to petals; ovary sessile, ovoid, 2-3 mm long, style 3 conspicuous, 3-4 branched from middle, white, branches filiform, glabrous, other 2 inconspicuous, smaller, not branched; stigma spot-like.



Fig. 185. *Melochia taiwaniana* S. S. Ying, close-up of a flower

Fruit a capsule, ovoid, 4.5-5.5 mm long, 3.5-4 mm wide, 5-angular, accrescent red calyx persistent, glabrous; seed one in each cell, reniform, 1.5-2 mm long, 1.5 mm wide, with membranous wing on one side, pale black, glabrous to very few hairy.

Diagnosis.

Melochia taiwaniana is a distinctive species of Taiwan *Melochia* species, it is differ *M. corchorifolia* Linn. in having a erect habit, ovate to ovate-triangular in outline, 3-5 shallow-lobed leaves, pink flowers, pink and white at base, with 3 dark purple veins from base to middle, ovate-cuneate, emarginate and wavy at margins at apex, clawed at base, hairy along margins at base petals, and with style 3 conspicuous, 3-4 branched from middle, white, branches filiform, glabrous, other 2 inconspicuous, smaller, not branched.



Fig. 186. *Melochia taiwaniana* S. S. Ying, fruits



Fig. 187. *Melochia taiwaniana* S. S. Ying, opened fruits and seeds



Fig. 188. *Melochia taiwaniana* S. S. Ying, the holotype

NTUF-111-025

Distribution and phenology.

Melochia taiwaniana S.S. Ying is endemic to Taiwan ° It is known from Piluchi (碧綠溪), Hoping District (和平區), Taichung City, central Taiwan ° It was collected in the mountain slopes , between 2000 and 2250m altitudes; and flowering time is December to February and fruiting time January to May.



Fig. 189. *Melochia taiwaniana* S. S, Ying, close-up of seeds

15.A New Species of Genus *Daphne* (Thymelaeaceae) from Taiwan

Daphne yangtoushanensis S. S. Ying

Daphne yangtoushanensis S.S. Ying, *sp. nov.* 羊頭山瑞香

TYPE:TAIWAN. Taichung City, Hoping District (和平區), Yamgtoushan (羊頭山) 2550 m alt. S. S. Ying, *s.n.* January 20, 2021. (holotype, NTUF).



Fig. 190. *Daphne yangtoushanensis* S. S. Ying, close-up of inflorescence

Morphology : A erect evergreen shrub to small tree about 1.5-3 m high; trunk short, much branched; branches erect to ascending, grayish or nearly so, smooth, glabrous. Leaves simple, alternate, lanceolate to narrowly lanceolate, 4-6 cm long, 5-9 mm wide, acuminate at apex, cuneate at base, coriaceous, entire and slightly wavy at margins, glabrous on both surfaces,

lustrous dark green surface and pale green beneath, midrib slight elevated surface and elevated beneath. petioles short, 3-5 mm long, greenish brown in color, slightly groove on surface, glabrous.

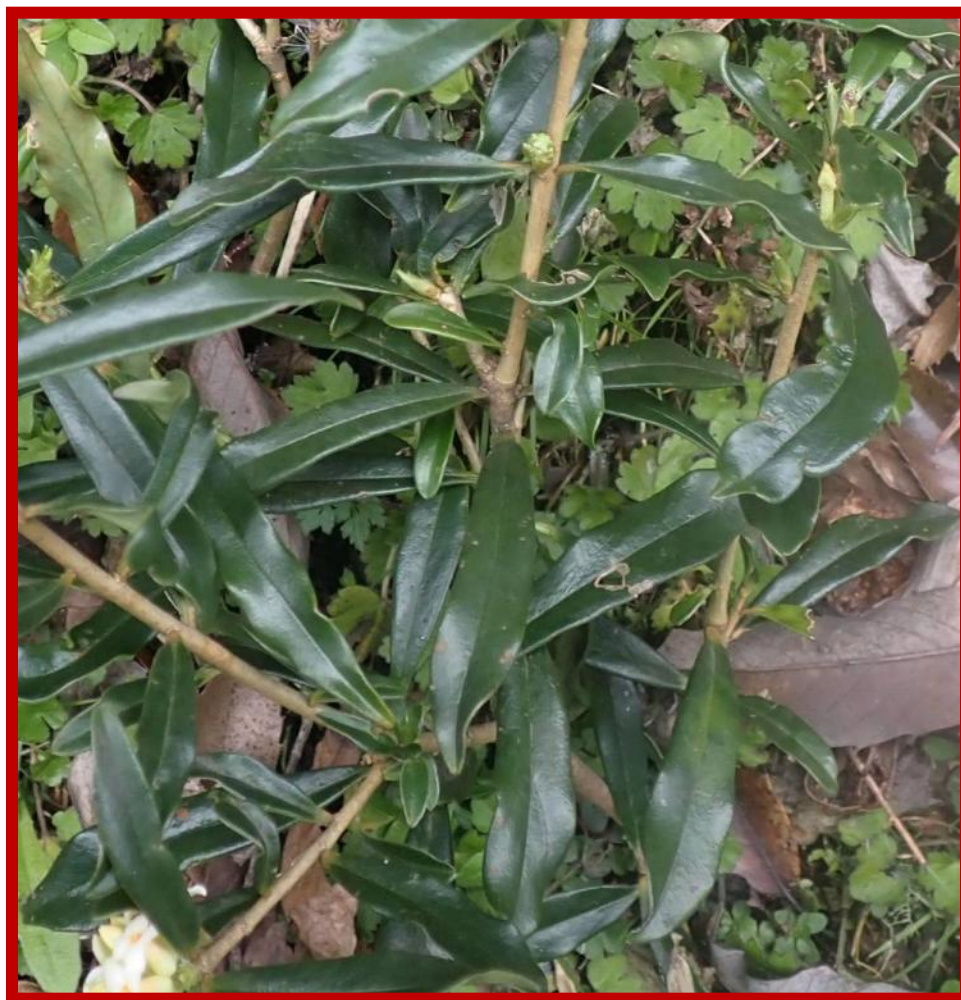


Fig. 191. *Daphne yangtoushanensis* S. S, Ying, branches and leaves

Flowers 8-14, white, 6-9 mm in diameter when opened, in a terminal and axillary short umbel, scentless; peduncle short, 3-5 mm long, green, glabrous; bracts ovate, 4-6 mm long, 2.5-3 mm wide, acute at apex, green, glabrous, caducous; pedicels short, 2-3 mm long, green, glabrous; calyx white, 4-lobed at apex; calyx tube cylindrical, 4.5-5 mm long, green at base and white upward, glabrous; lobes ovate, 2-2.5 mm long, 1.5-1.8 mm wide, obtuse and



Fig. 192. *Daphne yangtoushanensis* S. S. Ying, inflorescence, see from side

sometimes emarginat at apex, glabrous, pure white; stamens 4 in one series, attached at the throat of calyx-tube; filaments 0.3-0.4 mm long; anthers oblong, 1.5-2 mm long, yellow to pale yellow, included, connective indistinct; staminode 1-3; ovary sessile, ovoid, 1-1.5 mm across, glabrous, green; style short, stigma capitate. Fruits unknown.

Diagnosis.

Near to *D. morrisonensis* C. E. Chang, but it is differ it in having more narrowly lanceolate dark green leaves, many flowers in a inflorescence, stamens 4 in one series at the throat of calyx-tube, staminodes 1-3 at the middle of calyx-tubes. the flowering time of the species February to March, otherwise the former is October to November.



Fig. 193. *Daphne yangtoushanensis* S. S. Ying, close-up of flowers



Fig. 194. *Daphne yangtoushanensis* S. S. Ying, close-up of a flowers



Fig. 195. *Daphne yangtoushanensis* S. S. Ying, the holotype, NTUF-111-026

Distribution and phenology.

Daohne yangtoushanensis S.S. Ying is endemic to Taiwan ° It is known from Yangtoushan (羊頭山, Hoping District (和平區), Taichung City, central Taiwan ° It was collected in the mountain slopes, between 2400 and 2650m altitudes; and flowering time is December to February and fruiting time is February to March,



Fig. 196. *Daphne chingshuishaniana* S.S.Ying

The species was described in 1988, and is accepted by

[Daphne chingshuishaniana S.S.Ying — The Plant List](#)

[Daphne chingshuishaniana S.S.Ying | Plants of the World Online | Kew Science](#)

16.A New record and a New combination of Genus *Veronica* (Plantaginaceae)

from Taiwan

A.A new Record species of Taiwan

Veronica laxa Benth., Scroph. Ind. 45. 1835. 疏花婆婆纳



Fig. 197. *Veronica laxa* Benth. the habit

A perennial herb, about 15-30 cm tall, entirely with white multicellular hairs. Stems erect to ascending, branched at base, somewhat purple in color . Leaves sessile or short petiolate; ovate to ovate-deltoid, 2-5 cm long, 1-3 cm wide, chartaceous, coarsely dentate and mostly double dentate at margins, lustrous green surface and pale green beneath, midrib impressed surface and elevated beneath, lateral veins 3-5 per side. petioles very short, 2-3 mm long, hairy.



Fig. 198. *Veronica laxa* Benth. the plant



Fig. 199. *Veronica laxa* Benth. the infructescence



Fig. 200. *Veronica laxa* Benth. the infructescence



Fig. 201. *Veronica laxa* Benth. opened capsules and seeds

Flowers 6-10, 7-9 mm in diameter when opened, light blue to blue-purplish, in an axillary racemes; inflorescences 12-15 cm long, erect to ascending, hairy; bracts broadly linear to oblanceolate, 3- 5 mm long, acute at apex; pedicel much shorter than bract, nearly sessile. calyx 4-lobed; lobes linear-elliptic, subequal, 3-4 mm at anthesis, 5-6 mm in fruit, obtuse at apex; corolla purple to blue, rotate; tube less than 1.5 mm; throat hairy; lobes orbicular to rhomboid-ovate, obtuse at apex, 4-6 veins from base to apex; Stamens almost as long as corolla.

Capsule obcordate, strongly compressed, 4-6 mm long, 5-6 mm wide, ciliate with multicellular hairs, cuneate to rounded at base; style 3-4 mm. Seeds 2-10 per locule, ovoid, pale brown, glabrous, lustrous, flattened, about 1 mm long and wide

Japan, India, Kashmir, Pakistan and Mainland China (SE Gansu, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Yunnan). Taiwan, known from eastern part of the island, in fields near to coastal region. the specimen was collected between Heping (和平)and Heren (和仁) , Xiulin Township (秀林鄉) , Hualien county , at plain fields, near to coastal region, somewhat rare.



Fig. 202. *Veronica laxa* Benth. close-up of capsules

B. A new Combination species of Taiwan

Veronica shichiengensis (S.S. Ying) S. S. Ying, comb. nov. 石城婆婆纳

Linderina shichengensis S.S. Ying, New Taxa and New Name 4:68 (2022)(2021)

The characters of the species is match the genus *Veronica*, I transferred it to the genus.
The species also see at seashores of Hejen (和仁), Hualien County.



-149- Fig. 203. *Veronica sichengensis* (S.S.Ying) S.S. Ying, plant colony at Heren

17.A New Species of Genus *Indigofera* (Fabaceae) from Taiwan

Indigofera hopinensis S. S. Ying

Indigofera hopingensis S.S. Ying , *sp. nov.* 和平木藍

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉) , Between Hoping (和平) and Horen (和仁) , 21 m alt. *S. S. Ying* , *s.n. March 03, 2022* ° (holotype,



Fig. 204. *Indigofera hopingensis* S. S, Ying, close-up of flowers

Morphology : A erect evergreen shrub, 2-2.5 m tall, trunk short, 5-8 cm long, glabrous, grayish, much branched at base; branches erect to ascending, 1-1.8 m long, short white hairy, green tinged with purple. Leaves odd-pinnate, 3-5 cm long, 1.5-2 cm wide; rachis somewhat groove surface; stipules absent; leaflets 7-9, rarely 11, oblong to ovate-oblong, 1.2-1.5 cm long, 5-7 mm wide, obtuse and slightly emarginate at apex, rounded at base, chartaceous, entire at margins, scattered with simple white hairs on both surfaces, midrib and lateral veins inconspicuous, lustrous green surface, pale green beneath; petioles 2-4 mm long, hairy.



Fig. 205. *Indigofera hopingensis* S. S, Ying, branches and leaves

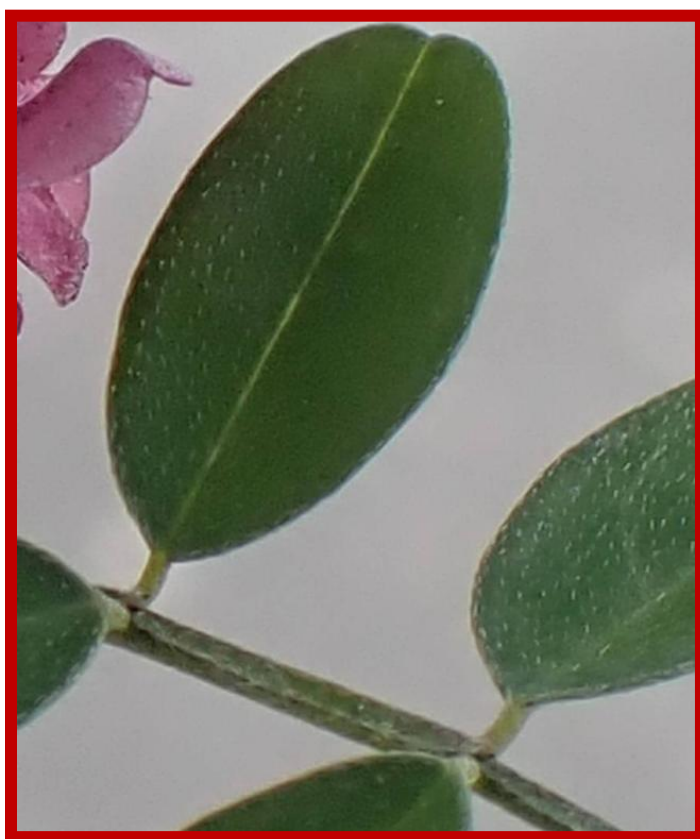


Fig. 206. *Indigofera hopingensis* S. S, Ying, close-up of leaves, mind simple hairs on surface



Fig. 207. *Indigofera hopingensis* S. S. Ying, flowering plants



Fig. 208. *Indigofera hopingensis* S. S. Ying, inflorescences

Flowers many, pink, 5-6 mm in diameter when opened, in axillary racemes; the inflorescence 3-5 cm long, often ascending, green, scattered with warts at base, hairy; bracts minute, caducous; pedicels 1-1.5 mm long, pale yellow, hairy; calyx campanulate, 1.5-2.5 mm long, hairy outside and glabrous inside, dark brown, 5-lobed at apex; the lobes subequal, triangular, 1 mm long, acute at apex; corolla widely opened, pink; standard erect, broadly ovate, 4.5-5.5 mm long, 4.2-5 mm wide, obtuse at apex, pink but with a large white plaque at base, 8-10 white veins from it to apex, white hairy outside and glabrous inside; wings conspicuous, ovate, 3.6-4.3 mm long, 2.5-3 mm wide, obtuse at apex, elongate claw at base, glabrous; keel falcate, rather smaller, 1.5-2 mm long, about 1.5 mm wide, obtuse at apex, glabrous; stamens diadelphous, 9+1, filaments slender, 2.5-3.4 mm long, pale yellow; anthers uniform, basifixed, apiculate at apex; ovary cylindrical, sessile, 2.5-3 mm long, green, glabrous; style linear, green; stigma capitate.



Fig. 209. *Indigofera hopingensis* S. S. Ying, flowers, mind standard and wings



Fig. 210. *Indigofera hopingensis* S. S, Ying, plants with fruits



Fig. 211. *Indigofera hopingensis* S. S, Ying, legumes

Legume straight, linear, 2-3.2 cm long, 1-1.3 mm across, light brown, glabrous, suture thickened; seeds 5-7 per legume, rounded, 1.5mm in diameter, brownish, glabrous, smooth.



Fig. 212. *Indigofera hopingensis* S. S. Ying, legumes

Diagnosis.

Indigofera hopingensis is a distinctive species of Taiwan *Indigofera* species, it is differ other *Indigofera* species in having 7-9 leaflets pinnate with simple short white hairs; standard pink but with a large white plaque at base, 8-10 white veins from it to apex, white hairy outside and glabrous inside; wings conspicuous, ovate, 3.6-4.3 mm long, 2.5-3 mm wide , obtuse at apex, elongate claw at base and 5-7 seeds per legume.



Fig. 213. *Indigofera hopingensis* S. S. Ying, the holotype, NTUF-111-026
-156-

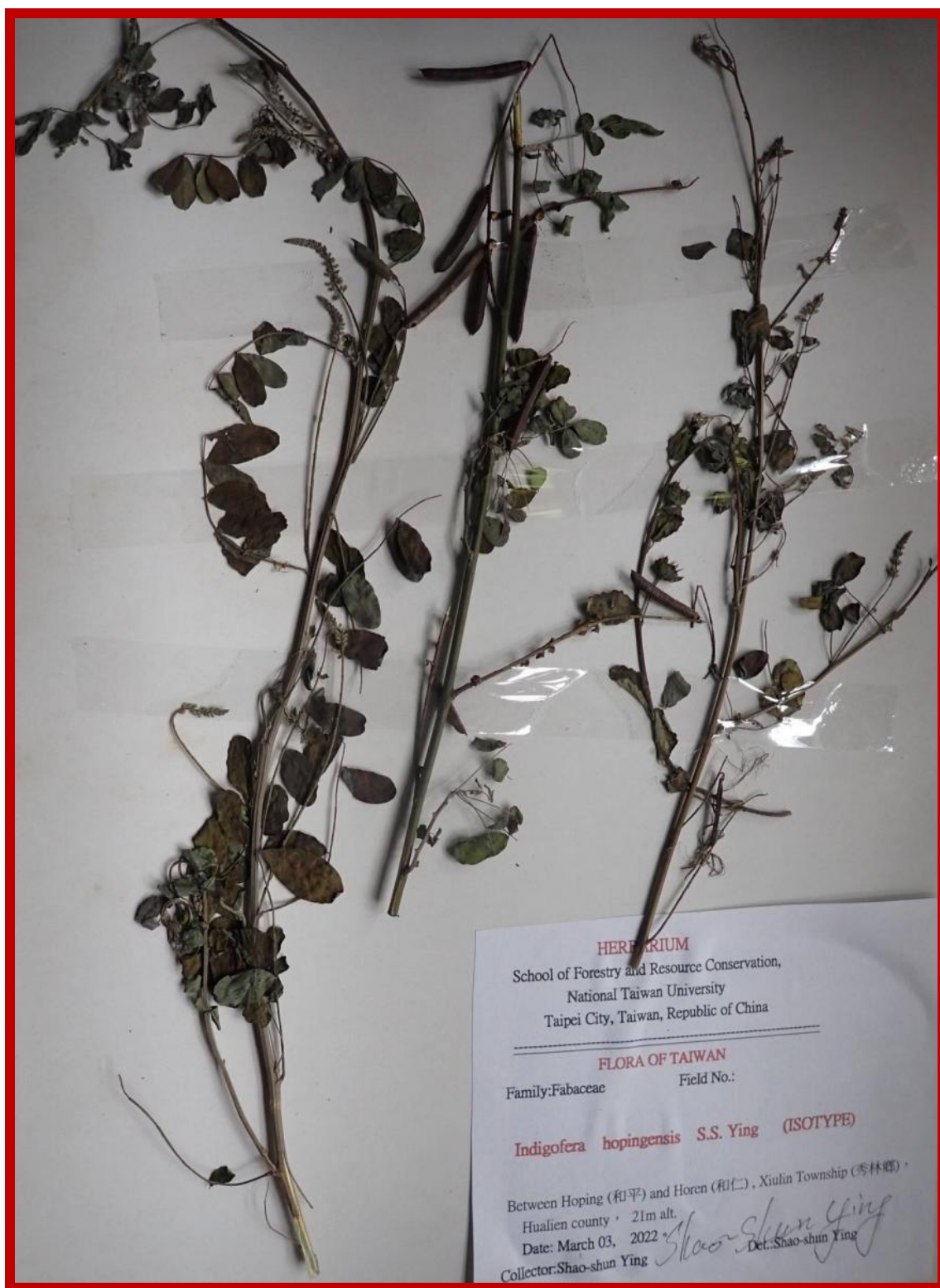


Fig. 214. *Indigofera hopingensis* S. S. Ying, the isotype, NTUF-111-027

Distribution and phenology.

Indigofera hopingensis S.S. Ying is endemic to Taiwan ° It is known from between Hoping (和平) and Horen (和仁) , Xiulin Township (秀林鄉) , Hualien county , eastern Taiwan ° It was collected in the plain fields , between 15 and 25m altitudes; and flowering and fruiting time are all year round.



Fig. 215. *Indigofera hopingensis* S. S, Ying, legumes and seeds



Fig. 216. *Indigofera hopingensis* S. S, Ying, legumes and seeds

18.A New Species of Genus *Lepidagathis* (Acanthaceae) from Taiwan

Lepidagathis palinensis S. S. Ying

Lepidagathis palinensis S.S. Ying, *sp. nov.* 巴陵鱗球花

TYPE:TAIWAN. Taoyuan city, Fuhsin District (復興區), Palin (巴陵), 693 m alt. *S. S. Ying*, *s.n. February 26, 2022* (holotype, NTUF) °



Fig. 217. *Lepidagathis palinensis* S. S. Ying, the habit

Morphology : A erect perennial herb, about 15-30 cm tall, stem erect, green to greenish brown, glabrous, branched upward; branches short, 5-9 cm long, ascending to erect, glabrous, greenish brown. Leaves simple, opposite, ovate to ovate-oblong, 3-6 cm long, 1.8-3 cm wide, acuminate apex, attenuate to obtuse at base, chartaceous, entire to remote dentate at margins, green surface and pale green beneath, glabrous on both surfaces, midrib impressed surface and elevated beneath; lateral veins 3-4 per side impressed surface and slightly elevated beneath; petioles 8-15 mm long, glabrous, slightly winged on both sides, greenish brown.



Fig. 218. *Lepidagathis palinensis* S. S. Ying, stem, branches and leaves



Fig. 219. *Lepidagathis palinensis* S. S. Ying, stem, branches and leaves

Flowers smaller, pure white without any spots inside , 2.5-3.5 mm in diameter when opened, 8-16 in a terminal spike; spikes solitary to 2-3 clustered, unbranched, short, 1.5-2 cm long; peduncles 3-5 mm long, terete, glabrous; bracts ovate, 5.0-6.5 mm long, about 2.6 mm wide, acute at apex, pubescent outside and glabrous inside; pedicels 0.5-0.8 mm long; calyx 5-lobed at base, lanceolate, 5.5-7 mm long, 2 mm wide, acuminate at apex, pubescent outside and glabrous inside, ciliate at margins; corolla white without any spots inside, tube usually expanded into a distinct throat near middle, 2.5-3.5 mm long; limb 2-lipped, slightly exserted the calyx ; lower lip 2.3-3 mm long, 3-lobed; the lobes subequal; upper lip erect, slightly 2-lobed; lobes obtuse at apex; stamens 4, didynamous, included; filaments short, 2-2.8 mm long; anthers 2-theous; thecae oblong, spurred at base; ovary ovoid, about 1.5 mm long, 2-celled; style slender, stigma capitate.



Fig. 220. *Lepidagathis palinensis* S. S. Ying, close-up of inflorescence

Fruit a capsule, lanceolate, 4-4.5 mm long, about 2 mm wide, acuminate at apex, smooth, glabrous, with 2 distinct groove on lateral side. Seeds rounded, 1.5 mm in diameter, glabrous, brownish.

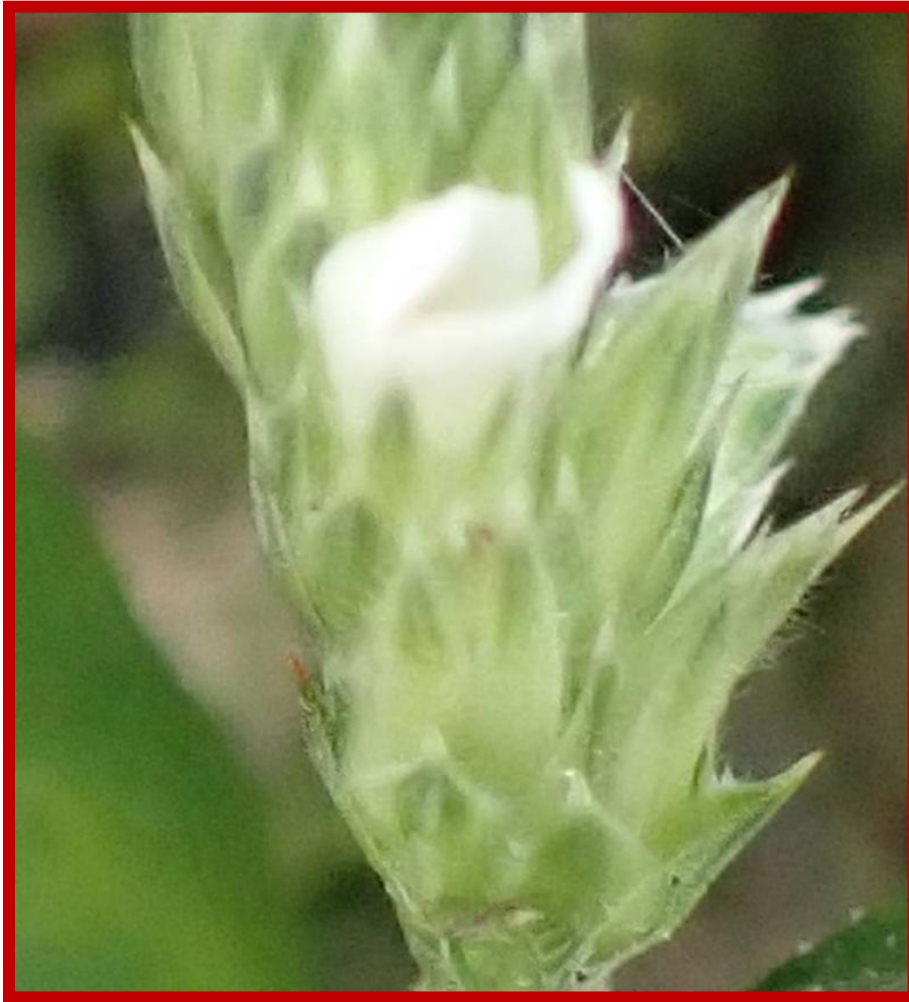


Fig. 221. *Lepidagathis palinensis* S. S. Ying, close-up of flower, very smaller

Diagnosis.

Lepidagathis palinensis is a distinctive species of Taiwan *Lepidagathis* species, it is differ other *Lepidagathis* species in having ovate to ovate-oblong, smaller, glabrous leaves; solitary to 2-3 clustered, unbranched, short, 1.5-2 cm long spikes and smaller white corolla which without any spots inside.



Fig. 222. *Lepidagathis palinensis* S. S. Ying, the holotype, NTUF-111-028

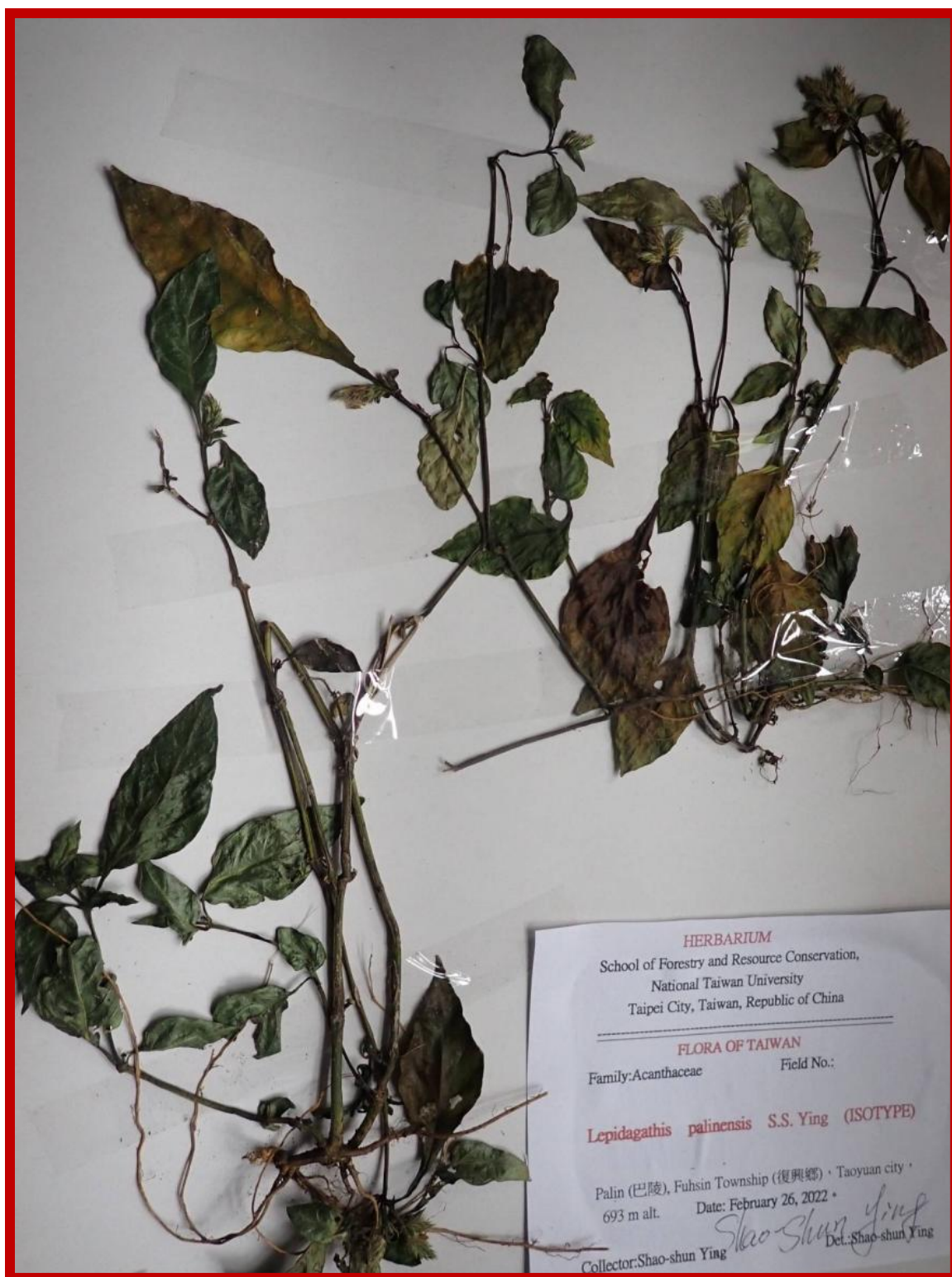


Fig. 223. *Lepidagathis palinensis* S. S. Ying, the isotype, NTUF-111-029

Distribution and phenology.

Lepidagathis palinensis S.S. Ying is endemic to Taiwan. It is known from Palin (巴陵), Fuhsin District (復興區), Taoyuan city, northern Taiwan. It was collected in the mountane slope between 650 and 725m altitudes; and flowering times is from March to April and fruiting time is April to June.



Fig. 22A. *Lepidagathis palinensis* S. S. Ying, close-up of inflorescence

19.A New Species of Genus *Asarum* (Aristolochiaceae) from Taiwan

Asarum tuncyanshanianum S. S. Ying

Asarum tuncyanshanianum S.S. Ying, *sp. nov.* 東眼山細辛

TYPE:TAIWAN. Taoyuan city, Fuhsin District (復興區), Tuncyanshan (東眼山), on the trail between Tuncyanshan (東眼山) and Manyueyuan (滿月圓), 893 m alt. S. S. Ying, *s.n.* March 10, 2022. (holotype, NTUF).



Fig. 225. *Asarum tuncyanshanianum* S. S. Ying, the flower

Morphology : A perennial herb, about 15-25 cm tall, rhizome creeping, horizontal, 7-9 mm in diameter, fleshy, dark brownish, internodes 1-2.5 cm long. Leaves 1-2 from the rhizome, cordate-triangular, 5-10 cm long, 4-9 cm wide, acuminate at apex, deeply cordate at base, thinly coriaceous, green and scattered pale green to white plaques surface, pale green and tinged with purple veins at base, glabrous on both surface, palmate veins at base tinged with purple somewhat inconspicuous on both surfaces; Petioles elongate, 11-20 cm long, terete, fleshy, glabrous, tinged with purplish red.



Fig. 226. *Asarum tungyanshanianum* S. S. Ying, habit



Fig. 227. *Asarum tungyanshanianum* S. S. Ying, leaves and petioles



Fig. 228. *Asarum tungyanshanianum* S. S. Ying, plant colony

Flowers 1-2, from rhizome, yellow to pale yellow, 2-2.5 cm in diameter when opened; cataphylls ovate, $1.5.2 \times 1$ cm; peduncles 3-4 mm long, fleshy, brown; pedicles 6-9 mm long, dark brown; calyx-tube 1.5-1.9 cm long . 8-9 mm wide, scattered short hairs outside, light brown, dark brown inside, 5-6 series of white protrusions at calyx-tube orifice, 3-lobed at apex; lobes oblong, 1-1.3 cm long, 0.9-1.1 cm wide, obtuse at apex, ciliate and fine serrulate at margin, glabrous on both surface, pale yellow veins inconspicuous; stamens 8, filaments longer than anthers; connectives extended beyond anthers, ligulate; ovary half-inferior, 6-loculed; styles connate, 6-clefted at apex, stigmas terminal.



Fig. 229. *Asarum tungyanshanianum* S. S. Ying, close-up of calyx-lobe



Fig. 230. *Asarum tungyanshanianum* S. S. Ying, close-up of calyx-tube (inside)



Fig. 231. *Asarum tungyanshanianum* S. S. Ying, plant with one flower



Fig. 232. *Asarum tungyanshanianum* S. S. Ying, plant with two flowers



Fig. 233. *Asarum tungyanshanianum* S. S. Ying, one flower plant



Fig. 234. *Asarum tungyanshanianum* S. S. Ying, the holotype NTUF-111-030
-172-



Fig. 235. *Asarum tungyanshanianum* S. S. Ying, the isotype NTUF-111-031



Fig. 236. *Asarum tungyanshanianum* S. S. Ying, close-up of centre of flower

Diagnosis.

Asarum tungyanshanianum close ally of *A. chatiense* differs in having 1-2 yellow flowers, calyx lobes oblong, 1-1.3 cm long, 0.9-1.1 cm wide, obtuse at apex, ciliate and fine serrulate at margin, glabrous on both surface, 5-6 series of white protrusions at calyx-tube orifice and 8 stamens.

Distribution and phenology.

Asarum tungyanshanianum S.S. Ying is endemic to Taiwan. It is known from Tungyanshan (東眼山), on the trail between Tungyanshan (東眼山) and Manyueyuan (滿月圓), Fuhsin District (復興區), Taoyuan city, northern Taiwan. It was collected under rich loam of broad-leaves forest, between 1065 and 885 m altitudes; and flowering times is from March to April and fruiting time is April to June.

20.A New Species and variety of Genus *Oxalis* (Oxalidaceae) from Taiwan

A.Oxalis taitastricta S. S. Ying

Oxalis taitastricta S.S. Ying , *sp. nov.* 台大條紋酢醬草

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Pilushan(畢祿山) 2050 m alt. *S. Ying* , *s.n. March17, 2022* ° (holotype , NTUF) °

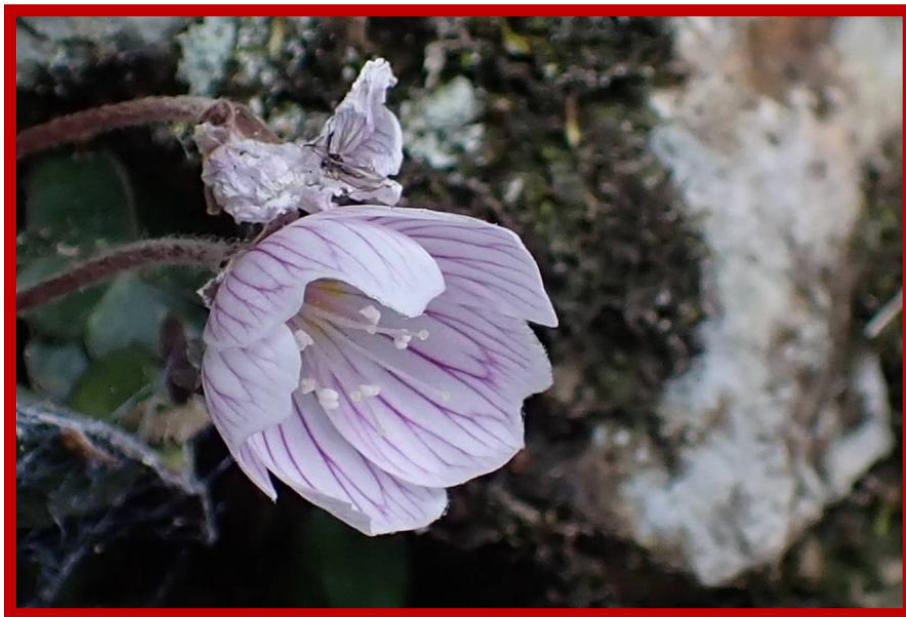


Fig. 237. *Oxalis taitastricta* S. S. Ying, close-up of flower

Morphology : A lithophytic perennial herb, without bulb, rhizome creeping, horizontal, pale pink, glabrous . 5-12 cm long, slightly fresh, branched at nodes; roots slender, very fibrous, produced from nodes of rhizome; branches from nodes, 4-6 cm long, 1.5 mm across, purplish red, glabrous, smooth; bracts at middle of branches, ovate, 7-9 mm long, 2-3 mm wide, obtuse at apex, amplexicual at base, dark purple, a nodule at top of branches where leaves and flowers produced. Leaves 4-6, trifoliate ; leaflets sessile , inverted triangular , 9-11 mm long, 15-26 mm wide, emarginate at apex, cuneate at base, entire and ciliate at margins, slightly fresh, lustrous green with white stripes surface, purplish red beneath,



Fig. 238. *Oxalis taitastricta* S. S, Ying, rhizome, leaves produced from branch-top



Fig. 239. *Oxalis taitastricta* S. S, Ying, leaves, showing both surfaces

glabrous on surface and densely villose beneath; midrib impressed surface and elevated beneath; lateral vein inconspicuous. Petioles terete, 4-6 cm long, slender, fleshy, pubescent, pale purplish.



Fig. 240. *Oxalis taitastricta* S. S. Ying, habitat

Flowers solitary to four produced from the plant, and only one flower at the top of pedicels, rather larger, 2.4-3 cm wide when opened, white with purplish red veins; scape (pedicels) elongate, 8-13 cm long, densely white pubescent, pale brownish; bracts 1, at middle of pedicels, ovate, 3-4 mm long, 2-2.5 mm wide, acute at apex, amplexicual at base, green; calyx rather small, sepals 5, ovate-lanceolate, 6-7.6 mm long, 2.5-3.5 mm wide, obtuse to acute at apex, green, slightly pubescent outside and glabrous inside; petals 5, ovate-oblong, 1.5-2.1 cm long, 7-9 mm wide, obtuse and emarginate or slightly 2-lobed at apex, attenuate at base, glabrous, white with conspicuous purple to violet veins; stamens 10, unequal; filaments slender, white, included; anthers white, 2-celled; ovary cylindrical, about 3-4 mm long; style 5, slender, longer than filament, transparent white, glabrous; stigma capitate, transparent white.

Diagnosis.



Fig. 241. *Oxalis taitastricta* S. S. Ying, the holotype, NTUF-111-032

Oxalis taitastricta is a distinctive new species of Taiwan *Oxalis*, readily recognised by its without bulb; horizontal, branched rhizomes; leaves 4-6 on the nodules of rhizome-branches; leaflets purplish red and densely villose beneath and rather larger, white with purplish red or violet veins flowers.



Fig. 242. *Oxalis taitastricta* S. S. Ying, flowering plant

Distribution and phenology.

Oxalis taitastricta S.S. Ying is endemic to Taiwan. It is known from Pilushan(畢祿山), Hoping District (和平區), Taichung City, central Taiwan. It grows on limestone cliff on montane slope, between 2050 and 2200 m altitudes; and flowering times is from March to April.

B.Oxalis taitastricta var. *taichungensis* S.S. Ying

Oxalis taitastricta var *taichungensis* S.S. Ying , var. nov. 台中條紋酢醬草

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Pilushan(畢祿山) 2150 m alt. *S. S. Ying* , s.n. March17, 2022 ° (holotype , NTUF) °



Fig. 243. *Oxalis taitastricta* var. *taichungensis* S. S, Ying, close-up of flower

Morphology : The variety differs the typical form by its terrestrial, alway form a small plant colony in habitat, rather larger leavesthe leaflets being 12-14 mm long, 16-27 mm wide, and rather larger flowers 2.8-3.5 cm wide when opened, the petals white with light violetslender veins.



Fig. 244. *Oxalis taitastricta* var. *taichungensis* S. S. Ying, plant colony



Fig. 245. *Oxalis taitastricta* var. *taichungensis* S. S. Ying, leaves



Fig. 246. *Oxalis taitastricta* var. *taichungensis* S. S. Ying, the holotype,

NTUF-111-033



Fig. 247. *Oxalis taitastricta* var. *taichungensis* S. S, Ying, plant colony



Fig. 248. *Oxalis taitastricta* var. *taichungensis* S. S, Ying, flowering plants

Diagnosis.

Same as the morphology.

Distribution and phenology.

Oxalis taitastricta var. *taichungensis* S.S. Ying is endemic to Taiwan ° It is known from Pilushan(畢祿山), Hoping District (和平區) , Taichung City, central Taiwan ° It grows on rich loam on montane slope, between 2150 and 2300 m altitudes; and flowering times is from March to April.



Fig. 249. *Oxalis taitastricta* var. *taichungensis* S. S, Ying, plant colony

21. Two New Species of Genus *Viola* (Violaceae) from Taiwan

A. *Viola pilushanensis* S. S. Ying

Viola pilushanensis S.S. Ying, *sp. nov.* 畢祿山三色堇

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Pilushan (畢祿山) 2050 m alt. *S. Ying*, *s.n.* March 17, 2022. (holotype, NTUF).



Fig. 150. *Viola pilushanensis* S. S. Ying, close-up of flower

Morphology : Annual herbs, tap root slightly fleshy, 1.5-2 cm long, 2.5-3 mm across; fibrous roots few, slender, 3-7 mm long, glabrous; stolon slender, 4-6 cm long, usually young plant at top, pubescent. Leaves 6-11, radical, petioled, ovate to ovate-oblong, 1.5-2.5 cm long, 1.2-1.7 cm wide, acute at apex, obtuse to cordate at base, chartaceous to slightly fleshy, pubescent to nearly glabrous surface, densely scattered long white hairs beneath; crenate and long-white ciliate at margins; midrib impressed surface and elevated beneath, midrib with long white hairs on both surface; lateral veins inconspicuous,



Fig. 251. *Viola pilushanensis* S. S. Ying, leaves



Fig. 252. *Viola pilushanensis* S. S. Ying, hairs on the leaves



Fig. 253. *Viola pilushanensis* S. S. Ying, flowers, mind hairs on the pedicels

lustrous green surface and pale green beneath. Petioles 8-15 mm long, densely scattered white hairs, purplish red; stipules absent or very minute, cauduous °

Flowers solitary, white with purplish red veins, terminal, 1.5-2.5 cm in diameter when opened; scape 3-5 cm long, erect to ascending, purplish red, densely scattered white long hairs; bracts 3 at base of sepals, triangular, 2-3 mm long, about 1.5-2 mm wide, acute at apex, cauduous; sepal 5, oblong, 5-8 mm long, 2-3.2 mm wide, obtuse at apex, green, truncate at base, densely scattered white long hairs outside and glabrous inside, brownish outside and pale green inside; petals white with purplish red veins, pale green at base, unequal; 2 dorsal petals ovate-oblong, 9-11 mm long, 8-10 mm wide, obtuse at apex, obtuse at base and

wavy at margins; the middle 2 petals broadly oblong, 10-12 mm long, 7-9.5 mm wide, obtuse at apex, scattered glandular-hairs at base, slightly clawed at base; the claws 1-1.5 mm long; lip ovate wedge-like, smallest, 7.5-8.7 mm long, 6-7.5 mm



Fig. 254. *Viola pilushanensis* S. S, Ying, unopened flower, showing calyx



-188- Fig. 255. *Viola pilushanensis* S. S, Ying, close-up of flower



Fig. 256. *Viola pilushanensis* S. S. Ying, nectium and appendages at spur-mouth

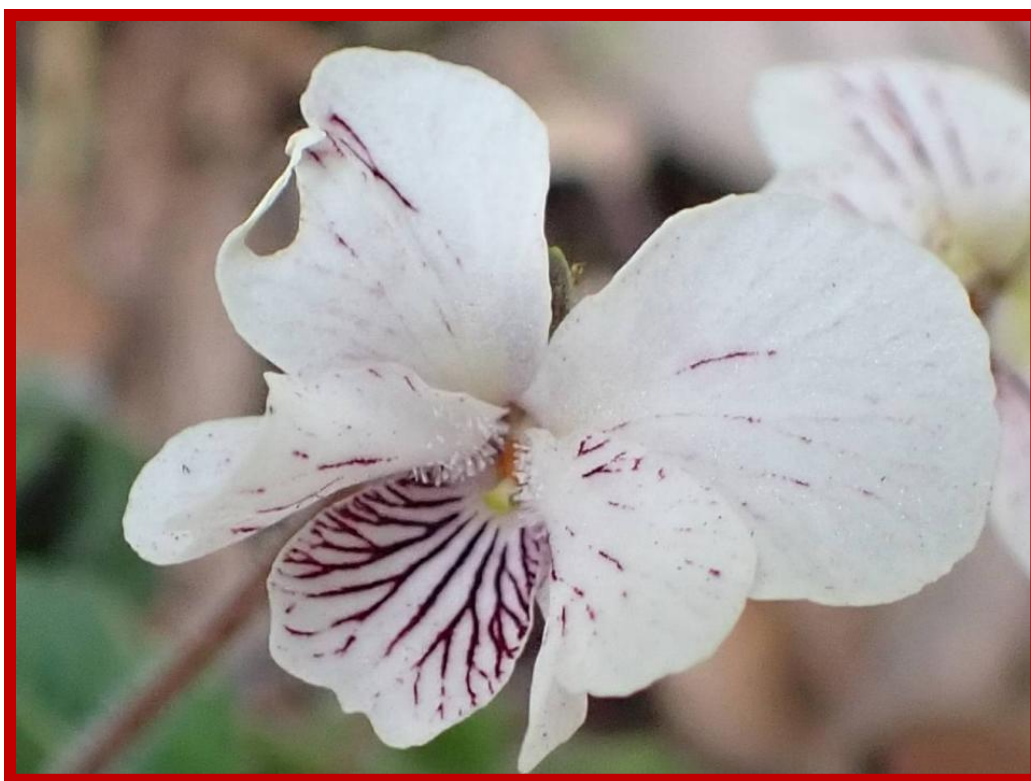


Fig. 257. *Viola pilushanensis* S. S. Ying, another type of lip



Fig. 258. *Viola pilushanensis* S. S. Ying, the holotype, NTUF-111-034

wide, white with purplish red veins, obtuse and emarginate at apex, sometime with a mucro at tip, narrowed at base ,with a brownish nectium at base; spur 3-4.5 mm long , 2 mm wide, not inflate and with two appendages at mouth, lightly grayish white ; stamens 5, included ; ovary globose , 2-3 mm long, 3-celled; ° Fruits capsules °

Diagnosis.

Viola pilushanensis is a distinctive new species of Taiwan *Viola*, readily recognised by its elongate white hairy on leaves and pedicels, flowers rather larger; petals unequal, with a brown nectium and with two appendages at spur mouth.

Distribution and phenology.

Viola pilushanensis S.S. Ying is endemic to Taiwan ° It is known from Pilushan(畢祿山), Hoping District (和平區) , Taichung City, central Taiwan ° It grows on montane slope, between 2000 and 2300 m altitudes; and flowering times is from March to April.



Fig. 259. *Viola pilushanensis* S. S, Ying, habitat

B. Viola wulinfarmensis S. S. Ying

Viola wulinfarmensis S.S. Ying, *sp. nov.* 武陵農場三色堇

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Wulin Farm (武陵農場) 1780 m alt. S. S. Ying , *s.n. March 24, 2022* ° (holotype , NTUF) °



Fig. 260. *Viola wulinfarmensis* S. S. Ying, habit

Morphology:Lithophytic, perennial herbs, tap root slightly fleshy, 2.5-3.2 cm long, 2.5-3 mm across; fibrous roots slender, 6-12 mm long,, glabrous; stolon slender, 5-8 cm long, usually young plant at top, pubescent. Leaves 9-15 in a clustered, radical, petioled, cordate to cordate-ovate, 2.2-3.5 cm long, 1.5-2.5 cm wide , acuminate at apex, deeply cordate at base, chartaceous, glabrous ob both surfaces ; serrulate at margins; palmate veins impressed surface and elevated beneath, lustrous green to green surface and pale wine-red especially on vian beneath. Petioles slender, 4-8 cm long, wine-red, glabrous; stipules lanceolate, 8-12 mm long, 2.5-3.5 mm wide, sparsely fimbriate at margins, glabrous.



Fig. 261. *Viola wulinfarmensis* S. S, Ying, leaves



Fig. 262. *Viola wulinfarmensis* S. S, Ying, leaf beneath

Flowers solitary, white to pale violet, lip usually with violet veins, terminal, 0.8-1.3 cm in diameter when opened; scape slender, 5-12 cm long, erect to ascending, purplish red, glabrous; bracts 2 at base and 1 at apex of pedicels, lanceolate, 3-4.5 mm long, about 1.5-2 mm wide, acute at apex; sepal 5, lanceolate, 6-8 mm long, 2-2.5 mm wide, acuminate at apex, pale brown to pale purple, glabrous, basal auricles short, apex shallowly dentate; petals unequal; 2 dorsal petals ovate to obovate-rouned, 8-10 mm long, 7-9 mm wide, obtuse at apex, attenuate at base and entire at margins; the middle 2 petals broadly ovate, 9-11 mm long, 7-9.5 mm wide, obtuse at apex, scattered glandular-hairs at base, slightly clawed at base; the claws 0.9-1.2 mm long; lip oblong, smallest, 6.5-7.7 mm long, 5.6-6.5 mm wide, white with violet veins, obtuse at apex, narrowed at base, with a brownish nectium at base; spur 3-3.5 mm long, 2 mm wide, obtuse at apex, pale yellow, glabrous; stamens 5, included; ovary globose, 2-3 mm long, 3-celled; Fruits capsules.



Fig. 263. *Viola wulinfarmensis* S. S. Ying, pedicels, bracts and calyx



Fig. 264. *Viola wulinfarmensis* S. S, Ying, close-up of flower



Fig. 265. *Viola wulinfarmensis* S. S, Ying, close-up of flower, see from back



Fig. 266. *Viola wulinfarmensis* S. S. Ying, the holotype, NTUF-111-035
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Diagnosis.

Viola wulinfarmensis is a distinctive new species of Taiwan *Viola*, readily recognised by its glabrous leaves with palmated veins and wine-red beneath, flowers with unequal petals, and the lip smallest, white with violet veins.

Distribution and phenology.

Viola pilushanensis S.S. Ying is endemic to Taiwan ° It is known from Wulin Farm (武陵農場), Hoping District (和平區), Taichung City, central Taiwan ° It grows on limestones of montane cliffs, between 1700 and 2000 m altitudes; and flowering times is from March to April.



Fig. 267. *Viola wulinfarmensis* S. S, Ying, light violet flower

22. A New Species of Genus *Salix* (Salicaceae) from Taiwan

Salix pilushanensis S. S. Ying

Salix pilushanensis S.S. Ying, *sp. nov.* 畢祿山柳

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Pilushan(畢祿山) 2250 m alt. *S. S. Ying* , *s.n.* March17, 2022 ° (holotype , NTUF) °



Fig. 268. *Salix pilushanensis* S. S. Ying, flowering branchlets

Morphology : Erect shrubs to small trees, up to 2.5 m high , trunk slender, much branched upward; branches erect or ascending, elongate, 50-150 cm long, glabrous, purplish red, juvenile branchlets slightly downy; buds russet, ovoid, 4-5.5 mm, glabrous. Leaves simple, alternate, lanceolate, 8-12.5 cm long, 1.8-2.4 cm wide, acuminate at apex , attenuate at base, chartacea, serrulate at margins, lustrous green surface, pale green beneath, glabrous on both surfaces; midrib impressed surface and elevated beneath, lateral veins 7-9



Fig. 269. *Salix pilushanensis* S. S, Ying, leaves



Fig. 270. *Salix pilushanensis* S. S, Ying, , serrulate and glabrous leaves

per side ° Petioles short , 1.5-2.1 cm long, slightly downy firstly and then become glabrous, purplish red.

Flowers unisexual, dioecious, precocious; catkin bracts, ovate, 4-6 mm long, 2.5-3 mm wide, acute at apex, brownish, caducous; male catkin many, terminal and axillary, elongate, 7-9 cm long, 1.2-1.5 cm across; peduncle short, 2-3 mm long, somewhat green, without leaflet; bracts triangular, 1.5-2.5 mm long, 1.2-1.5 mm wide at base, acute at apex, black; glands minute' stamens 2, free; filaments elongate, 8-12 mm long, white, with long-white villose at middle to base; anthers yellow, 0.5-1 mm long, 2-celled, basifixed, opening lengthwise.



Fig. 271. *Salix pilushanensis* S. S. Ying, ,male catkins



Fig. 272. *Salix pilushanensis* S. S. Ying, ,close-up of bract and stamens



Fig. 273. *Salix pilushanensis* S. S. Ying, „close-up of villose on filaments



Fig. 274. *Salix pilushanensis* S. S. Ying, „male catkin just opened

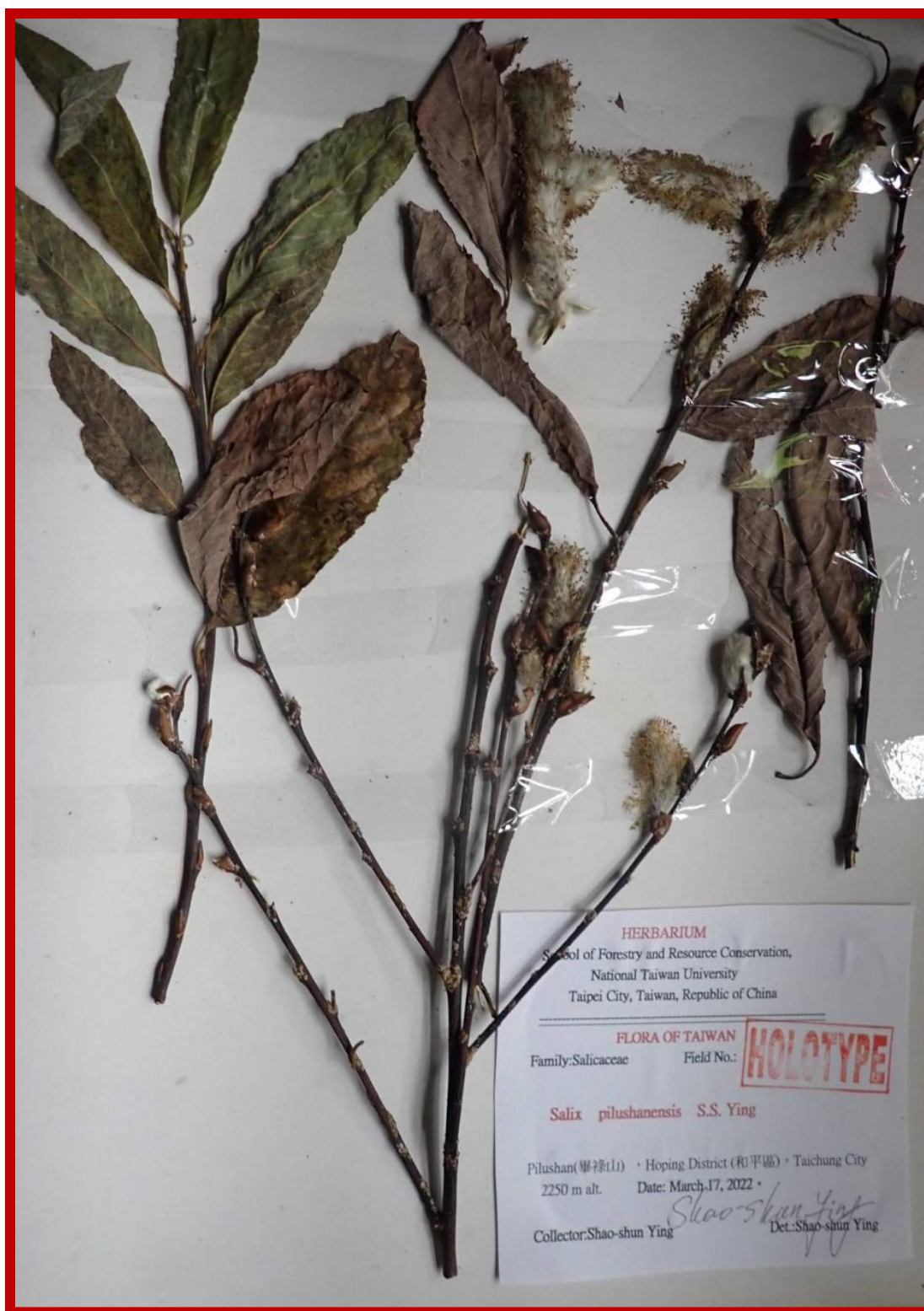


Fig. 275. *Salix pilushanensis* S. S. Ying, NTUF-111-036

Diagnosis.

Salix pilushanensis is closely related to *S. fulvopubescens*, but is distinguished from it by glabrous, serrulate leaves; elongate male catkins; triangular, black foral bracts and elongate, villous filaments.



Fig. 276. *Salix pilushanensis* S. S. Ying, male catkin

Distribution and phenology.

Salix pilushanensis S.S. Ying is endemic to Taiwan. It is known from Pilushan(畢祿山), Hoping District (和平區), Taichung City, central Taiwan. It grows on montane slope, between 2000 and 2200 m altitudes; and flowering times is from March to April.

23. A New Species of Genus *Ilex* (Aquifoliaceae) from Taiwan

Ilex rubroantheriana S. S. Ying

Ilex rubroantheriana S.S. Ying, *sp. nov.* 紅蕊冬青

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Wulin Farm (武陵農場) 1780 m alt. S. S. Ying , *s.n.* March 24, 2022 ° (holotype , NTUF) °



Fig. 277. *Ilex rubroantheriana* S. S. Ying, , male flowers

Morphology : Evergreen erect shrubs to 1.5 m high , trunk short, much branched from base; branches ascending to somewhat pending, elongate, 20-75 cm long, densely short hairs, green turning to gray brownish, juvenile branchlets green; stipules ovate, 2.5-3 mm long, cauduous. Leaves simple, alternate, ovate, 6-11 mm long, 4.2-6.8 mm wide, obtuse at apex , narrowly obtuse at base, coriaceous, serrulate and with a arista at apex at margins, lustrous green surface, pale green beneath, glabrous on both surfaces; midrib impressed surface and slightly elevated beneath, lateral veins inconspicuous; petioles short, 2-3 mmlong, green to pale green, nearly glabrous.

Flowers unisexual, dioecious. Male flowers solitary to 2-4 fasciculate at branches



Fig. 278. *Ilex rubroantheriana* S. S, Ying, , leaves and flowers



Fig. 279. *Ilex rubroantheriana* S. S, Ying, , leaves and flowers



Fig. 280. *Ilex rubroantheriana* S. S. Ying, , flowers fasciculate at branches and leaf-axil



Fig. 281. *Ilex rubroantheriana* S. S. Ying, , calyx, corolla and stamens

and leaf-axils, 5-7 mm in diameter when opened, purplish red to dark red (anther colour); pedicels short, 2-3 mm long, hairy, pale yellow; bracts ovate, 1.5-2.2 mm long, 1.5 mm wide, scattered with red spots; calyx 4-merous, minute, campanulate, 2.5 mm in diameter, 4-lobed at apex; lobes triangular, 2.5-3 mm long, 1.5 mm wide, acute at apex, pale yellow to greenish yellow, scattered red spots; corolla deeply 5-lobed at apex, 4.5-5.5 mm in diameter; lobes oblong, 2.5-3 mm long, 1.2-1.6 mm wide, obtuse at apex, hit to pale yellow, scattered with red spots, ciliate at margins, hairy outside and glabrous inside; stamens 4, filaments short, 0.5-1 mm long; anthers oblong, 4.5-5 mm long, 2.5 mm wide, obtuse at apex, bright red, 2-celled; rudimentary ovary ovoid, 0.5 mm long, green. Female not known.



Fig. 282. *Ilex rubroantheriana* S. S. Ying, , habit

Diagnosis.

Ilex rubroantheriana is a distinctive new species of Taiwan *Ilex*, readily recognised by its male flowers solitary to 2-4 fasciculate at branches and leaf-axils, and 4 conspicuous bright red, oblong anthers in each flower.

Distribution and phenology.



Fig. 283. *Ilex rubroantheriana* S. S. Ying, , the holotype NTUF-111-037

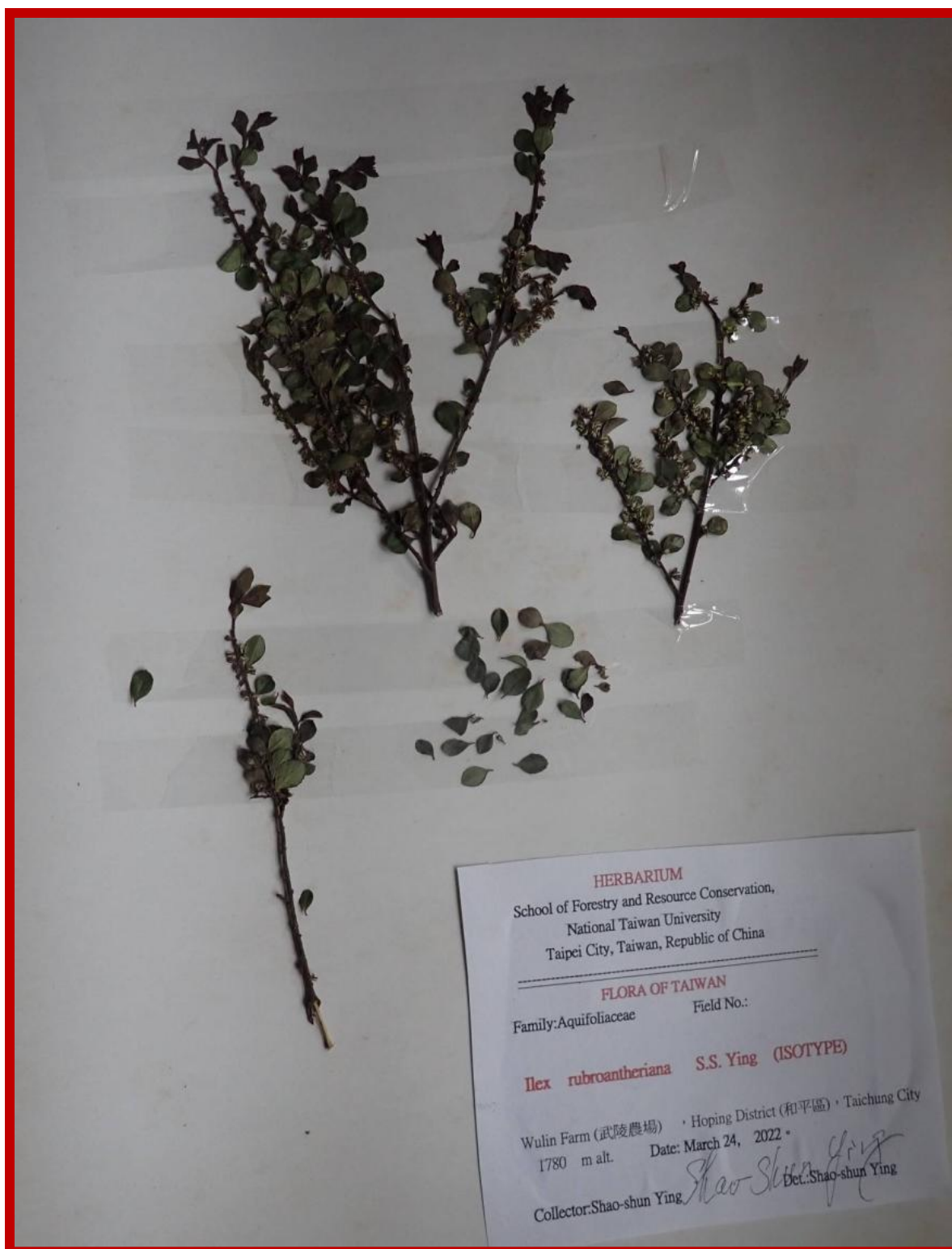


Fig. 284. *Ilex rubroantheriana* S. S. Ying., the isotype NTUF-111-038

Ilex rubroantheriana S.S. Ying is endemic to Taiwan. It is known from Wulin Farm (武陵農場), Hoping District (和平區), Taichung City, central Taiwan. It grows on montane cliffs just opposited side of the river to the frist bridage at farm entrance (農場入口第一座橋河流對面山坡的峭壁), between 1700 and 2000 m altitudes; and flowering times is from March to April.



Fig. 285. *Ilex rubroantheriana* S. S. Ying, , close-up of part of specimen



-210- Fig. 286. *Ilex rubroantheriana* S. S. Ying, , part of specimen

24. A New Species of Genus *Dianthus* (Caryophyllaceae) from Taiwan

Dianthus taoshanensis S. S. Ying

Dianthus taoshanensis S.S. Ying , *sp. nov.* 桃山石竹

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Taoshan (桃山) 1980 m alt. *S.*

S. Ying , *s.n.* March 24, 2022 ° (holotype , NTUF) °



Fig. 287. *Dianthus taoshanensis* S. S. Ying, , close-up of flower

Morphology : Perennial herbs to 30-45 cm tall, rhizome creeping, somewhat lignified, 6-12 cm long, glabrous, pale brownish , branched from it. branches many, caespitose, 20-35 cm long, erect to ascending, green to purplish red, glabrous. Leaves simple, opposite, linear, 1.5-2.5 cm long, 1.5-2 mm wide, obtuse to acuminate at apex and amplexicual at base forming a 1-1.5 mm long sheath, chartaceous, entire at margins, lustrous green surface and



Fig. 288. *Dianthus taoshanensis* S. S. Ying, , cstem and leaves



Fig. 289. *Dianthus taoshanensis* S. S. Ying, , young plant colony

pale green beneath, glabrous on both surface, midrib and lateral veins inconspicuous on both surfaces.



Fig. 290. *Dianthus taoshanensis* S. S, Ying, , flowers, mind brownish calyx



Fig. 291. *Dianthus taoshanensis* S. S, Ying, , close-up of petals, stamens and style

Flowers solitary, terminal on end of branches, rather larger, 3-3.5 cm in diameter when opened, pink with a white throat; bracts 4 at base of calyx, linear to ovate, 5-7 mm long, about 1-2.5 mm wide, acuminate at apex, green; calyx campanulate, 1.5-2 cm long, 4-5 mm wide, brownish, nearly glabrous, 5-toothed at apex; teeth triangular, 0.4 mm long, acute at apex; petals 5, dark pink at limb and white at claw, 2.7-3.5 cm long, claw 1.5-2 cm long, surrounded by calyx tube; limb ovate, 1-1.5 cm long, 7-8 mm wide, fimbriate for 1/3 to 1/2 its length; throat slightly hairy; stamens 10, some exserted, filaments filiform, 1.5-3 cm long, white with a purple tip; anthers spot-like, 0.5 mm long; ovary ovoid, 3-4 mm long, glabrous; style slender, exserted, white, 2-lobed at apex.



Fig. 292. *Dianthus taoshanensis* S. S. Ying, habitat

Diagnosis.

Dianthus taoshanensis is a distinctive new species of Taiwan *Dianthus*, readily recognised by its brownish calyx, dark pink at limb and white at claw of petals, exserted white stamens and white, slender, 2-lobed style.

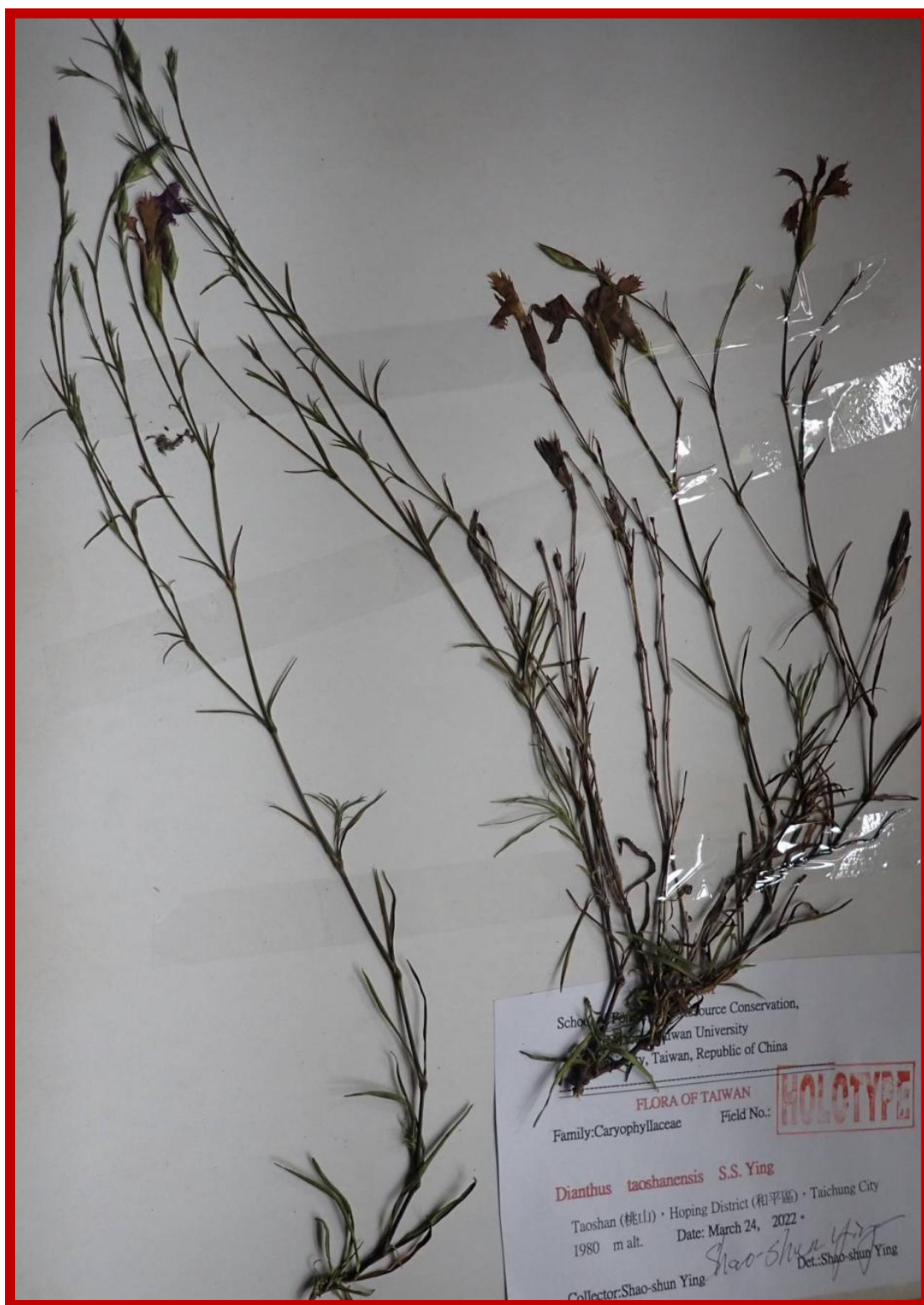


Fig. 293. *Dianthus taoshanensis* S. S. Ying, the holotype NTUF-111-039

Distribution and phenology.

Dianthus taoshanensis S.S. Ying is endemic to Taiwan ° It is known from Taoshan (桃山), Hoping District (和平區), Taichung City, central Taiwan ° It grows on montane slopes in sunny loam-rich soil, sometimes also see on steep grass limestone cliffs between 1800 and 2000 m altitudes; and flowering times is from March to April.



Fig. 294. *Dianthus taoshanensis* S. S. Ying, habitat

25. A New Species of Genus *Rhododendron* (Ericaceae) from Taiwan

Rhododendron chiliangense S. S. Ying

Rhododendron chiliangense S.S. Ying, *sp. nov.* 志良杜鵑

TYPE:TAIWAN. Between Chiliang Police Station (志良派出所) and Huapu (花圃), Hoping District (和平區), Taichung City, 1580 m alt. *S. S. Ying*, *s.n. April 14, 2022* ° (holotype, NTUF) °



Fig. 295. *Rhododendron chiliangense* S. S. Ying, flowers

Morphology : Shrubs, up to 1.5 m high, trunk short, much branched; branchlets erect to ascending, terete, hairy when young and then glabrous, grayish brown. Leaves simple,



Fig. 296. *Rhododendron chiliangense* S. S. Ying, leaves of last year

alternate, somewhat clustered at branchlet apex, dimorphic; the last year leaves ovate to oblong, 8-14 mm long, 5.5-9.5 mm wide, obtuse and arista at apex, obtuse at base, chartaceous to coriaceous, entire and ciliate at margins, appressed pubescent on both surfaces; midrib impressed surface and elevated beneath, lateral veins inconspicuous; leaves of this year lanceolate to broadly lanceolate, 1.5-2.5 cm long, 5-8 mm wide, acuminate at apex, attenuate at base, chartaceous, entire and ciliate at margins, scattered appressed pubescent on both surfaces, especially on the midrib beneath; midrib impressed surface and elevated beneath, lateral veins inconspicuous. Petioles short, terete, 3-4 mm long, scattered appressed pubescent all over.;

Flowers 3-5, mostly 3- fascicled on the terminal of branchlets, rather smaller, 2.5- 3.2 cm in diameter when opened, purplish red, pink to pale pink and 1-2 corolla-lobes with dark red specks and plaques; pedicels 3-3.5 mm long, pale pink, scattered pubescent, scaly; scales lanceolate, 1.5-2.5 mm long, acute at apex, scattered with hairy; calyx smaller, 3.4-4.5 mm wide, green, pubescent outside, 5-lobed at apex; lobes lanceolate-triangular,



Fig. 297. *Rhododendron chiliangense* S. S. Ying, leaves for this year



Fig. 298. *Rhododendron chiliangense* S. S. Ying, appressed pubescent on leaves



Fig. 299. *Rhododendron chiliangense* S. S, Ying, pedicel, scales and calyx-lobed



Fig. 300. *Rhododendron chiliangense* S. S, Ying, pedicel and calyx-lobed

2-3.5 mm long, acute at apex, truncate at base, pubescent outside and glabrous inside, dirty green outside and pale green inside; corolla widely 5-lobed ; the lobes oblong to oblong-lanceolate , 1.8-2.3 cm long, 4.5-6.8 mm wide, obtuse at apex, glabrous; the lower 1-2 lobes always tinged with dark red specks and plaques ; stamens 8-10, filaments slender, 2.5-3.5 cm long, pink to white, villous but glabrous upward; anthers 2-celled, oblong, 2-3 mm long, dark brown, opening by terminal pore; style slender, 3.5-4.5 cm long, purplish red to pink, villous but glabrous upward; stigma capitate, about 2 mm across, red; ovary globose, densely scattered white pubescent, 2 mm across.

Fruits capsules, oblong, 5-6 mm long, about 2.5 mm across, pubescent, dehiscent from top when mature, septical; valves thick, straight; seeds numerous, minute, reniform, pale brown, glabrous..



Fig. 301. *Rhododendron chiliangense* S. S, Ying, flowers in pink colour

Diagnosis.

Rhododendron chiliangense is characterized by:

1. The plant is flowering in late April to May, one of late flowering species of



Fig. 302. *Rhododendron chiliangense* S. S. Ying, the holotype NTUF-111-040



Fig. 303. *Rhododendron chiliangense* S. S. Ying, the isotype, NTUF-111-041



Fig. 304. *Rhododendron chiliangense* S. S, Ying, flowers in pale pink colour

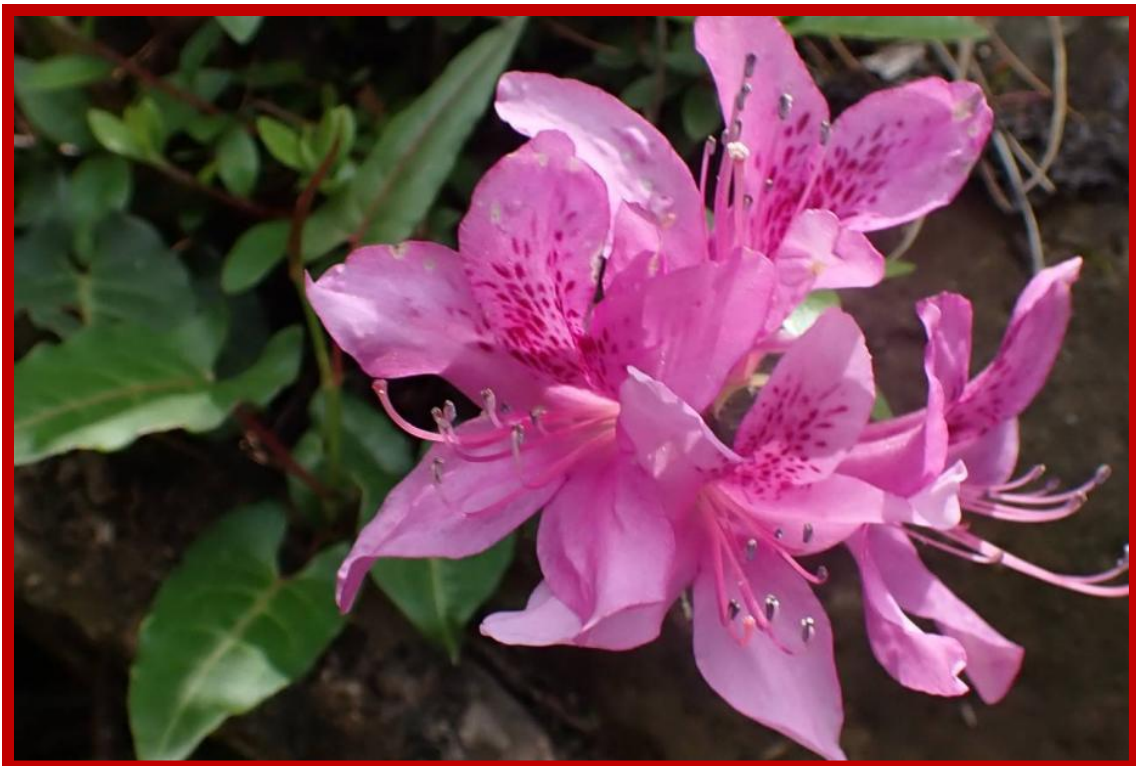


Fig. 305. *Rhododendron chiliangense* S. S, Ying, flowers in purplish red colour

Rhododendron in Taiwan.

2. Leaves with dimorphic styles; the last year leaves ovate to oblong, 8-14 mm long, 5.5-9.5 mm wide, and leaves of this year lanceolate to broadly lanceolate, 1.5-2.5 cm long, 5-8 mm wide. ,

3. Flowers 3-5, mostly 3- fascicled on the terminal of branchlets, rather smaller, 2.5- 3.2 cm in diameter when opened, purplish red, pink to pale pink and 1-2 corolla-lobes with dark red specks and plaques



Fig. 306. *Rhododendron chiliangense* S. S. Ying, habitat

Distribution and phenology.

Rhododendron nantouense S.S. Ying is endemic to Taiwan ° It is known from montane slope and under woodland between Chiliang Police Station (志良派出所) and Huapu (花

圖), at elevation between 1500 and 1900 m. Hoping District (和平區), Taichung City, and flowering time from late April to May, and fruiting time from June to August.



Fig. 307. *Rhododendron chiliangense* S. S. Ying, flower-bud



Fig. 308. *Rhododendron chiliangense* S. S. Ying, habitat

26. A New Species of Genus *Prunus* (Rosaceae) from Taiwan

Prunus chiliangensis S. S. Ying

Prunus chiliangensis S.S. Ying , *sp. nov.* 志良野櫻

TYPE:TAIWAN. Between Chiliang Police Station (志良派出所) and Huapu (花圃), Hoping District (和平區) , Taichung City, 1580 m alt. *S. S. Ying* , *s.n. April 14, 2022* ° (holotype , NTUF) °



Fig. 309. *Prunus chiliangensis* S. S. Ying, flowers

Morphology : Medium sized trees, up to 12 m high, trunk staight, bark gray to dark gray, smooth, much branched; branchlets erect to ascending, terete, green to turn gray, glabrous, -227-



Fig. 310.*Prunus chiliangensis* S. S, Ying, leaves



Fig. 311.*Prunus chiliangensis* S. S, Ying, branches with flowers and fruits

lenticels inconspicuous. Leaves simple, alternate, usually terminal on the branches, oblong, 5-6.5 cm long, 1.8-2.6 cm wide, chartaceous, acuminate and long-caudate at apex, obtuse and slightly oblique at base, simple serrulate, without glands at margins, glabrous on both surfaces, midrib impressed surface and elevated beneath, lateral veins 6-8 per side impressed and elevated beneath. Petioles 1.5-2.5 cm long, groove surface, scattered pubescent, purplish to purplish green, 2 red nectaries at apex; stipules linear, with distant dark purple glands at margins, soon caducous.

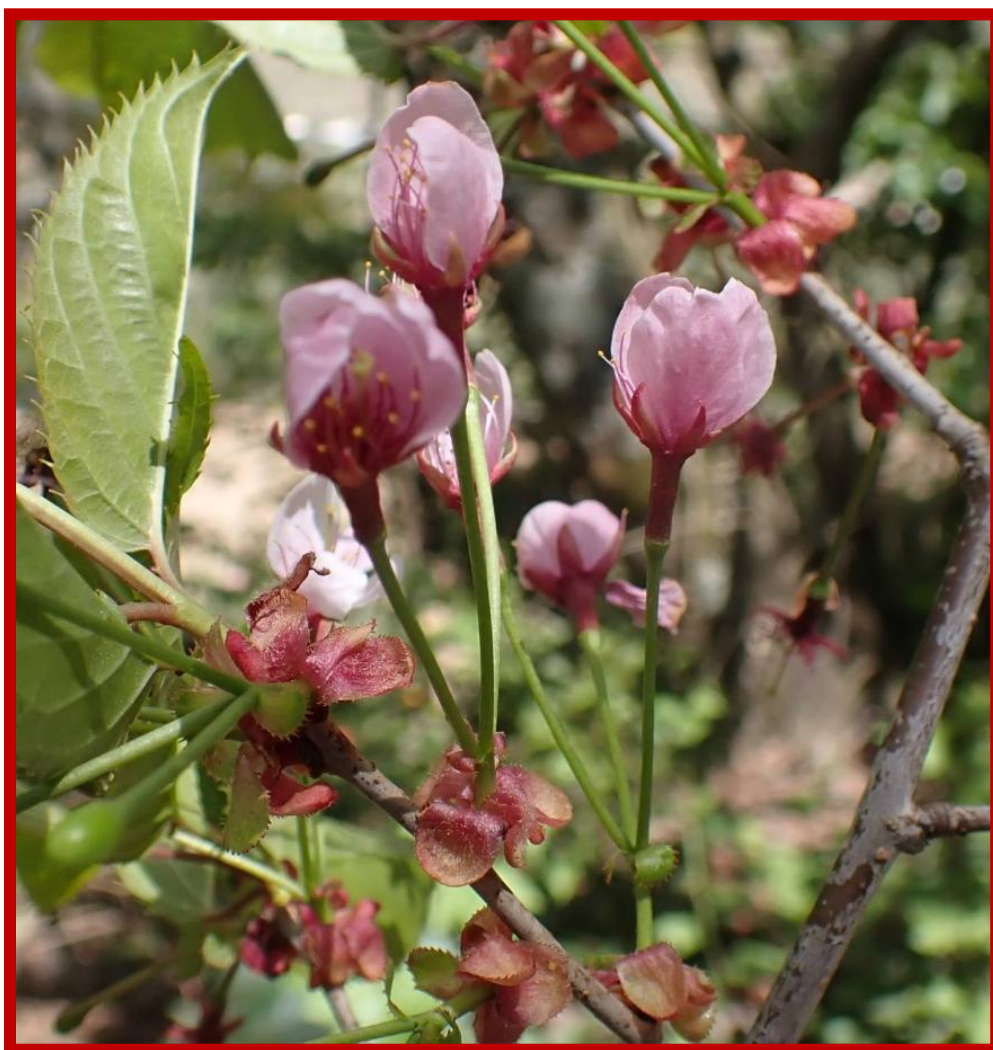


Fig. 312. *Prunus chiliangensis* S. S. Ying, 2-5 flowers in a fascicle

Flowers pink, pale pink to white, usually opening at same time as leaves, 9-12 mm in diameter when opened, 2-5, mostly 3-flowered fascicled, base often with an involucre formed by floral bud scales; scales 3-5, ovate to ovate-oblong, 5-7 mm long, 3-5 mm wide, obtuse at apex, serrulate at margins, red to redish green, glabrous; pedicels 1.5-2.5 cm long, green, glabrous; hypanthium tubular, 6-8 mm long, red to pink, glabrous; sepals 5, lanceolate, 7-9 mm long, 2.4-3 mm wide, acuminate at apex, erect, glabrous on both surfaces; petals 5, ovate to broadly ovate, 8-10 mm long, 4-5 mm wide, obtuse and emarginate at apex, obtuse and without claw at base, glabrous; stamens many, unequal; filaments slender, 4-9 mm long, white, glabrous; anthers rounded, 1 mm across; carpel 1, ovary superior, oblong, 1.5 mm long, 0.8 mm across, tuse at apex; style slender, shorter than petals, pink to pale green, glabrous; stigmas disc-like, emrginate at base, pale green, glabrous.



Fig. 313. *Prunus chilianensis* S. S. Ying, hypanthium, calyx and petals



Fig. 314. *Prunus chiliangensis* S. S, Ying, pink petals on ground



Fig. 315. *Prunus chiliangensis* S. S, Ying, calyx, petals, stamens, style and stigma

Fruits drupe, smaller, oblong, 5-7 mm long, 3-4.5 mm across, purplish red when mature, glabrous, without a longitudinal groove; mesocarp thin, fleshy; endocarp globose, smooth, 1-seeded. s



Fig. 316. *Prunus chiliangensis* S. S. Ying, fruits just turning to purplish red

Diagnosis.

Prunus chiliangensis is characterized by:

1. The plant is flowering in late April to May, one of late flowering species of *Prunus* of Taiwan.
2. Flowers opened at same time with leaves.
3. Petals usually pink to pale pink, and some petals turned to white at last.
4. Fruits smaller, oblong, 5-7 mm long, 3-4.5 mm across, purplish red when mature.



Fig. 317. *Prunus chiliangensis* S. S. Ying, the holotype NTUF-111-042

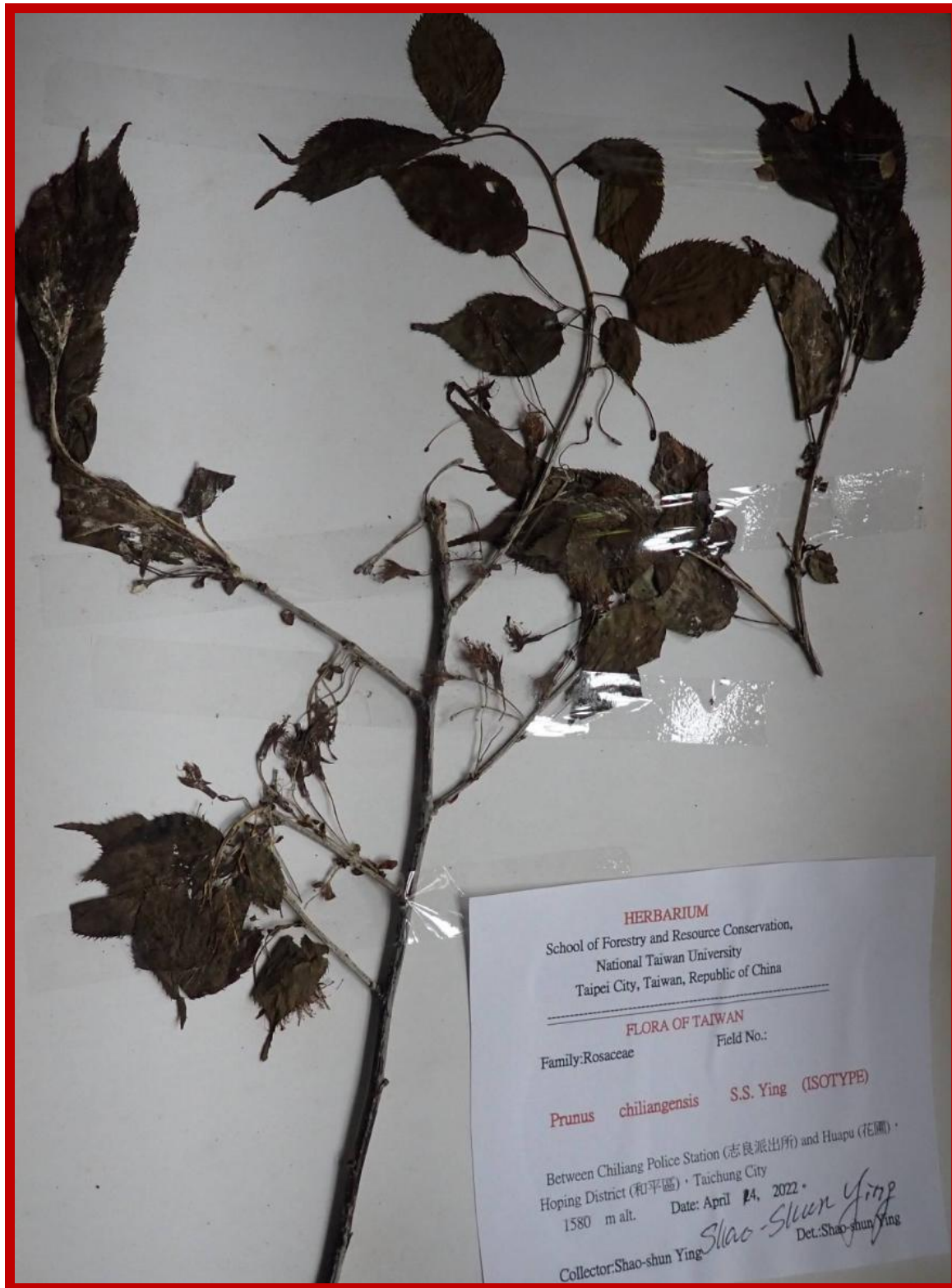


Fig. 318. *Prunus chiliangensis* S. S. Ying, the isotype NTUF-111-043

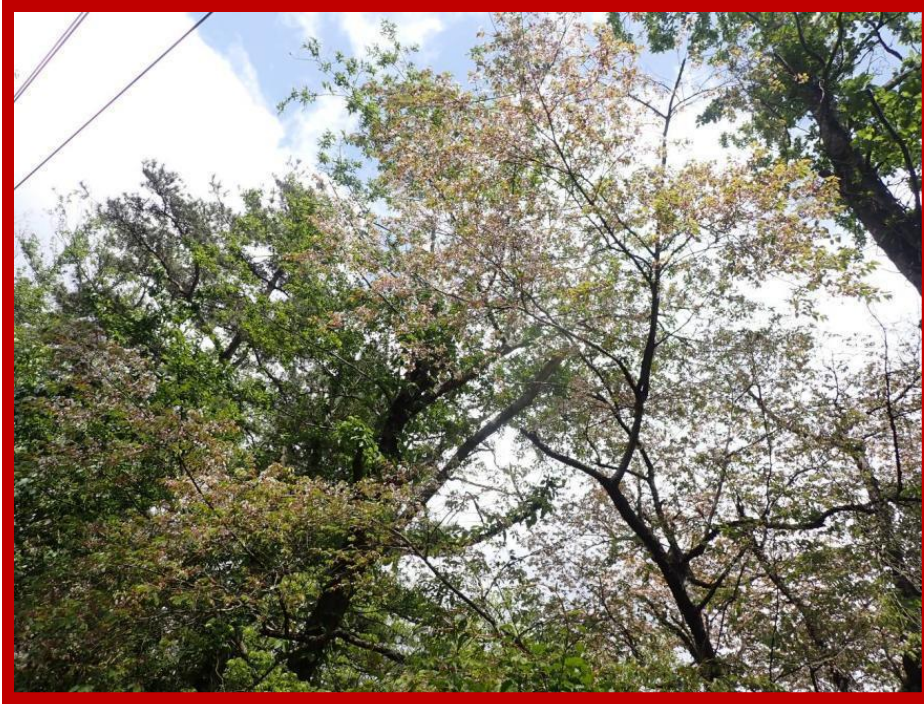


Fig. 319. *Prunus chiliangensis* S. S. Ying, habit

Distribution and phenology.

Prunus nantouensis S.S. Ying is endemic to Taiwan. It is known from broadleaves forests between Chiliang Police Station (志良派出所) and Siyuan (思源), at elevation between 1600 and 1950 m. Hoping District (和平區), Taichung City, and flowering time from late April to May, and fruiting time from May to August.



27. A New Species of Genus *Clinopodium* (Lamiaceae) from Taiwan

Clinopodium wutaianum S. S. Ying

Clinopodium wutaianum S.S. Ying , *sp. nov.* 武塔光風輪

TYPE:TAIWAN. I-Lan County,Nanao Township (南澳鄉) , Wuta (武塔) 45 m alt. *S. S. Ying* , *s.n.* April 07, 2022 ° (holotype , NTUF) °



Fig. 321. *Clinopodium wutaianum* S. S. Ying, plant colony

Morphology : Annual prostrate herbs, stem several produced from the root system, somewhat shorter, 7-11 cm long, erect to ascending, green, short white pubescent, sometimes rooting at branched points, green to green tinged with purple. Leaves simple, opposite, ovate, 1.2-2.0 cm long, 9-13 mm wide, acuminate at apex, obtuse to slightly cordate at base, dentate and ciliate at margins, chartaceous, lustrous green surface and pale green beneath; glabrous on both surfaces; midrib impressed surface and elevated beneath; lateral veins 3-4 per side. Petioles 6-8 mm long, slender, glabrous or nearly so.



Fig. 322. *Clinopodium wutaianum* S. S. Ying, leaves

Flowers small, pink, many, 1.5-2.5 mm in diameter when opened, usually 6-9 flowers forming a verticillaster, 4-6 verticillaster to form a short terminal inflorescence; inflorescence erect to ascending, 1-1.8 cm long, scattered glandular hairs, green; bracts linear to lanceolate, 4-6 mm long, 1-2 mm wide, acuminate at apex; pedicels 2-3.5 mm long, green, scattered hairs; calyx tubular, 3-4 mm long, about 2.5 mm wide, green tinged with purplish red, 6-8-nerved, usually hirsute at nerves; limb 2-lipped; upper lip 3-toothed, equal, 0.6-0.8 mm long, 0.6 mm wide, acuminate at apex, entire at margins; lower lip 2-toothed, linear, 0.8-1.5 mm long, 0.3 mm wide, acuminate at apex, blackish, long white ciliate at margins; corolla pink, 1.5-2.5 mm in diameter when opened, 2-lipped, tube exerted, gradually dilated upward to throat, pubescent outside and glabrous inside; upper lip straight, 0.4-0.5 mm long, obtuse at apex; lower lip 3-lobed, 0.45-0.6 mm long, lateral lobes smaller, obtuse at apex; middle lobe larger, somewhat square-like, obtuse at apex; stamens 4, anterior 2 longer than posterior 2, included, filaments slender, 0.5-0.7 mm long; anther cells 2, divaricate, \pm obliquely inserted on dilated connectives; style slender,



Fig. 323. *Clinopodium wutaianum* S. S. Ying, inflorescence, mind calyx lower lip



Fig. 324. *Clinopodium wutaianum* S. S. Ying, close-up of calyx, mind low lip 2-lobed

included, 0.8-1.7 mm long, unequally 2-cleft; ovary globose, 0.5 mm across, glabrous. Fruit a nutlet, cylindrical, 0.2-0.3 mm long, black .



Fig. 325. *Clinopodium wutaianum* S. S. Ying, inflorescence, mind corolla

Diagnosis.

Clinopodium wutaianum grows in the lower altitude of northeastern Taiwan, The characteristics of the species states as follows:

1. Inflorescence very short, 1-1.8 cm long, terminal on the stem.
2. Calyx green tinged with purplish red, 6-8-nerved, usually hirsute at nerves; limb 2-lipped; upper lip 3-toothed, equal; lower lip 2-toothed, linear, 0.8-1.5 mm long, 0.3 mm wide, acuminate at apex, blackish, long white ciliate at margins;
3. Corolla pink, pubescent outside and glabrous inside; upper lip straight; lower lip 3-lobed, lateral lobes smaller, obtuse at apex; middle lobe larger, somewhat square-like, obtuse at apex;

Distribution and phenology.



Fig. 326. *Clinopodium wutaianum* S. S. Ying, the holotype NTUF-111-044
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The species is endemic in Taiwan, It is known from Wuta (武塔), Nanao Township (南澳鄉), I-Lan County, **northeastern** Taiwan. ◦ It was discovered on the way between Wuta (武塔) and Nanao Farm (南澳農場) on the roadsides at elevations of 30-50 meters. Its flowering time is May to June.



Fig. 327. *Clinopodium wutaianum* S. S. Ying, habitat



Fig. 328. *Clinopodium wutaianum* S. S. Ying, habit

Clinopodium cirenianum S.S. Ying, another species of genus *Clinopodium* which I described in last year, (New taxa and New Names Vol. 4, 228, 2021), however, I obtain some good pictures to show more clear characters of the species near to Chingchuan bridge, Taichuang City, four pictures are posted here to explain the plant.



Fig. 329. *Clinopodium cirenian* S. S, Ying, habitat



Fig. 330. *Clinopodium cirenian* S. S, Ying, habit



Fig. 331. *Clinopodium cirenian* S. S, Ying, inflorescence



Fig. 332. *Clinopodium cirenian* S. S, Ying, close-up of inflorescence

28. A New Species of Genus *Maesa* (Primulaceae) from Taiwan

Maesa tairukouensis S. S. Ying

Maesa tairukouensis S.S. Ying, *sp. nov.* 太魯閣山桂花

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Shakadang Trails (砂卡礑步道) 60 m alt. *S. S. Ying*, *s.n. April 21, 2022* ° (holotype, NTUF) °



Fig. 333. *Masea tairukouensis* S. S, Ying, close-up of bisexual flowers

Morphology : Lithophytic shrubs up to 2.0 m high, much branched, glabrous, wrinkled, with lenticels; branches erect to ascending, slender, green to brownish, grooved, lenticels inconspicuous; pith solid . Leaves simple, alternate, oblong, 5-7.5 cm long, 2.5-3.2 cm wide, obtuse and arista at apex, obtuse at base, chartaceous, remotely dentate at margins, lustrous green surface and pale green beneath; midrib elevated on both surfaces, the lateral veins (3-5 per side) impressed surface and elevated beneath, glabrous on both surfaces. Petioles slender, 8-13 mm long, subterete to terete, slightly grooved above and elevated beneath.



Fig. 334.*Masea tairukouensis* S. S, Ying, leaves and branches



Fig. 335.*Masea tairukouensis* S. S, Ying, inflorescence



Fig. 336. *Masea tairukouensis* S. S. Ying, close-up of inflorescence

Flowers 5-8 in a short racemes, bisexual, white, 1.5-2 mm in diameter when opened, scentless; inflorescence axillary, short, 6-10 mm long, glabrous, green; bracts ovate, 0.5-0.8 mm long, acute at apex, pale greenish; pedicels very short, about 1-1.5 mm long, pale green, glabrous; calyx campanulate, adnate to ovary, 1.5-2 mm wide, glabrous, 5-lobed at apex; lobes triangular, 0.7-0.9 mm long, acute at apex, pale yellow to green; corolla white, widely campanulate, 1.5-2.0 mm long, about 2.5 mm wide, 5-lobed at apex; the lobes ovate, 0.3-0.4 mm long, obtuse at apex; stamens 5, included, opposite to corolla-lobe; filaments slender, 0.5-0.6 mm long, white; anthers reniform, brownish; ovary globose, 0.5 mm across, green, glabrous; style slender, 0.5-0.6 mm long; stigma entire, disc-like, pale brownish.

Diagnosis.

Maesa tarukouensis is characterized by:

1. A lithophytic shrub, usually grows on the limestones facing to Shakadang river (砂卡礑溪) about 2 m high.
2. Inflorescences very short, 6-8 mm long; flowers 5-8 in a short racemes, flowers bisexual only.
3. corolla widely white, campanulate, 1.5-2.0 mm long, about 2 mm wide, 5-lobed at apex.



Fig. 337. *Macsa tairukouensis* S. S. Ying, the holotype NTUF-111-045



Fig. 338. *Maesa tairukouensis* S. S. Ying, close-up of flowers

Distribution and phenology.

Maesa tairukouensis S.S. Ying is endemic to Taiwan ° It is known from Shakadang Trails (砂卡礑步道), about 40-60 m elevation, Xiulin Township (秀林鄉) , Hualien county , eastern Taiwan. and flowering time from April to May, and fruiting time from May to July °



Fig. 339. *Maesa tairukouensis* S. S. Ying, inflorescence



Fig. 340. *Masea tairukouensis* S. S. Ying, habit, plant on cliff facing to Shakadang river
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29. A New Species of Genus *Cinnamomum* (Lauraceae) from Taiwan

Cinnamomum chingchuanium S. S. Ying

Cinnamomum chingchuanium S.S. Ying, *sp. nov.* 清泉樟

TYPE:TAIWAN. Taichung City, Hoping District (和平區), Near to Chingchuan bridge (清泉橋), 1640 m alt. *S. S. Ying*, *s.n. May12, 2022* ° (holotype, NTUF) °



Fig. 341. *Cinnamomum chingchuanium* S. S. Ying, flowering branchlets

Morphology : Lithophytic evergreen shrubs to small trees up to 4.5 m high, 4.5-5 cm in diameter, bark gray, smooth; branchlets greenish yellow, terete, glabrous; bud small. Leaves simple, alternate to nearly opposite, lanceolate, 4.5-5.5 cm long, 1.5-2 cm wide, acuminate apex, attenuate at base, attenuate to obtuse at base, chartaceous, entire and slightly wavy at margins, lustrous dark green surface and glaucous beneath, glabrous on both surfaces; 3-nerved from base and impressed surface and elevated beneath; lateral veins inconspicuous. Petioles 8-12 mm long, grooved on surface, glabrous.



Fig. 342. *Cinnamomum chingchuanium* S. S. Ying, leaves



Fig. 343. *Cinnamomum chingchuanium* S. S. Ying, inflorescences

Flowers smaller, 2.5-3 mm in diameter when opened, pale yellow, scentless, in axillary 1-3-mostly 3-flowered umbel, 2-4 umbels opposite or nearly so, on the top of branchlets; peduncles 1.5-2 cm long, pale green, glabrous; pedicels 8-14 mm long, glabrous; perianth tube obconical, about 1.5 mm long, glabrous, 6-lobed at apex; lobes ovate, 1.5-2 mm long, about 0.8 mm wide, obtuse at apex, pale yellow to greenish yellow, glabrous; fertile stamens 9 in 3 whorl, filaments slender, shorter than perianth-lobes, filaments of 1st and 2nd whorls eglandular, those of 3rd whorl each with 2 stalked glands near base; anthers kidney-shaped, 0.4 mm long, 4-celled, yellow; cells introrse (of 1st and 2nd whorls) and extrorse (of 3rd whorl); staminodes 3, of innermost whorl, sagittate, stipitate; ovary ovoid, 0.4-0.5 mm across, glabrous, green; style slender, 0.6-0.7 mm long; stigma capitate, somewhat inconspicuous.



Fig. 344. *Cinnamomum chingchuanium* S. S. Ying, close-up of flowers

Diagnosis.

Cinnamomum chingchuanium is characterized by:

1. A lithophytic shrub to small tree, usually grows on the limestones facing to Nanhu river(南湖溪) about 2-4.5 m high.
2. Leaves smaller, alternate to nearly opposite, lanceolate, 4.5-5.5 cm long, 1.5-2 cm wide,
3. Flowers smaller, 2.5-3 mm in diameter when opened, pale yellow, scentless, in axillary 1-3-mostly 3-flowered umbel, 2-4 umbels opposite or nearly so, on the top of branchlets.



Fig. 345. *Cinnamomum chingchuanium* S. S. Ying, habitat

Distribution and phenology.

Cinnamomum chingchuanium i S.S. Ying is endemic to Taiwan ° It is known from near to Chingchuan bridge (清泉橋), at the confluence of Nanhu reiver (南湖溪) and



Fig. 346. *Cinnamomum chingchuanium* S. S. Ying, the holotype NTUF-111-045

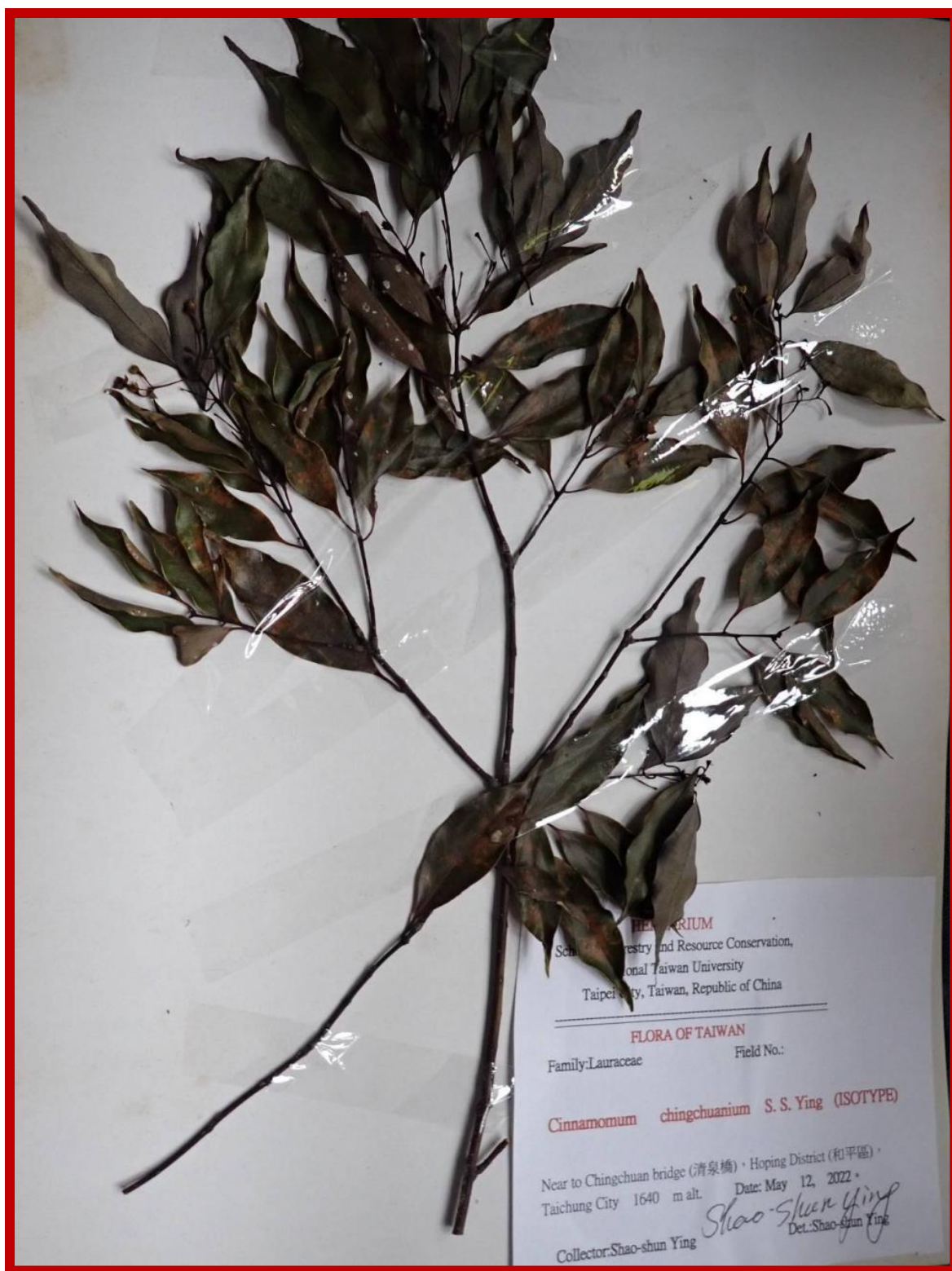


Fig. 347. *Cinnamomum chingchuanium* S. S. Ying, the isotype NTUF-111-046

Hohuan River (合歡溪), about 1500-1650 m elevation, Hoping District (和平區), Taichung City, central Taiwan. and flowering time from May to June, and fruiting time from July to September.



Fig. 348. *Cinnamomum chingchuanium* S. S. Ying, habit



-256- Fig. 349. *Cinnamomum chingchuanium* S. S. Ying, inflorescence

30. Four New Species of Genus *Elatostema* (Urticaceae) in Taiwan

A.*Elatostema lalashanense* S.S. Ying 拉拉山樓梯草

Elatostema lalashanense S.S. Ying, *sp. nov.* 拉拉山樓梯草

TYPE:TAIWAN. Taoyuan city, Fuhsin District (復興區), Lalashan (拉拉山), 1953 m alt.
S. S. Ying, *s.n.* May 29, 2022. (holotype, NTUF).



Fig. 350. *Elatostema lalashanense* S. S. Ying, the habitat

Morphology : Annual to binnial herbs, about 15-25 cm high, stem somewhat creeping, branched, pale green, fleshy, smooth, glabrous; branches short to elongate, 7-9 cm long, erect to ascending, glabrous, fleshy, angular. Leaves simple, alternate, distichous, sessile, nanophyll absent; lamina lanceolate to oblong-lanceolate, 0.5-3.5 cm long, 0.4-1.8 cm wide, herbaceous, acuminate at apex, oblique and asymmetrical at base, green surface and pale green beneath, dentate at margins, midrib impressed surface and elevated beneath; lateral veins 2-4 per side, appressed haired surface and scattered sparsely puberulent along midrib and lateral veins beneath; stipules ovate, 2.5-4.5 mm long, 2-3 mm wide, obtuse at apex, cauduous.



Fig. 351. *Elatostema lalashanense* S. S. Ying, the leaves



Fig. 352. *Elatostema lalashanense* S. S. Ying, branches with inflorescences



Fig. 353. *Elatostema lalashanense* S. S. Ying, close-up of inflorescence

Flowers dioecious, small, many; the male flowers in an axillary discoid inflorescence; the peduncles slender, 1.5-4.5 cm long, green, glabrous, pale green; inflorescence discoid, 8-11 mm in diameter; bracts 1-2 series, ovate to ovate-lanceolate, 2.5-3.5 mm long, about 1.5-2 mm wide, acute at apex, white to pale greenish; each inflorescence with 18-30 flowers; pedicels 0-4.5 mm long, pale green to white, glabrous; the marginal flowers with elongate pedicels and central flowers nearly sessile; sepals 4-5, ovate, 1.9-2.8 mm long, 0.8-1.5 mm wide, acute and slightly caudate at apex, white; stamens 4-5, filaments spread, 1.2-1.7 mm long, glabrous; anthers 0.3 mm long. Pistillate inflorescence unknown.

Diagnosis.

Elatostema lalashanense grows in the medium altitude of northern Taiwan, The characteristics of the species states as follows:

1. The secondary species which the inflorescence with a elongate peduncle among Taiwan *Elatostema* species.

2. the species grows under the *Chamaecyparis formosensis* forests with rich leaf litter and humus at elevations of 1900 to 2100 meters of Lalashan, somewhat common in the forest.



Fig. 354. *Elatostema lalashanense* S. S. Ying, habitat

3. Annual to binnial herbs, about 15-25 cm high, stem somewhat creeping, branched; branches short to elongate, 7-9 cm long, erect to ascending, glabrous, fleshy.

4. Leaves simple, alternate, distichous, sessile, nanophyll absent; lamina lanceolate to oblong-lanceolate, 0.5-3.5 cm long, 0.4-1.8 cm wide, acuminate at apex, oblique and asymmetrical at base.

5. Flowers dioecious, small, many; the male flowers in an axillary discoid inflorescence; the peduncles slender, 1.5-4.5 cm long, green, glabrous, pale green; inflorescence discoid, 8-11 mm in diameter.

6. Each inflorescence with 18-30 flowers; pedicels 0-4.5 mm long, pale green to white, glabrous; the marginal flowers with elongate pedicels and central flowers nearly sessile.

;

Distribution and phenology.

The species is endemic in Taiwan. It is known from Lalashan (拉拉山), Fushin District (復興區), Taoyuan city, northern Taiwan. It was discovered under the species *Chamaecyparis formosensis* forest at elevations of 1900-2100 meters. Its flowering time is May to June.



Fig. 355. *Elatostema lalashanense* S. S. Ying, the holotype NTUF-111-047



Fig. 356. *Elatostema lalashanense* S. S. Ying, habit, mind branches angular



Fig. 357. *Elatostema lalashanense* S. S. Ying, close-up of inflorescence

B.*Elatostema taiwanense* S.S. Ying 台灣樓梯草

Elatostema taiwanense S.S. Ying, *sp. nov.* 台灣樓梯草

TYPE:TAIWAN. Taoyuan city , Fuhsin Dsitric (復興區) , Lalashan (拉拉山), 1953 m alt.
S. S. Ying , *s.n.* May 29, 2022 ° (holotype, NTUF) °



Fig. 358. *Elatostema taiwanense* S. S. Ying, close-up of flowers

Morphology : Annual herbs, about 10-18 cm high, stem somewhat creeping, branched, pale green, fleshy, smooth, glabrous; branches short to elongate, 4-6 cm long, erect to ascending, hairy, fleshy, terete. Leaves simple, alternate, distichous, sessile; nanophyll single, opposite to leaf, ovate, 3-4 mm long, 2.5-3 mm wide, acute at apex, serrate at margins, persistent when flowering; lamina oblong to oblong-ovate, 1.2-4.1 cm long, 0.3-1.5 cm wide, herbaceous, acuminate at apex, oblique and asymmetrical at base, green surface and pale green beneath, serrate usually with an awn at apex at margins, obliquely 3-nerved impressed surface and elevated beneath; appressed haired surface and scattered sparsely



Fig. 359. *Elatostema taiwanense* S. S. Ying, close-up of leaves



Fig. 360. *Elatostema taiwanense* S. S. Ying, mind nanophyll opposited to leaf



Fig. 361. *Elatostema taiwanense* S. S. Ying, normal leavaes and nanophylls



Fig. 362. *Elatostema taiwanense* S. S. Ying, close-up of nanophylls

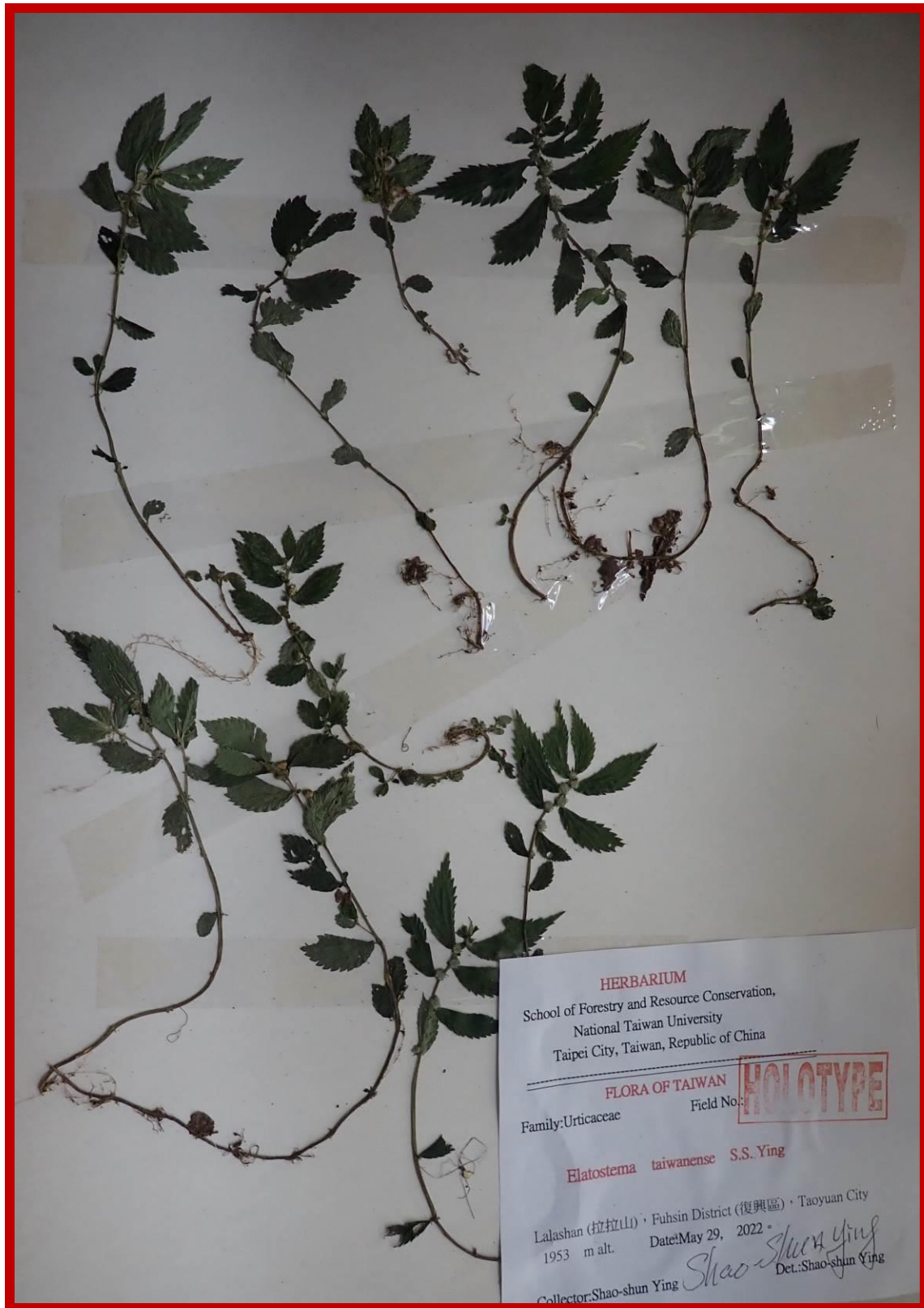


Fig. 363. *Elatostema taiwanense* S. S. Ying, the holotype NTUF-111-048

puberulent along veins beneath; stipules minute, ovate, 0.6-1.5 mm long, 0.3-0.6 mm wide, obtuse at apex, cauduous.



Fig. 364. *Elatostema taiwanense* S. S. Ying, close-up of flowers

Flowers dioecious, small, many; the male flowers in an axillary discoid inflorescence; the peduncles sessile to very short, if have being 0.5-2.5 mm long, pale green, hairy; inflorescence discoid, 3.5-4.5 mm in diameter; bracts 1-2 series, lineate to lanceolate, 1.8-2.5 mm long, about 1.1-1.6 mm wide, acuminate at apex, pale greenish; each inflorescence with 8-14 flowers; pedicels 0; sepals 4, ovate-triangular, 1.5-2.5 mm long, 0.8-1.2 mm wide, acute to acuminate at apex, white, transparent; stamens 4, filaments spread, 1.5-1.7 mm long, glabrous, white, transparent; anthers 0.5 mm long, white, transparent, horse-shoe-like, basifixied. Pistillate inflorescence unknown.



Fig. 365. *Elatostema taiwanense* S. S. Ying, close-up of inflorescence discoid

Diagnosis.

Elatostema taiwanense grows in the medium altitude of northern and central Taiwan. The characteristics of the species states as follows:

1. Leaf with nanophyll, the nanophyll single, opposite to leaf, ovate, 3-4 mm long, 2.5-3 mm wide, acute at apex, serrate at margins, persistent when flowering.
2. Leaf lamina oblong to oblong-ovate, obliquely 3-nerved impressed surface and elevated beneath.
3. Male flowers in an axillary discoid inflorescence; the peduncles sessile to very short.
4. Inflorescence discoid, 3.5-4.5 mm in diameter; bracts 1-2 series, linear to lanceolate; each inflorescence with 8-14 flowers.
5. Sepals 4, ovate-triangular, acute to acuminate at apex, white, transparent; stamens 4, filaments spread, white, transparent; anthers 0.5 mm long, white, transparent, horse-shoe-like, basifixed.

Distribution and phenology.

The species is endemic in Taiwan, It is known from Lalashan (拉拉山) , Fuhsin District (復興區) , Taoyuan city , northern Taiwan. it is also saw at Cuifeng Nantou county . It was discovered the species under *Chamaecyparis formosensis* or others forest at elevations of 1700-2500 meters. Its flowering time is May to June.



Fig.366. *Elatostema taiwanense* S. S, Ying, habitat



Fig. 367. *Elatostema taiwanense* S. S, Ying, flowering branch

C.*Elatostema pauciflorum* S.S. Ying 少花樓梯草

Elatostema pauciflorum S.S. Ying, *sp. nov.* 少花樓梯草

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Lalashan (拉拉山), 1983 m alt.

S. S. Ying , *s.n.* 花 August 18, 2022 ° (holotype, NTUF) °



Fig. 368. *Elatostema pauciflorum* S. S. Ying, flowering branch

Morphology : Annual herbs, about 8-12 cm high, stem somewhat creeping, branched, dark brown, fleshy, smooth, angular, glabrous, slightly winged; branches short to elongate, 3-5 cm long, erect to ascending, glabrous, fleshy, terete, angular. Leaves simple, alternate, distichous, sessile; nanophyll absent; lamina oblique oblong to oblong-ovate, 1.2-2.1 cm long, 8-2 mm wide, herbaceous, acuminate at apex, oblique and asymmetrical at base, lustrous green surface and pale green beneath, serrate and ciliate at margins, obliquely 3-nerved impressed surface and elevated beneath; lateral veins impressed surface and elevated beneath; appressed haired surface and scattered sparsely puberulent along veins



Fig. 369. *Elatostema pauciflorum* S. S, Ying, leaves, mind ciliate at margins

beneath; stipules minute, ovate, 0.5-1.2 mm long, 0.3-0.4 mm wide, obtuse at apex, cauduous.



Fig. 370. *Elatostema pauciflorum* S. S, Ying, inflorescences

Flowers white, dioecious, small, few, usually 5-8 in a discoid inflorescence, 3-4 mm in diameter when opened; the male flowers in an axillary discoid inflorescence; the peduncles elongate, 2.1-2.8 cm long, erect, pale brown, glabrous to slightly hairy; inflorescence discoid, 3.0-3.5 mm in diameter; bracts 1-2 series, ovate to ovate-lanceolate, 1.5-2.1 mm long, about 1.0-1.3 mm wide, acuminate and slightly caudate at apex, green to pale greenish; each inflorescence with 5-8 flowers; pedicels 0.4-0.6 mm long, pale green, hairy; bracteoles linear, 0.3-0.35 mm long, about 0.1 mm wide; sepals 4, ovate-triangular, 2.5-3.5 mm long, 0.7-1.1 mm wide, acute at apex, white, slightly transparent; stamens 4, filaments spread, 1.2-1.5 mm long, glabrous, white, transparent; anthers 0.5 mm long, white, basifixed. Pistillate inflorescence unknown.



Fig. 371. *Elatostema pauciflorum* S. S. Ying, habit

Diagnosis.

Elatostema pauciflorum grows in the medium altitude of northern Taiwan, The characteristics of the species states as follows:

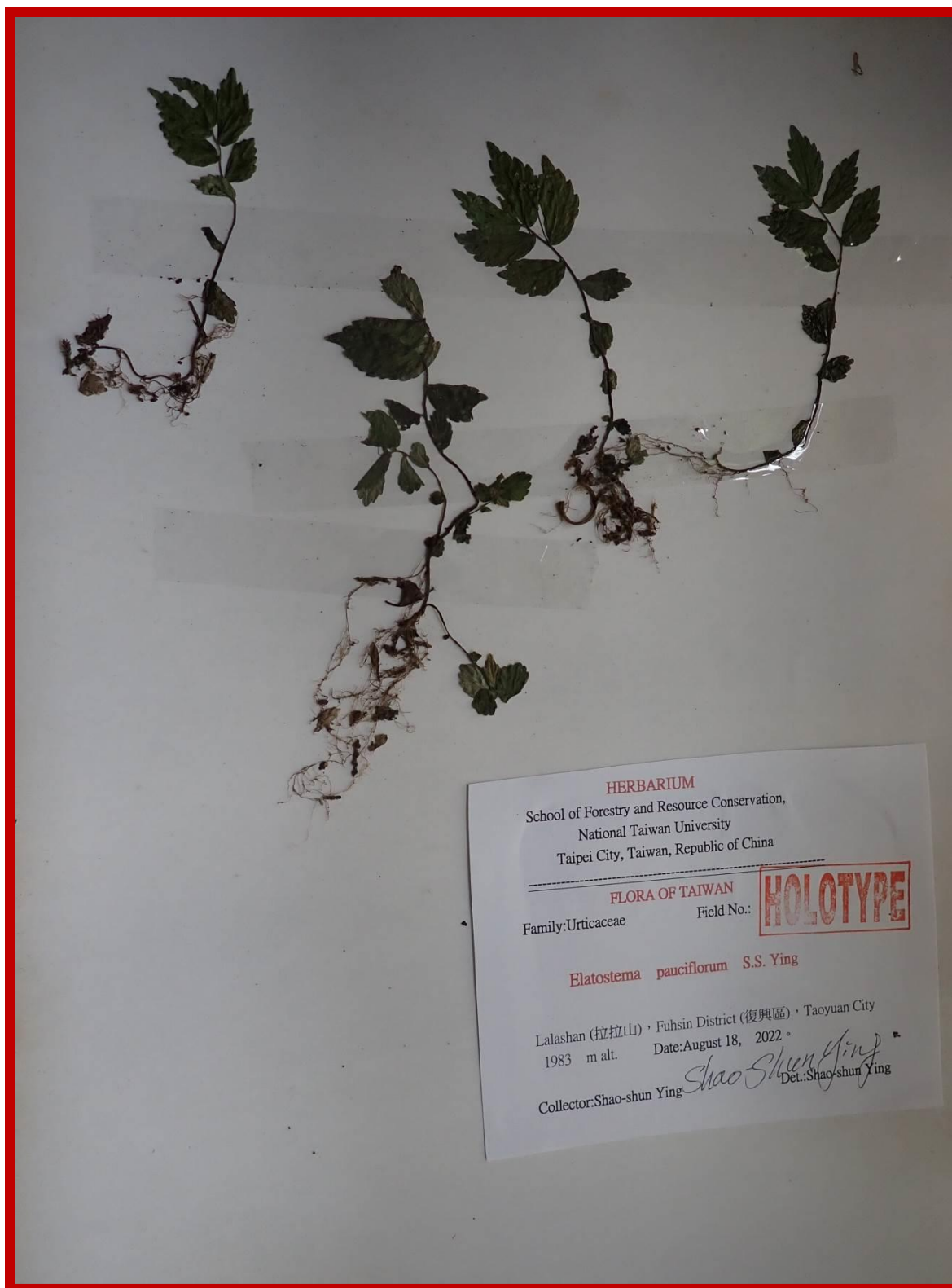


Fig. 372. *Elatostema pauciflorum* S. S. Ying, the holotype NTUF-111-049

1. Leaf without nanophyll,
2. Leaf lamina oblique oblong to oblong-ovate, 1.2-2.1 cm long, 8-2 mm wide, herbaceous, acuminate at apex, oblique and asymmetrical at base.
3. Male flowers in an axillary discoid inflorescence; peduncles elongate, 2.1-2.8 cm long, erect, pale brown, glabrous to slightly hairy;
4. Inflorescence discoid, 3.0-3.5 mm in diameter; bracts 1-2 series, ovate to ovate-lanceolate; each inflorescence with 5-8 flowers; pedicels 0.4-0.6 mm long, pale green.
5. Sepals 4, ovate-triangular, 2.5-3.5 mm long, 0.7-1.1 mm wide, acute at apex, white, slightly transparent.



Fig. 373. *Elatostema pauciflorum* S. S. Ying, habit

Distribution and phenology.

The species is endemic in Taiwan, It is known from Lalashan (拉拉山), Fuhsin District (復興區), Taoyuan city, northern Taiwan. It was discovered the species under

Chamaecyparis formosensis forestst at elevations of 1800-2050 meters. Its flowering time is August to September..



Fig. 374. *Elatostema pauciflorum* S. S, Ying, habitat



Fig. 375. *Elatostema pauciflorum* S. S, Ying, branch, leaves and inflorescences

D.*Elatostema siyuanwukouense* S.S. Ying 思源埡口樓梯草

Elatostema siyuanwukouense S.S. Ying, *sp. nov.* 思源埡口樓梯草

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉) , Siyuanwukou (思源埡口) 1840 m alt. *S. S. Ying* , *s.n.* *September 22, 2022* ° (holotype , NTUF) °



Fig. 376. *Elatostema siyuanwukouense* S. S. Ying, branch, habit

Morphology : Annual creeping herbs, about 10-22 cm long, stem creeping, branched at base, green slightly pale purplish at base, fleshy, smooth, terete, glabrous, without winged; branches short to elongate, 8-15 cm long, creeping, glabrous, fleshy, terete. Leaves simple, alternate, remotely distichous; nanophyll absent; lamina oblique oblong to oblong-ovate, -276-

uppermost largest and smaller gradually to base, 2.2-5.5 cm long, 0.8-2 cm wide, herbaceous, acuminate to acute at apex, oblique and asymmetrical at base, lustrous green surface and pale green beneath, remotely dentate and 1-2 bristles at apex at margins, obliquely 3-nerved impressed surface and elevated beneath; lateral veins impressed surface and elevated beneath but inconspicuous; bristled surface and scattered sparsely puberulent to glabrous beneath; stipules minute, ovate, 0.8-1.7 mm long, 0.4-0.6 mm wide, obtuse at apex, cauduous. Petioles very short, 2-4 mm long, green, fleshy, glabrous or nearly so.



Fig. 377. *Elatostema siyuanwukouense* S. S. Ying, uppermost leaves

Flowers green, dioecious, small, numerous in a discoid inflorescence, 1.5-2.5 mm in diameter when opened; the female flowers in an axillary discoid inflorescence; the peduncles, 0-1.5 mm long, erect, green, glabrous to slightly hairy; inflorescence discoid, 5.5-7.5 mm in diameter; bracts several in 1 series, linear to linear-lanceolate, 2.5-3.6 mm long, about 1.0-1.5 mm wide, acuminate to acute at apex, green to pale greenish; each inflorescence with numerous flowers; pedicels 0.3-0.5 mm long, pale green, glabrous; bracteoles linear, 0.2-0.3



Fig. 378. *Elatostema siyuanwukouense* S. S. Ying, inflorescences



Fig. 379. *Elatostema siyuanwukouense* S. S. Ying, female flowers in inflorescence

mm long, about 0.1 mm wide; sepals 4, ovate-triangular, 1.5-2.2 mm long, 0.6-1.0 mm wide, acute at apex, green to pale green; ovary ovoid to ellipsoid, 0.2-0.3 mm long, glabrous, stigma 1-2 haired, 0.2-0.3 mm long, cauduous. Staminate inflorescence unknown.



Fig. 380. *Elatostema siyuanwukouense* S. S. Ying, inflorescence

Diagnosis.

Elatostema siyuanwukouense grows in the medium altitude of northern Taiwan, The characteristics of the species states as follows:

1. Leaf without nanophyll,
2. Leaf lamina oblique oblong to oblong-ovate, uppermost largest and smaller gradually to base, 2.2-5.5 cm long, 0.8-2 cm wide, herbaceous, acuminate to acute at apex, oblique and asymmetrical at base.
3. Female flowers in an axillary discoid inflorescence; peduncles 0-1.5 mm long; inflorescence discoid, 5.5-7.5 mm in diameter; bracts several in 1 series, linear to linear-



Fig. 381. *Elatostema siyuanwukouense* S. S. Ying, the holotype NTUF-111-050

lanceolate.

4. Sepals 4, ovate-triangular, 1.5-2.2 mm long, 0.6-1.0 mm wide, acute at apex, green to pale green; ovary ovoid to ellipsoid, 0.2-0.3 mm long, glabrous, stigma 1-2 haired, 0.2-0.3 mm long, cauduous.



Fig. 382. *Elatostema siyuanwukouense* S. S. Ying, habitat

Distribution and phenology.

The species is endemic in Taiwan, It is known from Siyuanwukou (思源埡口) , Tatung Township (大同鄉) , I-Lan County, northern Taiwan. It was discovered the species on the edges of forests at elevations of 1800-1900 meters. Its flowering time is September to October.

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

Alpinia lalashanense S.S. Ying 拉拉山月桃

Alpinia lalashanense S.S. Ying, *sp. nov.* 拉拉山月桃

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Lalashan (拉拉山), 1953 m alt.

S. S. Ying , *s.n.* May 29, 2022 ° (holotype, NTUF) °



Fig. 383. *Alpinia lalashanense* S. S. Ying, habit

Morphology : Perennial herbs, Pseudostems 85-135 cm high, 6-8 mm in diameter, ascending to erect, glabrous, greenish; Leaves 6-10 in a pseudostem, distichous, oblong, 52-67cm long, 6-7.5 cm wide, acuminate and short-caudate at apex, attenuate at base, entire and slightly wavy at margins, coriaceous, lustrous green surface somewhat pale green beneath, glabrous on both surfaces, midrib impressed surface and prominent elevated beneath. Petioles 18-25 cm long, pale green tinged with brownish, glabrous; ligule , 6-8 mm long, entire to 2-lobed, membranous.



Fig. 384. *Alpinia lalashanense* S. S. Ying, pseudostem and leaves



Fig. 385. *Alpinia lalashanense* S. S. Ying, part of inflorescence

Flowers numerous, white sometimes tinged with pink, 2.8-3.7 cm in diameter when opened, closely approximated, nearly verticillate and 5-8 flowers for a whorl, in a terminal elongate spike, 2-4 flowers opened a time; inflorescence upright erect, 58-68 cm long, brownish pubescent; spatulate involucral bract ovate-oblong, 8-15 cm long, 3-5 cm wide, obtuse at apex, truncate at base, glabrous on both surface, brownish; bracts ovate, 8-12 mm long, 4-6 mm wide, obtuse at apex, membranous; calyx tubular, split on 1 side, 10-13 mm long, 4.5-5.5 mm wide, slightly 2-lobed at apex; corolla-tube shorter than calyx, dorsal lobe broadly ovate, 10-14 mm long, 8-9 mm wide, obtuse at apex, white and turning to pale yellow, membranous; lateral lobes oblong-lanceolate, 12-15 mm long, 4.5-5.5 mm wide, obtuse at apex; labellum oblong-ovate, 1.8-2.8 cm long, 1-1.5 cm wide, slightly convolute, white with a red middle, red stripes extended to margins and apex, denate to wavy at margins; stamen 2.5-3 cm long, anther 10-12 mm long, white cream; staminode inconspicuous, obtuse; stigma expanded head-like; style slender, 3-3.5 cm long, upright and extended over anther, white; ovary ovoid to globose, white, 5-6 mm long, 4-5 mm wide, glabrous; epigynous glands 2, at style base, 2.3-3 mm long.



Fig. 386. *Alpinia lalashanense* S. S. Ying, inflorescences



Fig. 387. *Alpinia lalashanense* S. S. Ying, the holotype NTUF-111-051



Fig. 388. *Alpinia lalashanense* S. S. Ying, close-up of flower

Fruits berry-like, not opened, globose, 8-12 mm diameter, red when mature, scattered with short pubescent, 5-7 ridges. Seeds 8-12 in each fruit, reniform, 2.5-3 mm long, brownish, enclosed by white arils.

Diagnosis.

Alpinia lalashanense is characterized by:

1. one of high altitudes species of genus *Alpinia* in Taiwan.
2. Flowers numerous, white sometimes tinged with pink, 2.8-3.7 cm in diameter when opened, closely approximated, nearly verticillate and 5-8 flowers for a whorl, in a terminal elongate spike, 2-4 flowers opened a time
3. inflorescence upright erect, 58-68 cm long, brownish pubescent.
4. Labellum oblong-ovate, 1.8-2.8 cm long, 1-1.5 cm wide, slightly convolute, white with a red middle, red stripes extended to margins and apex, denate to wavy at margins;

Distribution and phenology.

The species is endemic in Taiwan, It is known from Lalashan (拉拉山), Fuhsin



Fig. 389. *Alpinia lalashanense* S. S. Ying, immature fruits



Fig. 390. *Alpinia lalashanense* S. S. Ying, immature fruits

District (復興區), Taoyuan city, northern Taiwan. ° It was discovered the species under broad-leaved forest at elevations of 1500-1950 meters. Its flowering time is April to May.

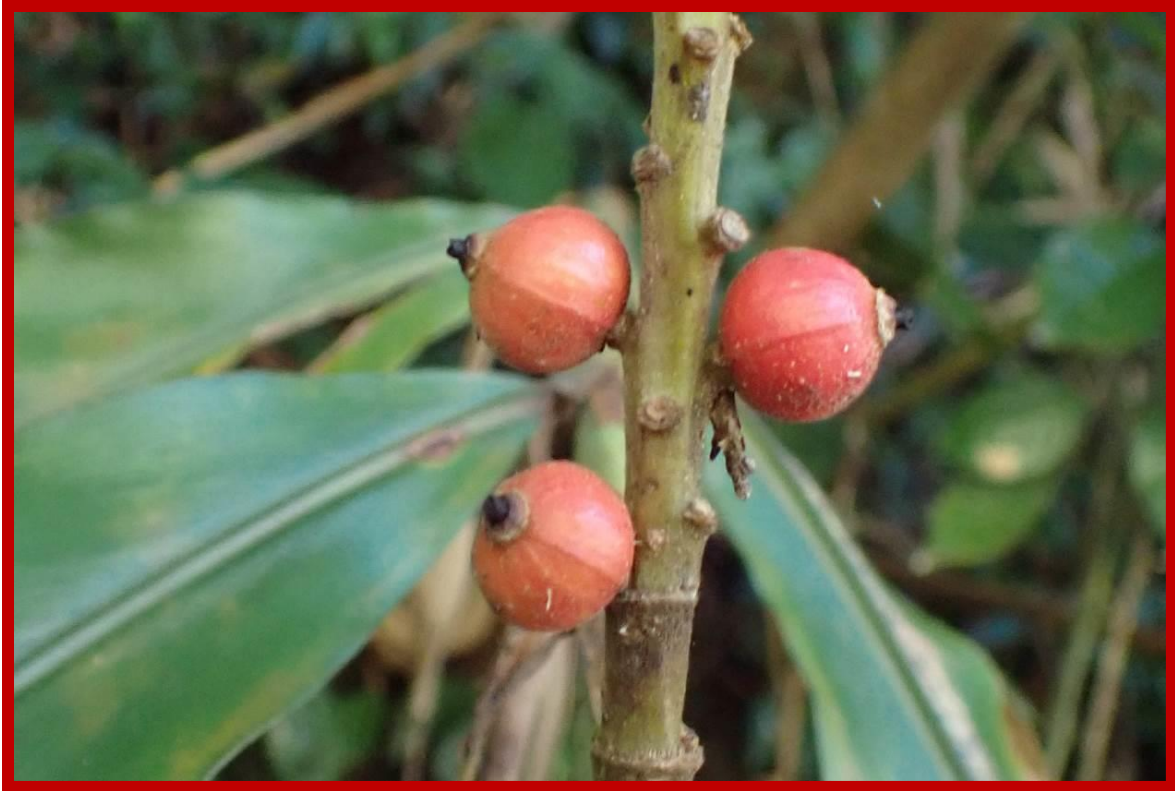


Fig. 391. *Alpinia lalashanense* S. S. Ying, mature fruits



Fig. 392. *Alpinia lalashanense* S. S. Ying, seeds with and without arils

32. Two New Species of Genus *Lonicera* (Caprifoliaceae) from Taiwan

A. Lonicera taiwanensis S.S. Ying

Lonicera taiwanensis S.S. Ying, *sp. nov.* 台灣金銀花, 台灣忍冬

TYPE: TAIWAN. Taoyuan city, Fuhsin District (復興區), Lalashan (拉拉山), 1953 m alt.

S. S. Ying, *s.n.* June 17, 2022. (holotype, NTUF).



Fig. 393. *Lonicera taiwanensis* S. S. Ying, habit

Morphology : Climbers, stem elongate, 3-5 m long, somewhat lignified, usually entwine other plants or trees, much branched, pubescent when young and nearly glabrous when adult. branches elongate, 50-90 cm long, not hollow, densely scattered with long pale brownish hairs, green to brownish when adult. Leaves simple, opposite, oblong to ovate-oblong, 3-4 cm long, 1.5-2 cm wide, acuminate at apex, slightly cordate at base, chartaceous to thin coraceous, entire and ciliate at margins, lustrous green surface and pale



Fig. 394. *Lonicera taiwanensis* S. S. Ying, branch and leaves

green beneath; glabrous surface and pubescent along midrib; midrib impressed surface and elevated beneath, lateral veins 4-6 per side, inconspicuous. Petioles 4-5 mm long, terete, scattered with pubescent.



Fig. 395. *Lonicera taiwanensis* S. S. Ying, flowers

Flowers few, white turned to pale yellow when withering, paired, 1-1.5 cm in diameter when opened, axillary, only 1 to 3 terminal leaf-axil with 1-2 paired flowered; peduncles very short, 2.5-3 mm long, pubescent; bracts ovate, 2-3 mm long, about 1.5 mm wide, obtuse at apex, brownish; 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, 3-4 mm long, 1.5 mm wide, acute at apex, glabrous; corolla bilabiate, white, later pale yellow, 1.5-2.2 cm long, short white hairs outside and glabrous inside; tube 1-1.3 cm long, 2-3 mm in diameter, base not gibbous; upper lip 9-12 mm long, 4-5.5 mm wide, 4-lobed at apex; the lobes 0.5-1.5 mm long, obtuse at apex; lower lip oblong, about 1-1.2 cm long, 3-4 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; perfect



Fig. 396. *Lonicera taiwanensis* S. S. Ying, close-up of flowers

anthers oblong, 2.5-3.5 mm long, yellow, dorsifixed; sterile anthers ovoid, 0.2 mm across, basifixed; ovary 5-celled; style as long as the stamens, white to pale yellow; stigma capitate, green.

Diagnosis.

Lonicera taiwanensis is characterized by:

1. Leaves simple, opposite, oblong to ovate-oblong, 3-4 cm long, 1.5-2 cm wide, acuminate at apex, slightly cordate at base,
2. Flowers few, white turned to pale yellow when withering, paired, 1-1.5 cm in diameter when opened, axillary, only 1 to 3 terminal leaf-axil with 1-2 paired flowered.
3. Corolla bilabiate, white, later pale yellow, 1.5-2.2 cm long, short white hairs outside and glabrous inside; tube 1-1.3 cm long, 2-3 mm in diameter; upper lip 3-4-lobed to 0.5-1.5 mm long, obtuse at apex; lower lip oblong, about 1-1.2 cm long, 3-4 mm wide,



Fig. 397. *Lonicera taiwanensis* S. S. Ying, the holotype NTUF-111-052



Fig. 398. *Lonicera taiwanensis* S. S, Ying, close-up of a flowers



Fig. 399. *Lonicera taiwanensis* S. S, Ying, habitat

Distribution and phenology.

The species is endemic in Taiwan, It is known from Lalashan (拉拉山) , Fuhsin District (復興區) , Taoyuan city , northern Taiwan. ° It was discovered the species under broad-leaved forest at elevations of 1600-1950 meters. Its flowering time is June to July, and fruiting time July to August.



Fig. 400. *Lonicera taiwanensis* S. S. Ying, habit

B.Lonicera tulinensis S.S. Ying

Lonicera tulinensis S.S. Ying, *sp. nov.* 突陵金銀花, 突陵忍冬

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉) , Tulin (突陵) 1620 m alt. *S. S. Ying* , *s.n.* June 23, 2022 ° (holotype , NTUF) °



Fig. 401. *Lonicera tulinensis* S. S. Ying, branches with flowers

Morphology : Climbers, stem elongate, 3-4.5 m long, somewhat lignified, usually entwine other plants or trees, much branched, densely pubescent, purplish red; branches elongate, 40-110 cm long, not hollow, densely scattered with long purplish red pubescent, green to pale brownish when adult. Leaves simple, opposite, ovate to ovate-oblong, 2.5-3.5 cm long, 1.8-2.5 cm wide, acuminate to acute at apex, cordate at base, chartaceous to thin coraceous, entire and ciliate at margins, lustrous dark green surface and pale green beneath; scattered hirsute to glabrous surface and glabrous or nearly so beneath; midrib impressed surface and elevated beneath, lateral veins 3-4 per side, inconspicuous. Petioles 3-4 mm long, terete, densely pubescent, slightly groove surface.



Fig. 402. *Lonicera tulinensis* S. S. Ying, branches and leaves



Fig. 403. *Lonicera tulinensis* S. S. Ying, inflorescences

Flowers 6-8, white turned to pale yellow when withering, paired, 1.5-2.2 cm in diameter when opened, axillary, only 1 to 4 terminal leaf-axil with 3-4 paired flowered, usually subtended by 2 leaf-like bracts; peduncles very short, 2.2-3.2 mm long, pubescent; bracts paired, ovate, 1-1.5 cm long, about 8-12 mm wide, acute at apex, green, usually grown up to leaf-like when flower-withered ; neighboring 2 ovaries free, globose, 2-2.2mm across, pubescent; calyx tubular, green, 1-1.5 mm long, 1.5 across, pubescent, 5-lobed at apex, lobes triangular, 2-3 mm long, 1.5 mm wide, acute at apex; corolla bilabiate, white, later pale yellow, 1.5-2.0 cm long, short white hairs outside and glabrous inside; tube 8-10 mm long, 2-3 mm in diameter, base not gibbous; upper lip 9-11 mm long, 5-6 mm wide, 4-lobed at apex; the lobes 0.5-1.5 mm long, obtuse at apex; lower lip oblong, about 6-8 mm long, 2.5-3 mm wide, obtuse at apex, stamens 5, exserted from corolla tube, all perfect; filament slender, 1.5-2.2 cm long, white to pale yellow; anthers oblong, 2.5-3.5 mm long, yellow to brownish, orsifixed; ovary 5-celled; style slightly longer than the stamens, white to pale yellow; stigma capitate, green.





Fig. 405. *Lonicera tulinensis* S. S. Ying, habit

Diagnosis.

Lonicera tulinensis is characterized by:

1. Leaves ovate to ovate-oblong, 2.5-3.5 cm long, 1.8-2.5 cm wide, acuminate to acute at apex, cordate at base.
2. Flowers 6-8, white truned to pale yellow when withering, paired, 1.5-2.2 cm in diameter when opened, axillary, only 1 to 4 terminal leaf-axil with 3-4 paired flowered, usually subtended by 2 leaf-like bracts.
3. corolla bilabiate, white, later pale yellow, 1.5-2.0 cm long, short white hairs outside and glabrous inside; tube 8-10 mm long, 2-3 mm in diameter, base not gibbous; upper lip 9-11 mm long, 5-6 mm wide, 4-lobed at apex; the lobes 0.5-1.5 mm long, obtuse at apex; lower lip oblong, about 6-8 mm long, 2.5-3 mm wide, obtuse at apex

Distribution and phenology.



Fig. 406. *Lonicera tulinensis* S. S. Ying, the holotype NTUF-111-053

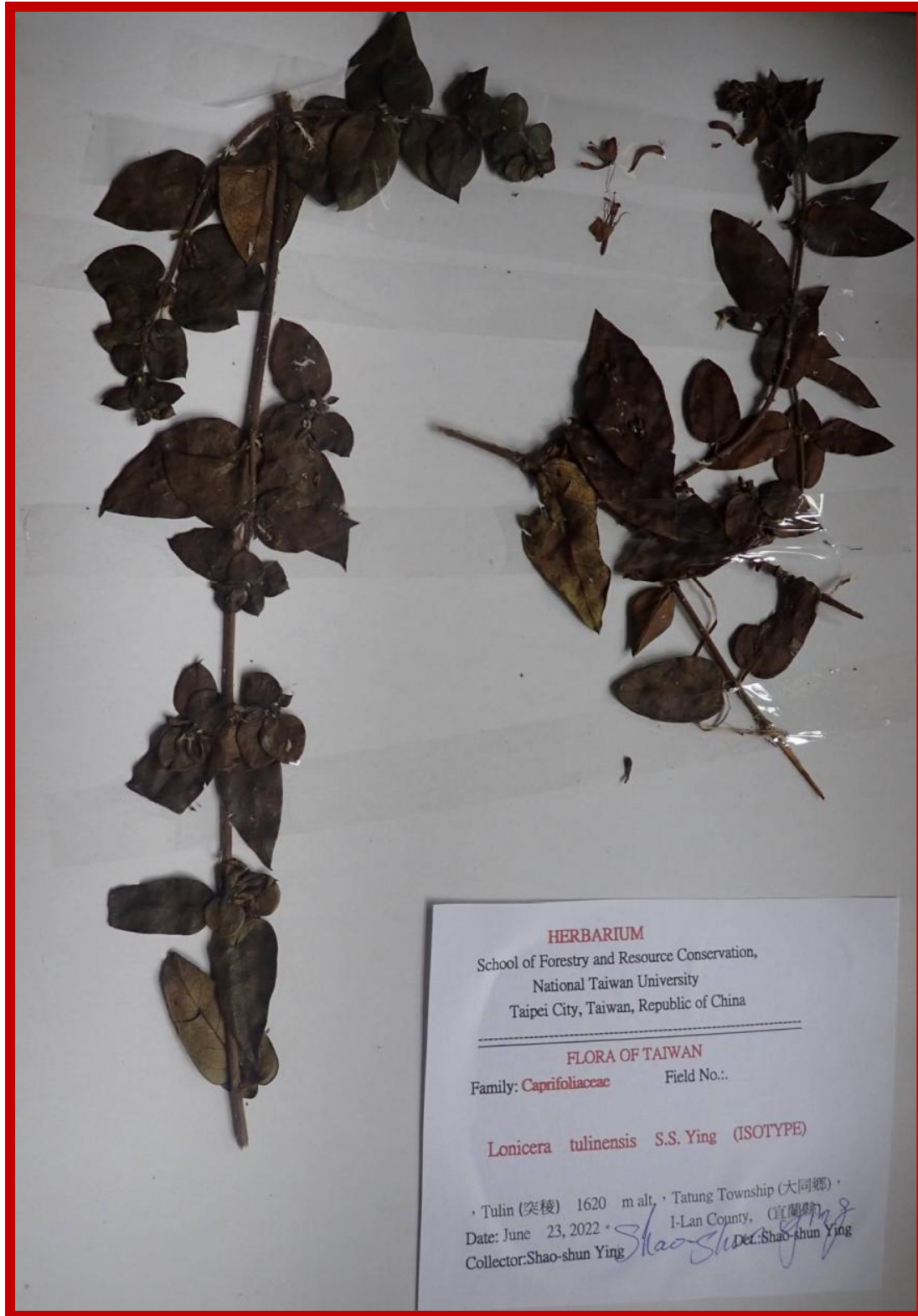


Fig. 407. *Lonicera tulinensis* S. S. Ying, the isotype NTUF-111-054

The species is endemic in Taiwan, It is known from Siyuanyakou (思源埡口) to Tulin (突稜), Tatung Township (大同鄉), I-Lan County, northern Taiwan. It was discovered the species under broad-leaved forest at elevations of 1650-1950 meters. Its flowering time is June to July, and fruiting time July to August.



Fig. 408. *Lonicera tulinensis* S. S. Ying, , flowers, mind the bracts



Fig. 409. *Lonicera tulinensis* S. S. Ying, , flowers, mind the bracts

33. One New Species of Genus *Trachelospermum* (Apocynaceae) from Taiwan

Trachelospermum tulinense S.S. Ying

Traxhelospermum tulinense S.S. Ying, *sp. nov.* 突稜絡石

TYPE: TAIWAN. I-Lan County, Tatung Township (大同鄉), Tulin (突稜) 1720 m alt. *S. S. Ying*, *s.n.* June 23, 2022. (holotype, NTUF).



Fig. 410. *Traxhelospermum tulinense* S. S. Ying, branches with flowers

Morphology : Climbers, with white latex. Stem woody, elongate, 3-6.5 m long, glabrous, brownish, usually entwine other plants or trees, much branched; branches elongate, 50-120 cm long, not hollow, glabrous, green to pale brownish when adult. Leaves simple, opposite, ovate to ovate-lanceolate, 3.2-4.5 cm long, 1.5-2.4 cm wide, acuminate to acute at apex, attenuate to narrowed at base, chartaceous to thin coraceous, entire, lustrous green surface

and pale green beneath; glabrous on both surfaces; midrib impressed surface and elevated beneath, lateral veins inconspicuous. Petioles 3-4 mm long, terete, glabrous, slightly groove surface.



Fig. 411. *Traxhelospermum tulinense* S. S. Ying, ,leaves



Fig. 412. *Traxhelospermum tulinense* S. S. Ying, ,inflorescence

Flowers 4-6, scentless, white turned to pale yellow when withering, 1.0-1.3 cm in diameter when opened, in an axillary cymose, only 1 to 3 terminal leaf-axil with 1 cymose inflorescence; peduncles 1-1.5 m long, green, glabrous; bracts ovate, 1.5-2.5 mm long, about 0.8-1.2 mm wide, acute at apex, brownish; pedicels slender, 6-9 mm long, green, glabrous; calyx cup-like, 1.5-2.5 mm long, 5-dentated at apex; teeth 0.2 mm long, acute at apex; basal glands 10; corolla salveriform, white, tube cylindric, 4-5.5 mm long, dilated at staminal insertion, throat constricted, 5-lobed at apex; lobes oblong, 5-6 mm long, 3-3.5 mm wide, obtuse at apex, minutely erose, not overlapping, reflexed; stamens included, inserted at lower third of corolla tube; anthers sagittate, connivent, adherent to pistil head, anther apex not exerted; disc scales 5, free, shorter than to as long as ovary; ovaries paired, linear or nearly so, 2-3 mm long, glabrous, .



Fig. 413. *Traxhelospermum tulinense* S. S. Ying, ,close-up of flower

Diagnosis.

Traxhelospermum tulinense is characterized by:

1. Leaves ovate to ovate-lanceolate, 3.2-4.5 cm long, 1.5-2.4 cm wide, acuminate to acute at apex.
2. Flowers fewer and smaller than other species of Taiwan, 4-6, white, scentless, 1.0-1.3 cm in diameter when opened, in an axillary cymose, only 1 to 3 terminal leaf-axil



Fig. 414. *Trachelospermum tulinense* S. S. Ying, the holotype NTUF-111-055

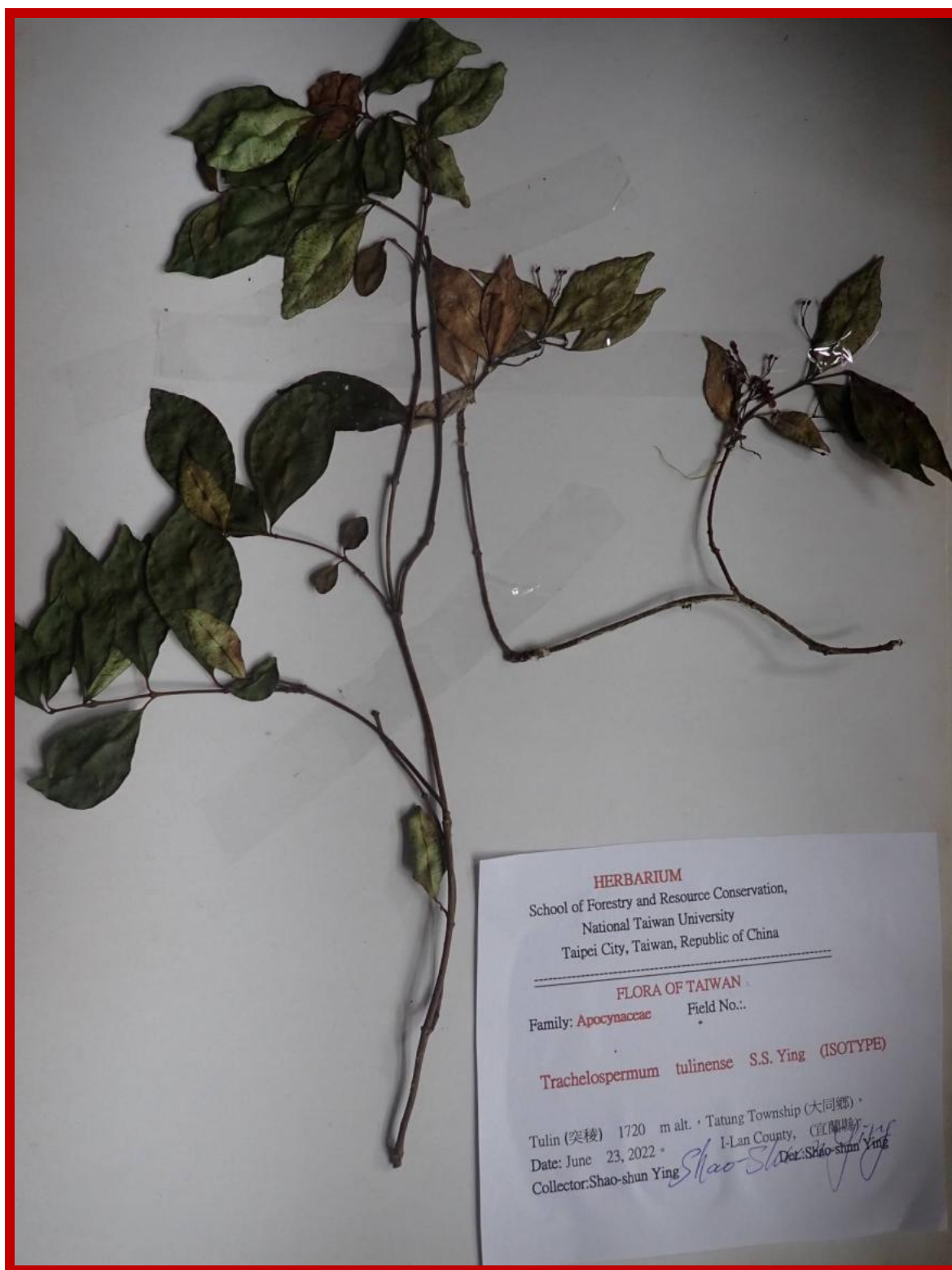


Fig. 415. *Trachelospermum tulinense* S. S. Ying, the isotype NTUF-111-056

with 1 cymose inflorescence

3. Corolla salveriform, white, tube cylindric, 4-5.5 mm long, dilated at staminal insertion, throat constricted, 5-lobed at apex; lobes oblong, 5-6 mm long, 3-3.5 mm wide, obtuse at apex, minutely erose, not overlapping, reflexed.



Fig. 416. *Traxhelospermum tulinense* S. S. Ying, ,habitat

Distribution and phenology.

The species is endemic in Taiwan, It is known from Siyuanyakou (思源埡口) to Tulin (突稜), Tatung Township (大同鄉), I-Lan County, northern Taiwan. ° It was discovered the species under broad-leaved forest at elevations of 1750-1950 meters. Its flowering time is June to July, and fruiting time July to August.

34. A New species of Genus *Epilobium* (Onagraceae) in Taiwan

Epilobium tulinianum S.S. Ying 突稜柳葉菜

Epilobium tulinianum S.S. Ying, *sp. nov.* 突稜柳葉菜

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉) , Tulin (突稜) 1520 m alt. *S. S. Ying* , *s.n. June 23, 2022* ° (holotype , NTUF) °



Fig. 417. *Epilobium tulinianum* S. S. Ying, ,habitat

Morphology : Annual erect small and dwarf herbs, about 8-14 cm high, stem erect, short, smooth, green, branched at base, scattered short pubescent; branches 6-10 cm long, erect or ascending, green, scattered short pubescent.

Leaves simple, opposite, ovate to oblong, 8-10 mm long, 5-6.5 mm wide, obtuse to acuminate, slightly cordate at base, chartaceous, acute-serrate at margins, lustrous green

surface and pale green beneath, glabrous on both surfaces, midrib and lateral veins (2-3 per side) impressed surface and elevated beneath. Petioles 0 to very short, 1-2 mm long if it present, glabrous or nearly so.



Fig. 418. *Epilobium tulinianum* S. S. Ying, ,leaves



Fig. 419. *Epilobium tulinianum* S. S. Ying, ,inflorescence, mind glanular-hairs on ovaries

Flowers white, protandrous, 2.5-3.5 mm in diameter when opened, solitary on the each 1-3 leaf-axil upward of stem, and forming a simple raceme; the inflorescence 1.2-1.9 cm long, 1.7-2.1 cm in infructescence, greenish sometimes tinged with pale purple, glabrous or nearly so; bractsove to lanceolate, 2.5-3 mm long, 1.2-2 mm wide, acuminate at apex; sepals 4, adnate to ovary, red, lanceolate, 2.5-3.5 mm long, 1.5-1.8 mm wide, acute at apex, glandular hairs outside and glabrous inside; petals 4, white, ovate to oblong, 5-5.8 mm long, 2.5-3.2 mm wide, slightly bilobed at apex; the lobes 0.25 mm long, obtuse at apex, veins inconspicuous, glabrous; stamens 8 in two series; filaments 1-2 mm long, white; anthers white, 0.5 mm long; ovary cylindrical, 1.2-2.1 cm long, 2-3 mm across, scattered with glandular-hairs, more or less 4-angular; style erect, shorter than petals.



Fig. 420. *Epilobium tulinianum* S. S. Ying, flowers

Fruits capsule, cylindrical, 3.2-4.5 cm long, 2-3 mm across, erect to ascending, green tinged with purplish, pubescent, 4-celled, loculidical when mature. Seeds numerous, small, ellipsoid, 1.4-1.8 mm long, with terminal white coma; coma 2-3 mm long, detaching readily.

Diagnosis.

The species is characterized by:

1. Annual erect small and dwarf herbs, about 8-14 cm high

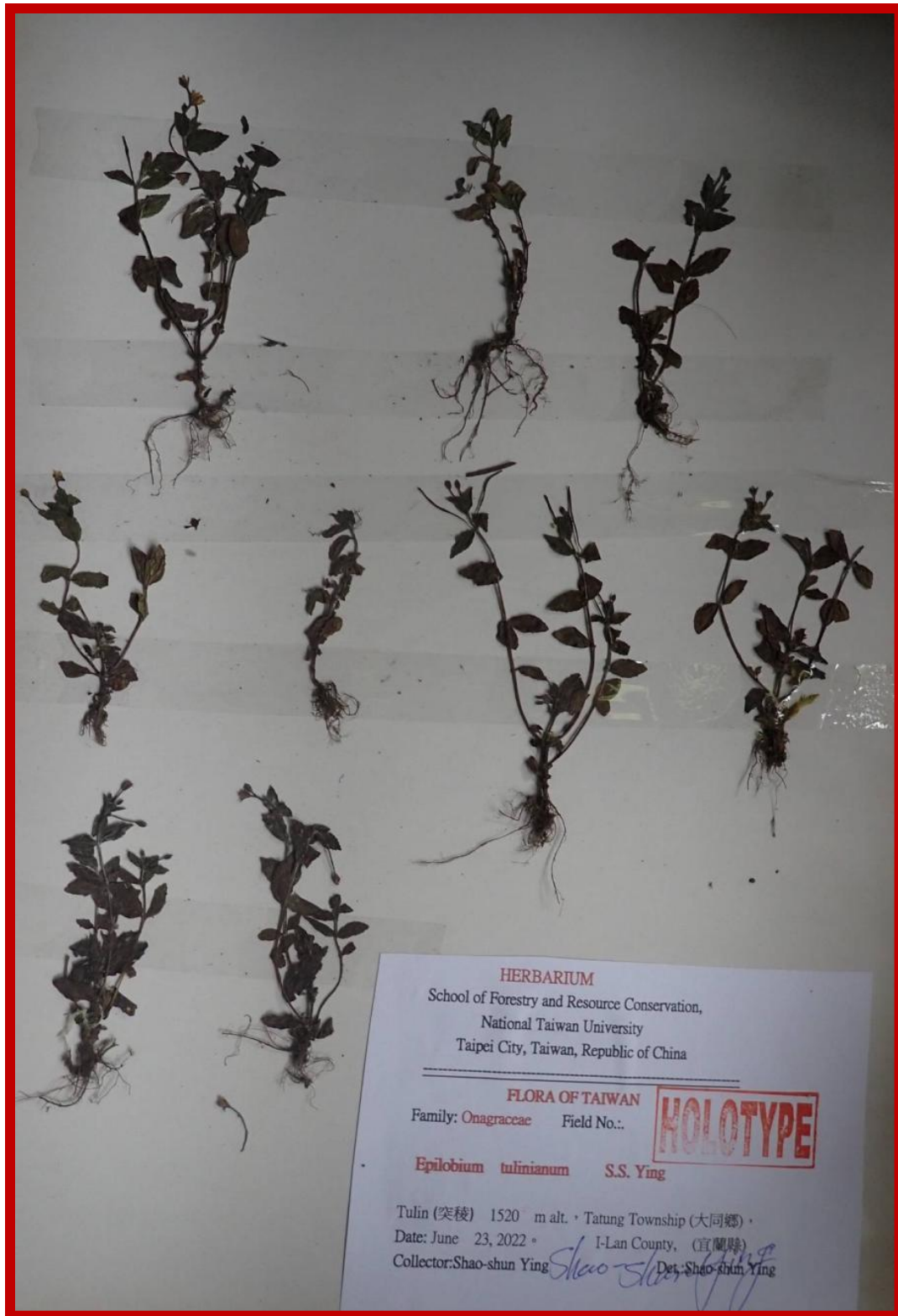


Fig. 421. *Epilobium tulinianum* S. S. Ying, , the holotype, NTUF-111-057



Fig. 422. *Epilobium tulinianum* S. S. Ying, capsules



-313- Fig. 423. *Epilobium tulinianum* S. S. Ying, capsules



Fig. 424. *Epilobium tulinianum* S. S. Ying, ,immature fruits

2. Leaves simple, opposite, ovate to oblong.,
3. Flowers white, protandrous, 2.5-3.5 mm in diameter when opened, solitary on the each 1-3 leaf-axil upward of stem, and forming asimple raceme
4. sepals 4, adnate to ovary, red, lanceolate, 2.5-3.5 mm long, 1.5-1.8 mm wide, acute at apex, glandular hairs outside and glabrous inside.
5. petals 4, white, ovate to oblong, 5-5.8 mm long, 2.5-3.2 mm wide, slightly bilobed at apex; the lobes 0.25 mm long, obtuse at apex.
6. Fruits capsule, cylindrical, 3.2-4.5 cm long, 2-3 mm across, erect to ascending, green tinged with brownish, glabrous.

Distribution and phenology.

Epilobium tulinianum S.S. Ying is endemic to Taiwan. It is known from Siyuanyakou (思源埡口) to Tulin (突稜), Tatung Township (大同鄉), I-Lan County, northern Taiwan. It was discovered the species on sunny roadsides at elevations of 1550-1650 meters. Its flowering time is June to July, and fruiting time July to August.

35. A New species of Genus *Euonymus* (Celastraceae) in Taiwan

Euonymus wulinensis S.S. Ying 武陵衛茅

Euonymus wulinensis S.S. Ying, *sp. nov.* 武陵衛茅

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Wulin Farm (武陵農場) 1780 m alt. *S. S. Ying* , *s.n. July 07 2022* ° (holotype , NTUF) °



Fig. 425. *Euonymus wulinensis* S. S. Ying, close-up of a flower, mind the petals

Morphology : An evergreen medium-sized tree up to 7 m or more high, 10-15 cm in DBH, trunk straight, 2.5-3.5 m long, smooth, grayish black, much branched; branches sturdy, 1.5-3.5 m long, erect to ascending, smooth, grayish black, glabrous; branchlets numerous,



Fig. 426. *Euonymus wulinensis* S. S. Ying, in full blooming tree



Fig. 427. *Euonymus wulinensis* S. S. Ying, branchlets, leaves and flowers

erect to ascending, grayish brown to greenish, smooth, glabrous. Leaves simple, opposit, lanceolate, ovate-lanceolate to ovate-oblong, 4-6.5 cm long, 2-2.5 cm wide, acute to obtuse at apex, attenuate at base, thin-coriaceous, dark lustrous green surface, pale green beneath, crenulate at margins, glabrous on both surfaces, midrib elevated on both surfaces, lateral veins inconspicuous. Petioles 8-10 mm long, green, glabrous. o



Fig. 428. *Euonymus wulinensis* S. S. Ying, inflorescences

Flowers numerous, 4-merous, widely opened, pale yellow, 1.2-1.5 cm in diameter, 2-5-flowered in a simple umbel, and 2-4 umbels to form a inflorescence; inflorescence 3-5.5 cm long, slender, green, glabrous; peduncles 1.5-2.5 cm long, slender, glabrous; pedicels 7-8 mm long, green, glabrous; bracts not see or cauduous; sepals 4, smaller, ovate to ovate-rounded, 2.5-3.5 mm long, 1.5-2 mm wide, rounded at apex, green; petals 4, ovate to rounded, 5.5-6.5 mm long, 5-5.5 mm wide, smooth when young and honeycomb-like when adult, obtuse at apex, inserted at base of disc, glabrous; disc rounded, 5-5.5 mm across, green, fleshy, 4-lobed, glabrous; stamens 4, on disc where often somewhat swollen; filaments short, 1.5-2 mm long, pale white; anthers 2-celled, gemini, white; ovary often



Fig. 429. *Euonymus wulinensis* S. S. Ying, close-up of a flower



Fig. 430. *Euonymus wulinensis* S. S. Ying, close-up of disc, stamen and ovary

immersion at central odisc, ovoid, 2-3 mm long, 4-locular; style short, pale green; stigma small, spot-like.



Fig. 431. *Euonymus wulinensis* S. S, Ying, immature fruits



Fig. 432. *Euonymus wulinensis* S. S, Ying, immature fruits see from back

Fruit a capsule, yellow when flesh, 5-6 mm across, glabrous, adule filaments persistent, 4-lobed; lobes well-developed, ovoid, aril red.

Diagnosis.

The species is characterized by its evergreen medium sized tree, small leaves, 4, ovate to rounded, 5.5-6.5 mm long, 5-5.5 mm wide, smooth when young and honeycomb-like when adult, obtuse at apex, inserted at base of disc, glabrous petals and yellow when flesh, 5-6 mm across, glabrous, adule filaments persistent, 4-lobed capsules.;



Fig. 433. *Euonymus wulinensis* S. S. Ying, inflorescences

Distribution and phenology.

Euonymus wulinensis S.S. Ying is endemic to Taiwan ° It is known from Wulin Farm (武陵農場), Hoping District (和平區), Taichung City, central Taiwan ° It grows on montane woods between 1700 and 2000 m altitudes; and flowering times is from June to July, and fruiting time August to September .



Fig. 434. *Euonymus wulinensis* S. S. Ying, the holotype NTUF-111-058

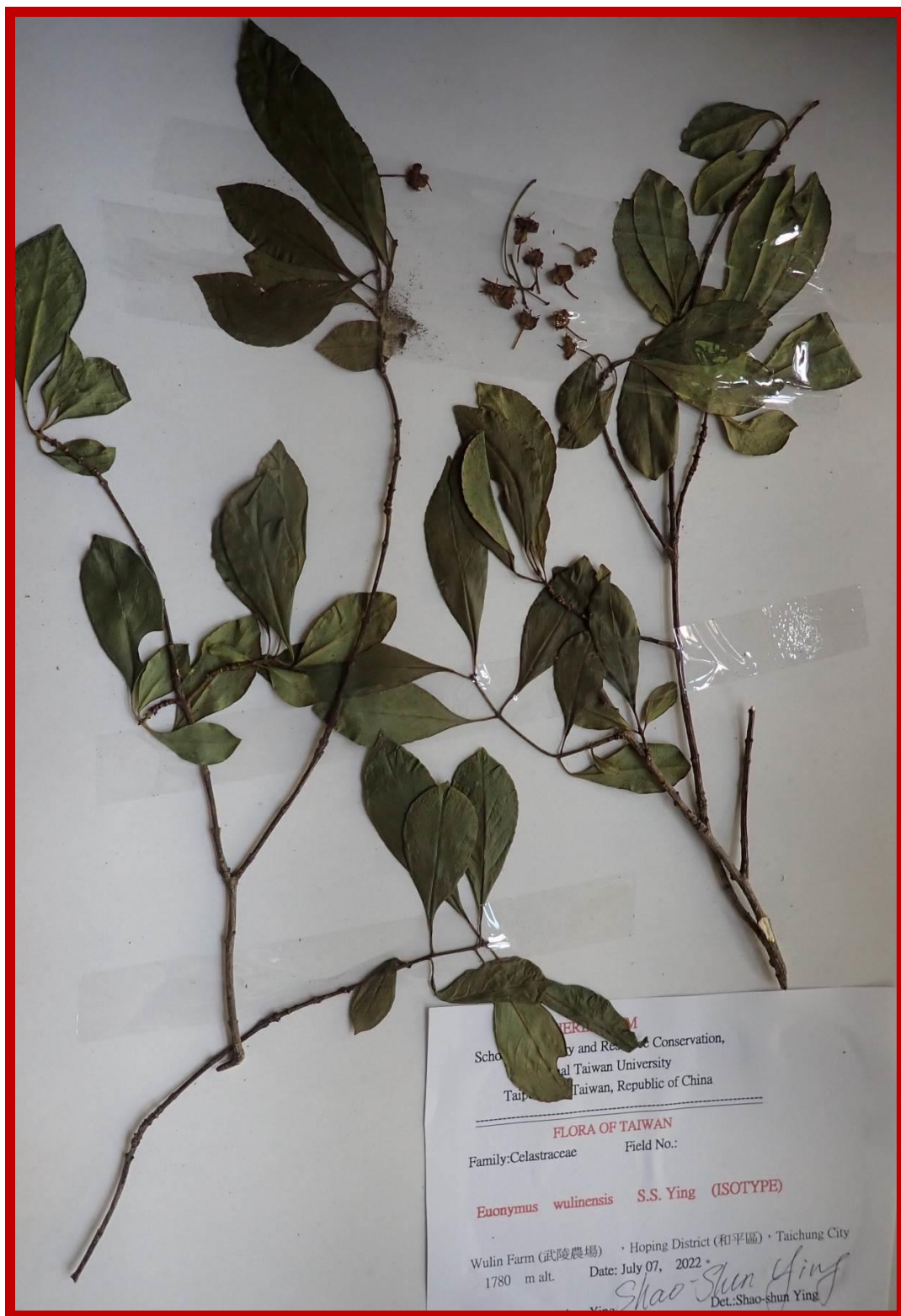


Fig. 435. *Euonymus wulinensis* S. S. Ying, the isotype NTUF-111-059

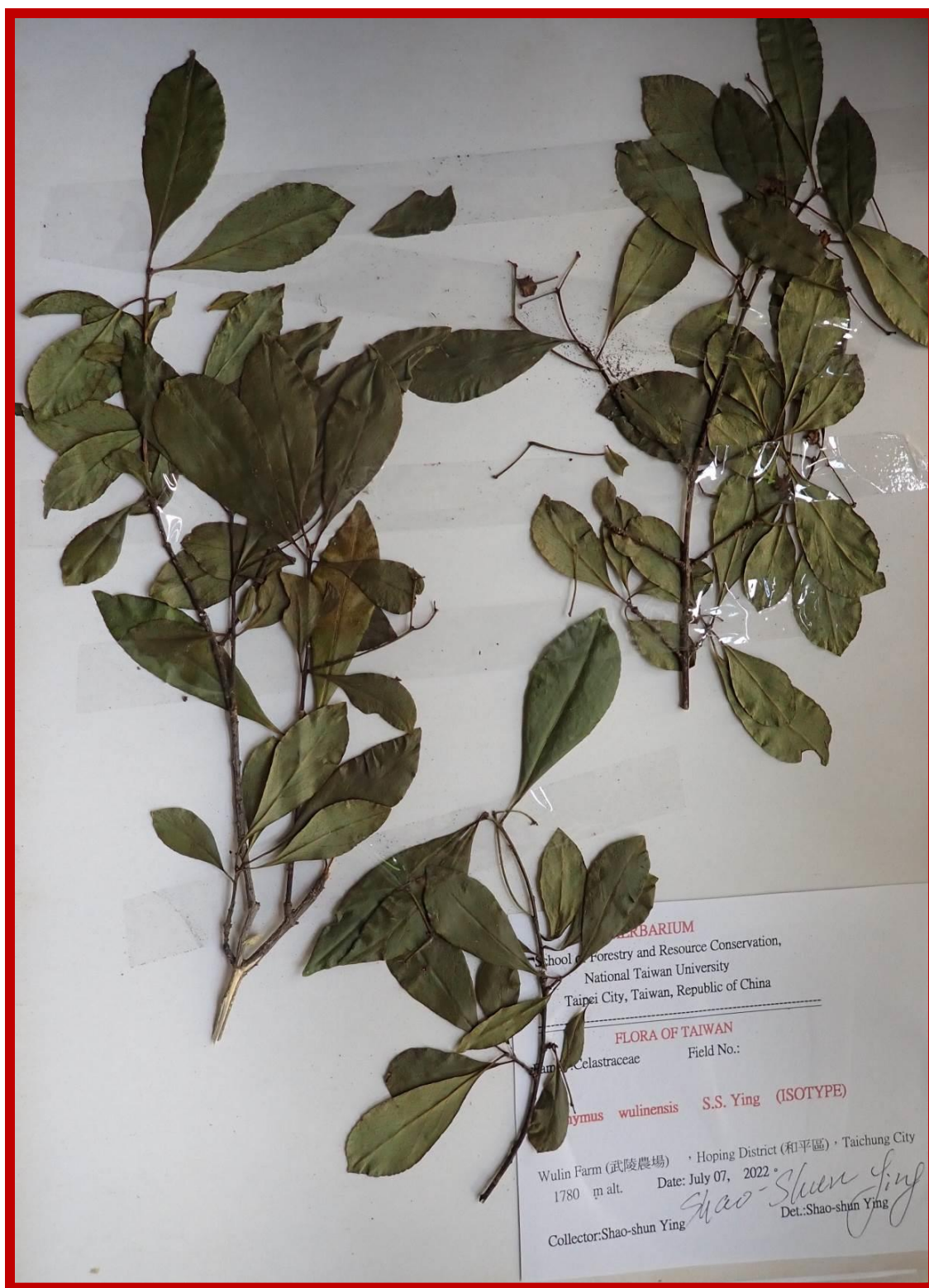


Fig. 436. *Euonymus wulinensis* S. S. Ying, the isotype NTUF-111-060



Fig. 437. *Euonymus wulinensis* S. S. Ying, fruits

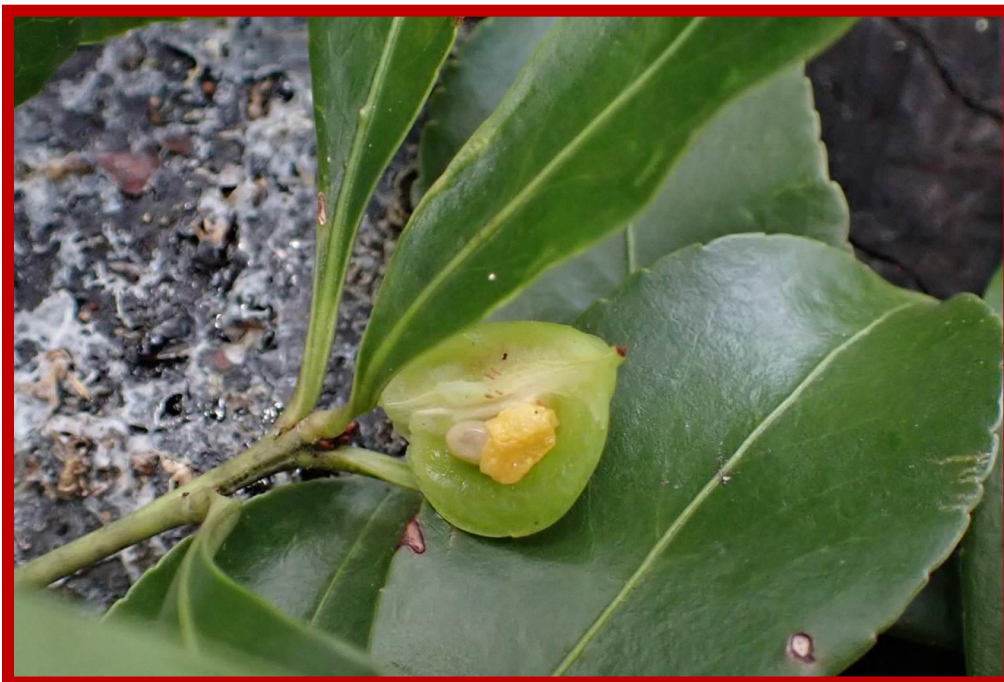


Fig. 438. *Euonymus wulinensis* S. S. Ying, an opened fruit

36. A New species of Genus *Callicarpa* (Lamiaceae) in Taiwan

Callicarpa tungyanensis S.S. Ying 東眼山紫珠

Callicarpa tungyanensis S.S. Ying, *sp. nov.* 東眼山紫珠

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Tungyanshan (東眼山), , 1193 m alt. *S. S. Ying* , *s.n. July 21, 2022* ° (holotype, NTUF) °



Fig. 439. *Callicarpa tungyanshanensis* S. S. Ying, fruiting branches

Morphology : Small shrubs , about 1.5 m high, trunk short, much branched; branches ascending, arched to pending, glabrous, grayish. Leaves simple, opposite, lanceolate 4-6 cm long, 1-1.6 cm wide, acuminate at apex, attenuate to the petioles at base, thinly chartaceous, lustrous green surface and pale green beneath, lateral veins 3-5 per side, somewhat inconspicuous, elevated on both surfaces, midrib impressed elevated on both surfaces, glabrous on both surfaces, serrulate at margins ° Petioles 4-6 mm long, glabrous °



Fig. 440. *Callicarpa tungyanshanensis* S. S. Ying, one leaf

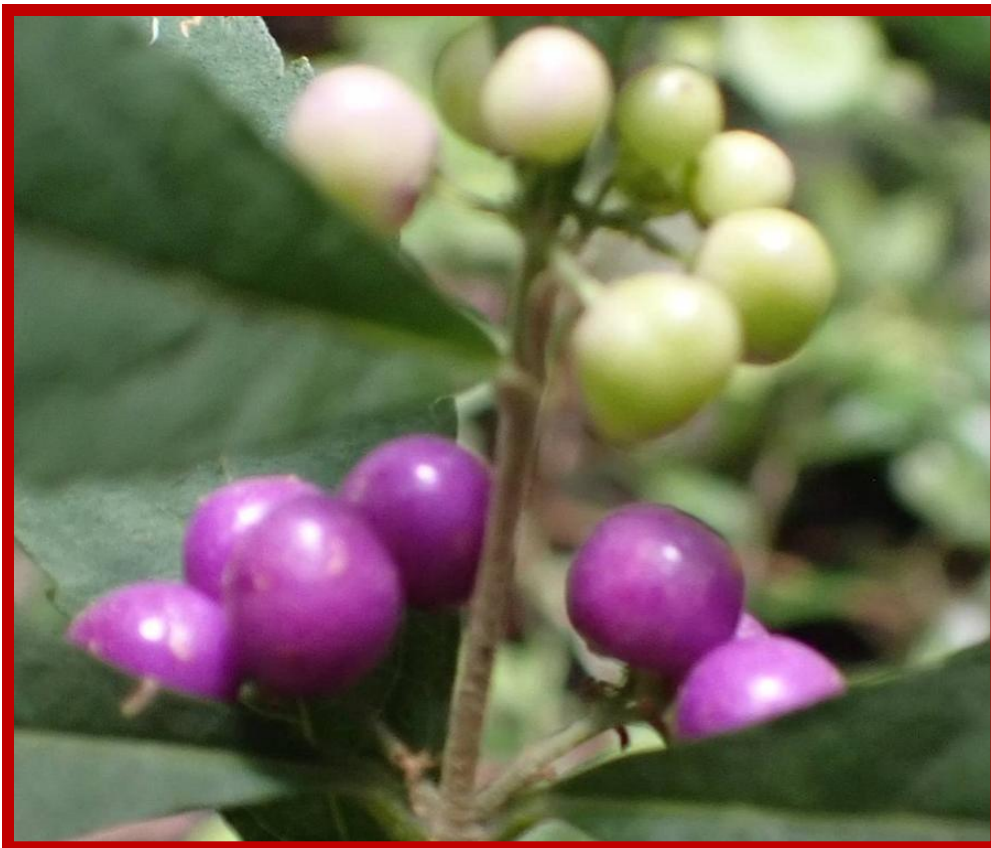


Fig. 441. *Callicarpa tungyanshanensis* S. S. Ying, infructescence

Flowers small, few, 2-3.5 mm in diameter when opened, 2-flowered in a pair, and 1-3 paired to form an inflorescence; the inflorescence terminal and axillary, very short, 4-6 mm long, greenish gray, glabrous; peduncel (for 2-3 paired inflorescences) short, 3-4 mm long, glabrous; pedicels 1.4-2.5 mm long, glabrous; calyx small, 1-1.5 mm long, 4-lobed at apex, glabrous; corolla tubular, 2-2.5 mm long, 4-lobed at apex; the lobes obtuse at apex, slightly reflexed; stamens, filaments slender, exserted, glabrous; anthers round, yellow. ovary ovoid, about 0.5 mm across, green, glabrous; style slender, same length with stamens, glabrous; stigma disc-like, glabrous.



Fig. 442. *Callicarpa tungyanshanensis* S. S. Ying, close-up of fruits

Fruits small, rounded to ovoid, 2.5-3.5 mm in diameter, pale purplish to purple, glabrous, 3 seeds inside; seeds compressed ovoid, 1.5-2 mm long and about 1 mm wide; pedicels 2-4 mm long, glabrous.

Diagnosis.

The species is characterized by its evergreen small shrub; lanceolate, 4-6 cm long, 1-1.6 cm wide leaves; 2-flowers in paired, and 1-3 pairs to form an inflorescence, very short infructescence and 3-seeds in each fruit.

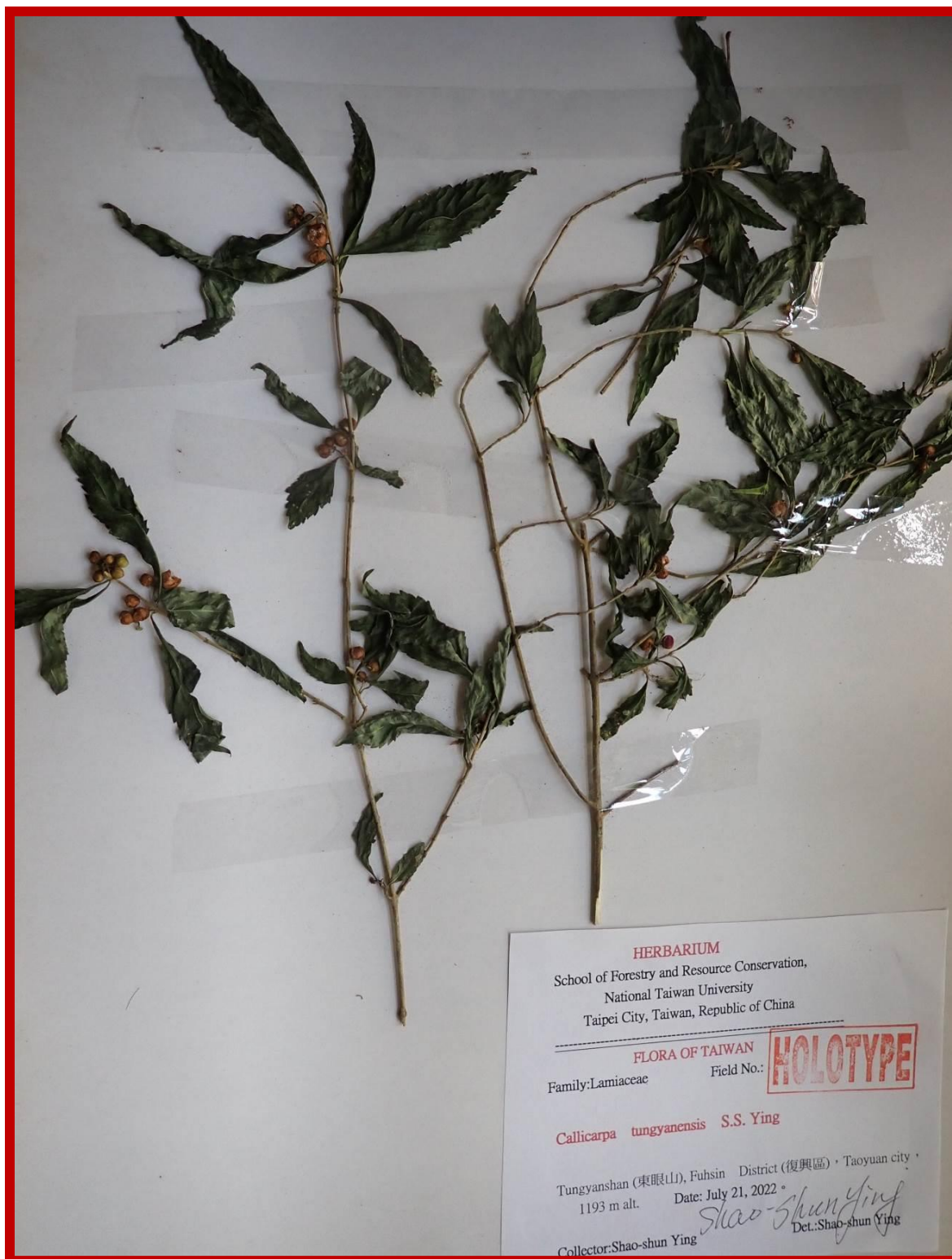


Fig. 443. *Callicarpa tungyanshanensis* S. S. Ying, the holotype NTUF-111-061

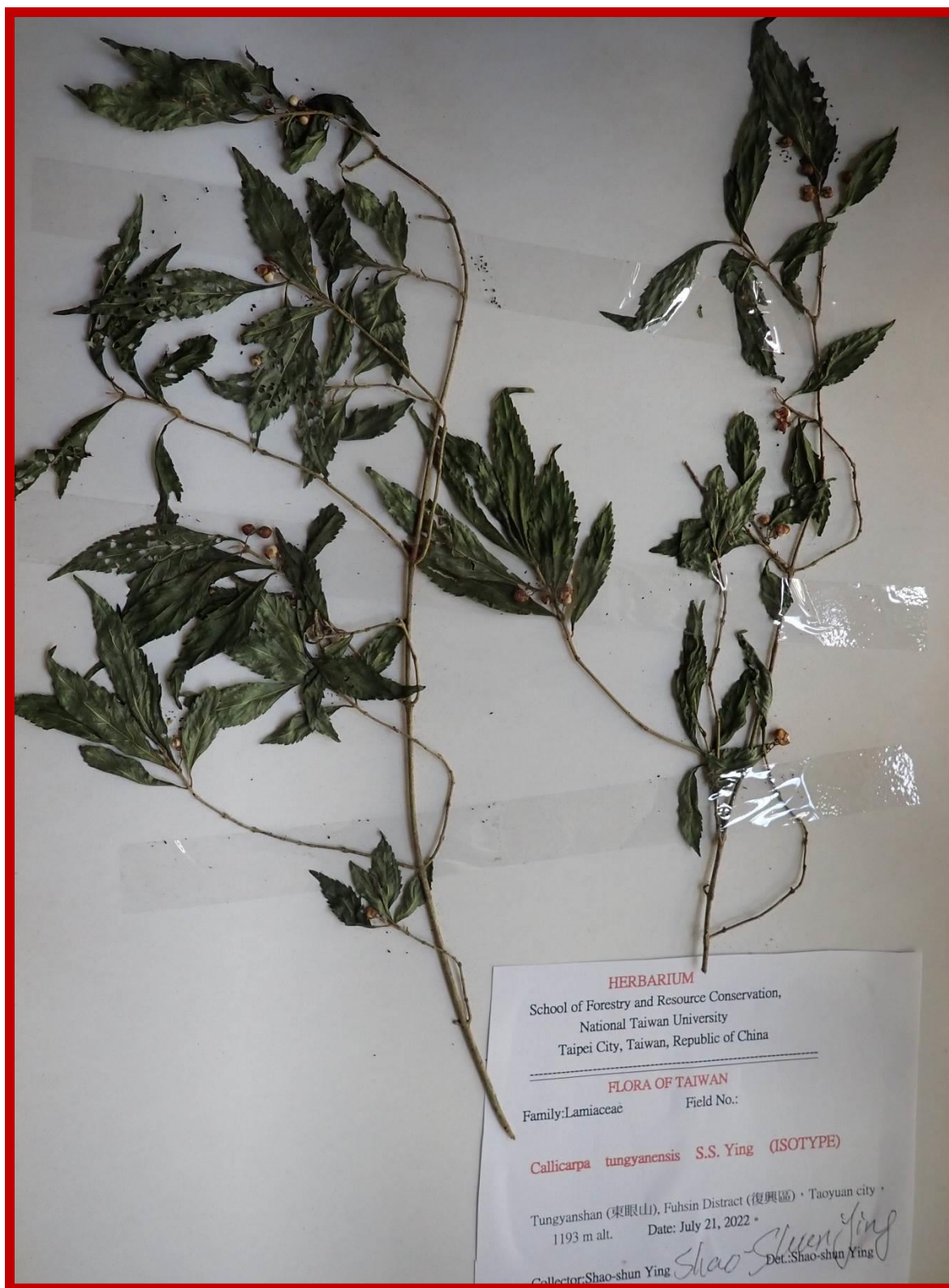


Fig. 444. *Callicarpa tungyanshanensis* S. S. Ying, the isotype NTUF-111-062



Fig. 445. *Callicarpa tungyanshanensis* S. S. Ying, close-up of fruits and seeds



Fig. 446. *Callicarpa tungyanshanensis* S. S. Ying, habit



Fig. 447. *Callicarpa tungyanshanensis* S. S. Ying, habit



Fig. 448. *Callicarpa tungyanshanensis* S. S. Ying, habitat

Distribution and phenology.

Callicarpa tungyanshanensis S.S. Ying is endemic to Taiwan ° It is known from Tungyanshan (東眼山), Fuhsin District (復興區), Taoyuan city, northern Taiwan ° It was collected under rich loam of broad-leaves forest, between 1015 and 1200 m altitudes; somewhat rare, and flowering times is from March to May and fruiting time is July to September.



Fig. 449. *Callicarpa tungyanshanensis* S. S. Ying, fruiting branches

37. Two New species of Genus *Lilium* (Liliaceae) in Taiwan

A.*Lilium linearofolium* S.S. Ying 細葉百合

Lilium linearofolium S.S. Ying, *sp. nov.* 細葉百合

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉) , Siyuanyakou (思源埡口) 1820 m alt. *S. S. Ying* , *s.n. August 11, 2022* ° (holotype , NTUF) °



Fig. 450.*Lilium linearofolium* S. S. Ying, habitat

Morphology : Perennial herbs, bulbiferous.. Bulb of many imbricate, fleshy scales, compressed globose, pale yellow sometimes with spotted. Stem erect to ascending 1-2.2 m high, green, glabrous. Leaves numerous, linear, 12-18 cm long, 1.5-2.5 mm wide, acuminate at apex, amplexicual at base, entire at margins, lustrous grenn surface and pale green beneath, midrib slightly impressed surface and elevated beneath, lateral veins inconspicuous, glabrous on both surfaces.

Flowers 1-3, rarely 4, pure white without any strips or spotted, widely opened, 6-8 cm in diameter when opened, in a terminal racemose; inflorescence 4-5.5 cm long if



Fig. 451. *Lilium linearifolium* S. S, Ying, stem leaves and flower-buds



Fig. 452. *Lilium linearifolium* S. S, Ying, stem and leaves



Fig. 453. *Lilium linearifolium* S. S. Ying, habitat

have, erect to ascending, green, glabrous; pedicels 2-4.5 cm long, green, glabrous, erect to arch-like; bracts leaf-like but somewhat smaller; perianth funnelform, horizontal to nodding, 15-18 cm long, 6-8 cm wide at apex, pure white, slightly scent or not; segments 6, usually connivent, 15-18 cm long, 1.5-2.2 cm wide, acuminate and reflexed at apex, truncate at base; nectariferous near base adaxially; stamens 6, filaments slender, whitish, shorter than perianth-segments; anthers oblong, 8-11 mm long, about 2.5 mm wide, versatile, basifixied; style elongate, pale green, glabrous, slightly longer than perianth-segments; stigma 3-lobed, green to pale green, 5-6 mm long, 3-4 mm wide; the lobes reflexed, obtuse at apex, smooth and glabrous; ovary 5-6.5 cm long, green, glabrous, 6-ridged. . ,



Fig. 454.*Lilium linearifolium* S. S, Ying, a single flower



Fig. 455.*Lilium linearifolium* S. S, Ying, stamens, style and stigma



Fig. 456. *Lilium linearifolium* S. S. Ying, the holotype NTUF-111-055



Fig. 457. *Lilium linearifolium* S. S. Ying, habitat

Fruit a capsule, erect, 6-8 cm long, green maturing to pale brown, dehiscent loculicidal 3-valved when mature. Seeds numerous, light brownish, with winged and a dark ovate embryo center.



Fig. 458. *Lilium linearifolium* S. S. Ying, flowers

Diagnosis.

The species is characterized by its numerous, linear leaves, 1-3, rarely 4 pure white flowered in a terminal racemose and acuminate and reflexed perianth-segment apex.

Distribution and phenology.

The species is endemic in Taiwan, It is known from Siyuanyakou (思源埡口), Tatung Township (大同鄉), I-Lan County, northern Taiwan. ◦ It was discovered the species on exposed fields and edges of forests at 1550-1950 meters. the species also see at Tungyanshan

(東眼山), Fuhsin District (復興區), Taoyuan city, Its flowering time is July to August, and fruiting time August to September.



Fig. 459. *Lilium linearifolium* S. S. Ying, fruits



Fig. 460. *Lilium linearifolium* S. S. Ying, fruits



Fig. 461. *Lilium linearifolium* S. S. Ying, opened capsules and seeds



Fig. 462. *Lilium linearifolium* S. S. Ying, close-up of seeds

B.Lilium lalashanense S.S. Ying 拉拉山百合

Lilium lalashanense S.S. Ying, *sp. nov.* 拉拉山百合

TYPE:TAIWAN. Taoyuan city , Fuhsin Township (復興區) , Lalashan (拉拉山), 1893 m alt. *S. S. Ying* , *s.n.August 18, 2022* ° (holotype, NTUF) °



Fig. 463.*Lilium lalashanense* S. S, Ying, flowers

Morphology : Perennial herbs, bulbiferous.. Bulb of many imbricate, fleshy scales, compressed globose, pale yellow sometimes with spotted. Stem erect to ascending 50-140 cm high, green, glabrous. Leaves numerous, lanceolate to lanceolate-linear, 21-28 cm long, 6.5-8.5 mm wide, acuminate at apex, amplexicual at base, entire at margins, lustrous grenn surface and pale green beneath, 3-nerved impressed surface and elevated beneath, lateral veins inconspicuous, glabrous on both surfaces.

Flowers solitary, rarely 2, pure white without any strips or spotted, widely opened, 4.5-6 cm in diameter when opened, in a terminal fascicled, if two flowers fascicled



Fig. 464. *Lilium lalashanense* S. S. Ying, stem and leaves

terminal the branches, without peduncled, only pedicels present; at ; pedicels 4-5 cm long, green, glabrous, erect to arch-like; bracts leaf-like but somewhat smaller; perianth funnelform, horizontal , 11-14 cm long, 4.5-6 cm wide at apex, pure white, slightly scent or not; segments 6, usually connivent, 11-14 cm long, 1.4-2.1 cm wide, acute and reflexed at apex, truncate at base; nectariferous near base adaxially; stamens 6, filaments slender, pale green, shorter than perianth-segments; anthers oblong, 10-12 mm long, about 4.5 mm wide, versatile, basifixied; style shorter than perianth-segments, pale green to white, glabrous ; stigma head-like, inconspicuous 3-lobed, green to pale green, 5-6 mm long, 3-4 mm wide; the lobes not clear; ovary 4-4.5 cm long, green, glabrous, 6-ridged. . ,

Fruit a capsule, erect, 4.5-5.8 cm long, green maturing to pale brown, dehiscent loculicidal 3-valved when mature. Seeds numerous, light brownish, with winged and a dark ovate embryo center.



Fig. 465. *Lilium lalashanense* S. S. Ying, flowers, and pedicels produced from same place



Fig. 466. *Lilium lalashanense* S. S. Ying, perianth segments, stamens, style and stigma

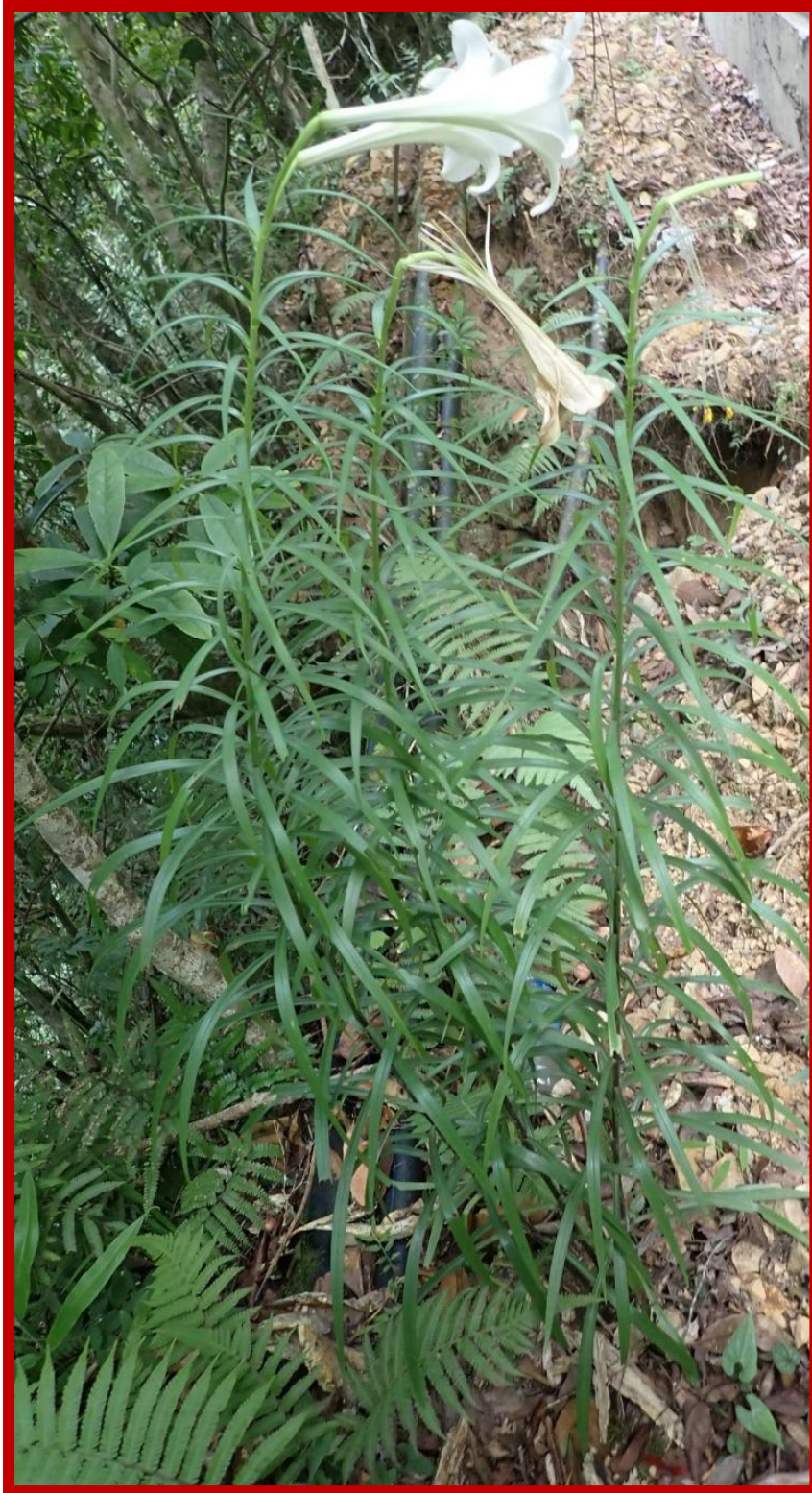


Fig. 467. *Lilium lalashanense* S. S. Ying, habit



Fig. 468. *Lilium lalashanense* S. S. Ying, the holotype NTUF-111-056

Diagnosis.

The species is characterized by its numerous, lanceolate to linear-lanceolate leaves; solitary to two terminal smaller flowers which without peduncel and with pedicels only; perianth 11-14 cm long, 4.5-6 cm wide tube smallest than other species than Taiwan *Lilium* species.



Fig. 469. *Lilium lalashanense* S. S. Ying, perianth, stamens, ovary, style and stigma

Distribution and phenology.

The species is endemic in Taiwan, It is known from Lalashan (拉拉山) , Fuhsin District (復興區) , Taoyuan city , northern Taiwan. It was discovered the species roadsides and mountain slopes at elevations of 1800-1950 meters. Its flowering time is August to September. and fruiting time from September to October. .

38. A New species of Genus *Rhynchoechum* (Gesneriaceae) in Taiwan

Rhynchoechum lalashanense S.S. Ying 拉拉山線柱苣苔

Rhynchoechum lalashanense S.S. Ying, *sp. nov.* 拉拉山線柱苣苔

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Lalashan (拉拉山), 1875 m alt.

S. S. Ying , *s.n.* June 17, 2022 ° (holotype, NTUF) °



Fig. 470. *Rhynchoechum lalashanense* S. S, Ying, habit

Mind 4 flowers to form a inflorescence

Morphology : Lithophytic annual herb, without stolon and rhizomatous, usually on mossy rocks. Stem simple, 1-1.5 cm long, erect, rust-brown woolly . Leaves simple, opposite, 2-3paired, ovate to ovate-oblong, 5-6.5 cm long, 1.8-2.5 cm wide, acuminate to acute at



Fig. 471. *Rhynchotechum lalashanense* S. S. Ying, leaves

apex, narrowed at base, chartaceous, gland-serrate at margins, lustrous green surface, somewhat pale rust- brown beneath, scattered some hirsute surface and rust-brown hairs especially on midrib and lateral veins beneath, midrib impressed surface and elevated beneath; lateral veins 4-6 per side impressed surface and elevated beneath. Petioles short, 8-14 mm long, slightly groove surface, rust-brown hairy. ;

Flowers white, 7-8 mm in diameter when opened, scentless, axillary; usually 4 flowers to form an umbel inflorescence; peduncles from leaf-axil, 2-2.7 cm long, erect to ascending, hairy; pedicels of middle flower elongate, 8-12 mm long, long-hairy; pedicels of other flowers short, 3-4 mm long, long-hairy; bracts linear, 4-5 mm long, about 1.5 mm wide, obtuse at apex, hairy; calyx campanulate, 2.5-3 mm long, 3.5 mm wide, brown hairy 5-lobed at apex; the lobes linear, 3.5-4 mm long, about 1-1.2 mm wide, green, obtuse at apex, hairy outside, glabrous inside; corolla white, glabrous; tube campanulate, 1.5-2 mm



Fig. 472. *Rhynchotechum lalashanense* S. S, Ying, inflorescence

long, about 2.5 mm wide, limb indistinctly 2-lipped; upper lip 2-lobed, ovate, 3.5-4.5 mm long, 3.2-3.8 mm wide, obtuse to rounded at apex; lower lip 3-lobed, lobes equal to slightly longer than the upper ones, 4-5 mm long, 3.5-3.9 mm wide, obtuse at apex; stamens 4, inserted near the base of corolla tube, filaments 2.5-3.5 mm long, white, glabrous; anthers brownish, 0.8-1 mm across, glabrous; staminodes none or inconspicuous; ovary ovoid, 2.5-3.2 mm long, 2mm across, glabrous, pale green; style shorter than ovary,



Fig. 473. *Rhynchotechum lalashanense* S. S. Ying, inflorescence



Fig. 474. *Rhynchotechum lalashanense* S. S. Ying, a single inflorescence



Fig. 475. *Rhynchoechum lalashanense* S. S. Ying, close-up of flowers

2-3 mm long, glabrous, pale green; stigma capitate, grayish.

Diagnosis.

Rhynchoechum lalashanense is characterized by:

1. It is an annual herb, not a shrub or subshrub, it appeared on limestones on July, and it is flowering on late August and fruiting on September to October.
2. Leaves smaller than other species of Taiwan *Rhynchoechum*, ovate to ovate-oblong, 5-6.5 cm long, 1.8-2.5 cm wide.
3. 4 flowers to form an umbel inflorescence; peduncles from leaf-axil, 2-2.7 cm long, erect to ascending, hairy; pedicels of middle flower elongate, 8-12 mm long, long-hairy; pedicels of other flowers short, 3-4 mm long, long-hairy.
4. corolla white, glabrous; tube campanulate, 1.5-2 mm long, about 2.5 mm wide, limb indistinctly 2-lipped; upper lip 2-lobed, ovate, 3.5-4.5 mm long, 3.2-3.8 mm wide, obtuse to rounded at apex; lower lip 3-lobed, lobes equal to slightly longer than the upper ones.



Fig. 476. *Rhynchotechum lalashanense* S. S. Ying, the holotype NTUF-111-057

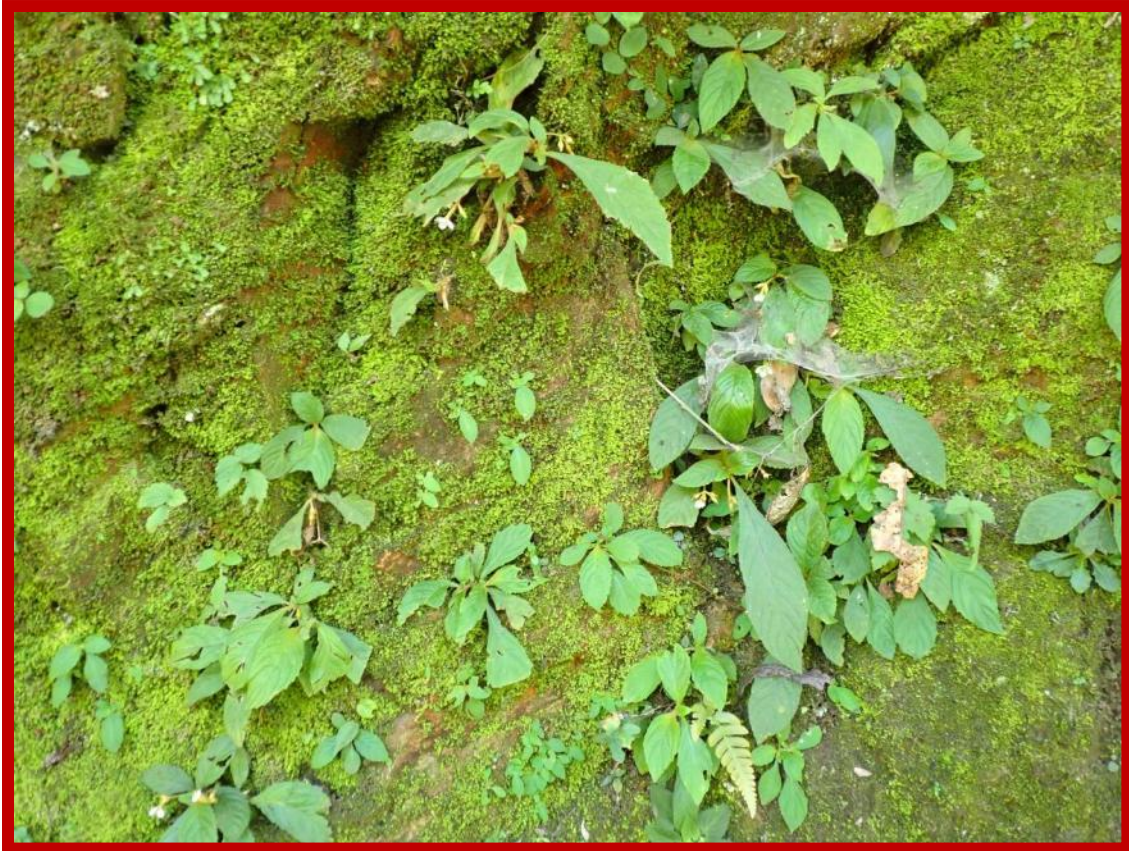


Fig. 477. *Rhynchoechum lalashanense* S. S. Ying, habitat

Distribution and phenology.

The species is endemic in Taiwan, It is known from Lalashan (拉拉山) , Fuhsin District (復興區) , Taoyuan city , northern Taiwan. ° It was discovered the species on the mossy limestones cliffs at elevations of 1650-1960 meters. Its flowering time is July to August, and fruiting time September to October.

39. A New species of Genus *Hypericum* (Hypericaceae) in Taiwan

Hypericum lalashanense S.S. Ying 拉拉山金絲桃

Hypericum lalashanense S.S. Ying, *sp. nov.* 拉拉山金絲桃

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Lalashan (拉拉山), 1955 m alt.

S. S. Ying , *s.n.* June 17, 2022 ° (holotype, NTUF) °



Fig. 478. *Hypericum lalashanense* S. S, Ying, close-up of flower

Morphology : A small annual herb, stem slender, about 15-25 cm long, prostrate, green, glabrous, few branches at nodes; branches slender, terete, green , glabrous. Leaves simple, opposite, oblong to rounded, 1-1.5 cm long, 5-7 mm wide, obtuse and slightly emarginate at apex, attenuate at base, chartaceous, entire to few dentate at margins, lustrous green



Fig. 479. *Hypericum lalashanense* S. S. Ying, leaves and stem

surface, pale green beneath, 3-nerved impressed surface and impressed beneath, glabrous on both surfaces, scattered some pale green gland dots on surface. Petioles slender, 2.5-4 mm long, green, glabrous.



Fig. 480. *Hypericum lalashanense* S. S. Ying, close-up of flower

Flowers solitary, rather small, terminal on the branch, yellow, 5-7 mm in diameter when opened; pedicels short, 1.5-2 mm long, glabrous, 1 bract at base; bracts linear to linear-lanceolate, 2-3 mm long, acuminate, glabrous; sepals 5, free, not equal in length, oblong-lanceolate, about 3-5.5 mm long, 2-2.5 mm wide, with some black gland dots at margins, glabrous; petals 5, yellow, oblong, 4-5 mm long, 2.5-3 mm wide, obtuse at apex, truncate at base, scattered some black gland dots at margins, glabrous; stamens 10, free; filaments slender, not equal in length, pale yellow, shorter than sepals; anthers small, rounded, yellow to pale yellow, basifixed; ovary globose, about 2-2.5 mm across, glabrous; style 3, slender, 2.5-2.7 mm long, pale yellow; stigma 3, capitate, 1 mm across, red to purple.

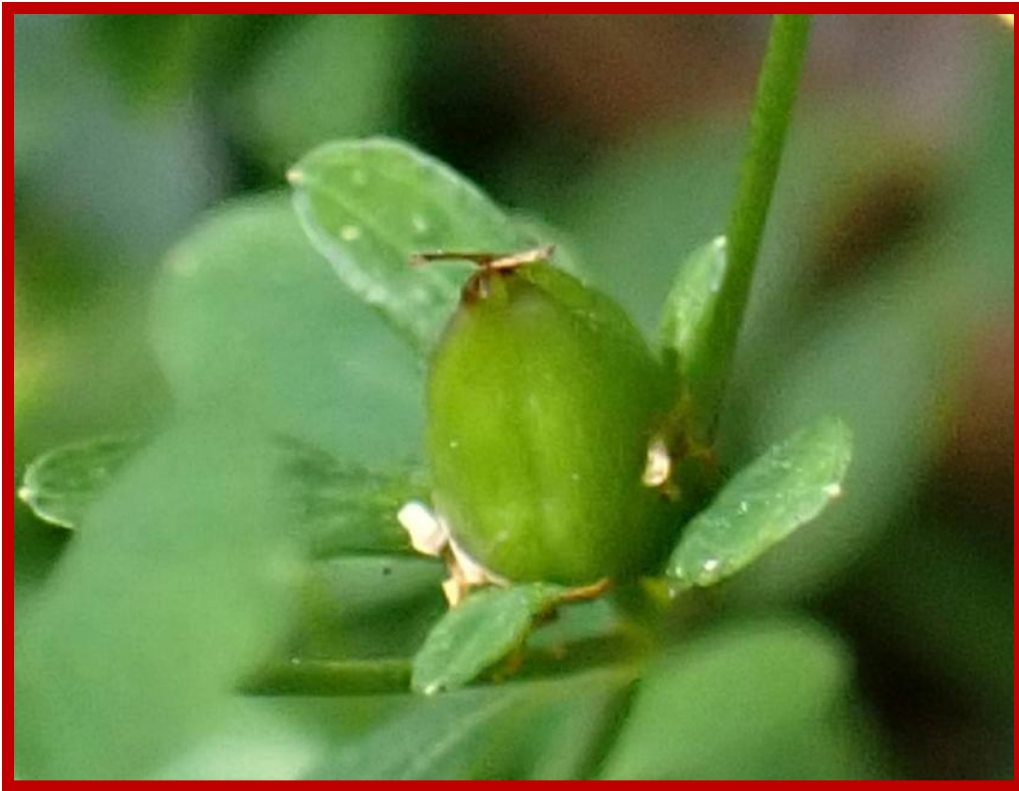


Fig. 481. *Hypericum lalashanense* S. S. Ying, close-up of fruit

Fruit a capsule, oblong, about 5-6 mm long, 3-4 mm across, red in color, 4-5 valve-dehiscent after mature and turn to brown in color, the sepals persistent.



Fig. 482. *Hypericum lalashanense* S. S. Ying, habit



Fig. 483. *Hypericum lalashanense* S. S. Ying, habitat

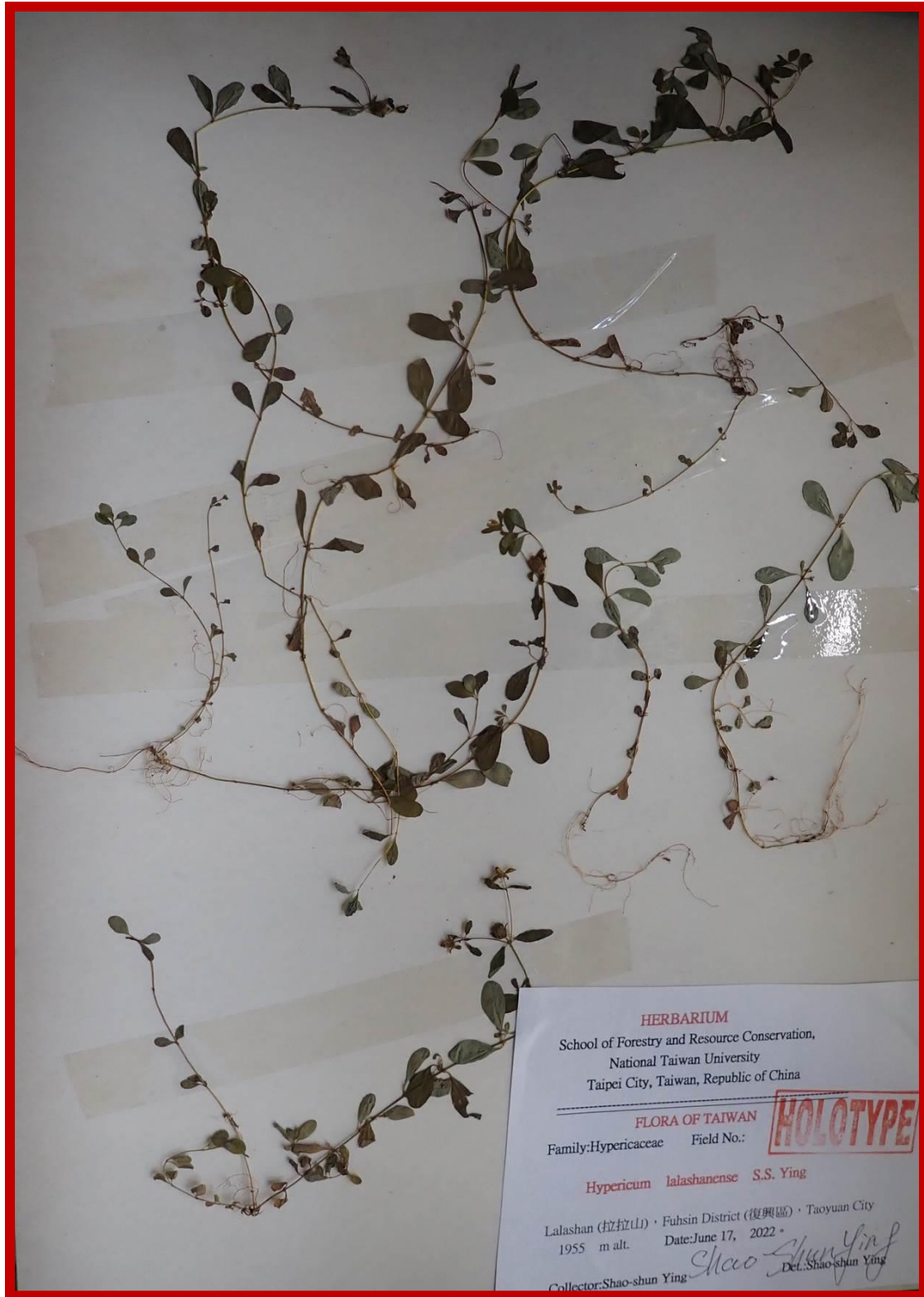


Fig. 484. *Hypericum lalashanense* S. S. Ying, the holotype NTUF-111-058

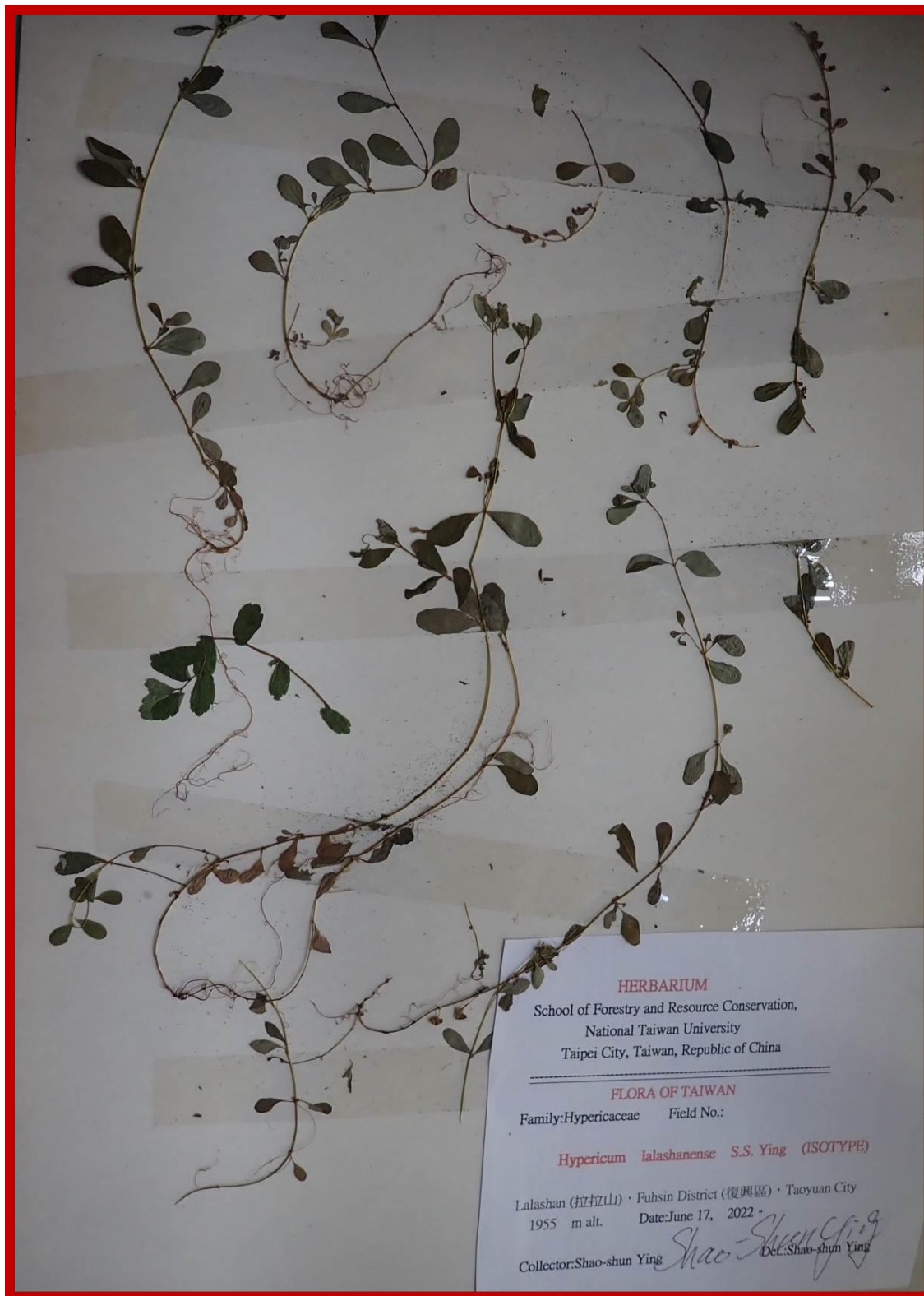


Fig. 485. *Hypericum lalashanense* S. S. Ying, the isotype NTUF-111-059

Diagnosis.

Hypericum lalashanense S.S. Ying is characterized by its prostrate stem with few branches, flowers smaller, solitary, terminal on branches, and oblong petals scattered with some black gland dots at margins. 1



Fig. 486. *Hypericum lalashanense* S. S. Ying, habit

Distribution and phenology.

Hypericum 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 discovered the species on the mossy limestones cliffs at elevations of 1850-1960 meters. Its flowering time is July to August, and fruiting time September to October.

40. A New species of Genus *Mussaenda* (Rubiaceae) in Taiwan

Mussaenda horenensis S.S. Ying 和仁玉葉金花

Mussaenda horenensis S.S. Ying, *sp. nov.* 和仁玉葉金花

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉) , Horen (和仁) , 23 m alt. *S. S. Ying* , *s.n.* August 04, 2022 . (holotype, NTUF) .



Fig. 487. *Mussaenda horenensis* S. S. Ying, branch with inflorescence

Morphology : A liana, stem elongate, 1.5-3 m long, dark brownish, glabrous, branches; branches elongate, 1-2.5 m long, horizontal to ascending, terete, green to turn brownish, glabrous. Leaves simple, opposite, oblong, 5-7.5 cm long, 1.5-2.3 cm wide, acuminate to short caudate at apex, attenuate at base, chartaceous, entire to wavy at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib and lateral vein



Fig. 488. *Mussaenda horensensis* S. S. Ying, branch and leaves

(4-5 per side) impressed surface and elevated beneath. Petioles 5-8 mm long, glabrous.

Flowers 8-12, 5-7 mm in diameter when opened, yellow, terminal, usually 2-3 to form a umbel, and 3-4 umbels to form a laxly cymes; inflorescence peduncle 1.5-2.5 cm long, green, glabrous; peduncles 8-12 mm long, green to pale green, glabrous; pedicels 4-5 mm long, pale green, glabrous; bracts minute, ovate-triangular, 2.5-3.5 mm long, 1.5 mm wide at base, acuminate and caudate at apex, amplexicual at base, membranous, brownish; calyx tube short, urceolate, 1-1.5 mm long, 1.5-2 mm wide, glabrous; calyx lobes 5, linear, 5-6 mm long, 0.7-0.8 mm wide, acute at apex, glabrous; one calyx-lobe of one outer flower



Fig. 489. *Mussaenda horensensis* S. S, Ying, inflorescence



Fig. 490. *Mussaenda horensensis* S. S, Ying, inflorescence, see from front
mind the withering corolla

per inflorescence enlarged and petaloid, white on both surfaces, blade oblong, 2.5-2.9 cm long, 1-1.5 cm wide, chartaceous, acute and slightly caudate at apex, obtuse at base; stipe 8-12 mm long, glabrous; corolla salverform 5-7 mm in diameter, corolla tube pale yellow to white outside and yellow inside, 8-11 mm long, glabrous; lobes 4-5 reduplicate-valvate in bud, yellow to brightly yellow on upper surface, pale yellow to white on lower surface, ovate-triangular, 3-4.5 mm long, 2.5-3 mm wide at base, glabrous on lower surface, glabrous to rare hairy upper surface; stamens 5, inserted in middle to upper part of the corolla tube, included; filaments adnate to the tube, 5-8 mm long, white; anthers oblong to ovoid, 3-4.5 mm long, dorsifixied; style 2 kinds, one kind long-style 7-9 mm long, white, glabrous; stigma 2-lobed, 3-4 mm long, slightly exserted; the other short-style, 5.5-6.5 mm long. stigma 2-lobed, 2.5-3 mm long, included.

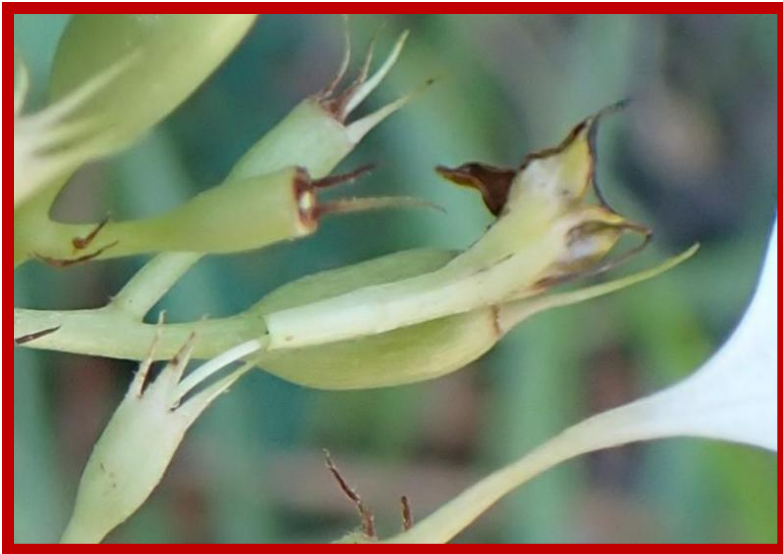


Fig. 491. *Mussaenda horenensis* S. S, Ying, close-up of corolla, see from outside

Fruit pale green when young, baccate, ellipsoid, 8-11 mm long, 5-6 mm in diameter, glabrous, with straight calyx lobed when young and calyx lobes cauduous adult; seeds numerous, pale brownish, 0.4-0.5 mm long, 0.2-0.25 mm wide, about 0.1 mm thick, lenticular; testa foveolate to smooth.



Fig. 492. *Mussaenda horensensis* S. S, Ying, inflorescence, see from back
mind the withering corolla



Fig. 493. *Mussaenda horensensis* S. S, Ying, corollas

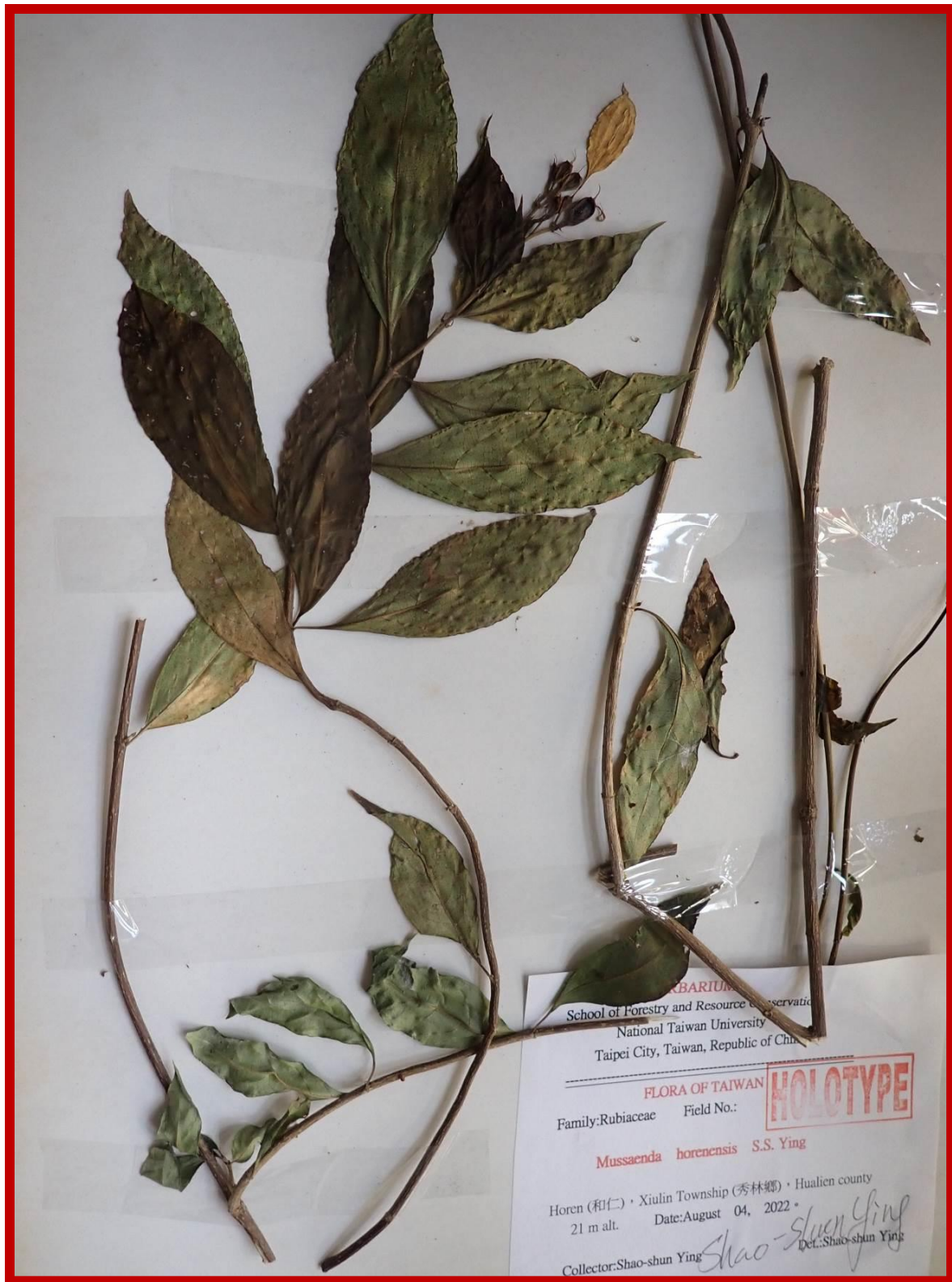


Fig. 494. *Mussaenda horensensis* S. S. Ying, the holotype NTUF-111-060

Diagnosis.

Mussaenda horenensis S.S. Ying is characterized by its glabrous oblong leaves, 2-3 flowered to form a umbel and 3-4 umbels to form a laxly cymes; one calyx-lobe of one outer flower per inflorescence enlarged and petaloid and styles wirh long and short 2 styles. ,



Fig. 495. *Mussaenda horenensis* S. S, Ying, habitat

Distribution and phenology.

The species is endemic in Taiwan, It is known from low altitude of 25-45 m. near to Horen (和仁) , Old Suhua Highway (舊蘇花公路), the sole locality as known the plant grows. It grows at limestone rocky cliff facing to Pacific Ocean, at Xiulin Township (秀林鄉) , Hualien county. Its flowering time is July to August, and fruiting time from August to September..

41. A New species of Genus *Lysimachia* (Primulaceae) in Taiwan

Lysimachia lalashanensis S.S. Ying 拉拉山珍珠菜

Lysimachia lalashanensis S.S. Ying, *sp. nov.* 拉拉山珍珠菜

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Lalashan (拉拉山), 1965 m alt.

S. S. Ying , *s.n.* August 18, 2022 ° (holotype, NTUF) °



Fig. 496. *Lysimachia lalashanensis* S. S, Ying, habit

Morphology : Annual small herbs about 10-16 cm long; rhizome absent; taproot conspicuous, 3-5.5 cm long, somewhat ligneous; roots fibrous, slender, delicate. Stem simple, not branched, angular, erect to ascending, 10- 15 cm long, green, fleshy, densely scattered short white hairs. Leaves simple, opposite, ovate , 1.2-1.8 cm long, 6-8 mm wide, acute to acuminate at apex, obtuse at base, chartaceous, entire to remotely dentate at



Fig. 497. *Lysimachia lalashanensis* S. S. Ying, stem, leaves and young fruits

margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib impressed surface and elevated beneath, lateral veins 3-4 per side, impressed surface and elevated beneath; petioles terete, 6-8 mm long, slender, slightly grooved surface, green, glabrous or nearly so.

Flower yellow, solitary, axillary on the axils of upper ward 1-3 leaf, 4-5.5 mm in diameter when opened, bracts ovate, 2-3 mm long, about 1.5 mm wide, acute at apex, caudate, sometimes absent;; pedicels elongate, 1.5-2.6 cm long, green, glabrous; calyx 5-deeply lobed; the lobes ovate, 4-5 mm long, 1.8 mm wide at base, caudate at apex, green, glabrous on both surfaces; corolla yellow, deeply 5-parted; lobes oblong, 4.5-5.5 mm long, 2.2-2.8 mm wide, obtuse at apex, shortly clawed at base; stamens 5, lean on style; filaments connate into a ring, 2.5-3.5 mm long, yellow; anthers elliptic, 2-3 mm long, white, dorsifixed; ovary globose, 2.5-3 mm long, green; style straight, slender, 3.5 mm long, pale green; stigma capitate, smooth, brownish.

Fruit a capsule, globose, 2.5-3 mm in diameter, green in young, glabrous, dehiscent by 5-valved when mature; seeds irregularly elliptic to oblong in outline, 1-1.2 mm long, about 0.6 mm wide, glabrous.



Fig. 498. *Lysimachia lalashanensis* S. S. Ying, close-up of flower



Fig. 499. *Lysimachia lalashanensis* S. S. Ying, young fruits

Diagnosis.

Lysimachia lalashanensis is characterized by its small habit being 10-16 cm long; simple, not branched stem, smaller ovate leaves being 1.2-1.8 cm long, 6-8 mm wide and smaller, few yellow flowers. e,



Fig. 500. *Lysimachia lalashanensis* S. S, Ying, habitat



Fig. 501. *Lysimachia lalashanensis* S. S, Ying, flowers and fruits



Fig. 502. *Lysimachia lalashanensis* S. S. Ying, the holotype NTUF-111-061

Distribution and phenology.

The species is endemic in Taiwan, It is known from Lalashan (拉拉山) , Fuhsin District (復興區) , Taoyuan City , northern Taiwan. It was discovered the species under *Chamaecyparis formosensis forestt* at elevations of 1900-2010 meters. Its flowering time is August to September, and fruiting time from August to October. ..



Fig. 503. *Lysimachia lalashanensis* S. S. Ying, young fruits

42. A New species of Genus *Circaea* (Onagraceae) in Taiwan

Circaea lalashanensis S.S. Ying 拉拉山露珠草

Circaea lalashanensis S.S. Ying, *sp. nov.* 拉拉山露珠草

TYPE:TAIWAN. Taoyuan City , Fuhsin District (復興區) , Lalashan (拉拉山), 1985 m alt.

S. S. Ying , *s.n.* August 18, 2022 ° (holotype, NTUF) °



Fig. 504. *Circaea lalashanensis* S. S, Ying, flowering plant

Morphology : Annual herbs; taproot somewhat lignifous, 5-7 cm long, fibrous roots numerous, slender, rhizome absent. Stem simple, erect to ascending, 22-40 cm long, glabrous.

Leaves opposite, simple, often with a pale purplish node at base, oblong to ovate-oblong, 4-6.5 cm long, 2.5-3.2 cm wide, chartaceous, acuminate to acute at apex, obtuse and slightly oblique at base, remotely dentate at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib and lateral veins (4-5 per side) impressed surface and elevated beneath. Stipules paired, at base of petioles, oblong, 3-5 mm long, 2-3.2 mm wide, acuminate at base, cauduous . Petioles slender, 2.5-3.5 cm long, glabrous, groove above.



Fig. 505. *Circaea lalashanensis* S. S. Ying, glabrous leaves

Flowers small, many, white, 2.1-3.2 mm in diameter when opened, in a remotely elongate raceme to panicle; if a panicle usually forming by 4-5 racemes; the racemes terminal and axillary (often from leaf-axil) 8-12.5 cm long, ascending, green, glabrous; bracts 2, at base of inflorescence, ovate- oblong, somewhat like leaf but smaller, 1.5-2.5 cm long, 6-7.5 mm

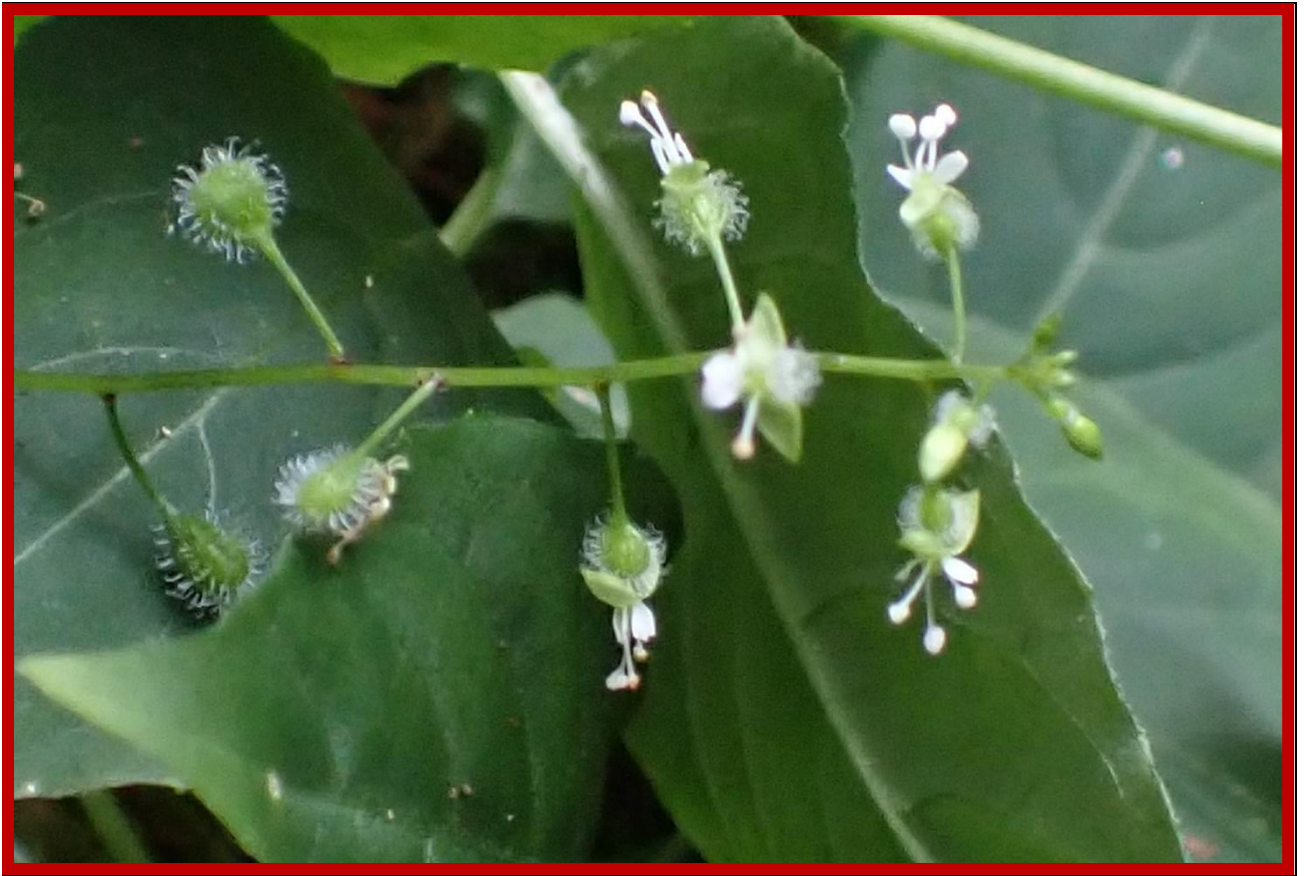


Fig. 506. *Circaea lalashanensis* S. S. Ying, close-up of flowers

wide, acuminate at apex , glabrous all over; pedicels 3-4.5 mm long, glabrous; bracteole absent; sepals 2, opposite, ovate, 4.5-5.2 mm long, about 2.5-3 mm wide, widely opened, green, acute at apex, concave, glabrous; petals 2, alternate to sepals, much smaller than sepals, cunate, 1.5-2.2 mm long, about 1.5 mm wide, white, emarginate at apex, glabrous; stamens 2, same length or slightly shorter than style, filaments slender, 2.5-3.2 mm long, white; anthers 2-celled, rounded, about 0.3-0.5 mm long, white; style slender, filiform 4-5.2 mm long, white,

glabrous; stigma head-like, 2.5 mm wide, 2.5 mm long, pale brownish; ovary rounded, 1.5-2 mm in diameter, densely scattered with reflexed elongate white hairs.



Fig. 507. *Circaea lalashanensis* S. S. Ying, close-up of flowers

Fruits many in each infructescence, rounded, 3.2-4.0 mm in diameter, green, scattered with elongate reflexed white hairs, smooth, without ribs; infructescence 7-13 cm long, green, glabrous, erect to ascending; fruiting pedicels 3.5-4.5 mm long, glabrous; locule 1, but with trace of a second locule in cross-section; seed 1, globose, 2.2-2.5 mm in diameter, smooth, glabrous.

Diagnosis.

Circaea lalashanensis is characterized by its rather robust plant body, oblong to ovate-oblong glabrous leaves, a remotely elongate raceme to penciled inflorescence and petals much smaller than sepals, white, emarginate at apex; ovary with reflexed white hairs; infructescence 7-13 cm long, green, glabrous, rounded fruits without any ribs.



Fig. 508. *Circaea lalashanensis* S. S. Ying, infructescence



Fig. 509. *Circaea lalashanensis* S. S. Ying, plant colony

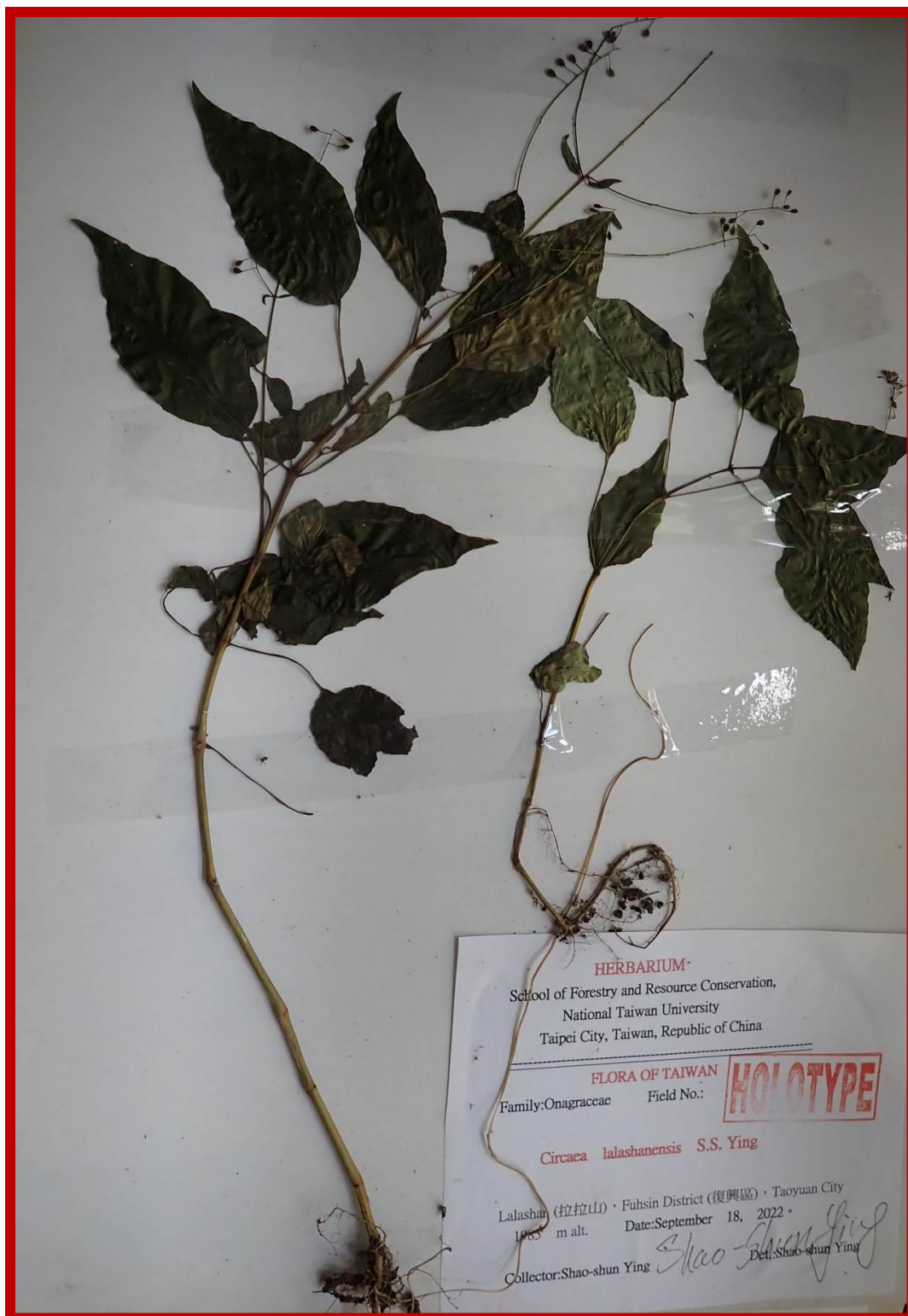


Fig. 510. *Circaea lalashanensis* S. S. Ying, the holotype NTUF-111-062



Fig. 511. *Circaea lalashanensis* S. S. Ying, the isotype NTUF-111-063

Distribution and phenology.

The species is endemic in Taiwan, It is known from medium altitude of 1900-2010 m. of Lalashan (拉拉山) area, Fuhsin District (復興區), Taoyun City, northernl Taiwan ° It was collected at edge of the forest. Its flowering time is August to October, and fruiting time from September to November.



Fig. 512. *Circaea lalashanensis* S. S. Ying, close-up of young fruits

43. A New species of Genus *Elsholtzia* (Lamiaceae) in Taiwan

Elsholtzia taiwanensis S.S. Ying 台灣香薷

Elsholtzia taiwanensis S.S. Ying, *sp. nov.* 台灣香薷

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Taoshan (桃山) 1560 m alt. *S. Ying* , *s.n.* September 01, 2022 ° (holotype , NTUF) °



Fig. 513. *Elsholtzia taiwanensis* S. S, Ying, part of inflorescence

Morphology : Annual herbs, scentless to slightly aromatic; taproot inconspicuous, fibrous roots numerous, slender, rhizome absent. Stem erect to ascending, 30-60 cm long, angular, green,

glabrous. Leaves opposite, simple, oblong to ovate-oblong, 8-14.5 cm long, 4.5-7.5 cm wide, chartaceous, acuminate at apex, obtuse and slightly oblique at base, dentate 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 slender, 4.5-7.5 cm long, winged at margins, glabrous, green, groove above.



Fig. 514. *Elsholtzia taiwanensis* S. S. Ying, leaves

Flowers small, white, numerous, 2.5-3 mm in diameter when opened, usually closely approximately in a terminal and axillary erect to ascending raceme; the inflorescences 15-25 cm long, densely covered short villous;bracts at base of pedicels, ovate-triangular, 3.5-4 mm long, about 3 mm wide at base, acute at apex, white with a green tip, glabrous or nearly so;



Fig. 515. *Elsholtzia taiwanensis* S. S. Ying, inflorescence



Fig. 516. *Elsholtzia taiwanensis* S. S. Ying, bracts and flower-buds



Fig. 517. *Elsholtzia taiwanensis* S. S. Ying, close-up of flowers

Mind corolla white and anthers purple

Pedicels short, 2.5-3.5 mm long, hairy; calyx campanulate, 4-5 mm long, 3-3.5 mm wide, green, elongate white hairs at base, somewhat hairy at other part of calyx, 8-10 nerved, 2-lipped; upper lip 3-toothed, middle tooth minute, 0.3 mm long; lateral teeth ovate, 0.8-1 mm long, acute at apex; lower lip 2-toothed; teeth ovate to ovate-lanceolate, 1-1.5 mm long, acute to obtuse at apex; corolla white, campanulate, 5-5.6 mm long, 2.5-3.5 mm in diameter, glabrous, with elongate hairs at throat; slightly 2-lobed, the upper lobe 2.5-3 mm long, slightly



Fig. 518. *Elsholtzia taiwanensis* S. S. Ying, close-up of calyx after flowering

2-lobed to deeply emarginate at apex; lower lip 3-lobed, lateral lobes hemirounded, smaller, 1.5-2 mm long, obtuse at apex; middle lobe elliptic, 2.5-3.5 mm long, obtuse at apex; stamens 4. equal, attached at upper part of corolla throat, 3-4 mm long, white; anthers purple, 2-celled, parallel; style included, 2-cleft at apex; lobes subulate.

Fruiting calyx 8-9 mm long, green to brownish when mature; nutlets 0.9-1.2 mm in diameter, brownish.

Diagnosis.

Elsholtzia taiwanensis is characterized by its oblong to ovate-oblong, 8-14.5 cm long, 4.5-7.5 cm wide leaves; smaller white flowers usually closely approximately in a terminal and axillary erect to ascending raceme; white with a green tip bracts; equal 4 stamens with white filament and purple 2-celled anthers.



Fig. 519. *Elsholtzia taiwanensis* S. S. Ying, habit



Fig. 520. *Elsholtzia taiwanensis* S. S. Ying, habitat



Fig. 521. *Elsholtzia taiwanensis* S. S. Ying, the holotype NTUF-111-064



Fig. 522. *Elsholtzia taiwanensis* S. S. Ying, the isotype NTUF-111-065

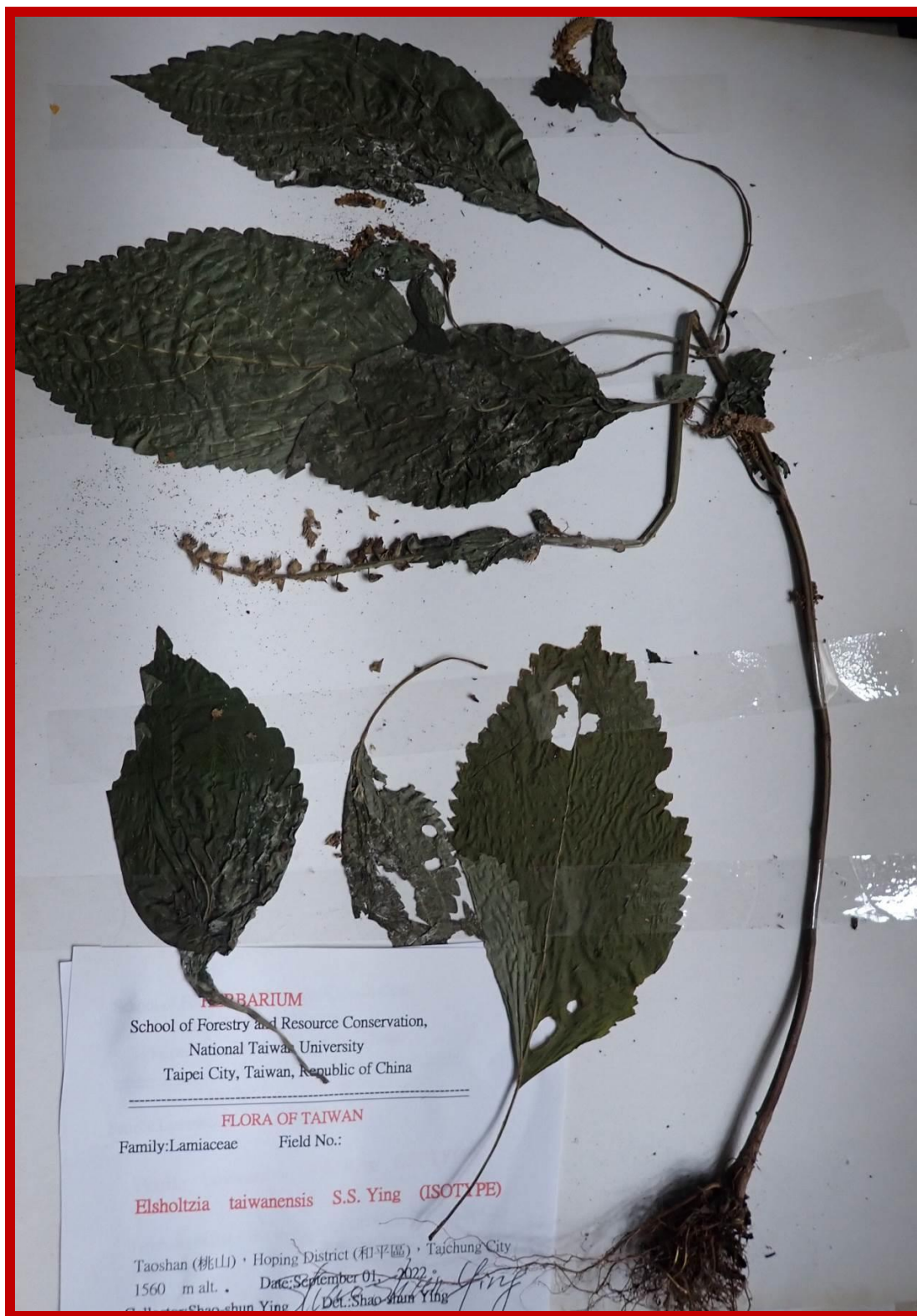


Fig. 523. *Elsholtzia taiwanensis* S. S. Ying, the isotype NTUF-111-066

Distribution and phenology.

The species is endemic in Taiwan, It is known from medium altitude of 1500-1720 m. of Taoshan (桃山) area, Heping District (和平區), Taichung City, central Taiwan. It was collected at edge of the forest. Its flowering time is September to October, and fruiting time from September to November.



Fig. 524. *Elsholtzia taiwanensis* S. S. Ying, habitat



-392- Fig. 525. *Elsholtzia taiwanensis* S. S. Ying, inflorescences

44. A New species of Genus *Begonia* (Begoniaceae) in Taiwan

Begonia shitoushanensis S.S. Ying 獅頭山秋海棠

Begonia shitoushanensis S.S. Ying, *sp. nov.* 獅頭山秋海棠

TYPE:TAIWAN. Miaoli County, Nanchuang Townshaip (南庄鄉), Shitoushan (獅頭山)
451 m alt. *S. S. Ying*, *s.n. September 09, 2022* ° (holotype, NTUF) °



Fig. 526. *Begonia shitoushanensis* S. S, Ying, habitat

Morphology : Annual lithophytic herbs, rhizome very short, 5-10 mm long, 5-6.5 mm across, fleshy; fibrous roots many, slender, short, 2-3.5 cm long; stolon slender, elongate, 5-20 cm



Fig. 527. *Begonia shitoushanensis* S. S. Ying, habit

long, pale yellow, glabrous. Leaves simple, alternate, 2-3, ovate-triangular, 3.5-6 cm long, 2.5-5 cm wide, acuminate at apex, slightly cordate and symmetric at base, fleshy to coriaceous, remotely denticate and ciliate at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, pinate-nerved inconspicuous, if present, usually impressed and slightly elevated beneath. Petioles terete, 3-5.5 cm long, fleshy, pale yellow to pale purplish, glabrous. Stipules smaller, usually cauduous.

Flowers 1-3 in a scape, monoecious, smaller, pink to white, 1-1.5 cm in diameter when opened; scape from the rhizome, 3-12 cm long, erect to ascending, purple, glabrous; bracts ovate, 5-7 mm long, 3-4 mm wide, pale green, obtuse at apex, glabrous; pedicels slender, 8-15 mm long, white to pale pink, glabrous or nearly so; staminate flowers: tepal 2, rounded, 6-8



Fig. 528. *Begonia shitoushanensis* S. S. Ying, habit



-395- Fig. 529. *Begonia shitoushanensis* S. S. Ying, staminate flowers

mm long, 8-11 mm wide, pink to white, obtuse to rounded at apex, glabrous; stamens 15-18, filaments short, 4-5 mm long, pale yellow to white, shortly fused at base; anthers 2-celled, rounded, 0.8 mm across, yellow; pistillate flowers: tepals 2, same as the staminate flower, but somewhat smaller, pink to white, glabrous; ovary trigonous-subspherical, body 3.5-4 mm long, 2.5-4 mm wide, white, 3-winged; wings subequal, triangular, 2.5-3 mm long, 3-4 mm wide; locules 3, placenta one per locule; styles 3, fused at base, 2.5 mm long, stigmas in a spiral and papillose.



Fig. 530. *Begonia shitoushanensis* S. S. Ying, a pistillate flowers (upper left)

Fruit a capsule, nodding, green when fleshy, 1.3-1.6 cm long, 8-10 mm wide; wings unequal, oblong, the longest one 8-10 mm long, 8-9 mm wide, truncate at apex, green tinged with pink at apex; seeds numerous, ellipsoid, 0.2 mm long.



Fig. 531. *Begonia shitoushanensis* S. S. Ying, young fruit and pistillate flowers

Diagnosis.

Begonia shitoushanensis is characterized by its monoecious 1-3 flowers, tepals of pistillate and staminate flowers only two, and same shape and size; and its lithophytic habitat.

Distribution and phenology.

The species is endemic in Taiwan, It is known from lower altitude of 430-492 m. of Shitoushan (獅頭山) area, Nanchuang Townshaip (南庄鄉), Miaoli County, central

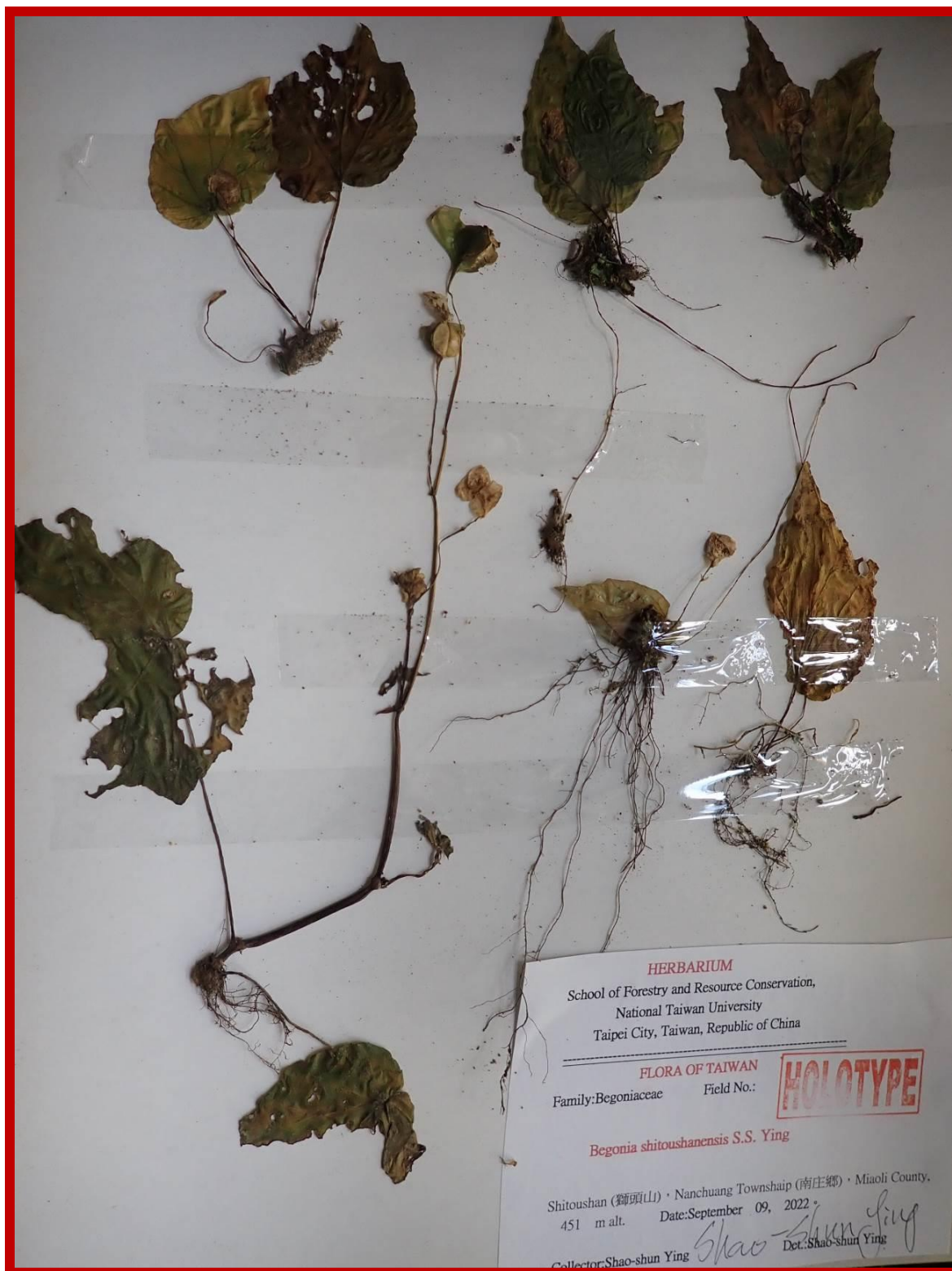


Fig. 532. *Begonia shitoushanensis* S. S. Ying, the holotype NTUF-111-067



Fig. 533. *Begonia shitoushanensis* S. S. Ying, the isotype NTUF-111-068

Taiwan ° It was collected at edge of the forest. Its flowering time is Septembert to October, and fruiting time from September to November.



Fig. 534. *Begonia shitoushanensis* S. S, Ying, habitat



Fig. 535. *Begonia shitoushanensis* S. S, Ying, young fruit, male and female flowers

45. A New species of Genus *Laportea* (Urticaceae) in Taiwan

Laportea taiwanensis S.S. Ying 台灣艾麻

Laportea taiwanensis S.S. Ying, *sp. nov.* 台灣艾麻

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉) , Siyuanyakou (思源埡口) 1820 m alt. *S. S. Ying* , *s.n. September 22, 2022* ° (holotype , NTUF) °



Fig. 536. *Laportea taiwanensis* S. S, Ying, habit, mind female and male flowers

Morphology : Annual terrestrial herbs, stem erect to ascending, about 60-100cm high, much-

branched; branches from base, erect to ascending, 40-70 cm long, somewhat fleshy, green, glabrous, without stinging hairs. Leaves simple, opposite, oblong to ovate-oblong, 7-15 cm long, 4.5-7.5 cm wide, acuminate and slightly caudate at apex, obtuse at base, chartaceous, coarsely dentate at margins, lustrous green sometimes with white stripes surface and pale green beneath, glabrous to scattered short hirsute surface and glabrous beneath, 3-nerved impressed and elevated beneath. Petioles 4-7 cm long, terete, green to pale green, glabrous, groove above.



Fig. 537. *Laportea taiwanensis* S. S. Ying, habitat , leaves

Flowers smaller, monoecious; female inflorescences on upper ward leaf-axils, glomerules forming spikes, green, 2.5-4 cm long; male inflorescences several, just below on female inflorescence leaf-axils, several branches from leaf-axil, each branch panicle-like, 3.5-5.5 cm long, pale yellow to greenish yellow, glabrous; female flowers sessile, somewhat subtended by fleshy matters; perianth lobes 4, minute, free at tip, subequal, ovate, lateral lobes larger, enclosing the ovary, 0.3-0.4 mm long; ovary ovary, straight at first and soon oblique;



Fig. 538. *Laportea taiwanensis* S. S, Ying, leaf beneath and female inflorescences



Fig. 539. *Laportea taiwanensis* S. S, Ying, close-up of female inflorescences

style filiform; stigma reflexed, papillose on one side; male flowers subsessile, green and inflexed in bud; perianth lobes 4-5, ovate, 0.5-0.7 mm long, 0.4-0.5 mm wide, obtuse at apex, white; stamens 4-5, rudimentary subglobose.



Fig. 540. *Laportea taiwanensis* S. S. Ying, close-up of male inflorescences

Achene obovoid, compressed, sessile, 1.5mm in diameter, smooth or slightly verrucose, green. Glabrous.

Diagnosis.

Laportea taiwanensis is characterized by its monoecious flowers, female inflorescences on upper ward leaf-axils, glomerules forming spikes, green, 2.5-4 cm long; male inflorescences several, just below on female inflorescence leaf-axils, several branches from leaf-axil, each branch panicle-like, 3.5-5.5 cm long, pale yellow to greenish yellow, glabrous.

Distribution and phenology.

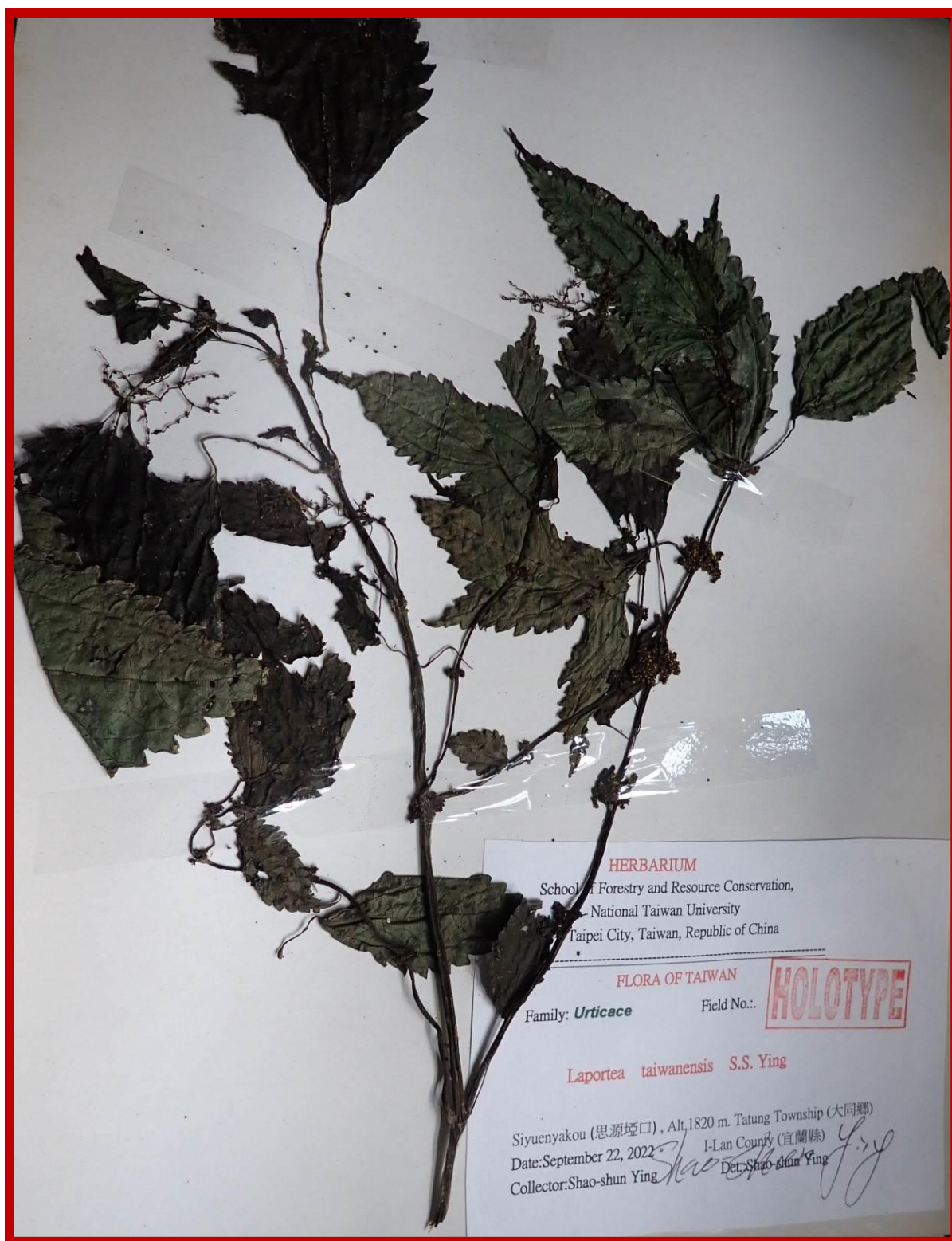


Fig. 541. *Laportea taiwanensis* S. S. Ying, the holotype NTUF-111-069



Fig. 542. *Laportea taiwanensis* S. S. Ying, the isotype NTUF-111-070



Fig. 543. *Laportea taiwanensis* S. S. Ying, close-up of male flowers

The species is endemic in Taiwan, It is known from Siyuanyakou (思源埡口), Tatung Township (大同鄉), I-Lan County, northern Taiwan. ° It was discovered the species on edges of forests at 1850-1950 meters. Its flowering time is Septembert to October, and fruiting time from September to November.

46. A New species of Genus *Teucrium* (Lamiaceae) in Taiwan

Teucrium taoshanense S.S. Ying 桃山香科科

Teucrium taoshanense S.S. Ying, *sp. nov.* 桃山香科科

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Taoshan (桃山) 1640 m alt. *S. Ying* , *s.n. September 01, 2022* ° (holotype , NTUF) °



Fig. 544. *Teucrium taoshanense* S. S, Ying, inflorescences

Morphology : Annual terrestrial herbs, stem erect to ascending, simple or nearly so, about 30-
-408-

65cm high, green, angular, pubescent when young and turn to glabrous adult. Leaves simple, opposite, along o ovate-oblong, 6-8 cm long, 2.5-3 cm wide, acuminate to acute at apex, attenuate at base, coarsely chartaceous, dentate and ciliate at margins, green surface and pale green beneath, glabrous on both surfaces, midrib and lateral veins (5-6 per side) impressed and elevated beneath. Petioles 3-4.5 cm long, groove above, pubescent.



Fig. 545. *Teucrium taoshanense* S. S, Ying, leaves and inflorescences

Flowers smaller, pink to purplish pink, 2.5-3.5 mm in diameter when opened, in terminal panicle and axillary racemes; raceme 3.5-5 cm long, erect to ascending; peduncles 1-2 cm long, green, pubescent to villose; pedicels 2-3 mm long, pale green, villose, somewhat fleshy; bracts often paired, opposite, ovate, 3-4 mm long, 1.5-1.8 mm wide, acute at apex, scattered with glandular hairs on both surfaces, persistent; calyx globose-campanulate, 2.5-3.2 mm long, 1.8-2.2 mm wide, villose outside and glabrous inside, 5-



Fig. 546. *Teucrium taoshanense* S. S, Ying, inflorescences



Fig. 547. *Teucrium taoshanense* S. S, Ying, close-up of inflorescences and flowers

toothed at apex; the teeth triangular, straight, nearly equal, 0.4-0.5 mm long, acute apex; corolla pink to purplish pink, exserted, 4.5-5.5 mm long, 2.5-3 mm wide, middle lobe largest, nearly circular, obtuse at apex, dark purple plaque at base, lateral lobes smaller, ovate-triangular, obtuse at apex; stamens 4, fertile, slightly exceeding calyx, posteriors longer than anteriors; filaments glabrous to anthers, hairy below; style exceeding corolla tube, glabrous, divided to 2 branches; ovary ovoid, glabrous.

Nutlets obovoid, 1-1.2 mm across, hairy, smooth.



Fig. 548. *Teucrium taoshanense* S. S. Ying, close-up of a flower

Diagnosis.

Teucrium taoshanense is characterized by its simple stem, smaller, pink to purplish pink flowers; panicle terminal and racemose inflorescences; globose-campanulate 5-toothed calyx



Fig. 549. *Teucrium taoshanense* S. S. Ying, habit



Fig. 550. *Teucrium taoshanense* S. S. Ying, the holotype

NTUF-111-071



Fig. 551. *Teucrium taoshanense* S. S. Ying, the holotype

NTUF-111-072

and pink to purplish pink corolla which the middle lobe largest, nearly circular, obtuse at apex, dark purple plaque at base, lateral lobes smaller, ovate-triangular.

Distribution and phenology.

The species is endemic in Taiwan, It is known from medium altitude of 1600-1780 m. of Taoshan (桃山) area, Hoping District (和平區) · Taichung City, central Taiwan ° It was collected at edge of the forest. Its flowering time is August to September, and fruiting time from September to October.



Fig. 552. *Teucrium taoshanense* S. S. Ying, habitat

47. A New species of Genus *Pilea* (Urticaceae) in Taiwan

Pilea taiwanensis S.S. Ying 台灣冷水麻

Pilea taiwanensis S.S. Ying, *sp. nov.* 台灣冷水麻

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉) , Siyuanyakou (思源埡口) 1820 m alt. *S. S. Ying* , *s.n.* September 22, 2022 ° (holotype , NTUF) °



Fig. 553. *Pilea taiwanensis* S. S, Ying, female inflorescences

Morphology : Flowers dioecious: Female plant: Annual terrestrial herbs, stem erect to ascending, simple to branched, 15-35cm high, purple to pale purplish, angular, grooved, slightly fleshy, glabrous. Leaves simple, opposite, oblong to elliptic-oblong, 1.5-2.5 cm long,



Fig. 554. *Pilea taiwanensis* S. S. Ying, leaves

1.2-1.7 cm wide, acute to acuminate at apex, obtuse at base, chartaceous, dentate and ciliate at margins, scattered hirsute on both surfaces, 3-nerved impressed surface and elevated beneath, lateral veins also impressed surface and elevated beneath. Petioles 7-14 mm long, fleshy, pale purplish, grooved above, slightly hirsute at base.

Female flowers smaller, numerous, 1.5-2 mm in diameter when opened, densely arranged on a spike; spikes axillary on leaf-axil, paired, fleshy, 6-9 mm long, glabrous or nearly so; perianth lobes 4, subequal, ovate, 1.5-1.8 mm long, about 0.9 mm wide, white with pink tip, obtuse at apex, glabrous; ovary ovoid, 0.5 mm long and wide, stigma sessile, shortly penicillate; staminodes present, white, scale-like.

Male plants somewhat smaller, often from a colony, stem short, much branched; branches 7-15 cm long, purple to pale purplish, angular, grooved, slightly fleshy, glabrous. Leaves simple, opposite, oblong to ovate-oblong, 0.8-1.3 cm long, 5-9 mm wide, obtuse at

apex, obtuse at base, chartaceous, dentate and ciliate at margins, scattered hirsute on both surfaces, especially on veins; 3-nerved impressed surface and elevated beneath, lateral veins also impressed surface and elevated beneath. Petioles 3-7 mm long, fleshy, pale purplish, grooved above, slightly hirsute at base.



Fig. 555. *Pilea taiwanensis* S. S. Ying, close-up of female inflorescences

Male flowers smaller, numerous, 0.9-1.2 mm in diameter when opened, densely arranged on a spike; spikes axillary on leaf-axil, paired, fleshy, 2.5-4 mm long, glabrous; perianth lobes 4, subequal, ovate, 0.7-0.9 mm long, about 0.7 mm wide, white with pink tip, obtuse at apex, glabrous; stamens 4, filaments inflexed in bud; rudimentary ovary inconspicuous.



Fig. 556. *Pilea taiwanensis* S. S. Ying, close-up of female flowers



Fig. 557. *Pilea taiwanensis* S. S. Ying, male plants



Fig. 558. *Pilea taiwanensis* S. S. Ying, male inflorescences



Fig. 559. *Pilea taiwanensis* S. S. Ying, male inflorescences



Fig. 560. *Pilea taiwanensis* S. S. Ying, the holotype, female plant NTUF-111-073



Fig. 561. *Pilea taiwanensis* S. S. Ying, the holotype, female plant NTUF-111-074

Diagnosis.

Pilea taiwanensis is characterized by its dioecious flowers, paired and axillary spike inflorescences, and the male plants smaller and often from a plant colony.

Distribution and phenology.

The species is endemic in Taiwan, It is known from Siyuanyakou (思源埡口), Tatung Township (大同鄉), I-Lan County, northern Taiwan. ° It was discovered the species on edges of forests at 1850-1950 meters at moist places. Its flowering time is September to October, and fruiting time from September to November.



Fig. 562. *Pilea taiwanensis* S. S. Ying, male plant

48. A New species of Genus *Quercus* (Fagaceae) in Taiwan

Quercus taiwanensis S.S. Ying 台灣橡樹

Quercus taiwanensis S.S. Ying, *sp. nov.* 台灣橡樹

TYPE:TAIWAN. Between Heping Farm (和平農場) and Chang-Ching Cabin (長青山莊), Central Cross-Island Highway, I-Lan Branch 中橫公路宜蘭支線), Heping District (和平區), Taichung City, 1680 m alt. *S. S. Ying*, *s.n.* October 13, 2022. (holotype, NTUF).



Fig. 563. *Quercus taiwanensis* S. S. Ying, branches with fruits

Morphology : Evergreen medium-sized trees, 12-15 m high, trunk straight, much-branched;

Branches erect to ascending, pale brownish to grayish brown, smooth, lenticle conspicuous, glabrous. Leaves simple, alternate, lanceolate to lanceolate-oblong, 6-12.5 cm long, 2-3 cm wide, acuminate at apex, obtuse at base, coriaceous, nearly entire but some spinose-serrate on upper margins, glabrous on both surfaces, lustrous and somewhat dark green surface and pale green beneath, midrib and lateral veins (7-9 per side) impressed surface and elevated beneath. Petioles 1.8-2.6 cm long, terete, pale green, glabrous.



Fig. 564. *Quercus taiwanensis* S. S. Ying, branches and leaves

Female inflorescences solitary, axillary, 2.5-4.5 cm long, 5-6 female flowers; peduncles 2-3.5 cm long, villose, pale black; cupule globose, 0.5-0.6 mm across, enclosing 1/4-1/3 of nut, villose; bracts triangular, adherent, acute at apex, entire at margins; ovary globose, 0.7-0.8 across, glabrous; style 3, 0.5-0.6 mm long; stigmas spot-like, inconspicuous, persistent easily.



Fig. 565. *Quercus taiwanensis* S. S. Ying, female inflorescences



Fig. 566. *Quercus taiwanensis* S. S. Ying, close-up of female inflorescences

Fruits usually 2, paired, rarely 1 or 3 in each infructescence; cupule cupular, 8-11mm across, 7-10 mm long, villose, enclosing 1/3-1/2 nut; bracts 6-9 series, triangular, 0.4 mm long, 0.3 mm wide at base, acute at base, gradually smaller upward. adherent. Nuts globose to ovoid-globose, 1.2-1.7 cm long, 1-1.2 cm across, green, glabrous; scar 5-5.5 mm in diameter; stylopodium 0.9-1.2 mm long.



Fig. 567. *Quercus taiwanensis* S. S. Ying, infructescences

Diagnosis.

Quercus taiwanensis is characterized by its usually 2 paired fruits, rarely 1 or 3 fruits in each infructescence, Cupule cupular, 8-11mm across, 7-10 mm long, villose, enclosing 1/3-1/2 nut; bracts 6-9 series, triangular, 0.4 mm long, 0.3 mm wide at base, acute at base, gradually smaller upward. adherent. Nuts globose to ovoid-globose, 1.2-1.7 cm long, 1-1.2 cm across, green, glabrous.

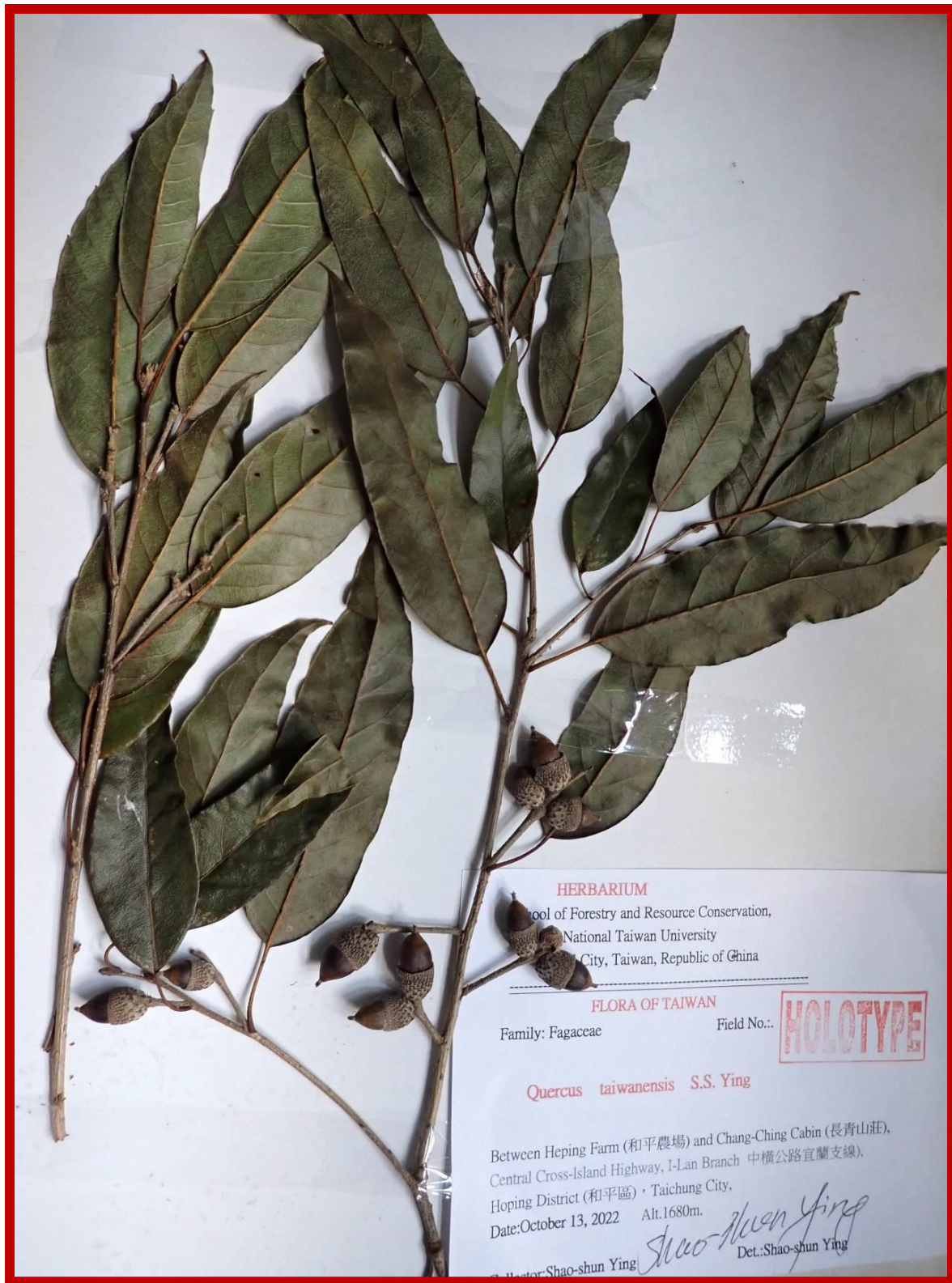


Fig. 568. *Quercus taiwanensis* S. S. Ying, the holotype NTUF-111-075

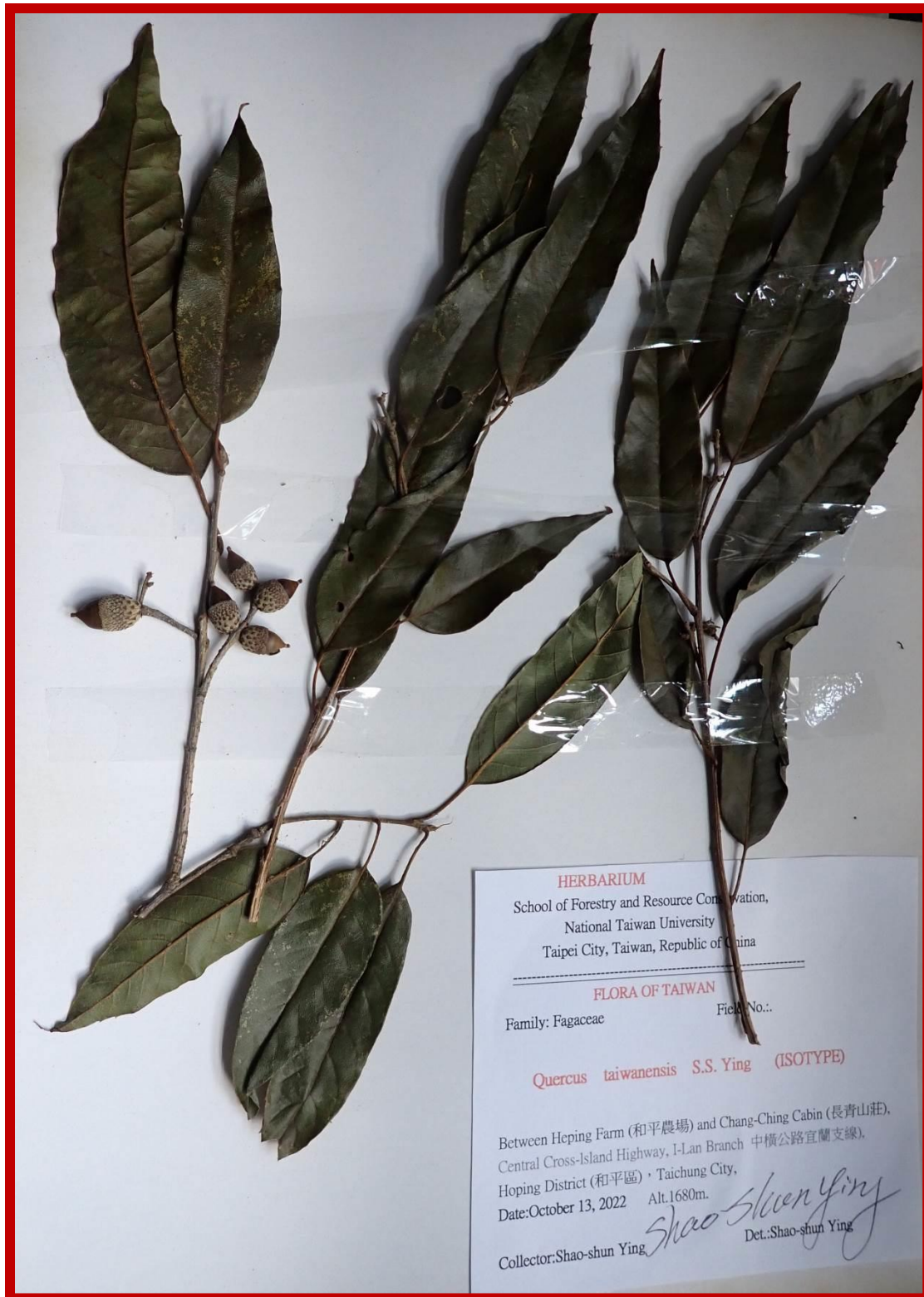


Fig. 569. *Quercus taiwanensis* S. S. Ying, the isotype NTUF-111-076

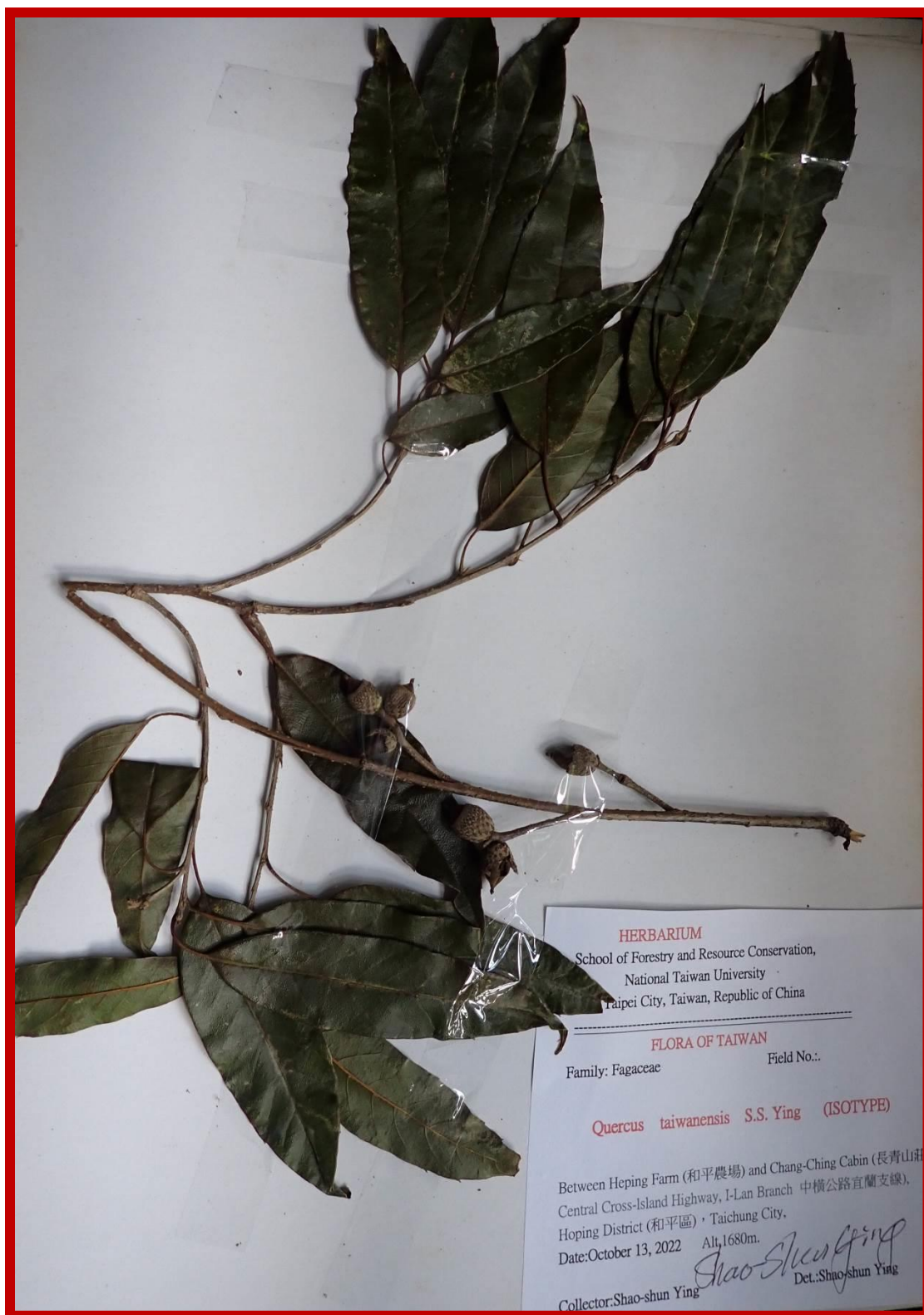


Fig. 570. *Quercus taiwanensis* S. S. Ying, the isotype NTUF-111-077

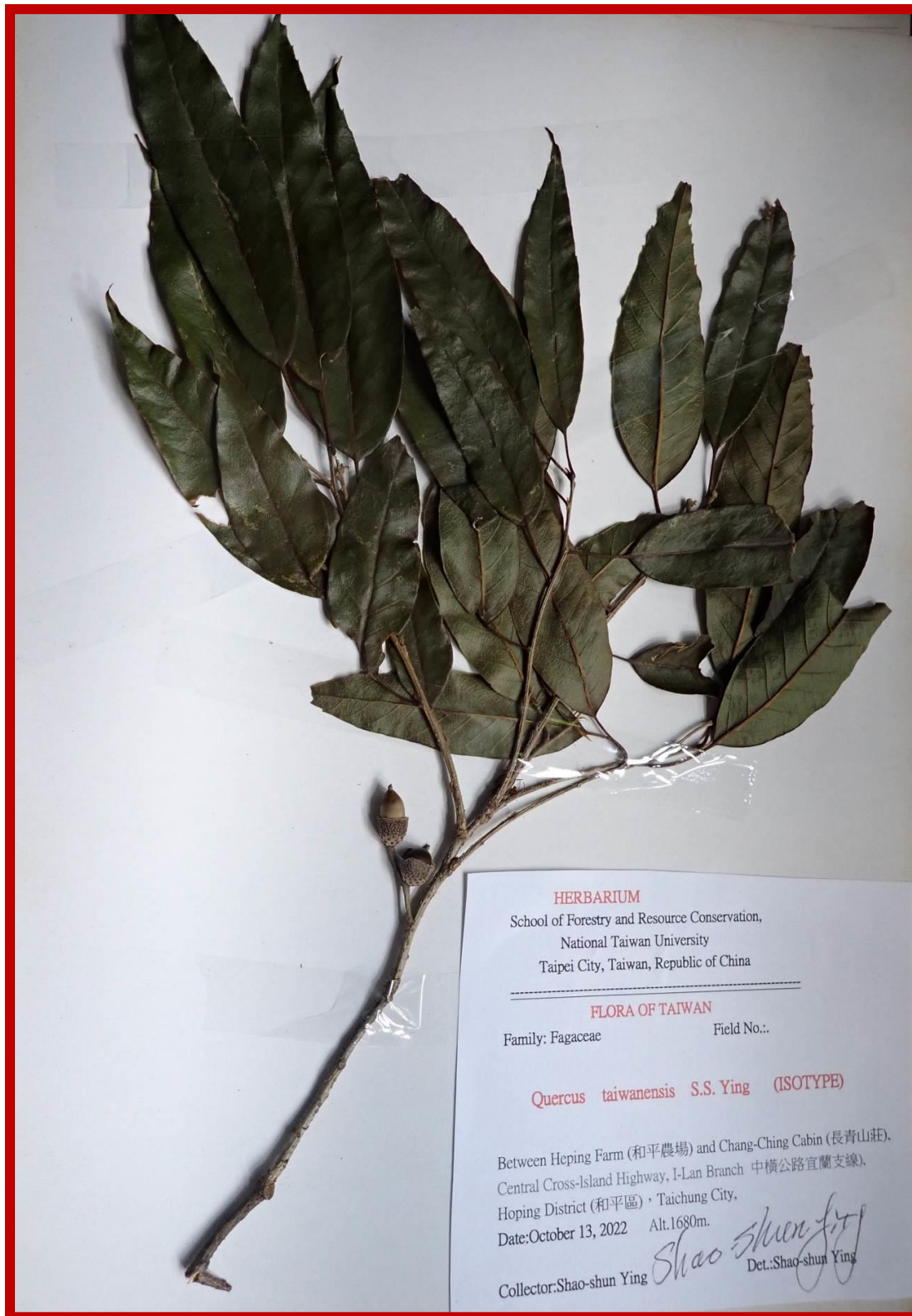


Fig. 571. *Quercus taiwanensis* S. S. Ying, the isotype NTUF-111-078



Fig. 572. *Quercus taiwanensis* S. S. Ying, fruits

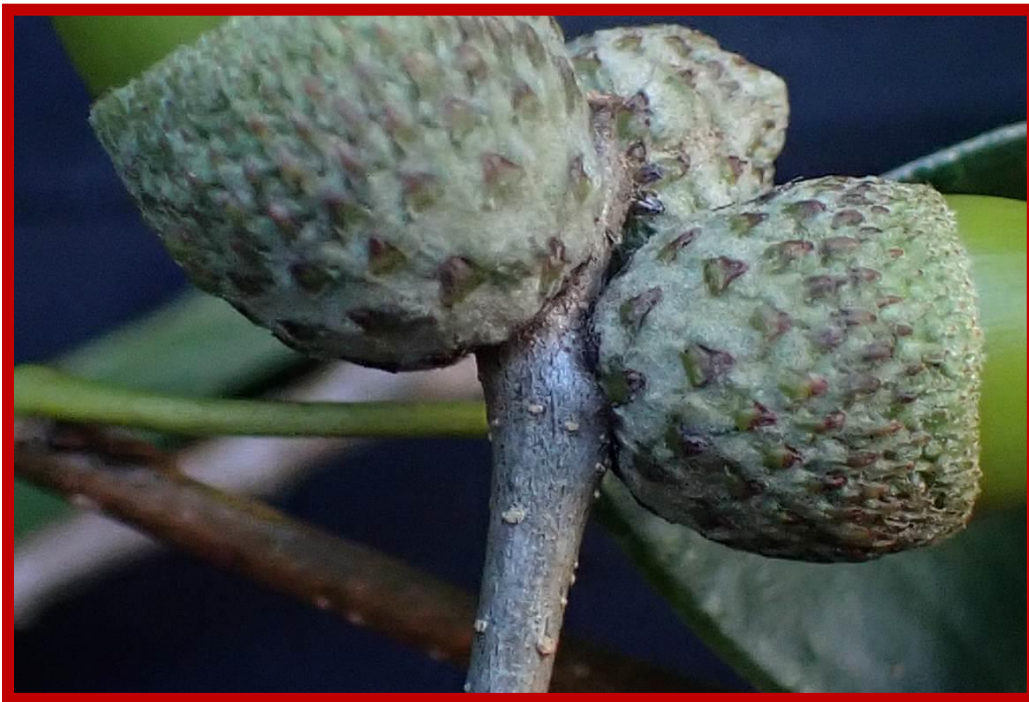


Fig. 573. *Quercus taiwanensis* S. S. Ying, close-up of cupules

Distribution and phenology.

Quercus taiwanensis S.S. Ying is endemic to Taiwan . It is known from broad-leaved forests between Heping Farm (和平農場) and Chang-Ching Cabin (長青山莊), Central Cross-Island Highway, I-Lan Branch (中橫公路宜蘭支線), at elevation between 1600 and 1950 m. Hoping District (和平區) , Taichung City, and flowering time from August to September, and fruiting time from October to November.



Fig. 574. *Quercus taiwanensis* S. S. Ying, habit

49. Another New species of Genus *Callicarpa* (Limaceae) in Taiwan

Callicarpa rubrocarpa S.S. Ying 紅果紫珠

Callicarpa rubrocarpa S.S. Ying, *sp. nov.* 紅果紫珠

TYPE:TAIWAN. Between Heping Farm (和平農場) and Chang-Ching Cabin (長青山莊), Central Cross-Island Highway, I-Lan Branch 中橫公路宜蘭支線), Heping District (和平區), Taichung City, 1750 m alt. *S. S. Ying*, *s.n. October 13, 2022* ° (holotype, NTUF) °



Fig. 575. *Callicarpa rubrocarpa* S. S. Ying, infructescences

Morphology : Small trees, about 3.5 m high; trunk short, much branched; branches erect to ascending, terete, with densely white-brownish short villose. Leaves simple, opposite,



Fig. 576. *Callicarpa rubrocarpa* S. S. Ying, branches with infructescences

opposite, ovate to ovate-elliptic, 8-10 cm long, 4.5-6 cm wide, acuminate to acute at apex, obtuse at base, rough chartaceous, lustrous green surface and pale green with slightly glaucous beneath, midrib and lateral veins (6-7 per side) impressed surface and elevated beneath, very short villose surfaces and , slightly pubescent on beneath, especially on veins; fine serrulate at margins. Petioles 8-13 mm long , short brownish villose.

Flowers small, numerous, 2-3 mm in diameter when opened, axillary, in densely compound- cymos on the upper ward leaf-axils; main inflorescence peduncle 1.2-2.5 cm long, densely covered with short brownish villose, with 4-6 cymose; the peduncle 8-15 mm long, densely covered with short brownish villose; each peduncle with 10-23 flowered in each cymose; pedicels 1.4-2.5 mm long, densely covered with short brownish villose; calyx small,



Fig. 577. *Callicarpa rubrocarpa* S. S. Ying, infructescences



Fig. 578. *Callicarpa rubrocarpa* S. S. Ying, close-up of infructescences

cup-like, 1-1.5 mm long, 4-lobed at apex, persistent; lobes ovate, 0.4-0.5 mm long, obtuse at apex, brownish pubescent outside; corolla tubular, 2-2.5 mm long, 4-lobed at apex; lobes obtuse at apex, slightly reflexed; stamens 4, filaments slender, exserted, 3-4 mm long, glabrous; anthers round, yellow; ovary ovoid, about 1.5 mm across, green, glabrous; style slender, white, same length with stamens, glabrous; stigma disc-like, white.

Fruits small, rounded, 1-1.5 mm in diameter, green at first and then turned to red colour, glabrous, lustrous, 1-1 seed inside; pedicels 1.5-2 mm long, densely covered with short brownish villose.



Fig. 579. *Callicarpa rubrocarpa* S. S. Ying, close-up of fruits, mind calyx persistent

Diagnosis.

Callicarpa rubrocarpa is characterized by its compound- cymos on the upper ward leaf-

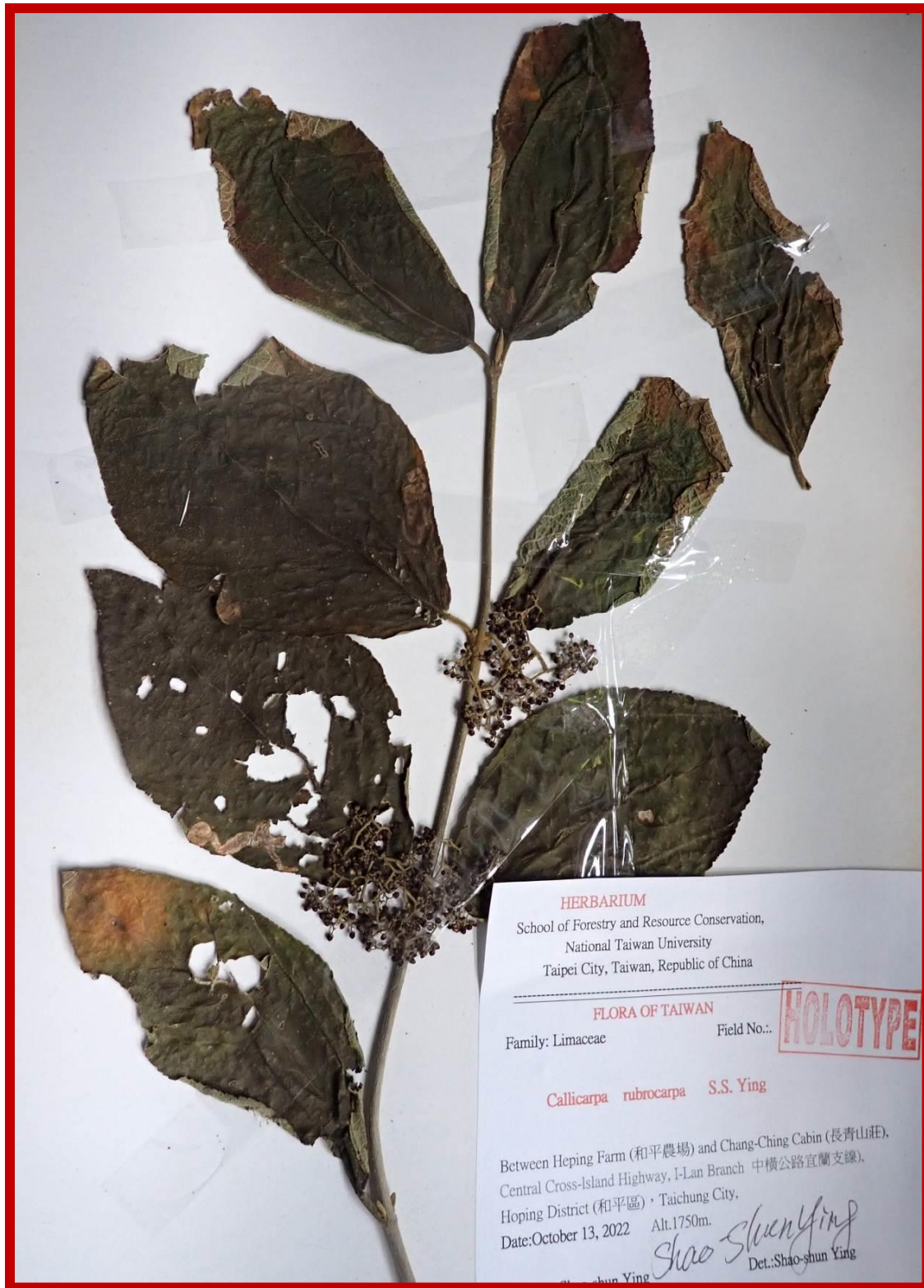


Fig. 580. *Callicarpa rubrocarpa* S. S. Ying, the holotype NTUF-111-079



Fig. 581. *Callicarpa rubrocarpa* S. S. Ying, the holotype NTUF-111-080

axils infructescences, small, rounded, 1-1.5 mm in diameter, green at first and then turned to red colour, glabrous, lustrous fruits and 1.5-2 mm long, densely covered with short brownish villose pedicels.

Distribution and phenology.

Callicarpa rubrocarpa S.S. Ying is endemic to Taiwan. It is known from broad-leaved forests between Heping Farm (和平農場) and Chang-Ching Cabin (長青山莊), Central Cross-Island Highway, I-Lan Branch (中橫公路宜蘭支線), at elevation between 1600 and 1950 m. Heping District (和平區), Taichung City, and flowering time from July to August, and fruiting time from September to October.

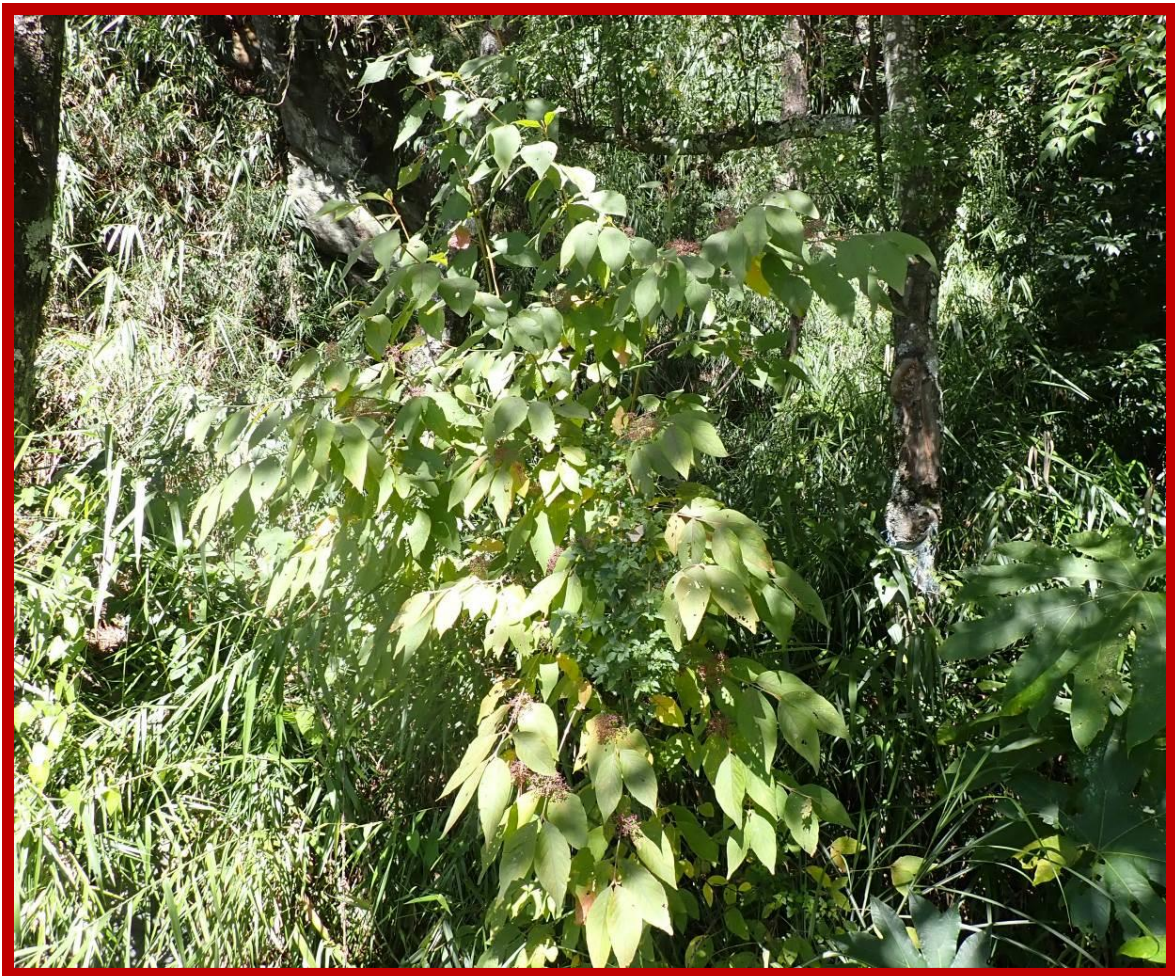


Fig. 582. *Callicarpa rubrocarpa* S. S. Ying, habit and habitat

50. A New species of Genus *Hylodesmum* (Fabaceae) in Taiwan

Hylodesmum taiwanianum S.S. Ying 台灣長柄山螞蝗

Hylodesmum taiwanianum S.S. Ying, *sp. nov.* 台灣長柄山螞蝗

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Lalashan (拉拉山), 1865 m alt.

S. S. Ying , *s.n.* August 18, 2022 ° (holotype, NTUF) °



Fig. 583. *Hylodesmum taiwanianum* S. S, Ying, inflorescence

Morphology : Annual herbs, stem recumbent, slender, 15-35 cm long, green, glabrous. Leaves 3-foliate, alternate, not clustered at apex of stem, leaflets equal, lanceolate to linear-lanceolate, 3.5-5.5 cm long, 1-1.5 cm wide, acuminate at apex, obtuse at apex, chartaceous, entire to inconspicuous dentate at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib and lateral veins (3-4 per side) impressed surface and elevated beneath. Petioles 3-5 cm long, slender, green, glabrous; petioles 3-8 mm long.



Fig. 584. *Hylodesmum taiwanianum* S. S. Ying, habits



Fig. 585. *Hylodesmum taiwanianum* S. S. Ying, stem and leaves

Flowers smaller, white tinged with pink at apex, 5-6 mm in diameter when opened, mostly 3-flowered at each node, in an elongate terminal raceme to lax panicle; inflorescence (peduncle) 17-22 cm long, 5-6-grooved, white pubescent; pedicels 2-3.5 mm long, pubescent; bracts ovate, 3-4 mm long, about 2.5 mm wide, acute at apex; scattered hirsute outside and glabrous inside; calyx campanulate, 2-3 mm long, 4-lobed at apex; lobes ovate, 0.7-0.9 mm long, obtuse at apex; standard hood-like, rounded, 3.5-4.5 mm long, 3.5 mm wide, obtuse at apex, white, shortly clawed at base; wings oblong, 2.5-3.2 mm long, 1.2 mm wide, obtuse at apex, white tinged with pink at apex; keel shorter than wings, obtuse, clawed, not auriculate; stamens monadelphous, divided into 2 bundles at apex; ovary short stipitate, linear, 1.5-2 mm long, glabrous; style curved upward, with a terminal capitate stigma. .



Fig. 586. *Hylodesmum taiwanianum* S. S. Ying, part of inflorescence

Diagnosis.

Hylodesmum taiwanianum is characterized by its annual herbs with recumbent stem, leaflets equal, lanceolate to linear-lanceolate leaves, white tinged with pink at apex and Monadelphous stamens which divided into 2 bundles at apex.

Distribution and phenology.

The species is endemic in Taiwan, It is known from medium altitude of 1800-1910 m.

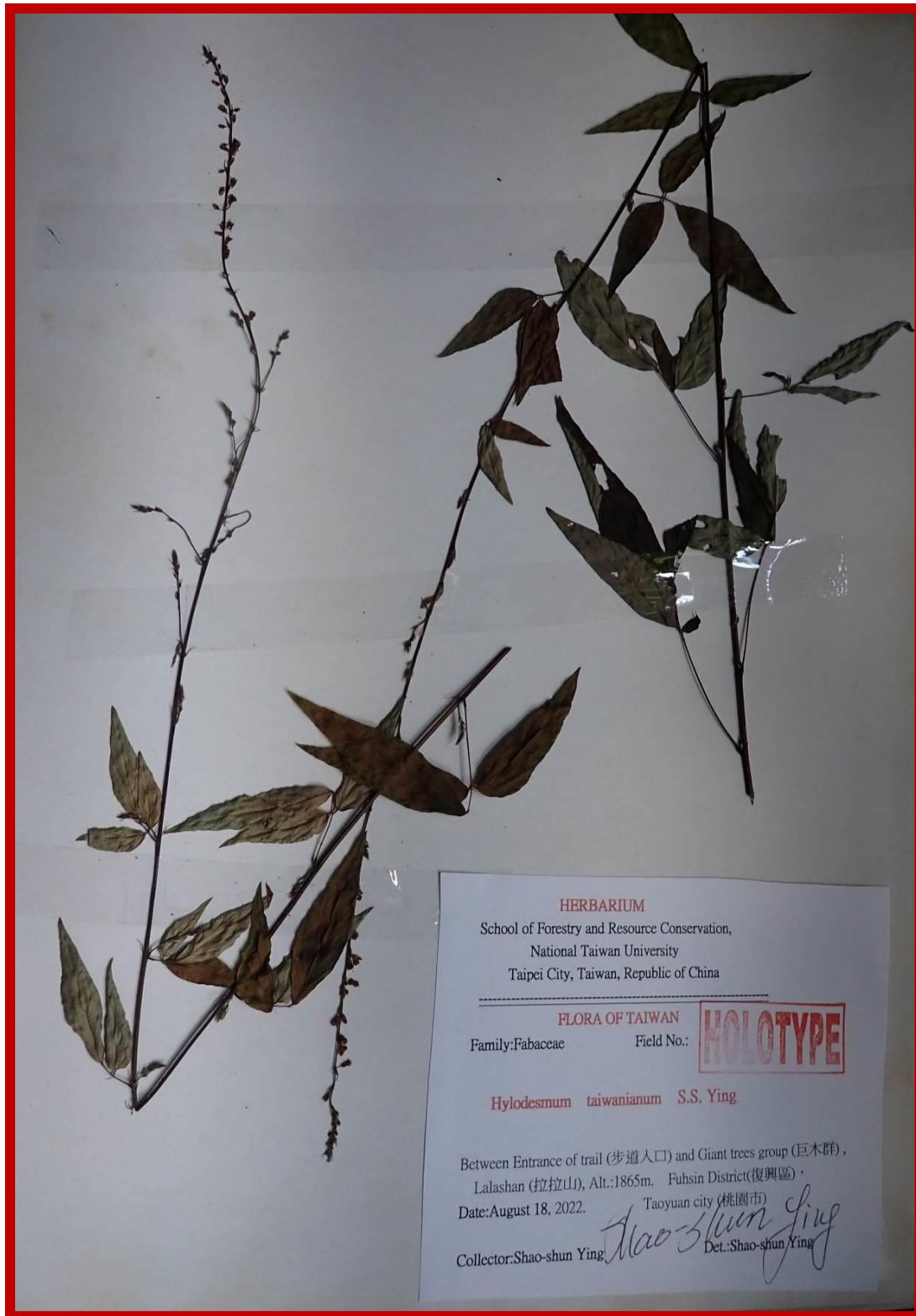


Fig. 587. *Hylodesmum taiwanianum* S. S. Ying, the holotype, NTUF-111-081

of Lalashan (拉拉山) area, Fuhsin District (復興區), Taoyun City, northern Taiwan. It was collected at edge of the forest. Its flowering time is August to September, and fruiting time from September to November.



Fig. 588. *Hylodesmum taiwanianum* S. S. Ying, close-up of flowers

51. A New species of Genus *Allium* (Amaryllidaceae) in Taiwan

Allium taiwanianum S.S. Ying 台灣野韭

Allium taiwanianum S.S. Ying, *sp. nov.* 台灣野韭

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉) , Horen (和仁) , 14 m alt. *S. Ying* , *s.n.* October 27, 2022 . (holotype, NTUF) .

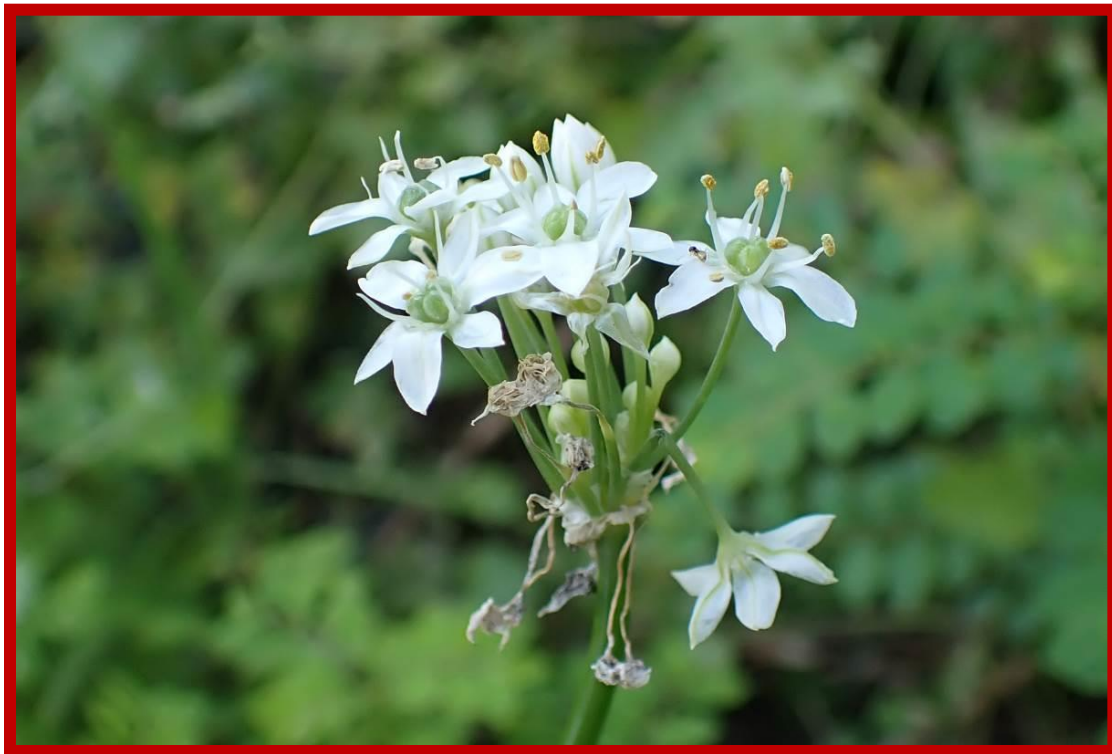


Fig. 589. *Allium taiwanianum* S. S. Ying, close-up of flowers

Morphology : Annual herbs, bulb solitary, small, globose, 8-10 mm long, 6-7 mm across, blackish gray; roots many, from bulb, elongate, 5-8 mm long; fibrous root few. Leaves 2-3, linear, 18-25 cm long, 2.5-3 mm wide, flat, obtuse at apex, attenuate at base, chartaceous, glabrous on both surfaces, green on surface and pale green beneath, midrib and lateral veins inconspicuous; petioles 0.



Fig. 590. *Allium taiwanianum* S. S. Ying, habitat



Fig. 591. *Allium taiwanianum* S. S. Ying, some plants remove out
and *A. taiwanianum*, the whole plant display.

Flowers white, 6-9 mm in diameter when opened, 12-17 in a terminal umbel; scape produced from leaf-fascicled, 35-45 cm long, terete, erect to ascending, green, glabrous, solid, covered with leaf sheaths at base; spathe 2-valved, membranous, persistent; pedicels subequal, 1-1.7 cm long, erect, green, glabrous; bracts small, linear, 2.5-3 mm long, 0.8 mm wide; perianth-segment 6, 2-series, pure white; the outer ones oblong to ovate-oblong, 5-6 mm long, about 3.5 mm wide, acute at apex; inner ones lanceolate to lanceolate-oblong, 4-5 mm long, 2.5 mm wide, acute at apex; stamens 6, connated at base; filaments slender, 5-5-6.5 mm long, white, glabrous, some without anther at apex; anthers reniform, 0.4 mm long, pale yellow; ovary 3-5-celled, compressed-rounded, 2.5-3 mm across, green, emarginate at apex, glabrous; style straight, slender, white, shorter than filaments; stigmas spot-like.

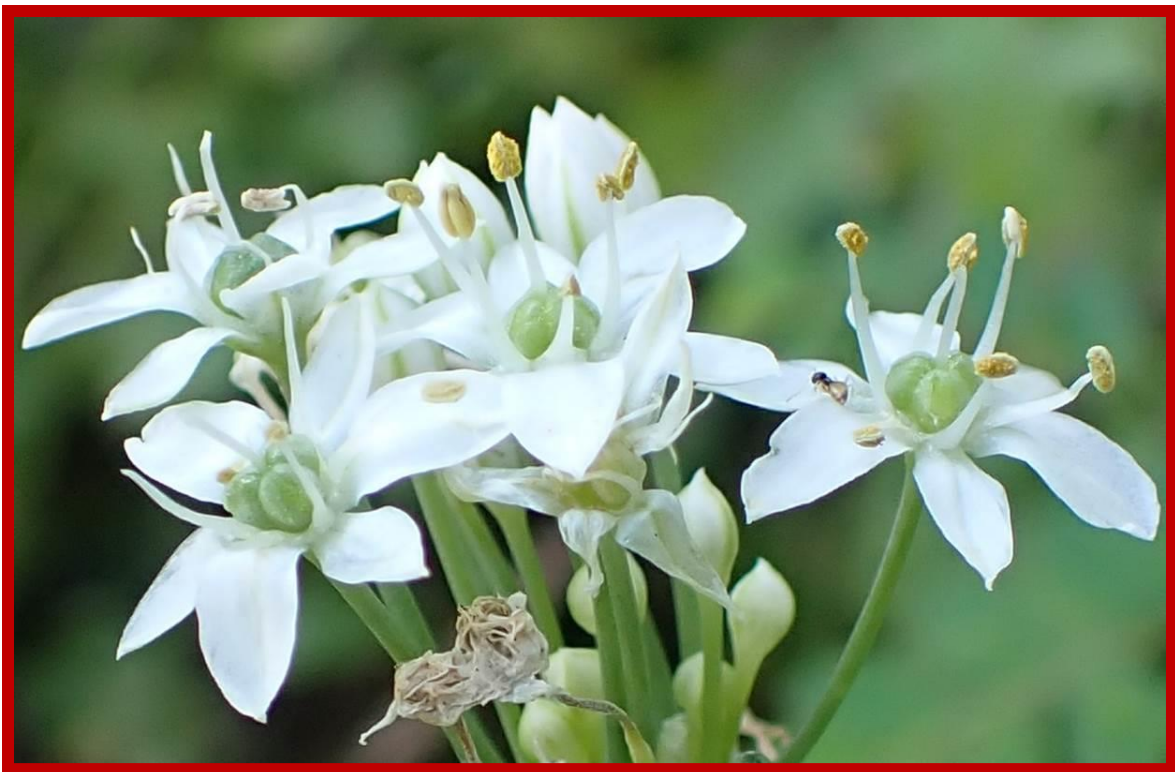


Fig. 592. *Allium taiwanianum* S. S. Ying, close-up of inflorescence

Fruit a capsule.



Fig. 593. *Allium taiwanianum* S. S. Ying, close-up of a flower



Fig. 594. *Allium taiwanianum* S. S. Ying, the whole plant

Diagnosis.

Allium taiwanianum is characterized by its annual herbs with inconspicuous solitary bulb, 2-3 leaves in a fascicle, 12-17-flowered in a terminal umbel, unequal perianth-segments and white filaments and style.

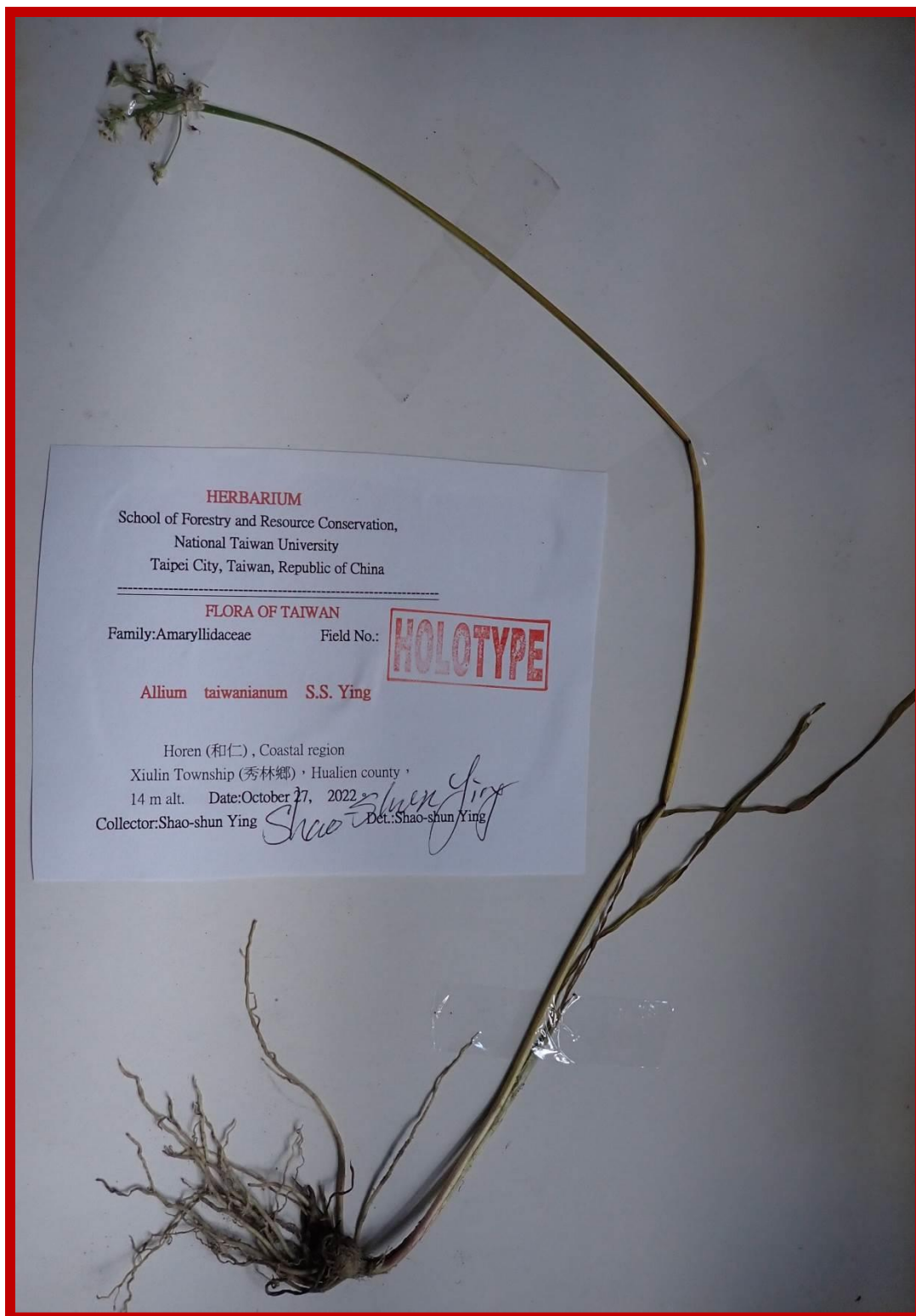


Fig. 595. *Allium taiwanianum* S. S. Ying, the holotyps NTUF-111-082

Distribution and phenology.

The species is endemic in Taiwan, It is known from low altitude of 15-25 m. near to Horen (和仁) , Old Suhua Highway (舊蘇花公路), the sole locality as known the plant grows. It grows at coastal sandy region facing to Pacific Ocean, at Xiulin Township (秀林鄉) , Hualien county. Its flowering time is October, and fruiting time from November to December..



Fig. 596. *Allium taiwanianum* S. S. Ying, bulb and roots

52. Two more New Species of Genus *Elatostema* (Urticaceae) in Taiwan

A.*Elatostema* *tungyanshanense* S.S. Ying 東眼山樓梯草

Elatostema *tungyanshanense* S.S. Ying, *sp. nov.* 東眼山樓梯草

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Tungyanshan (東眼山), 943 m alt. *S. S. Ying* , *s.n. November 10, 2022* . (holotype, NTUF) .



Fig. 597. *Elatostema tungyanshanense* S. S. Ying, habit

Morphology : Annual to binnial herbs, about 7-10 cm long, stem creeping or nearly so, branched at base, green, fleshy, smooth, pubescent; branches short to elongate, 5-7 cm long, procumbent to ascending, pubescent, fleshy, terete. Leaves simple, alternate, distichous,

sessile, nanophyll absent; lamina ovate to ovate-oblong, 1.2-2.5 cm long, 0.4-1.1 cm wide, herbaceous, obtuse at apex, oblique and asymmetrical at base, green surface and pale green beneath, dentate at margins, midrib impressed surface and elevated beneath; lateral veins 2-3 per side, appressed haired surface and scattered sparsely puberulent along midrib and lateral veins beneath; stipules ovate, 1.5-25 mm long, 1-2 mm wide, obtuse at apex, cauduous. Petioles 2-3 mm long, green, grooved, pubescent.



Fig. 598. *Elatostema tungschanense* S. S. Ying, stem and leaves

Flowers monocious, small, many; the male flowers in an axillary discoid inflorescence on upper part of stem and branches usually only 1; the peduncles slender, 0.8-1.2 cm long, green, glabrous to pubescent; inflorescence discoid, 5-6 mm in diameter; bracts 1-2 series, linear to linear-lanceolate, 1.5-1.9 mm long, about 1 mm wide, acute to acuminate at apex,



Fig. 599. *Elatostema tungschanense* S. S. Ying, close-up of male and female inflorescences



Fig. 600. *Elatostema tungschanense* S. S. Ying, close-up of male inflorescences, the female aside

white to pale greenish; each inflorescence with 8-13 flowers; pedicels 1.5-3.5 mm long, pale white to white, glabrous; bracts linear to ovate-linear, 1.5-2 mm long; the marginal flowers with elongate pedicels and central flowers nearly sessile; sepals 4-5, ovate, 1.5-2.5 mm long, 0.8-1.5 mm wide, obtuse at apex, white; stamens 4-5, filaments spread, 1.0-1.4 mm long, glabrous; anthers 0.3 mm long. Pistillate flowers in an axillary discoid inflorescence on lower



Fig. 601. *Elatostema tungschanense* S. S. Ying, close-up of female inflorescences

part of stem and branches usually 3-5 in a stem; the peduncles slender, 0.4-0.9 cm long, green, glabrous to pubescent; inflorescence discoid, 5.5-9 mm in diameter; bracts 1-2 series, linear to linear-lanceolate, 1.5-1.9 mm long, about 1 mm wide, acute to acuminate at apex, white to pale greenish; each inflorescence with 15-27 flowers; pedicels 0 mm long; bracts minute, ovate, 0.5-0.8 mm long; sepals 4-5, ovate, 1.2-1.8 mm long, 0.6-1.2 mm wide, acute and caudate at apex, pale green; ovary ovoid to ellipsoid, 0.2-0.3 mm long, glabrous, stigma 1-2. haired, 0.2-0.3 mm long, caudous.

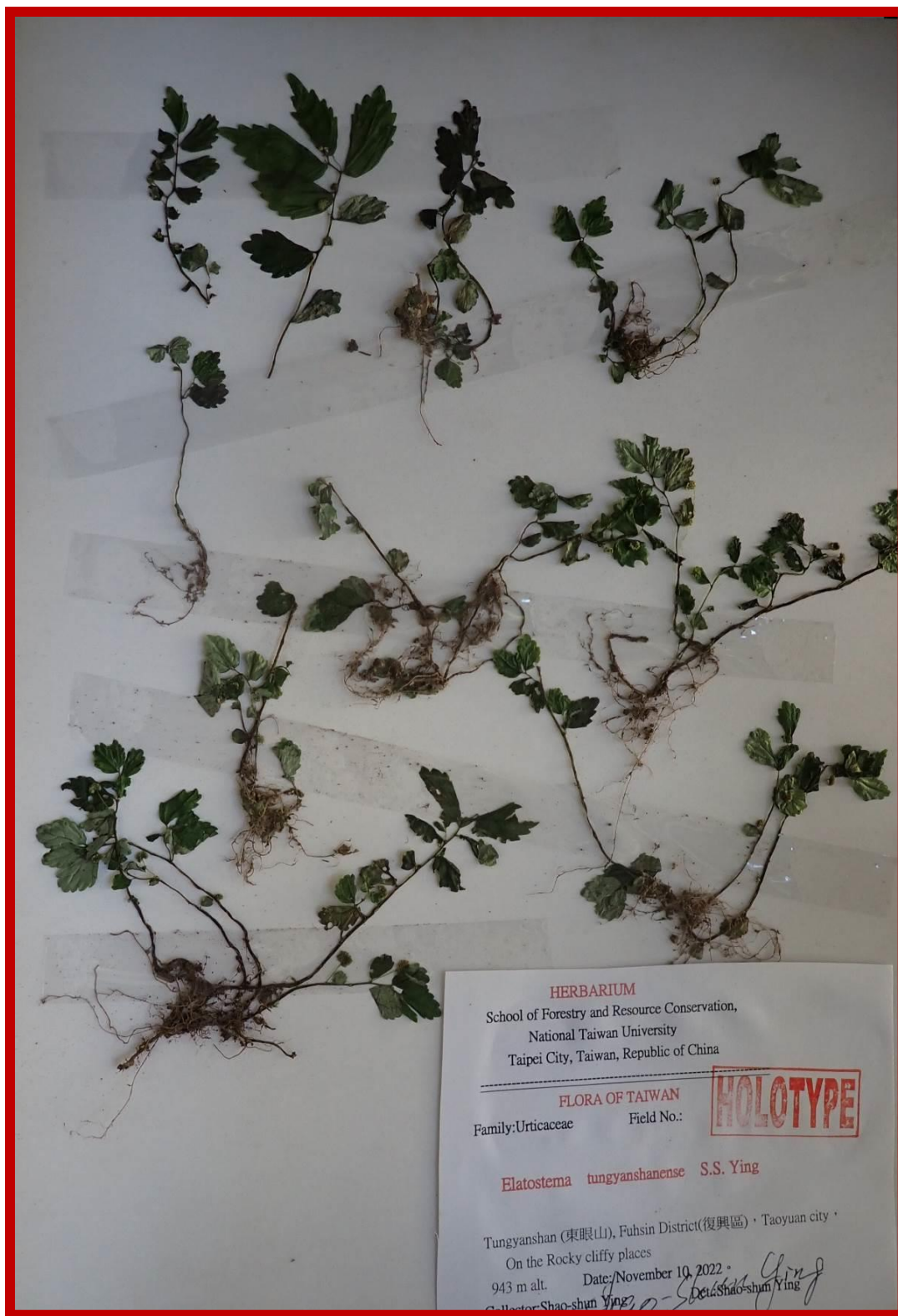


Fig. 602. *Elatostema tuncyanshanense* S. S. Ying, the holotype NTUF-111-083

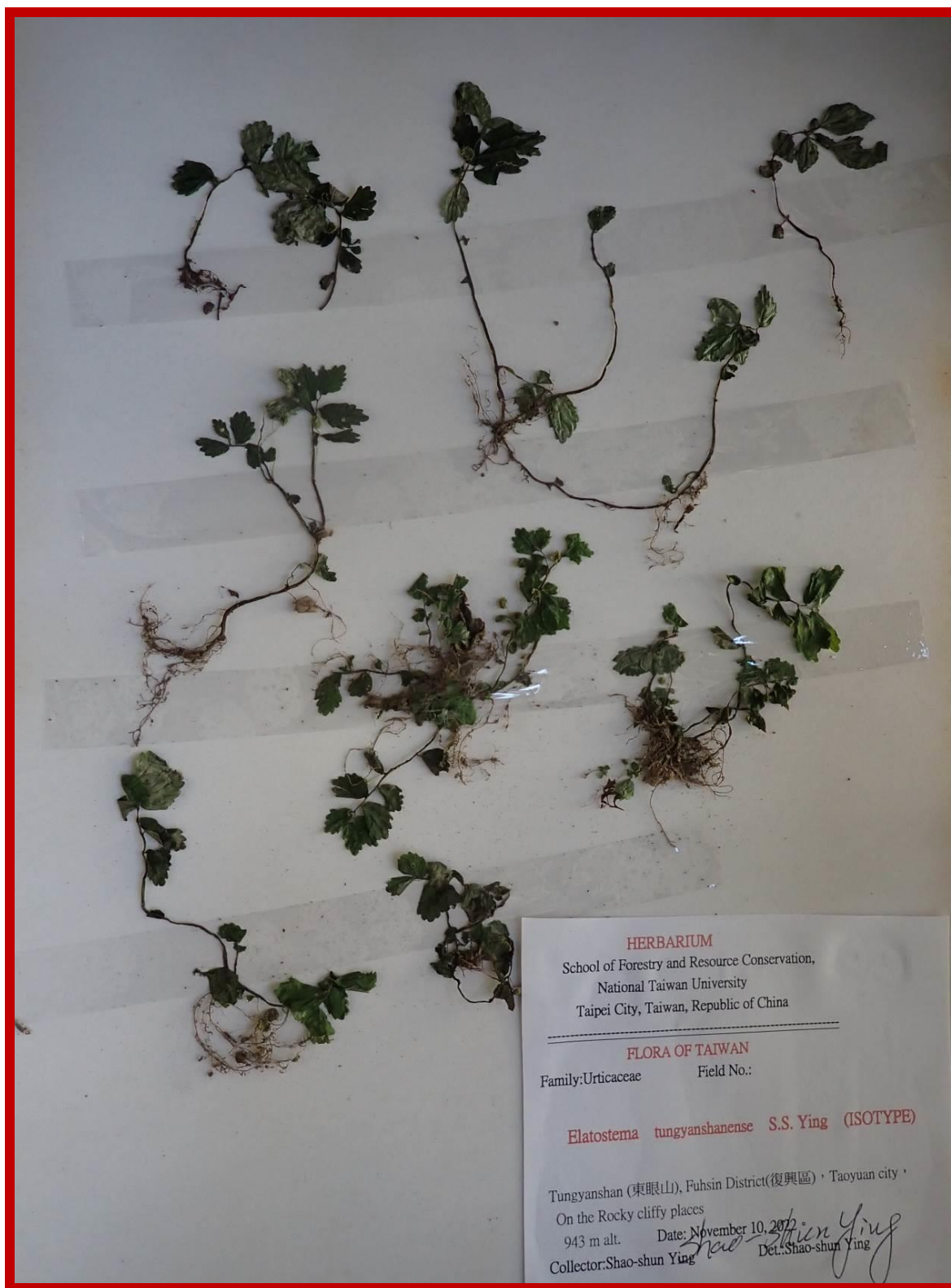


Fig. 603. *Elatostema tungyanshanense* S. S. Ying, the isotype NTUF-111-084



Fig. 604. *Elatostema tungsanense* S. S. Ying, close-up of female inflorescence,
partial flowers opened

Diagnosis.

Elatostema tungsanense is characterized by its monoecious flowers with a male and female discoid inflorescences, the male one only one on the upper part of stem (branches) and female 3-5 on lower part of stem; male inflorescence with 8-13 flowers and the female with 15-27 flowers.

Distribution and phenology.

The species is endemic in Taiwan, It is known from Tungsan (東眼山), Fuhsin District (復興區), Taoyuan city, It was collected on rocky places between 905 and 1000 m altitudes; somewhat rare, and flowering times is from November to December and fruiting time is December.

B.*Elatostema taoyuanense* S.S. Ying 桃園樓梯草

Elatostema taoyuanense S.S. Ying, *sp. nov.* 桃園樓梯草

TYPE:TAIWAN. Taoyuan city, Fuhsin District (復興區), Tungyanshan (東眼山), 1010 m alt. *S. S. Ying*, *s.n. November 10, 2022* ° (holotype, NTUF) °



Fig. 605. *Elatostema taoyuanense* S. S. Ying, habitat

Morphology : Lithophytic annual slightly drooping herbs, about 10-22 cm long, stem solitary, creeping, not branched at base, green tinged with pale purplish at base, fleshy, smooth, terete, glabrous, without winged. Leaves 3-5 on a stem, simple, alternate, remotely distichous; nanophyll absent; lamina oblong to oblong-ovate, uppermost largest and smaller gradually to
-459-

base, 10.5-16.5 cm long, 3.5-6 cm wide, herbaceous, acuminate and caudate at apex, slightly oblique and asymmetrical at base, lustrous green surface and pale green beneath, remotely dentate at margins, obliquely 3-nerved impressed surface and elevated beneath; lateral veins (3-5 per side) impressed surface and elevated beneath, glabrous on both surfaces; stipules minute, ovate, 1.2-1.7 mm long, 0.5-0.8 mm wide, obtuse at apex, caudous. Petioles very short, 2-3.5 mm long, green, fleshy, glabrous or nearly so.



Fig. 606. *Elatostema taoyuanense* S. S. Ying, habit

Flowers white, dioecious, small; female flowers numerous immerse in a fleshy discoid inflorescence, 0.9-1.5 mm in diameter when opened; peduncles 0, sessile; inflorescence discoid, 0.9-1.3 cm in diameter; bracts 10-12 in 1 series, linear to linear-lanceolate, 3.5-4.6 mm long, about 1.2-1.5 mm wide, obtuse at apex, green to pale greenish; each inflorescence with numerous flowers; pedicels 0; bracteoles linear, 0.2-0.3 mm long, about 0.1 mm wide;

sepals 4-5, ovate-triangular, 1.2-1.6 mm long, 0.4-0.6 mm wide, obtuse at apex, white; ovary ovoid to ellipsoid, 0.25-0.3 mm long, glabrous, stigma 1-2 haired, 0.2-0.3 mm long, cauduous. Staminate inflorescence unknown.



Fig. 607. *Elatostema taoyuanense* S. S. Ying, close-up of a inflorescence

Diagnosis.

Elatostema taoyuanense is characterized by its dioecious flowers, only female inflorescences were found, stem solitary, not branched; female inflorescence in a fleshy, sessile, discoid; female flowers very minute, numerous, immerse in a fleshy discoid inflorescence.



Fig. 608. *Elatostema taoyuanense* S. S. Ying, the holotype

NTUF-111-085



Fig. 609. *Elatostema taoyuanense* S. S. Ying, the isotype NTUF-111-086

Distribution and phenology.

The species is endemic in Taiwan, It is known from Tungyanshan (東眼山), Fuhsin District (復興區), Taoyuan city, It was collected on rocky places between 955 and 1030 m altitudes; somewhat rare, and flowering times is from November to December and fruiting time is December.



Fig. 610. *Elatostema taoyuanense* S. S. Ying, the habit

53. Taxonomic Notes on the Family Orchidaceae in Taiwan (2)

A. One New variety of *Vanda lamellata* (Orchidaceae) in Taiwan

1. *Vanda lamellata* var. *taiwuensis* S.S. Ying

Vanda lamellata var. *taiwuensis* S.S. Ying, sp. nov. 大武萬代蘭

TYPE: TAIWAN. Taitung county, Tawu Township (大武鄉), 421 m alt. cultivated in Taipei
S. S. Ying, s.n. March 22, 2022. (holotype, NTUF).



Fig. 611. *Vanda lamellata* var. *taiwuensis* S. S. Ying, close-up of flowers

Morphology : Epiphytic, stem 15-24 cm long, 1-1.5 in diameter, green, glabrous, erect to ascending. Leaves simple, alternate, distichous, lanceolate, 18-23 cm long, 1.2-1.5 cm wide, obtuse and unequal at apex, sheathed at base, coriaceous, lustrous green surface and slightly palr green beneath, glabrous on both surface



Fig. 612. *Vanda lamellata* var. *tawuensis* S. S. Ying, habit, cultivated in Taipei city

Flowers 5-6, 3-3.5 cm in diameter when opened, scentless, in a axillary racemose; peduncles 8-11 cm long, rachis not distinctly zigzag, 5-7 cm long; bracts linear, 1-1.5 mm long, cauduous; pedicels with ovaries 1.5-2 cm long, white tinged with pink, glabrous; dorsal sepals spatulate, 1.8-2.2 cm long, 6-8 mm wide, obtuse at apex, narrow and truncate at base, white with a pale brown large plaque at base, glabrous; lateral sepals oblong to ovate-oblong, 1.4-1.8 cm long, 7-10 mm wide, obtuse at apex, truncate at base, white tinged with green, pale brown large plaque and spots from middle half to base, glabrous; petals broadly spatulate, 1.3-1.5 cm long, 8-11 mm wide, obtuse at apex, attenuate at base, white with some brownish stripes at base, glabrous; lip 3-lobed, spurred;



Fig. 613. *Vanda lamellata* var. *tawuensis* S. S. Ying, lip and column



Fig. 614. *Vanda lamellata* var. *tawuensis* S. S. Ying, close-up of flowers

mid-lobe oblong, 9-11 mm long, 4-5 mm wide, slightly 2-lobed at apex, 2 longitudinal rings from base to middle, pink with a white apex, glabrous; lateral lobes erect, ovate, 2.5-3 mm long, about 1.5-2 mm wide, obtuse at apex, white scattered white blackish spots and with 2 brownish stripes of junctions between mid-and lateral lobes; spur conical 2.5-3 mm long, somewhat parallel with ovary, brownish; column 3.5-4 mm long, white with a pink apex; anther-cap yellow to pale yellow, rectangular, 1.5-2 mm wide; pollinia 2, yellow, waxy, sulcate; stipe white, shorter than pollinia, transparent; viscidium white and transparent.



Fig. 615. *Vanda lamellata* var. *tawuensis* S. S. Ying, close-up of lip and column

Diagnosis.

The variety was bought from an indigenous people at Tawu, Taitung county, he said, it is native to forests near to Tawu area, and cultivated in Taipei city, my house garden. , .

The variety differ typical variety in having rather few, scentless and smaller flowers, dorsal sepal spatulate and lateral sepals oblong to oblong to ovate-oblong, oblong mid-lobe and ovate lateral lobes of lip, and colour and plaque, stipes and spots on flower



Fig. 616. *Vanda lamellata* var. *taiwuensis* S. S. Ying, the holotype NTUF-111-0087-



Fig. 617. *Vanda lamellata* var. *tawuensis* S. S. Ying,
close-up of anther-cap and pollinia

are also not like the typical phase

Distribution and phenology.

Vanda lamellata var. *tawuensis* S.S. Ying is endemic to Taiwan ° It is known from broadleaves forests at Tawu township (大武鄉) at elevation between 160 and 350 m. , Taitung County, and flowering time from late March to April.



B.A New combination of Genus *Kuhlhasseltia* (Orchidaceae) in Taiwan

Kuhlhasseltia gouanyuanensis (S.S. Ying) S.S. Ying, *comb. nov.* 關原全唇蘭

Vexillabium (*Odontochilus*) *gouanyuanensis* S.S. Ying, New Taxa & New Names
4:309 (2021).



Fig.618. *Kahlhasselia gouanyuanensis* (S. S. Ying) S.S. Ying

Distribution and phenology.

The species is endemic in Taiwan, It is known from on forest floor of a coniferous and broadleaved mixed forest (*Picea morrisonicola* Hayata, *Pinus taiwanensis* Hayata and *Quercus semecarpifolia* Sm.) at the elevation between 2300-2500m near to Guanyuan area(關原) Hualien county , eastern Taiwan ° Its flowering time is August to September and fruiting September to October.

C. One New species of Genus *Epipogium* (Orchidaceae) in Taiwan

Epipogium lalashanense S.S. Ying

Epipogium lalashanense S.S. Ying, sp.nov. 拉拉山虎舌蘭

TYPE: TAIWAN. Taoyuan city, Fuhsin District (復興區), Lalashan (拉拉山), 1953 m alt.

S. S. Ying, s.n. June 17, 2022. (holotype, NTUF).



Fig. 619. *Epipogium lalashanense* S. S. Ying, the habit

Morphology : Holomycotrophic, emerging above-ground only when in flower. Rhizome tubular, goobose, 2-2.5 cm long, 1.5-2 cm in diameter, fleshy, soil-like colour to pale white, the surface smooth; scape erect, 35-40 cm long, fleshy, hollow, glabrous, siliver-white; cataphylla single, basal, tube-like, 5-6 mm long, somewhat transparent, truncate at apex; sterile bracts 2-3, scale-like, ovate-lanceolate, 8-12 mm long, 2-4 mm wide, acuminate at apex, amplexual at base; rachis 6-8 cm long,



Fig. 620. *Epipogium lalashanense* S. S. Ying, the inflorescencet



Fig. 621. *Epipogium lalashanense* S. S. Ying, close-up of flower

Flowers 6-8 in each scape; flowers nodding, somewhat widely opened, 6-9 mm in diameter when opened, silver-white; bracts ovate to ovate-lanceolate, 5-6.5 mm long, 2-3 mm wide, acute to acuminate at apex, amplexicual at base, white, semi-transparent; pedicels 4-5 mm long, glabrous; ovaries prominent, ovoid, 4.5-5.0 mm long, pure white, smooth, without any grooved, glabrous; sepals equal, lanceolate, 8-10 mm long, 1.5-2 mm wide, acuminate at apex, petals lanceolate, 7.5-9 mm long, 1.5-2 mm wide, obtuse at apex; lip spurred, adnated at the column base, ovate, 9-11 mm long, 5-6.5 mm wide, somewhat concave, acuminate at apex, dentate at half-upper margins, without any papillose, spots and markings, transparent; spur prominent, 3.5-4.5 mm long, club-shaped, drop-like at apex; column 2.5-3.5 mm long, helmet-like at apex; stigma situated under anther directly. pollinia 2, powdery. ,



Fig. 622. *Epipogium lalashanense* S. S. Ying, the holotype, NTUF-111-088



Fig. 623. *Epipogium lalashanense* S. S. Ying, close-up of bract and flower

Diagnosis.

The species somewhat near to *Epipogium roseum* (D. Don) Lindl in general appearance, but our species differs in having smooth tubular rhizome, few silver-white flowers, nearly equal sepal and petals and ovate, somewhat concave, acuminate at apex, dentate at half-upper margins, without any papillose, spots and markings, transparent lip.

Distribution and phenology.

Epipobium lalashanense S.S. Ying is endemic to Taiwan ° It is known 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 on the rich roam soil on mountain slope of hiking trail , at between 1900 and 1950 m elevation and flowering time from June to July.



Fig. 624. *Epipogium lalashanense* S. S, Ying, close-up of rhizome

D. One New species of Genus *Rhomboda* (Orchidaceae) in Taiwan

Rhomboda lalashanensis S.S. Ying

Rhomboda lalashanensis S.S. Ying, sp. nov. 拉拉山角唇蘭

TYPE: TAIWAN. Taoyuan city, Fuhsin District (復興區), Lalashan (拉拉山), 1940 m alt.

S. S. Ying, s.n. September 15, 2022. (holotype, NTUF).



Fig. 625. *Rhomboda lalashanensis* S. S. Ying, the plant

Morphology : Terrestrial, roots fleshy, several, somewhat hairy; stem erect, 8-12 cm long with scape), erect to ascending, pale purpleish, glabrous at base (below the part of leaves, 2-3 cm long). Leaves 2, simple, alternate, oblong to oblong-lanceolate, 2.5-, 8-15 mm wide, -478-



Fig. 626.*Rhomboda lalashanensis* S. S, Ying, roots and basal stem



Fig. 627.*Rhomboda lalashanensis* S. S, Ying, leaves

chartaceous, acute at apex, sheath and amplexicaul at base, entire at margins, lustrous green and with one central white stripe, pale green beneath, glabrous on both surfaces, midrib and lateral veins inconspicuous; sheathes 1.2-1.8 cm long, pale purplish or nearly so, slightly winged, entire, glabrous.



Fig. 628. *Rhomboda lalashanensis* S. S. Ying, inflorescence

Flowers 5-6, smaller, not widely opened, 2-2.5 mm in diameter when opened, white tinged brownish purple at apex, in a terminal spike; scape 6-7.5 cm long, erect to ascending, white hairy all over, with a bract at base; bract ovate, 4-5 mm long, about 3 mm wide, acute at apex, pale green, glabrous; floral bracts at base of ovaries, lanceolate to ovate-lanceolate, 3.5-4.2 mm long, about 1.5 mm wide, acute at apex, villous outside and glabrous inside; ovaries cylindrical, 6-9 mm long, erect, villous; dorsal sepal ovate, 1.5-2 mm long, about 1-1.2 mm wide at base, pale yellow with a purplish tip, acute at apex, hirsute outside and glabrous inside; lateral sepals attached with petals, not spreading, ovate to ovate-oblong, 1.4-2.1 mm long, 1.1-



Fig. 629. *Rhomboda lalashanensis* S. S. Ying, flowers, mind lateral sepals not spreading

1.2 mm wide, acute at apex; petals ovate, 1.2-1.8 mm long, 1.2-1.4 mm wide, acute at apex, pale yellow with purplish tip; lip included, ovate to oblong-ovate, 1-1.5 mm long, 0.9-1.2 mm wide, white tinged with purplish, 3-lobed from apical part, saccate at base; lateral lobes somewhat erect, minute; midlobe ovate to rounded, 0.4 mm long, convolute; sac with 2 compressed protuberance within; disc with 2 parallel combined ridges along midrib; column 0.8-0.9 mm long, with 2 winged-like parallel appendages bilaterally; anther- cap ovate; pollinia 2.

Diagnosis.

The species somewhat near to *R. tokioi* (Fukuyama) Ormerod in general appearance, but our species differs it in having smaller habit, smaller and fewer flowers, and

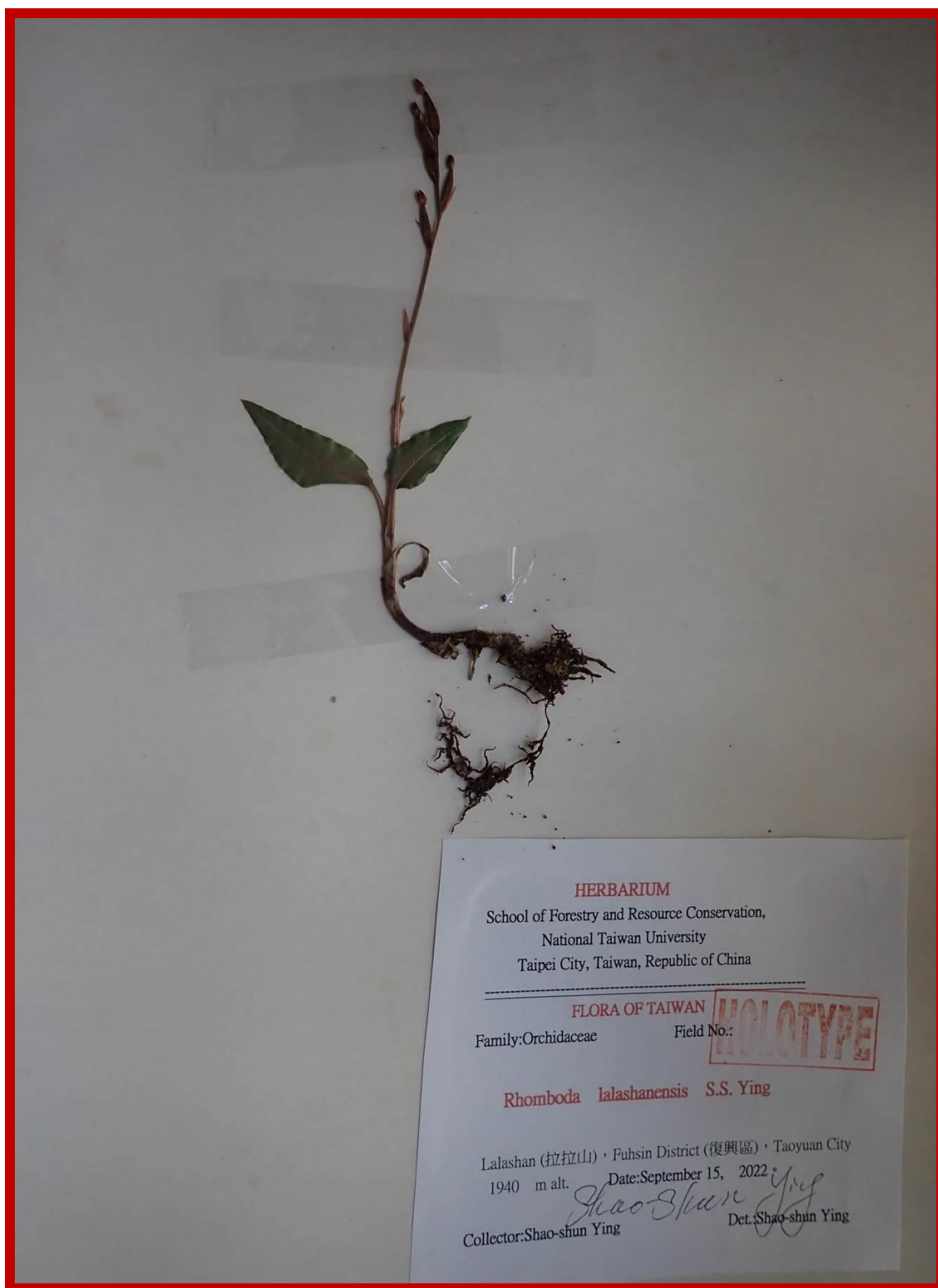


Fig. 630. *Rhomboda lalashanensis* S. S. Ying, the holotype NTUF-111-089

lateral sepals not spreading.

Distribution and phenology.

Rhomboda 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 discovered the species under *Chamaecyparis formosensis* forestst at elevations of 1900-2050 meters. Its flowering time is September to October..



Fig. 631. *Rhomboda lalashanensis* S. S, Ying, close-up of flowers



Fig. 632. *Rhomboda lalashanensis* S. S, Ying, fclose-up of young fruits

54. Taxonomic Notes on the Family Asteraceae in Taiwan (3)

A. Nine New Species of Asteraceae in Taiwan

1. *Ixeris hopingtunnelensis* S.S. Ying

Ixeris hopingtunnelensis S.S. Ying, sp.nov. 和平隧道兔兒菊

TYPE: TAIWAN. Hualien county, Xiulin Township (秀林鄉), Between Hoping Tunnel (和平隧道) and Hochung Tunnel (和中隧道), Old Suhua Highway (舊蘇花公路) 63m alt. *S. Ying*, s.n. December 09, 2021. (holotype, NTUF).



Fig. 633. *Ixeris hopingtunnelensis* S. S. Ying, the capitula

Morphology : Perennial herbs, roots somewhat ligneous, 4-6.5 cm long, 2-3 mm across, fibrous roots few, slender. stem short, 1.5-2 cm long, glabrous, without branches. Leaves

radical, rosulate-like, spatulate in outline, 5-11 cm long, 1.5-2.5 cm wide, obtuse at apex, attenuate at base, pinnatisect at margins, green to pale green surface, pale green beneath, glabrous on both surfaces, midrib impressed surface and elevated beneath, lateral veins inconspicuous; pinnae 6-12 per side, oblong, lanceolate to triangular, serrulate at margins, terminal one largest, 8-12 mm long, 2.5-4 mm wide, obtuse at apex; the others 5-11 mm long, 1-2 mm wide, obtuse to acute at apex; petioles 1.5-2.5 cm long, somewhat winged, glabrous.



Fig. 634. *Ixeris hopingtunnelensis* S. S. Ying, flowering plant,
mind the pinnected leaves

Capitula 2-6, yellow, 1.5-2.3 cm in diameter when opened, in terminal cymes; scape produced from base of stem, 6-13 cm long, slender, erect to ascending, glabrous; basal



Fig. 635. *Ixeris hopingtunnelensis* S. S. Ying, flowering plant,
mind the pinnected leaves



Fig. 636. *Ixeris hopingtunnelensis* S. S. Ying, the capitum

bracts somewhat leaf-like, 3.5-4.5 cm long, 1.5-2 cm wide, obtuse at apex, perfoliate at base; upper bracts linear, 1.3-1.9 cm long, 1.5 mm wide, acuminate at apex, glabrous; pedicels 1.5-2.5 cm long, green, glabrous; phyllaries 2-series, the outer series basal, triangular, 2.5-4.5 mm long, 1.5-2 mm wide, acute at apex; inner series lanceolate, 7-10 mm long, 2 mm wide, green but slightly purplish at apex, glabrous; florets 15-22, spatulate, 0.8-1.2 cm long, 4-4.5 mm wide, truncate with 5-dentate at apex, attenuate at base, bright yellow inside, pink to yellow tinged with pink outside; anther tubes 4-5.5 mm long, blackish; style 2-pobed at apex, yellow.

Achenes fusiform, 3-4 mm long, with 10 ribs, attenuate into filiform about 2 mm beak; pappus white, 5-7 mm long, bristles scabrid.



Fig. 637. *Ixeris hopingtunnelensis* S. S. Ying, inflorescence, mind bracts



Fig. 638. *Ixeris hopingtunnelensis* S. S. Ying, mind 2-series phyllaries



Fig. 639. *Ixeris hopingtunnelensis* S. S. Ying, mind pink outside surface of florets



Fig. 640. *Ixeris hopingtunnelensis* S. S. Ying, the holotype

NTUF-111-090

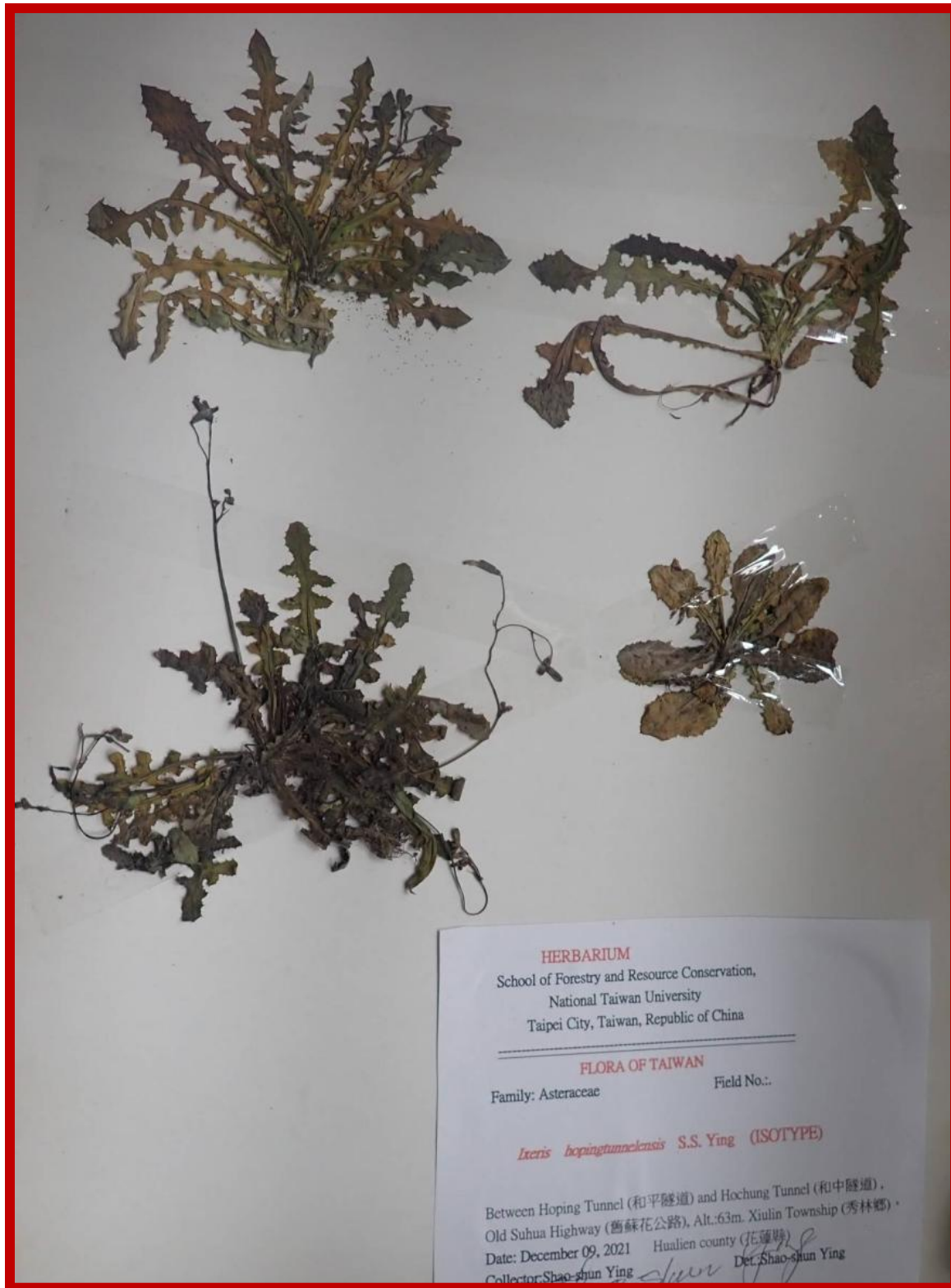


Fig. 641. *Ixeris hopingtunnelensis* S. S. Ying, the isotype NTUF-111-091

Diagnosis.

Ixeris hopingtunnelensis is closely allied in *I. chinensis*. It differs in having a pinnatisect leaves, few capitula, , 2-series phyllaries, and 15-22 bright yellow inside, pink to yellow tinged with pink outside florets.



Fig. 642. *Ixeris hopingtunnelensis* S. S. Ying, the habitat

Distribution and phenology.

The species is endemic in Taiwan, It is known from low altitude of 50-100 m. Between Hoping Tunnel (和平隧道) and Hochung Tunnel (和中隧道) , Old Suhua Highway (舊蘇花公路), the sole locality as known the plant grows. It grows at limestone rocky cliff facing to Pacific Ocean, at Xiulin Township (秀林鄉) , Hualien county. Its flowering time is December to January, and fruiting time from December to January..

2. *Ainsliaea lalashanensis* S.S. Ying

Ainsliaea lalashanensis S.S. Ying, sp.nov. 拉拉山鬼督郵

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興鄉) , Between Entrance of trail (步道入口) and Giant trees group (巨木群) , 1953 m alt. *S. S. Ying* , *s.n. January 27, 2022* .
(holotype, NTUF) .



Fig. 643. *Ainsliaea lalashanensis* S. S. Ying, the plant

Morphology : A perennial herb, with scape about 9-25 cm high; Stem short, 1.5-2.5 cm long, green to greenish brown, glabrous or nearly soous. Leaves 4-6 in a rosulate, cordate to cordate-ovate, 3-5 cm long, 1.5-3.5 cm wide, acuminate and with acaudate at apex, obtuse to slightly cordate at base, chartaceous, serrulate at margins, lustrous green surface, pale green beneath, 3-nerved impressed surface and elevated beneath, glabrous on both surfaces; petioles 8-20 mm long, terete, green, glabrous.

Scape from leaf-clusterous, erect or ascending, 4-20 cm long, erect to ascending, green, glabrous, with 8-15 capitula in a racemose arrangement; pedicels 2-3 mm long,



Fig. 644. *Ainsliaea lalashanensis* S. S. Ying, leaves

glabrous or nearly so, without bracts; involucre cylindrical , 7-9 mm long; phyllaries many in 5-seriate, green, green, glabrous, the lowest one smaller, ovate-triangular, 1-1.5 mm long,



Fig. 645. *Ainsliaea lalashanensis* S. S. Ying, part of inflorescence



Fig. 646. *Ainsliaea lalashanensis* S. S. Ying, close-up of capitula



Fig. 647. *Ainsliaea lalashanensis* S. S. Ying, infructescence



Fig. 648. *Ainsliaea lalashanensis* S. S. Ying, close-up of an anther



Fig. 649. *Ainsliaea lalashanensis* S. S. Ying, a smaller plant with inflorescence



Fig. 650. *Ainsliaea lalashanensis* S. S. Ying, the habitat

acute at apex, the upper ones lanceolate, 5-7 mm long, acuminate at apex; Florets 3, hermaphrodite; corolla 8-10 mm long, white, deeply 5-lobed; the lobes linear, 5.4-6 mm long, 1-1.5 mm wide, somewhat reflexed at apex; stamens extend, 3-4 mm long, anthers rounded, pink, 2-2.5 mm long, apical anther appendages ovoid, obtuse at apex, about 1 mm long; style 8-11 mm long, 2-branched at apex.

Achenes cylindrical, 5-6 mm long, brownish, 9-10 nerved, hirsute; pappus bristles, ca. 25-32, 8-12 mm long, brownish.



Fig. 651. *Ainsliaea lalashanensis* S. S. Ying, the habitat



Fig. 652. *Ainsliaea lalashanensis* S. S. Ying, the holotype, NTUF-111-092
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Fig. 653. *Ainsliaea lalashanensis* S. S. Ying, the isotype, NTUF-111-093

Diagnosis.

The species is characterized by its smaller plant with cordate leaves, 8-15 capitula on a scape and anther cylindrical, 5-6 mm long, brownish, 9-10 nerved, hirsute; pappus bristles, ca. 25-32, 8-12 mm long, brownish.

Distribution and phenology.

Ainsliaea lalashanensis S.S. Ying is endemic to Taiwan. It is known 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 on the limestone on mountain slope of hiking trail, at between 1900 and 1950 m elevation and flowering time from January to February, fruiting time from January to March.



Fig. 654. *Ainsliaea lalashanensis* S. S. Ying, another plant

3. *Cirsium nanhutashanense* var. *hopingense* S.S. Ying

Cirsium nanhutashanense var. *hopingense* S.S. Ying, var.*nov.* 和平薊

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Between Chiliang Police Station (志良派出所) and Wulin (武陵), 1750 m alt. *S. S. Ying* , *s.n.* April 14, 2022 .
(holotype , NTUF) .



Fig. 655. *Cirsium nanhutashanense* var.*hopingense* S. S. Ying, the heads

Morphology : Annual herbs, stems erect or ascending, simple, 150-190 cm long, unwinged, with densely white appressed hairs firstly, and then become glabrous or nearly so, hollow, smooth, without prickle, green to pale green. Leaves simple, alternate, oblong in outline, 12-21 cm long, 3.5-5.5 cm wide, pinnatisected at margins, lustrous green surface and glaucous beneath, midrib impressed surface and elevated beneath, scattered hirsute surface, glabrous but hirsute along midrib beneath; pinna 6-9 pairs, lanceolate-triangular, 2.5-4.5 cm long, 1-2 cm wide, spinulate-serrate at margins; spines 3.5-5.5 mm long; upper



Fig. 656. *Cirsium nanhutashanense* var. *hopingense* S. S. Ying, the leaves



Fig. 657. *Cirsium nanhutashanense* var. *hopingense* S. S. Ying, the inflorescence

cauline leaves gradually smaller.

Capitulum many, in a terminal racemose, 3.5-4.2 cm in diameter; inflorescence (peduncles) 4-6 cm long, somewhat arch-like, pubescent, pale white, pubescent; bract 1-2, leaf-like, at base of capitulum, lanceolate, 2.5-3 cm long, 3-3.5 mm wide, acuminate at apex; bracteoles 1-2, smaller, at top of pedicels; pedicels 3-4.5 cm long, erect, ascending to nodding, white-tomentose; involucre campanulate, 2.5-3.5 cm long, 2.-2.8 cm wide, contracted at apex; phyllaries 4-5 series, imbricate, uniform, the inner ones smaller, lanceolate, 1.2-1.5 cm long, 2.5-3 mm wide, purple to red, acute and needle-like at apex, obtuse at base, glabrous, the basal ones often with elongate white hairs along margins; some white linear appendages from top phyllaries; corolla light brown, 5-9 mm long, 1.5 mm 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; papus numerous, 5-6 mm long, slender, glabrous; style elongate, red, 8-12 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 3 mm long, opened on terminal.



Fig. 658. *Cirsium nanhutashanense* var. *hopingense* S. S. Ying, the heads



Fig. 659. *Cirsium nanhutashanense* var. *hopingense* S. S. Ying, the holotype NTUF-111-093
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Achenes obovoid, 2-3 mm long, about 1.5 mm wide, laterally compressed, smooth, sometime with 1 longitudinal ribs; apical rim forming a smooth-margined upright crown; pappus 8-12 mm long, with plumose bristles, usually forming basal ring, often shed.



Fig. 660. *Cirsium nanhutashanense* var. *hopingense* S. S. Ying, the habita

Diagnosis.

Cirsium nanhutashanense var. *hopingense* is near to typical variety but can be distinguished it by robust plant body being 150-190 cm high, many capitula to form a terminal a racemose inflorescence and 2 kinds of bracts (one at base of pedicels and the other at top of pedicels).

Distribution and phenology.

The species is endemic in Taiwan, It is known from between Chiliang Police Station (志良派出所) and Wulin (武陵), , Hoping District (和平區) , Taichung City , northern Taiwan . It was discovered on sunny broad fields at elevation between 1650 and 1800 meters, Its flowering time is from April to June, and fruiting from June to July.

4. *Youngia lalashanensis* S.S. Ying

Youngia lalashanensis S.S. Ying, sp.nov. 拉拉山黃鵪菜

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Between Entrance of trail (步道入口) and Giant trees group (巨木群) , 1953 m alt. *S. S. Ying* , *s.n.* May 29, 2022 .
(holotype, NTUF) .



Fig. 661. *Youngia lalashanensis* S. S. Ying, the habit

Morphology : Annual lithophytic herbs, stems absent. Leaves simple, many in a rosette, radial arrangement, spatulate in outline, 6-14 cm long, 2.3-3.5 cm wide, acute at apex, attenuate at base, chartaceous, pinnatisected at margins, glabrous on both surfaces, lustrous dark green surface and pale green beneath, midrib impressed surface and elevated beneath. lateral veins 4-6 per side impressed surface and elevated beneath; lateral lobes 4-6 pairs, opposite, ovate-triangular to oblong, 6-12 mm long, 4-7 mm wide, acute at apex, dentate at margins; terminal lobe oblong, 1.5-3.2 cm long, 8-15 mm wide, acute at apex, dentate at



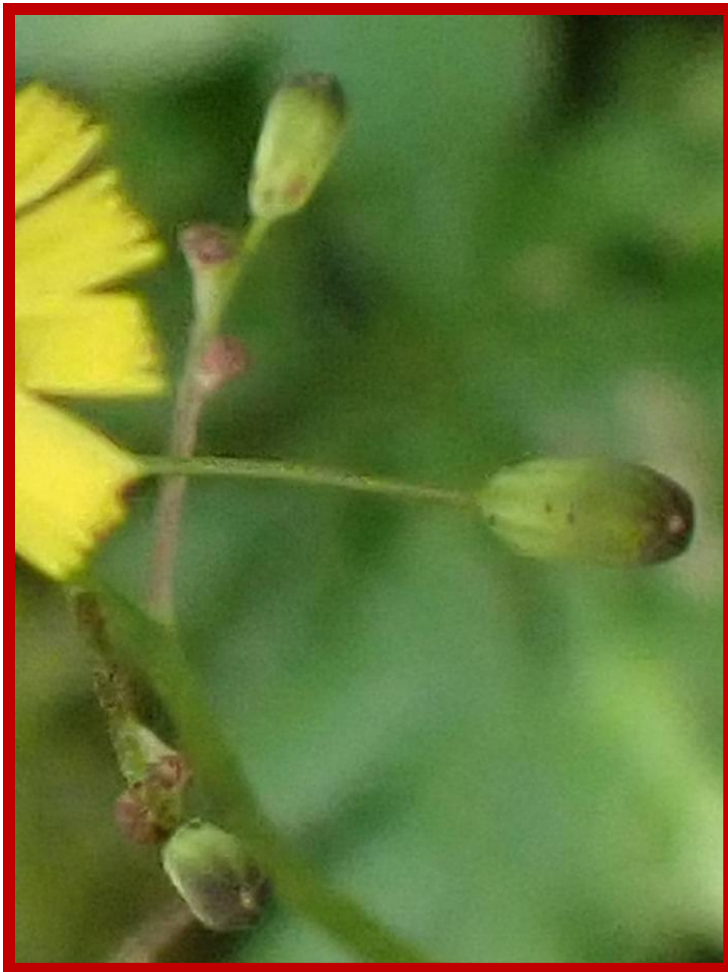
Fig. 662. *Youngia lalashanensis* S. S. Ying, the leaves



Fig. 663. *Youngia lalashanensis* S. S. Ying, the capitulum

margins; Petioles 2.5-3.7 cm long, hirsute, slightly winged to none, slightly groove on surface.e

Capitula 12-15, rather smaller, yellow, 7-9 mm in diameter, in a terminal loose cymose; scape 1-3, green, from leaf-fascicled, 12-22 cm long, erected to ascending, leafless, pubescent to hirsute at base and glabrous upward ; capitula with 15-17 florets; pedicels 8-13 mm long, slender, glabrous; involucre cylindrical, 4-5 mm long, 1.5-2 mm across; glabrous or nearly so, green tinged with purple at apex; outer phyllaries 5-6 ovate-triangular, 1-1.5 mm long, 0.8-1 mm wide, acute at apex; inner phyllaries 5-6, lanceolate, subequal, 6-8 mm long, 1.5-2 mm wide, green tinged with purple at apex,



, Fig. 664. *Youngia lalashanensis* S. S. Ying, the capitulum-buds
-508-



Fig. 665. *Youngia lalashanensis* S. S. Ying, the synflorescence

scarios-margined, acute at apex; ligules 7-9 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 mm long; style branches ca 1.5 mm long.



Fig. 666. *Youngia lalashanensis* S. S. Ying, close-up of achenes and pappus

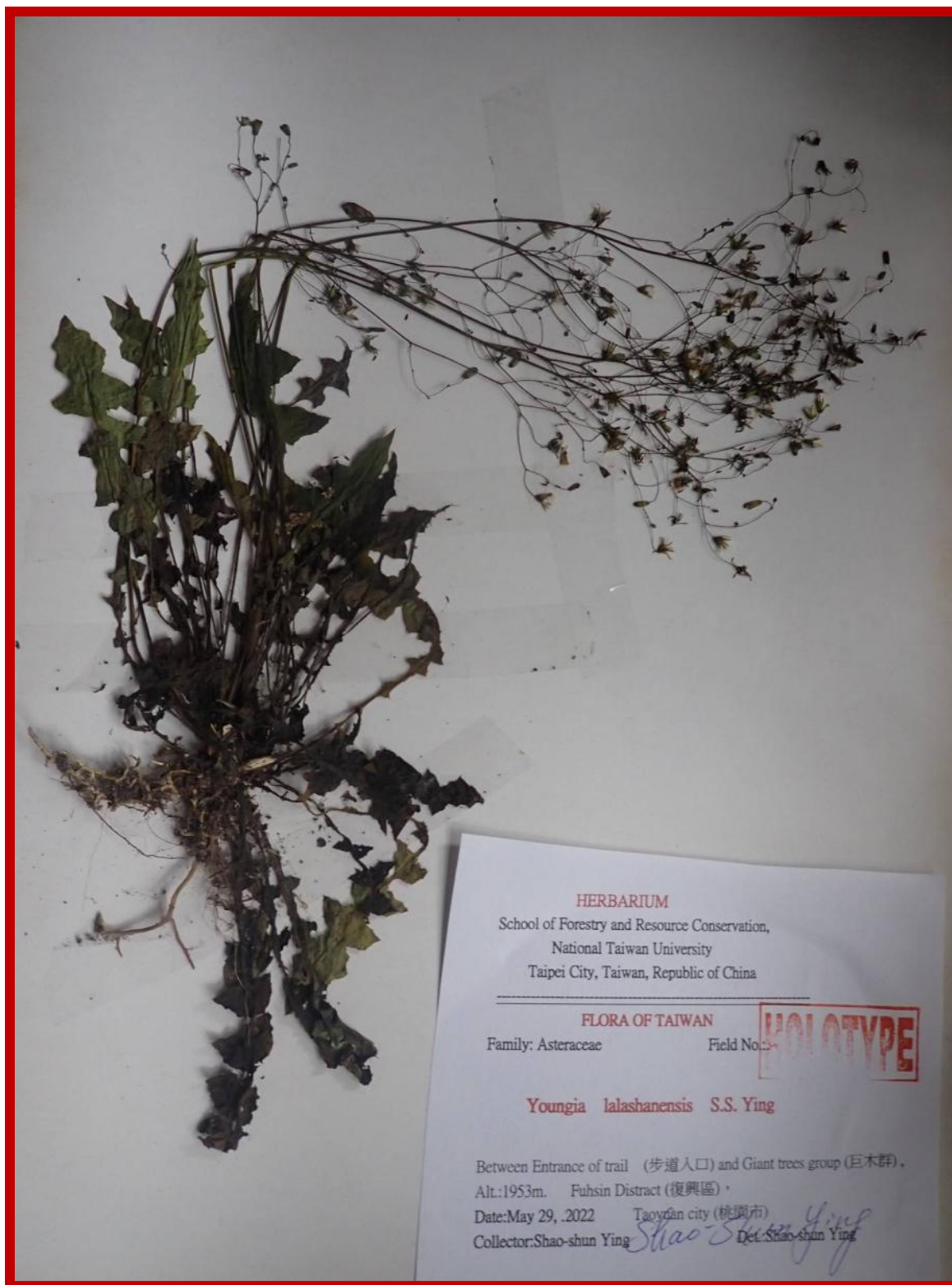


Fig. 667. *Youngia lalashanensis* S. S. Ying, the holotype NTUF-111-094
-510-



Fig. 668. *Youngia lalashanensis* S. S. Ying, the isotype (1) NTUF-111-095
-511-

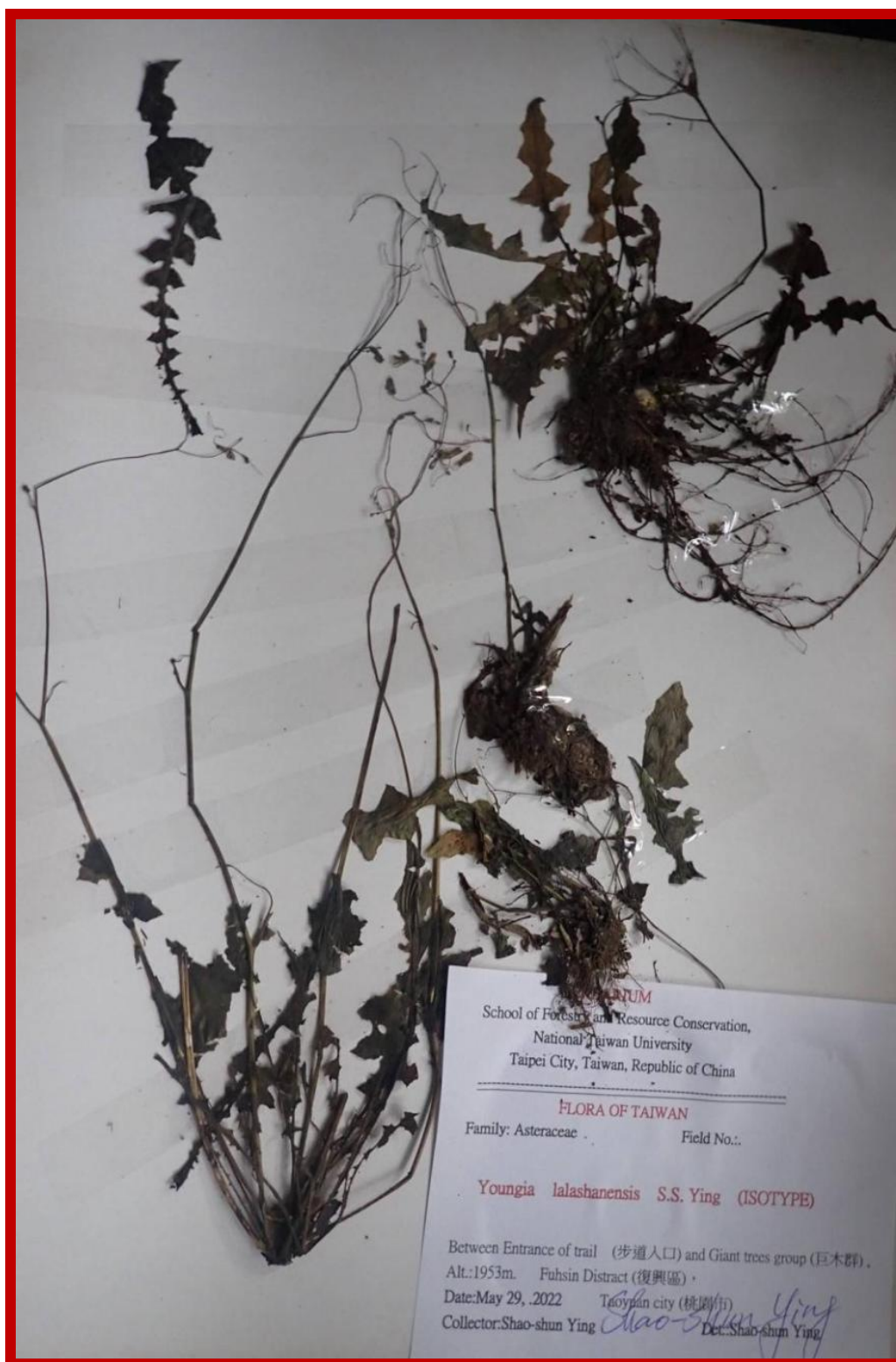


Fig. 669. *Youngia lalashanensis* S. S. Ying, the isotype (2) NTUF-111-096
-512-

Achenes fusiform, reddish brown, 2.5-3 mm long, 0.25 mm wide, compressed, attenuate to the narrow neck, with a white conical summit, 8-10-ribbed. Pappus white, 3.5-4.5 mm long, 1-seriate, cauduous.

Diagnosis.

Youngia lalashanensis is characterized by its lithophytic habitat, pinnatisected glabrous leaves, 12-15 capitula to form a terminal loose cymose; scape 1-3, green, from leaf-fascicled, 12-22 cm long, erected to ascending, leafless, pubescent to hirsute at base and glabrous upward, each capitula with 15-17 florets and fusiform, reddish brown achenes which with 8-10-ribbed..



Fig. 670. *Youngia lalashanensis* S. S. Ying, habitat

Distribution and phenology.

Youngia lalashanensis S.S. Ying is endemic to Taiwan. It is known 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 on the limestone on mountain slope of hiking trail , at between 1900 and 1950 m elevation and flowering time from May to July, fruiting time from June to August °



Fig. 671. *Youngia lalashanensis* S. S. Ying, habitat

5. *Senecio tulinensis* S.S. Ying

Senecio tulinensis S.S. Ying, sp.nov. 突稜黃宛

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉) , Tulin (突稜) 1420 m alt. *S. S. Ying* , s.n. August 11, 2022 ° (holotype , NTUF) °



Fig. 672. *Senecio tulinensis* S. S. Ying, capitula

Morphology : Annual herbs about 30-45 cm tall; stems erect or ascending, few-branched upward; branchlets erect to ascending, terete, glabrous, green . Leaves simple, alternate, lanceolate to narrowed lanceolate, 4.5-5.7 cm long, 10-12 mm wide, chartaceous, acuminate to acute at apex, attenuate at base, green surface, pale green beneath, glabrous on both surfaces, serrate with a gland at apex at margins, midrib and lateral veins (3-5 per

side) impressed surface and elevated beneath, the lateral veins somewhat inconspicuous;; petioles 3-4.5 mm long, glabrous, green.



Fig. 673. *Senecio tulinensis* S. S. Ying, branches and leaves

Capitula 3-5 in a cymose, terminal, 13-16 mm in diameter, 1-2 cymoses often forming a compound cymose; peduncles 5-8 cm long, slender, green, glabrous; pedicels 1.5-2.5 cm long, green, glabrous; bracts and bracteoles absent; involucre tubular, 6-8 mm long, green, glabrous; phyllaries 2 series, imbricate; the out series minute, triangular, 2-3 mm long, about 1.5 mm wide, acute at apex; inner series lanceolate, 4.5-5.5 mm long about 1.5 mm wide, acute, green; receptacles convex, 3.5-4.5 mm long, 4-5 mm wide; ray florets 5 in 1-series, yellow, tube (about 2.5 mm long) and basal lamina glabrous, eglandular, lamina lanceolate, 7.5-8.5 mm long, 2-2.5 mm wide, obtuse and 2-3 dentate at apex, glabrous; disk florets less than 20, bisexual, fertile, yellow, limb tubular, 3-4 mm long, 5-lobed at apex; lobes erect, triangular, 0.4-0.5 mm long, acute and reflexed at apex;



Fig. 674. *Senecio tulinensis* S. S. Ying, inflorescence, mind phyllaries 2 series

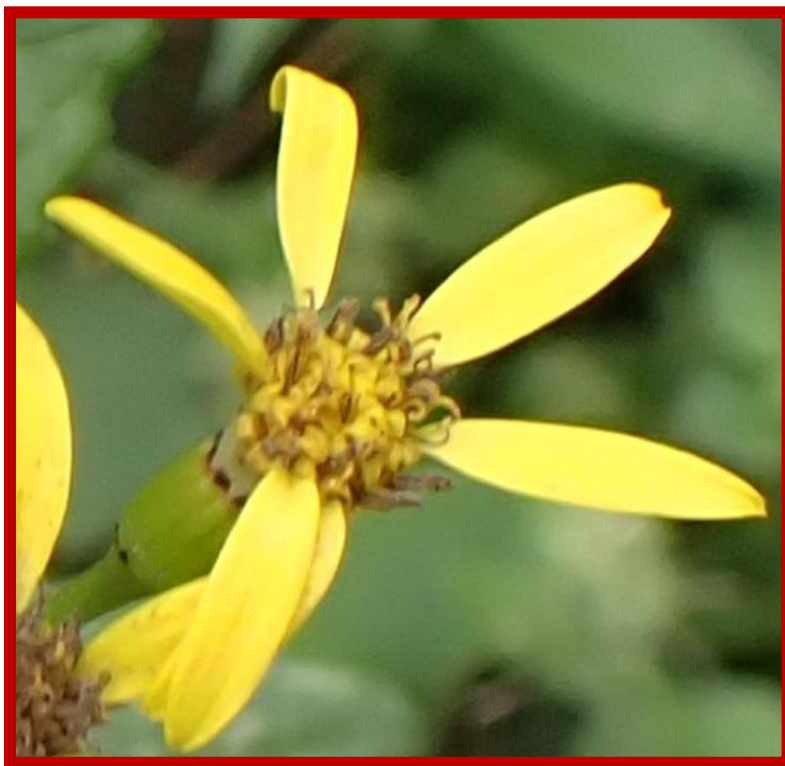


Fig. 675. *Senecio tulinensis* S. S. Ying, close-up of a capitulum

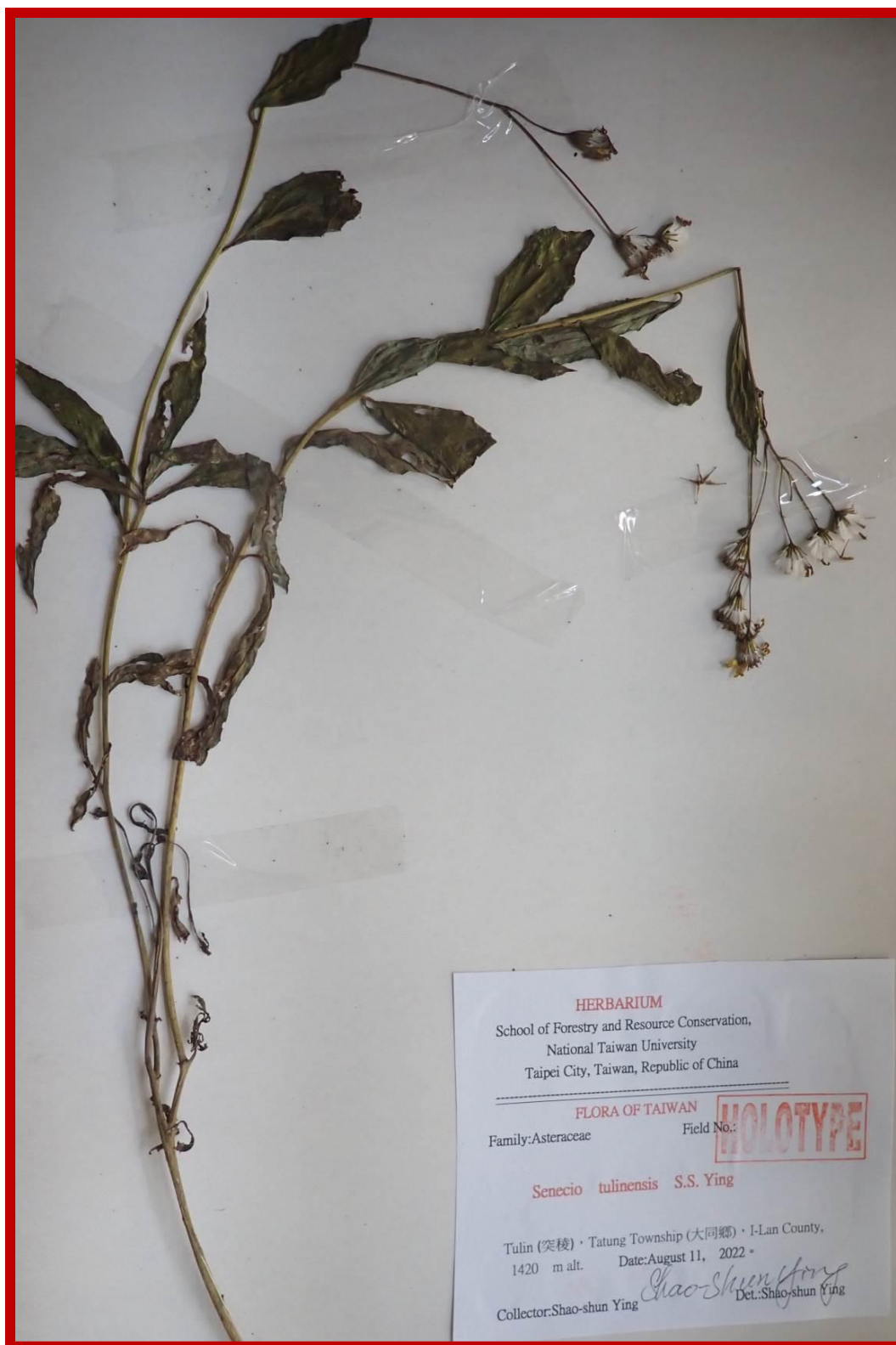


Fig. 676. *Senecio tulinensis* S. S. Ying, the holotype NTUF-111-097

ovary ovoid, 2-3 mm long; style elongate, exserted, 6-7 mm long, yellow, glabrous; stigma 2-lobed, the lobes linear, 1.5 mm long, yellow, reflexed, disc-like at apex,.

Achenes cylindrical, 2-2.5 mm long, 1 mm wide, glabrous, 2-4-ribbed, eglandular; pappus numerous, 7-9 mm long, white, uniform.



Fig. 677. *Senecio tulinensis* S. S. Ying, close-up of fruit, achenes and pappus

Diagnosis.

Senecio tulinensis is characterized by its lithophytic habitat, lanceolate leaves, few capitula in the cymose, 2 series phyllaries and 5-ray florets in a capitulum

Distribution and phenology.

Senecio tulinensis S.S. Ying is endemic to Taiwan. It is known from Tulin (突稜) to Nanshan Village (南山村), Tatung Township (大同鄉), I-Lan County, northern Taiwan. It was discovered on limestone rocky mountain slope at elevations of 1450-1350 meters. Its flowering time is August to September, and fruiting time August to October.



Fig. 678. *Senecio tulinensis* S. S. Ying, close-up of achenes and pappus



Fig. 679. *Senecio tulinensis* S. S. Ying, habitat

6. *Aster taoshanensis* S.S. Ying 桃山紫菀

Aster taoshanensis S.S. Ying, sp.nov. 桃山紫菀

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Taoshan (桃山) 1980 m alt. *S. S. Ying* , s.n. September 01, 2022 ° (holotype , NTUF) °

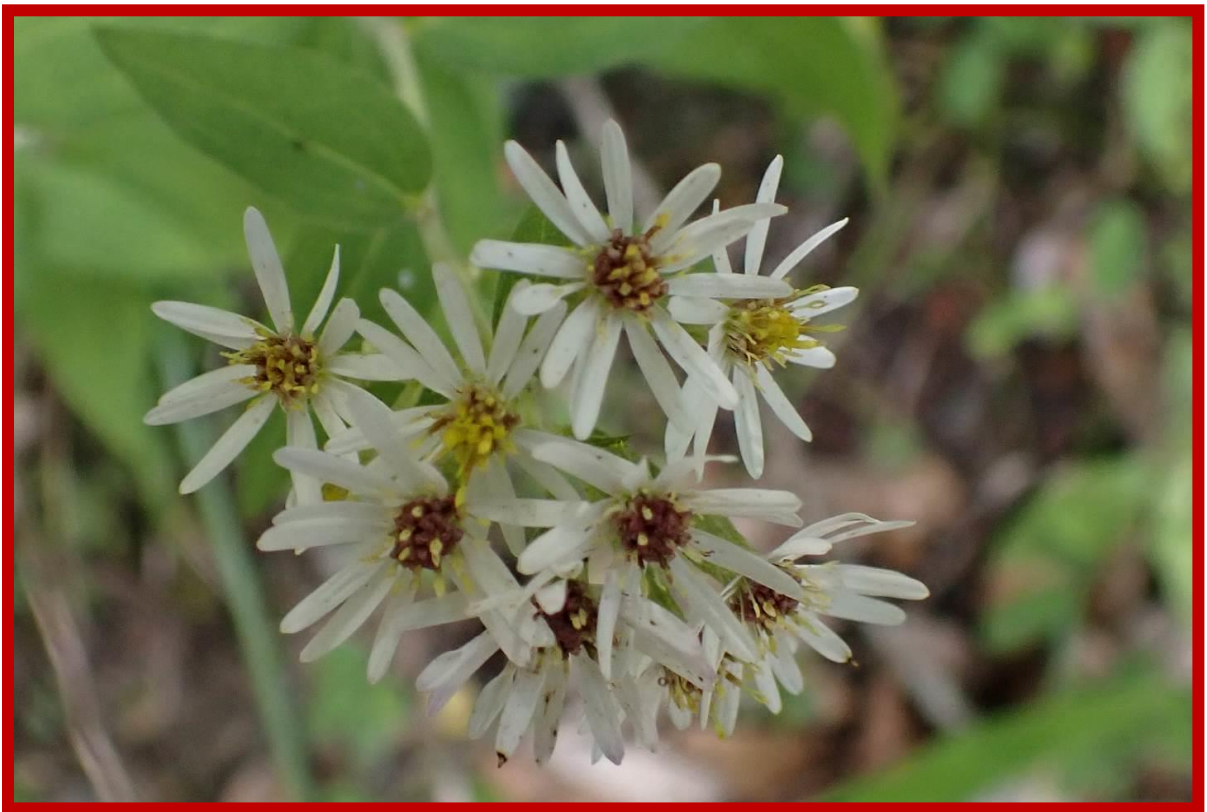


Fig. 680. *Aster taoshanensis* S. S. Ying, close-up of capitula

Morphology : Annual lithophytic herbs, rhizome ovoid to oblong, 1.3-2.2 cm long, 4-5 mm across, somewhat fleshy; stems erect or ascending, simple, 20-43 cm tall, unwinged, densely scattered short white villose. Leaves simple, alternate, oblong to oblong-ovate, 3.5-6 cm long, 1.2-2.5 cm wide, chartaceous, acute to acuminate at apex, slightly cordate to obtuse at base,



Fig. 681. *Aster taoshanensis* S. S. Ying, leaves

lustrous green surface, pale green beneath, short white villose on surfaces, villose on veins beneath, entire to remotely denate and ciliate at margins, 3-nerved impressed surface and elevated beneath; petioles 2-4.5 mm long, villous, grooved.

Capitula 8-11 in cymose, terminal, 9-11 mm in diameter when opened, peduncles 2-3.5 cm long, pale green, densely scattered with white villous; pedicels 6.5-8.5 mm long, pale green, densely scattered white villous; involucres tubular, 4.5-5.5 mm long, green, villous; phyllaries 2-4 series, imbricate, lanceolate, 2.5-3.5 mm long, about 1.2 mm wide, acute at apex, the basal ones short and upward ones longer; receptacles convex, 2.5-3.5 mm long, 3-4 mm wide; ray florets 11-14 in 1-series, white, tube and basal lamina glabrous, eglandular,

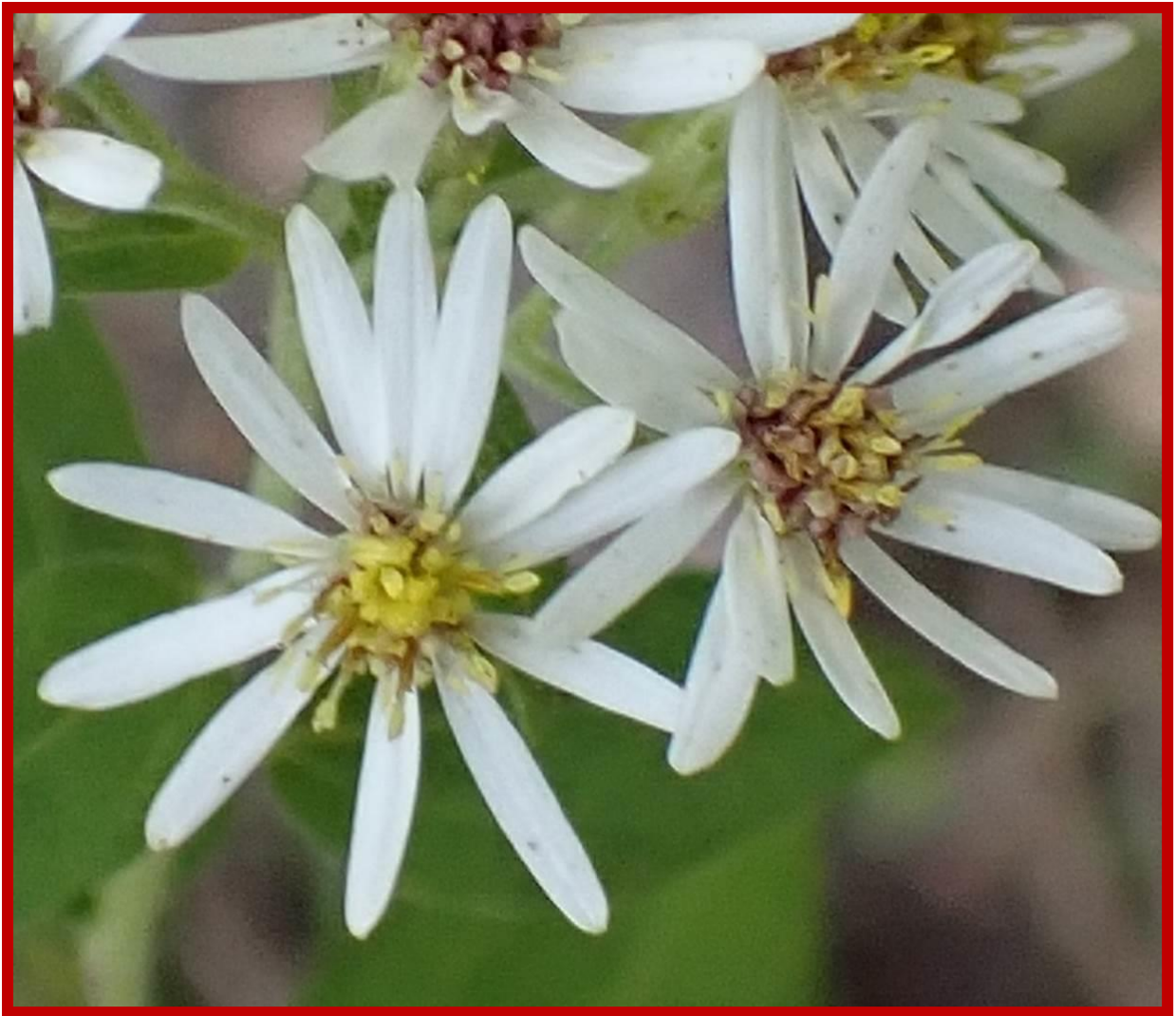


Fig. 682. *Aster taoshanensis* S. S. Ying, close-up of capitula

lamina lanceolate, 6-6.8 mm long, 1.2-1.6 mm wide, obtuse at apex, glabrous; disk florets less than 20, bisexual, fertile, purple, limb campanulate, 3-4.5 mm long, 5-lobed at apex; lobes erect, triangular, 0.4-0.5 mm long, obtuse at apex; ovary ovoid, 2-3 mm long, white; style elongate, 6-7 mm long, pale yellow, glabrous; stigma 2-lobed, the lobes linear, 1.5 mm long, white.

Achenes obovoid, 2-2.5 mm long, 1-1.5 mm wide, glabrous, 3-4-ribbed, eglandular; pappus 1-seriate, white, numerous, equal to subequal, barbellate or barbellulate bristles.



Fig. 683. *Aster taoshanensis* S. S. Ying, close-up of young achenes and pappus

Diagnosis.

Aster taoshanensis is characterized by its lithophytic habitat, oblong to ovate-oblong, villous leaves, 8-11 capitula, 11-14 ray florets and less than 20 disc florets.

Distribution and phenology.

Aster taoshanensis S.S. Ying is endemic to Taiwan . It is known from Taoshan (桃山) , Hoping District (和平區) , Taichung City, central Taiwan . It was collected on the limestone cliffs of mountain , at elevations about 1850-2200 m.. and flowering time is September to October, Fruiting time is October to November .

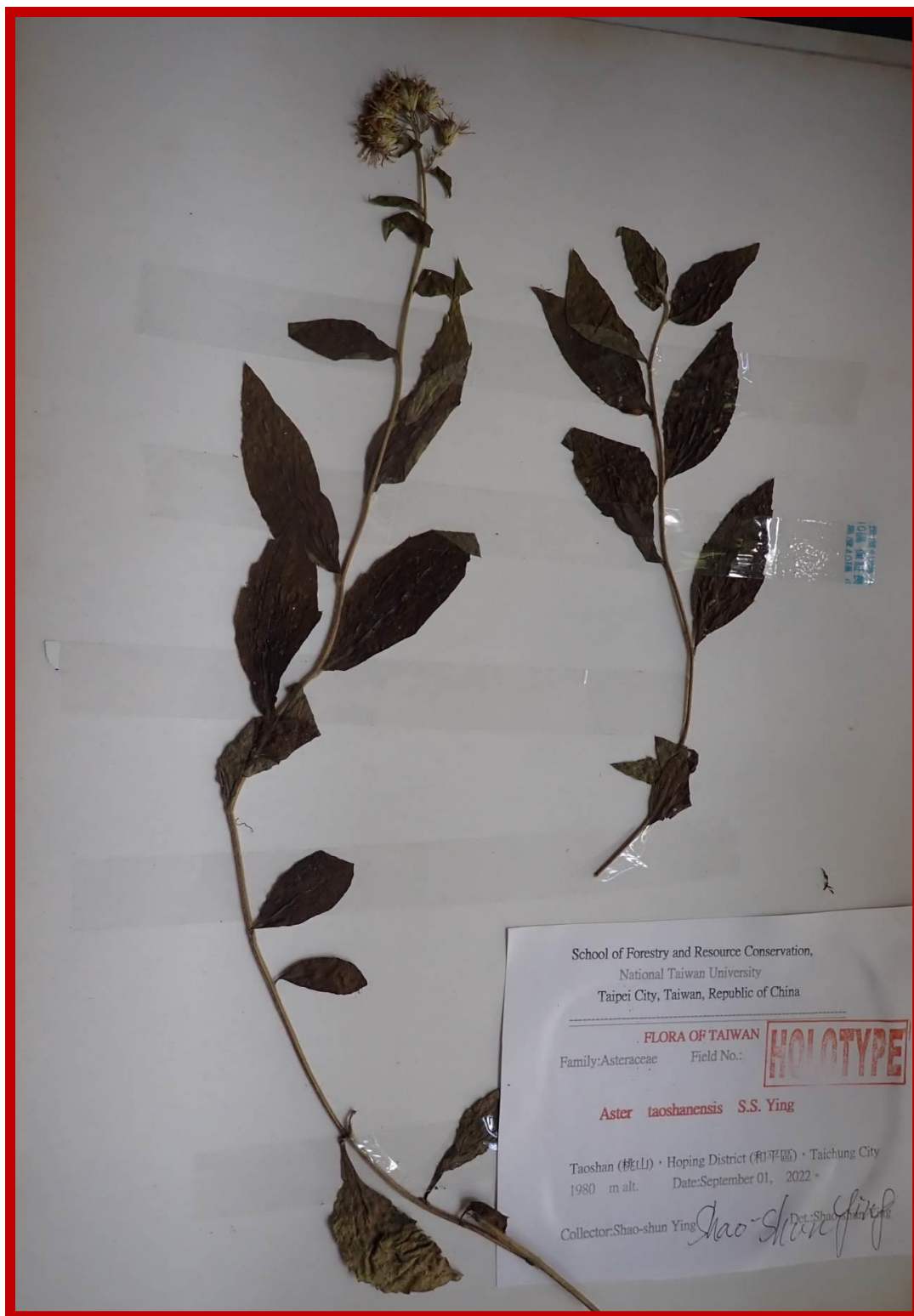


Fig. 684. *Aster taoshanensis* S. S. Ying, the holotype NTUF-111-098



Fig. 685. *Aster taoshanensis* S. S. Ying, habitat

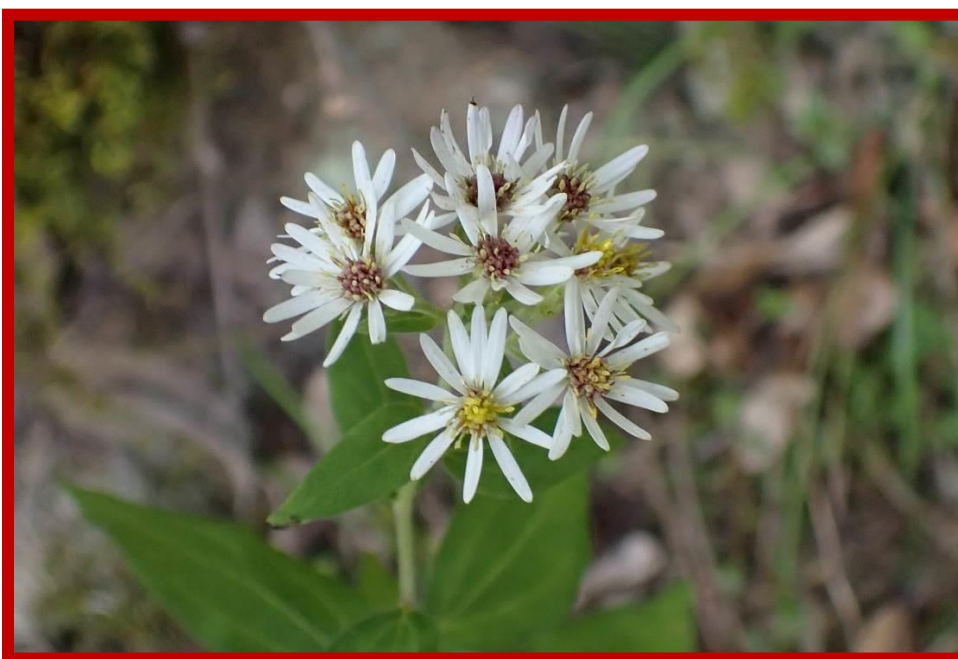


Fig. 686. *Aster taoshanensis* S. S. Ying, habit

7. *Aster ilanmontanus* S.S. Ying 宜蘭山地紫菀

Aster ilanmontanus S.S. Ying, sp.nov. 宜蘭山地紫菀

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉), Siyuanwukou (思源埡口) 1910 m alt. *S. S. Ying*, *s.n.* September 22, 2022. (holotype, NTUF).



Fig. 687. *Aster ilanmontanus* S. S. Ying, close-up of capitula

Morphology : Annual terrestrial herbs, rhizome unknow; stems erect or ascending, simple, 120-210 cm tall, unwinged, green, scattered short villose. Leaves simple, alternate, oblong to oblong-lanceolate, 9.5-14.5 cm long, 3.5-4.5 cm wide, chartaceous, coarse when touch the

leaf, acuminate at apex, acuminate at base, lustrous green surface, pale green beneath, glabrous on both surfaces, remotely dentate at margins, 3-nerved impressed surface and elevated beneath; petioles 5-7.5 mm long, green, glabrous, grooved.



Fig. 688. *Aster ilanmontanus* S. S. Ying, leaves

Capitula numerous, white, 1.5-2.2 cm in diameter when opened, usually 8-11 capitula in a cymose, and 5-8 cymoses to form a terminal compound cymose; each cymose: peduncle 4.5-8.5 cm long, green, white short villous; bracts somewhat the leaf but much smaller, 1-4 cm long, 6-12 mm wide, acute to acuminate at apex; pedicels 1.2-1.5 cm long, green to pale green, scattered white short villous; involucres tubular, 5.5-6.5 mm long, green, villous; phyllaries 2 series, imbricate, ovate-lanceolate, 3.5-4.5 mm long, about 1.5 mm wide, acute at apex, the basal ones short and upward ones longer; receptacles convex, 3.5-4.5 mm long, 3-4

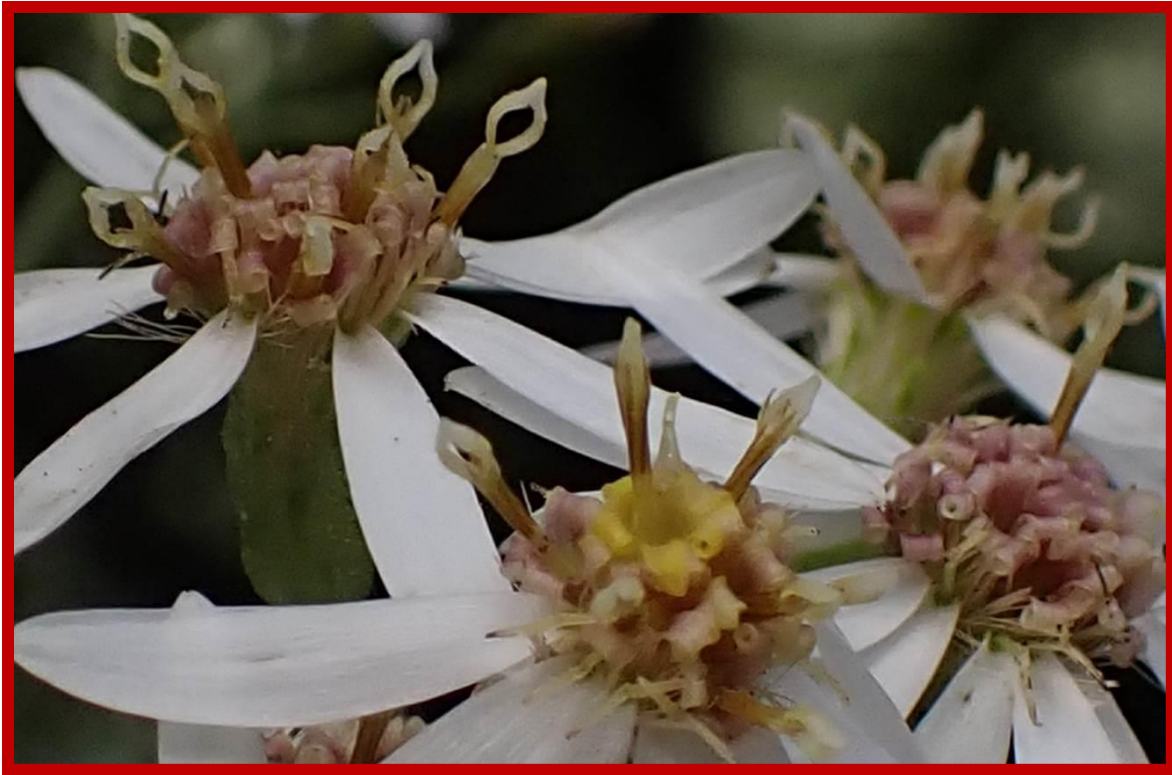


Fig. 689. *Aster ilanmontanus* S. S. Ying, close-up of tubular florets

mm wide; ray florets 8-10 in 1-series, white, tube and basal lamina glabrous, eglandular, lamina oblong to oblong-lanceolate, 8-11 mm long, 1.5-2.3 mm wide, obtuse at apex, glabrous; disk florets less than 12, bisexual, fertile, yellow to pale purple, limb campanulate, 4.5-6.5 mm long, 5-lobed at apex; lobes reflexed, oblong, 1.4-1.7 mm long, obtuse at apex; anther-tube exserted, 6-7.5 mm long, green-brownish, 5-toothed at apex; teeth 0.5-0.6 mm long, glabrous; tovary ovoid, 2.5-3 mm long, white; style elongate, 7-8.5 mm long, pale yellow to white, glabrous; stigma 2-lobed, the lobes linear, 2.5 mm long, white.

Achenes obovoid, 3.5-4.5 mm long, 1-1.5 mm wide, glabrous, 3-4-ribbed, eglandular; pappus 1-seriate, white, numerous, equal to subequal, barbellate or barbellulate bristles.

Diagnosis.

Aster ilanmontanus is characterized by its terrestrial 120-210 cm tall in habit, oblong



Fig. 690. *Aster ilanmontanus* S. S. Ying, the holotype NTUF-111-098



Fig. 691. *Aster ilanmontanus* S. S. Ying, the isotype NTUF-111-099



Fig. 692. *Aster ilanmontanus* S. S. Ying, the isotype NTUF-111-100

to oblong-lanceolate leaves; capitula numerous, white, 1.5-2.2 cm in diameter when opened, usually 8-11 capitula in a cymose, and 5-8 cymoses to form a terminal compound cymose.



Fig. 693. *Aster ilanmontanus* S. S. Ying, habitat

Distribution and phenology.

Aster ilanmontanus S. S. Ying is endemic to Taiwan ° It is known from Siyuanwukou (思源埡口), Tatung Township (大同鄉), I-Lan County, northern Taiwan ° It was collected at the edge of forests , at elevations about 1850-1910 m., and flowering time is September to October, Fruiting time is October to November .



Fig. 694. *Aster ilanmontanus* S. S. Ying, habit

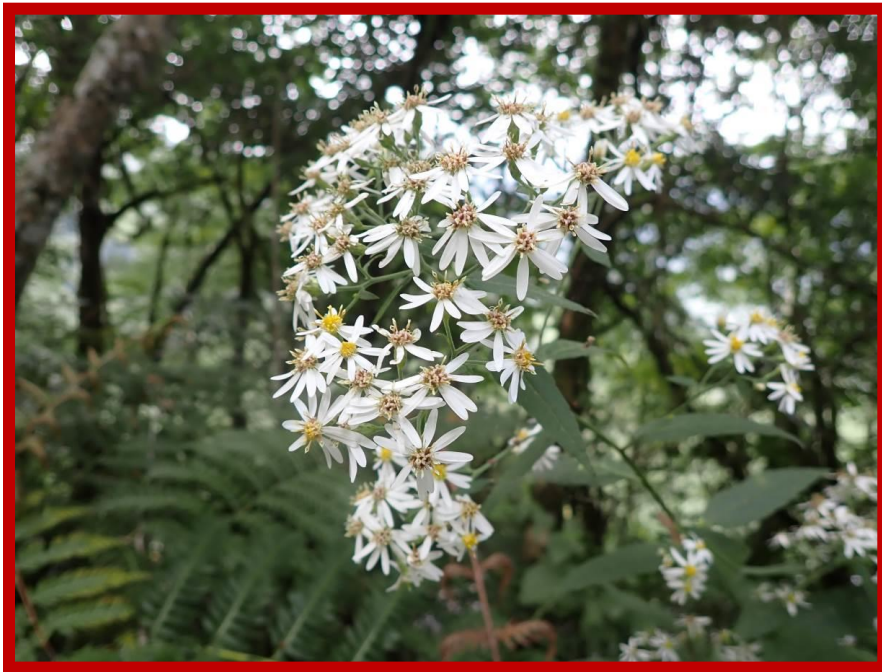


Fig. 695. *Aster ilanmontanus* S. S. Ying, habit

8. *Scorzonera taiwanensis* S.S. Ying 台灣鴉蔥

Scorzonera taiwanensis S.S. Ying, sp.nov. 台灣鴉蔥

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Lalashan (拉拉山) under *Chamaecyparis formosensis* Forests, 1983 m alt. *S. S. Ying* , s.n. August 18, 2022 .
(holotype, NTUF) .



Fig. 696. *Scorzonera taiwanensis* S. S. Ying, habit

Morphology : Annual terrestrial herbs, root woody, somewhat taproot-like, 6-8 cm long, 5-6



Fig. 697. *Scorzonera taiwanensis* S. S. Ying, root system and leaves

mm in diameter, fleshy, pale brownish; fibrous slender, many. Stem simple, not branched, erect to ascending, with scape 25-35 cm long, green to pale green, glabrous. Leaves simple, basal, spathulate to spathulate-lanceolate, 6-8 cm long, 1-1.5 cm wide, obtuse at apex, attenuate and amplexicaul at base, chartaceous, remotely dentate at margins, green surface and glaucous beneath, midrib impressed surface and elevated beneath, lateral veins inconspicuous; glabrous on both surfaces. Cauline leaf only 1, at base of scape, like the basal ones but smaller. Petioles 0.

Capitulum solitary, terminal, 1.5-2 cm in diameter when opened, yellow; scape 13-15 cm long, erect to ascending, green, glabrous; involucre cylindric, 1.3-1.6 cm long, 0.6-0.75mm



Fig. 698. *Scorzonera taiwanensis* S. S. Ying, capitulum



Fig. 699. *Scorzonera taiwanensis* S. S. Ying, involucre and phyllaries



Fig. 700. *Scorzonera taiwanensis* S. S. Ying, capitulum see from front

in diameter; phyllaries scattered with purplish glandular hairs; outermost phyllaries ovate-triangular to triangular, 2-3 mm long, acute at apex; inner phyllaries lanceolate to linear-lanceolate, 8-9 mm long, 1-1.5 mm wide, acuminate at apex; florets homogamous, ligulate;

corolla longer than involuere, 1.5-1.8 cm long, 2.5-3.5 mm wide, 5-toothed at apex, teeth 0.4-0.5 mm long; style branched, filiform, 7-8 mm long; anthers oblong or nearly so, 5-6 mm long, sagittate at base.

Achene cylindrical, 4-6 mm long, 1-1.5 mm wide, brownish, ridged; pappus 8-9 mm long, white, pappus hairs barbellate and plumose below, barbellate above.



Fig. 701. *Scorzonera taiwanensis* S. S. Ying, close-up of achenes and pappus

Diagnosis.

The genus is new to flora of Taiwan.

Scorzonera taiwanensis is characterized by its terrestrial 25-35 cm tall in habit, roots taproot-like, fleshy; capitula solitary, terminal; phyllaries scattered with purplish glandular hairs and florets homogamous, ligulate.

Distribution and phenology.

Scorzonera taiwanensis S.S. Ying is endemic to Taiwan. It is known from Lalashan (拉拉山) Taoyuan city, northern Taiwan. It was collected under the gaps of *Chamaecyparis formosensis* forests at between 1900 and 1990 m elevation and flowering time from August to September, fruiting time from September to October.

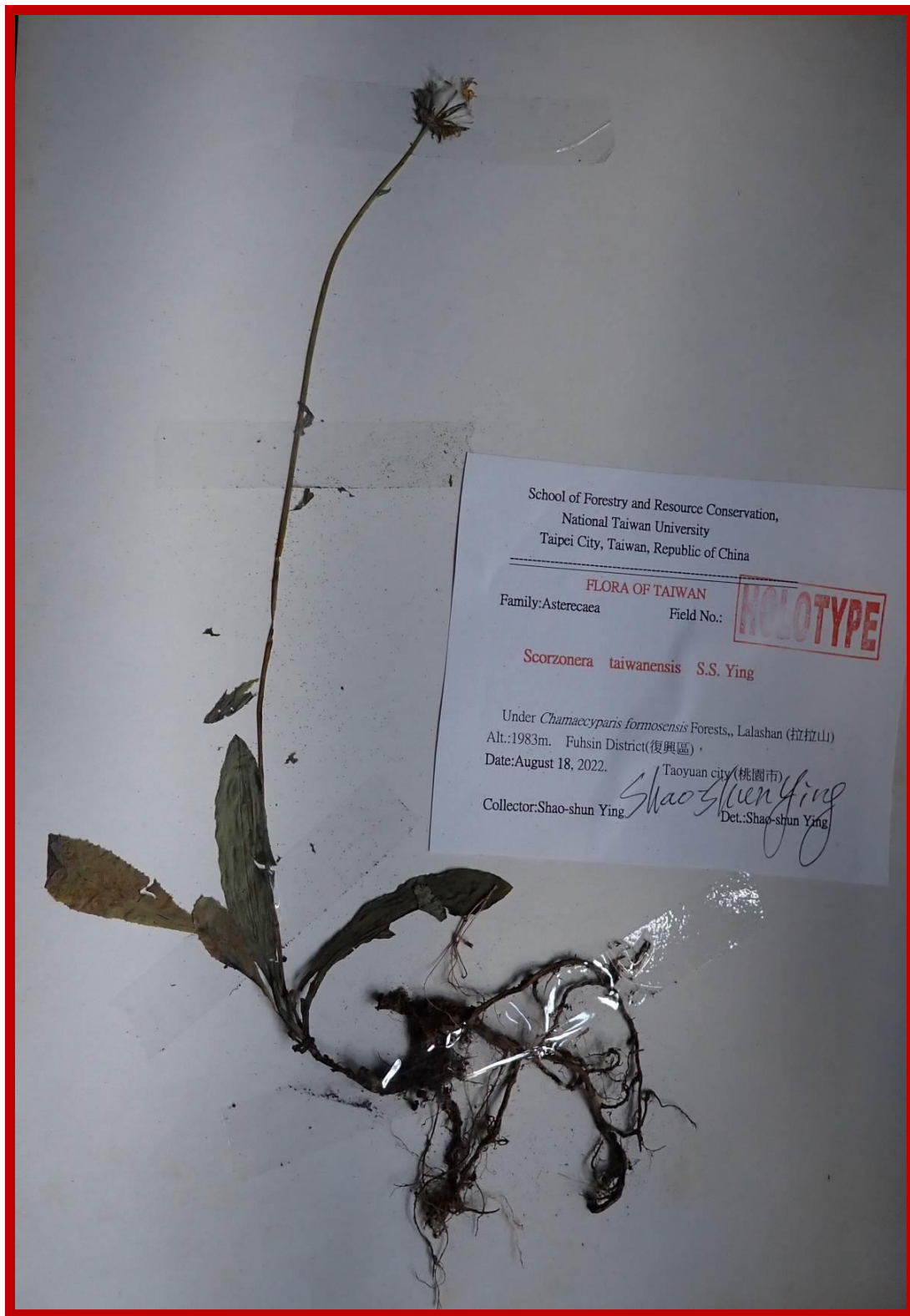


Fig. 702. *Scorzonera taiwanensis* S. S. Ying, the holotype NTUF-111-101



Fig. 703. *Scorzonera taiwanensis* S. S. Ying, habitat

9. *Gynura tuncyanshanensis* S.S. Ying 東眼山黃鳳菜

Gynura tuncyanshanensis S.S. Ying, sp.nov. 東眼山黃鳳菜

TYPE:TAIWAN. Taoyuan city , Fuhsin District (復興區) , Tuncyanshan (東眼山), on the trail between Tuncyanshan (東眼山) and Manyueyuan (滿月圓), 893 m alt. *S. S. Ying* , s.n. October 20, 2022 ° (holotype, NTUF) °

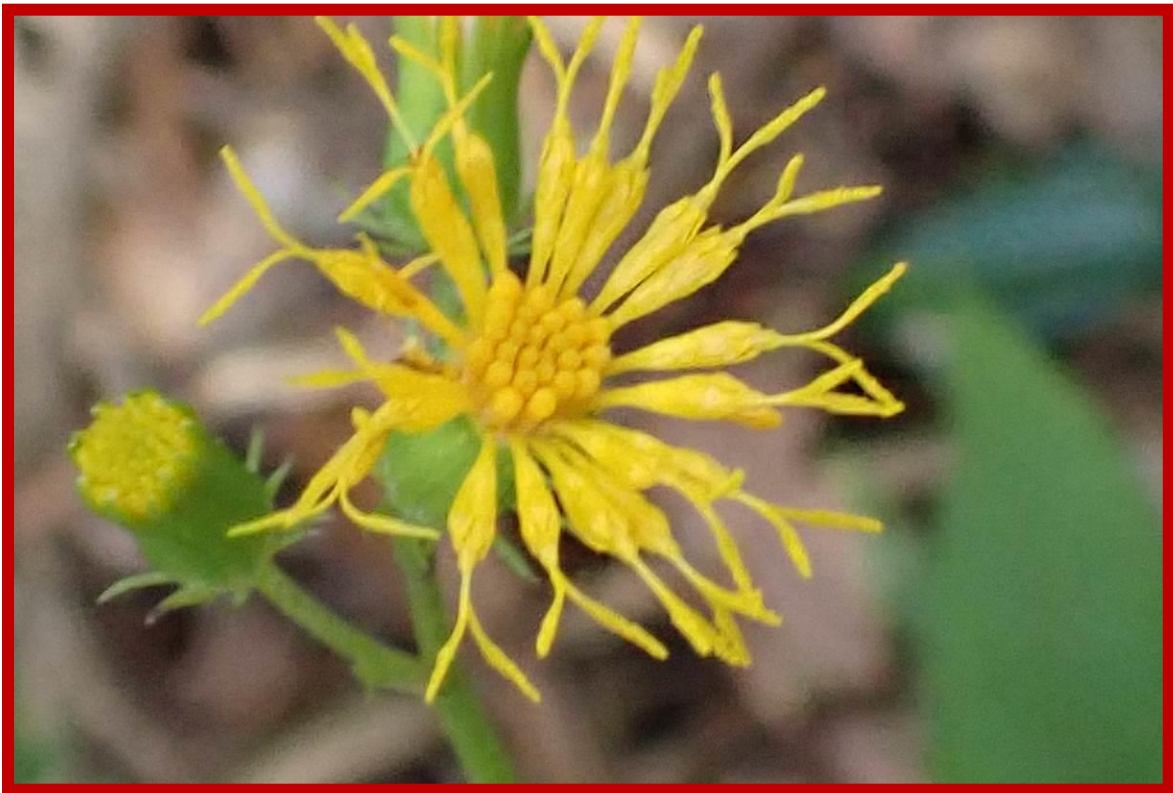


Fig. 704. *Gynura tuncyanshanensis* S. S. Ying, close-up of capitula

Morphology : Annual terrestrial herbs, root woody, 4-7 cm long, 5-6 mm in diameter, fibrous few. Stem simple, not branched, erect to ascending, 20-40 cm tall, green, somewhat tinged



Fig. 705. *Gynura tungyanshanensis* S. S. Ying, leaves

with purple at base, glabrous or nearly so. Leaves simple, alternate, ovate to ovate-elliptic, 5.5-7 cm long, 3-4 cm wide, acuminate to obtuse at apex, attenuate at base, chartaceous, conspicuous dentate at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib and lateral veins (3-5 per side) impressed surface and elevated beneath. Petioles 1-3 cm long, grooved, slightly winged on both margins, glabrous.

Capitula several, terminal, yellow, 1.5-2 cm in diameter when opened, usually 2-4 in a raceme, 2-3 racemes to form a remote inflorescence; inflorescence 8-10 cm long, erect to ascending, green, glabrous; peduncles 5-7 cm long, slender, green, glabrous; pedicels 8-12 mm long, green, glabrous; bracts 8-12, verticillate, linear to linear-lanceolate, 5-6 mm long, about 1.4 mm wide, acuminate at apex, green; involucre cylindric, 8-9 mm long, 5-6 mm wide, green, glabrous; phyllaries uniseriate, 7-9 mm long, 1.5 mm wide, acute at apex, glabrous; florets 25-32, yellow; corolla 5-6 mm long, tube 4.5-5 mm long, 5-lobed at apex; lobes triangular; anthers obtuse at base; style elongate, exserted, 2-branched at apex; branches slender, 0.6-0.7 mm long, with conical papillose appendages.

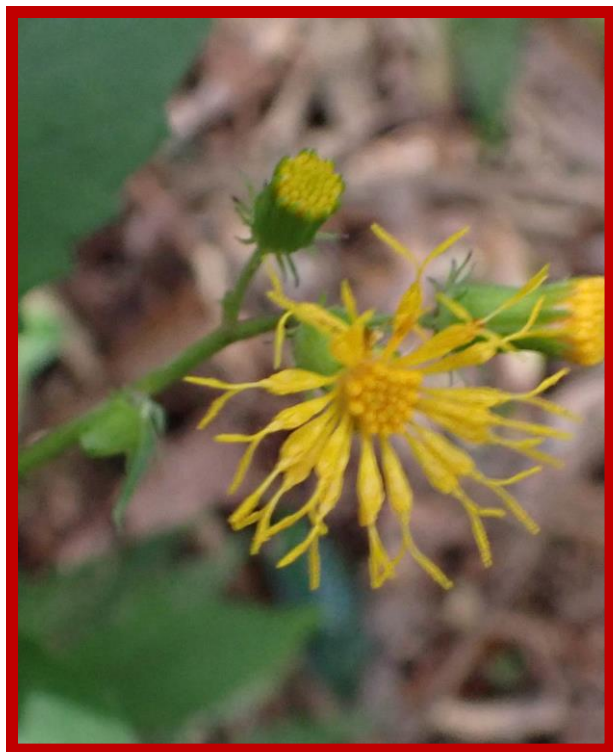


Fig. 706. *Gynura tungyanshanensis* S. S. Ying, inflorescence



Fig. 707. *Gynura tungyanshanensis* S. S. Ying, a capitulum



Fig. 708. *Gynura tungyanshanensis* S. S. Ying, capitula and fruits

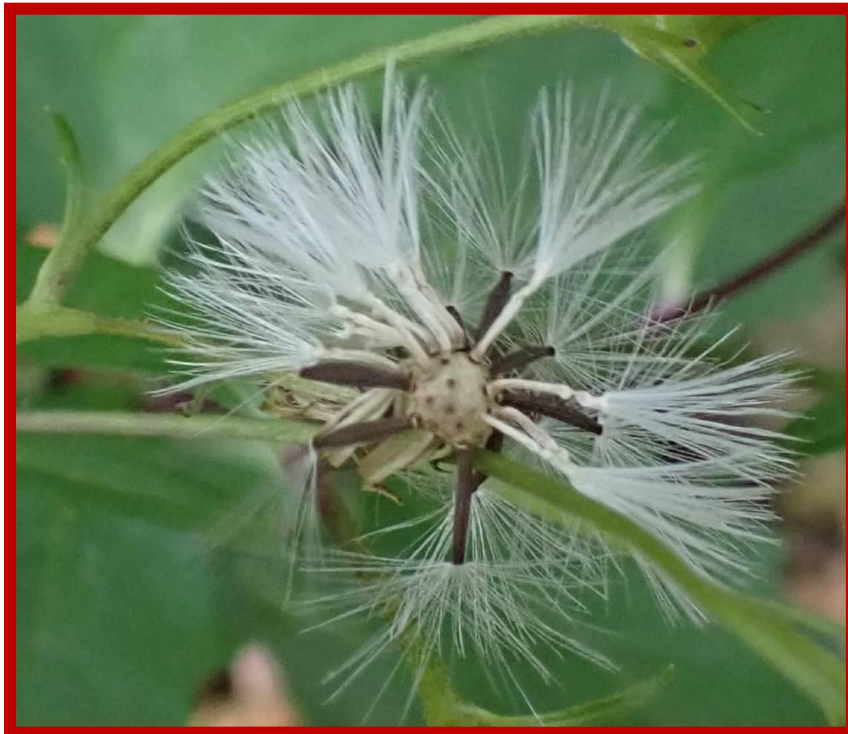


Fig. 709. *Gynura tungyanshanensis* S. S. Ying, close-up of achenes



Fig. 710. *Gynura tungyanshanensis* S. S. Ying, the holotype NTUF-111-102

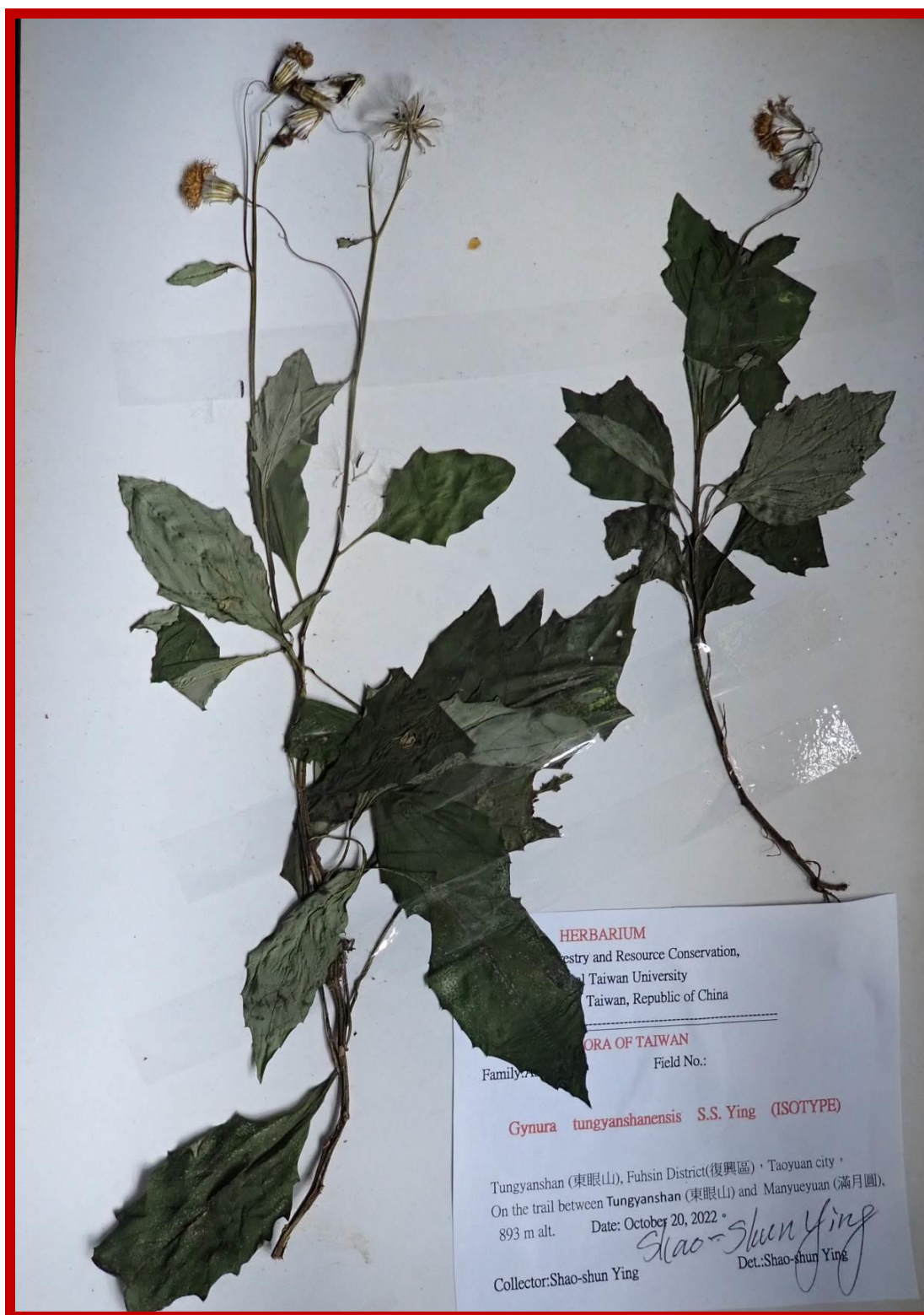


Fig. 711. *Gynura tungyanshanensis* S. S. Ying, the isotype NTUF-111-103

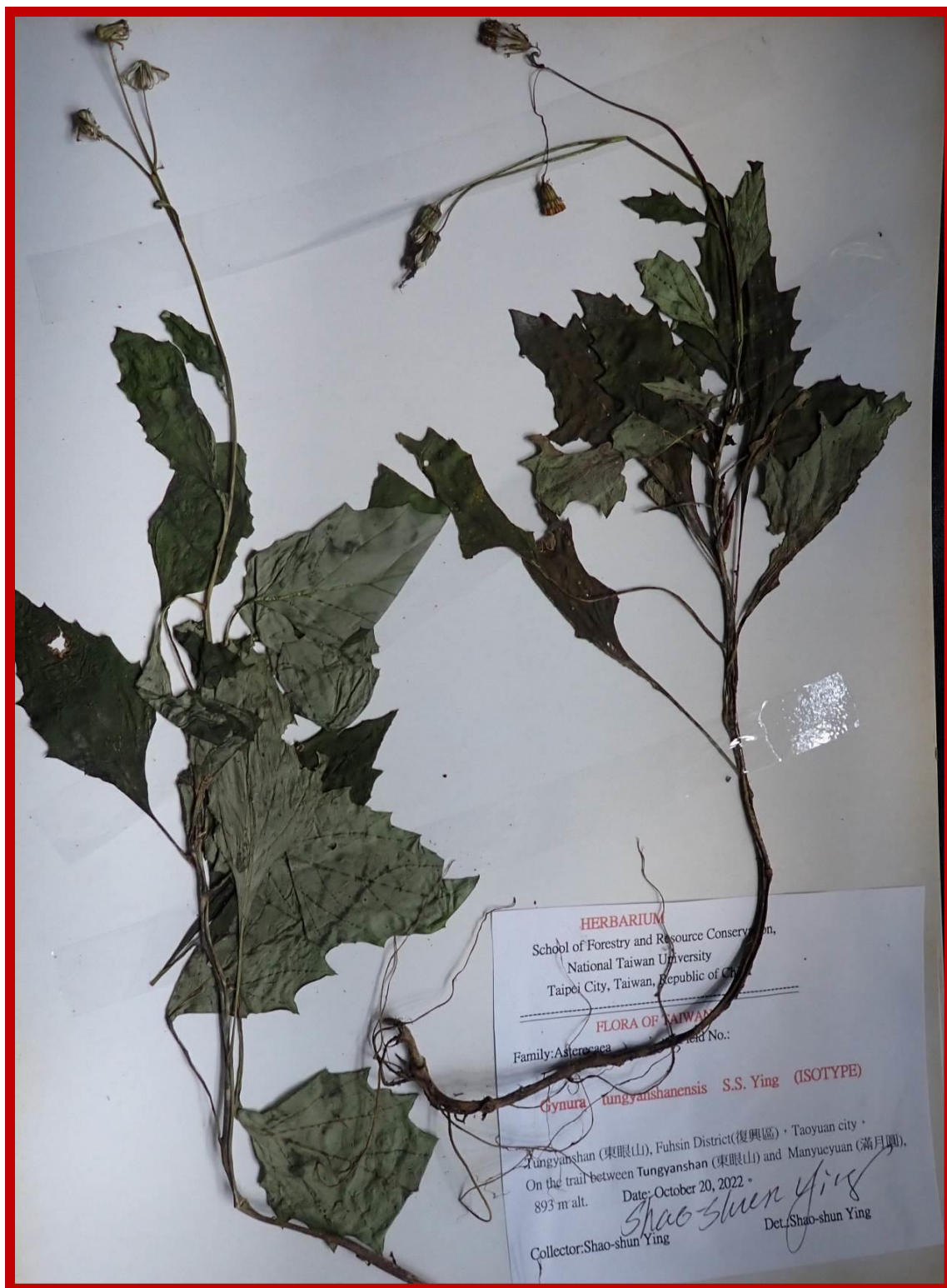


Fig. 712. *Gynura tungyanshanensis* S. S. Ying, the isotype NTUF-111-104

Achenes cylindrical, 4-5 mm long, black, 10-ribbed, glabrate, truncate at both ends; Pappus slender, 7-9 mm long, white, sericeous, deciduoud.



Fig. 713. *Gynura tungyanshanensis* S. S. Ying, habit and habitat

Diagnosis.

Gynura tungyanshanensis is characterized by its terrestrial 20-40 cm tall in habit, ovate to ovate-elliptic, conspicuous dentate leaves and few capitula.

Distribution and phenology.

Gynura tungyanshanensis S.S. Ying is endemic to Taiwan ° It is known from Tungyanshan (東眼山), on the trail between Tungyanshan (東眼山) and Manyueyuan (滿月圓), Fuhsin District (復興區), Taoyuan city, northern Taiwan ° It was collected under rich loam of broad-leaves forest, between 1065 and 755 m altitudes; and flowering times is from October to November and fruiting time is October to December.

10. *Blumea humilis* S.S. Ying 矮艾納香

Blumea humilis S.S. Ying, sp.nov. 矮艾納香

TYPE: TAIWAN. Taoyuan city, Fuhsin District (復興區), Tungyanshan (東眼山), on the trail between Tungyanshan (東眼山) and Manyueyuan (滿月圓), 893 m alt. *S. S. Ying*, s.n. October 20, 2022. (holotype, NTUF).



Fig. 714. *Blumea humilis* S. S. Ying, habit and habitat

Morphology : Annual herbs about 15-25 cm high, stem simple, short, erect to ascending, somewhat woody at base, without branches, white villose. Leaves basal, simple, alternate, oblong to lanceolate-oblong, 8-12 cm long, 2-4 cm wide, acute at apex, attenuate and slightly winged at base, chartaceous, entire to remotely fine serrulate at margins, glabrous upward and villous at base, especially on the midrib and veins surface, glabrous beneath; midrib and lateral veins (6-8 per side) impressed surface and elevated beneath, green surface and pale green beneath; petioles slender, 8-12 mm long, slightly winged, scatters white villous.



Fig. 715. *Blumea humilis* S. S. Ying, leaves

Capitula few, usually 5-6 in a terminal racemose, cylindrical, 2.8-3.2 mm in diameter, 6-7 mm long; rachis of inflorescence peduncle 7-15 cm long, pale green, shortly white villose; bracts basal, like the leaf but much smaller, 2.5-3 cm long, 5-7 mm wide, acute at apex; bracteoles lanceolate, 6-8 mm long, 3-4 mm wide, acuminate at apex; pedicels 3-3.5 mm long, slender, white villous; phyllaries 4-5 series, imbricate; the outer ones shorter, lanceolate, 2.5-3.5 mm long, acute at apex, truncate at base, green, not reflexed, white villous; medium and inner ones lanceolate to linear-lanceolate, 4.5-5.5 mm long, 1.5 mm wide, acute at apex, truncate at base, green, membranous, white villous, not reflexed, entire at margins; receptacle flat, 4.5-5 mm in diam., with white villose; each capitula with 10-15 disk florets, disk florets



Fig. 716. *Blumea humilis* S. S. Ying, inflorescence

bisexual; corolla yellow, tubular; the tube 3.1-4.5 mm long, with 5 lobes at apex, lobes ovate, 1.5-2 mm long, about 1 mm wide, obtuse at apex, glabrous; style longer than stamens tube, exserted on the corolla tube, 2-branched, obtused at apex, stamen tube exserted to corolla, yellow .

Cypselas black, cylindrical, 0.8-1.2 mm long, ribs inconspicuous; pappus numerous, white, 6-7 mm long.



Fig. 717. *Blumea humilis* S. S. Ying, inflorescence, the holotype NTUF-111-105

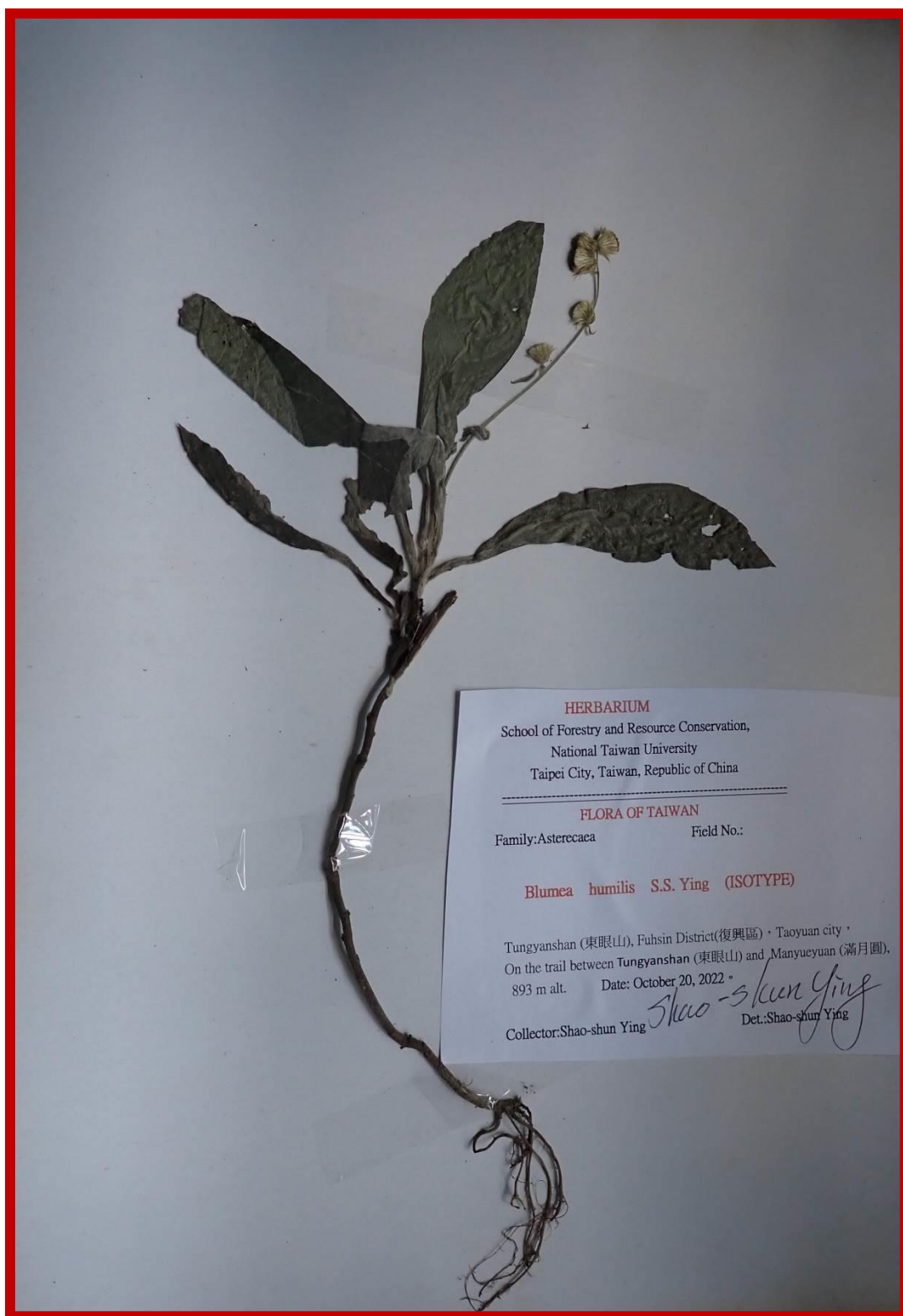


Fig. 718. *Blumea humilis* S. S. Ying, inflorescence, the isotype NTUF-111-106



Fig. 719. *Blumea humilis* S. S. Ying, close-up of capitulum

Diagnosis.

Blumea humilis is characterized by its short and smaller in habit, few capitula and 0.8-1.2 mm achenes with numerous, white, 6-7 mm long pappus.

Distribution and phenology.

Blumea humilis S.S. Ying is endemic to Taiwan ° It is known from Tungyanshan (東眼山), on the trail between Tungyanshan (東眼山) and Manyueyuan (滿月圓), Fuhsin Distract (復興區), Taoyuan city, northern Taiwan ° It was collected at edges of broad-leaves forest, between 755 and 1155 m altitudes; and flowering times is from October to November and fruiting time is October to December.



Fig. 720. *Blumea humilis* S. S. Ying, habitat



Fig. 721. *Blumea humilis* S. S. Ying, cypselas and pappus

新植物及新名稱 (第五卷)

(NEW TAXA AND NEW NAMES)

(VOLUME Five)

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