

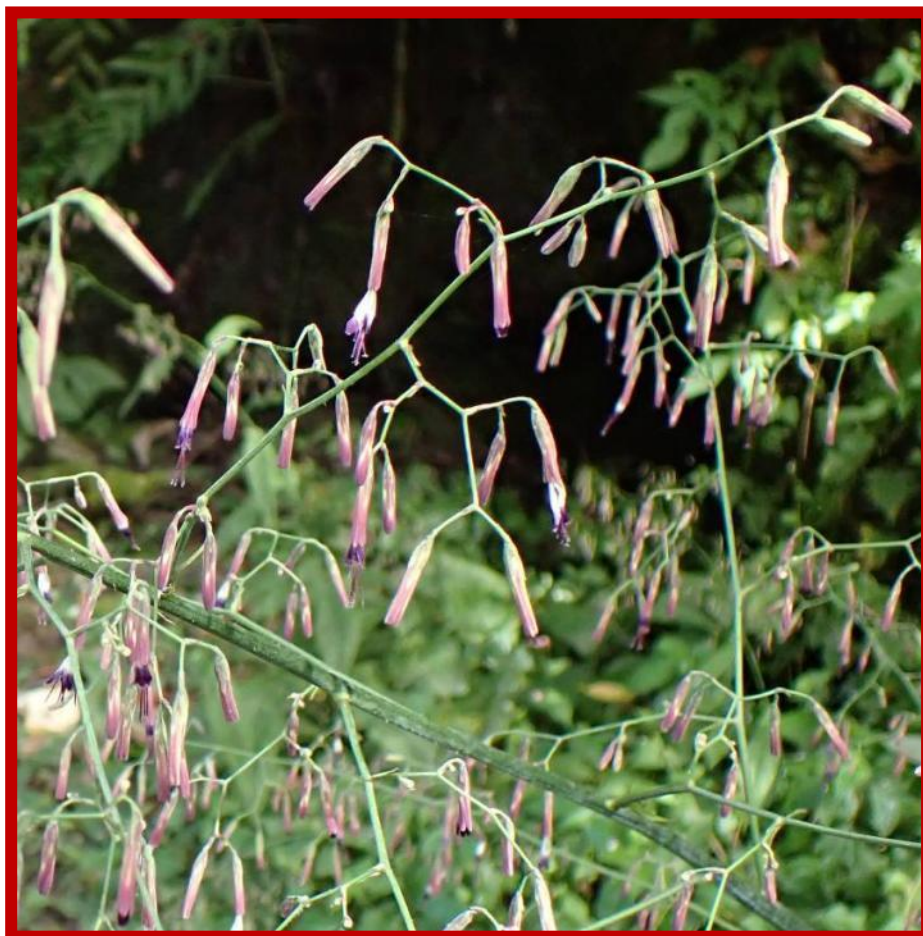
植物分類著作電子叢書 (e-books)

# 新植物及新名稱

(NEW TAXA & NEW NAMES)

(第四卷, Volume Four)

應紹舜 (Shao-shun Ying) 著



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# 新植物及新名稱

(NEW TAXA & NEW NAMES)

(第四卷, Volume Four)

應紹舜著

By: Shao-shun Ying

(Emeritus Professor, National Taiwan University)

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20, September, 2022



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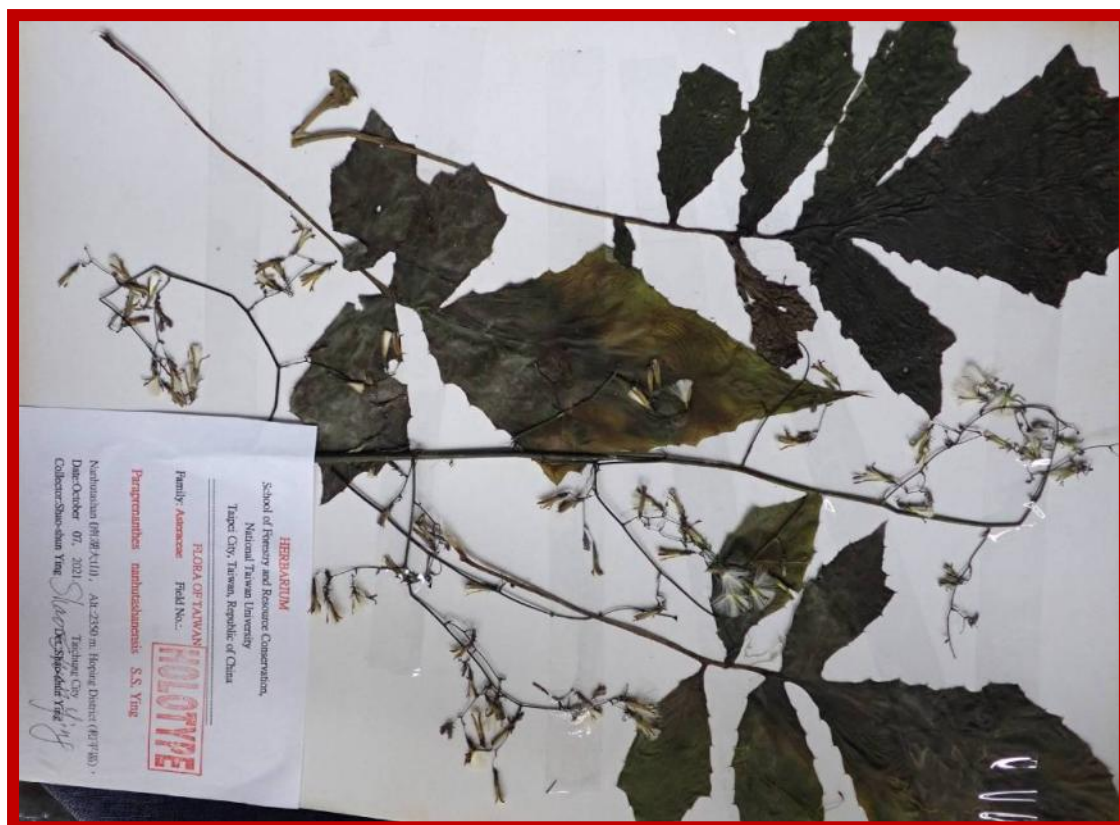
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*Parietaria taiwaniana* S.S. Ying , close-up of female flowers





*Paraprenanthes nanhutashanensis* S. S. Ying,



-VII-

*Disporopsis shaolinchiensis* S.S. Ying



## Preface

As a proverb goes, one hard work, one gain, (一分耕耘，一分收穫), although the outbreak of novel coronavirus epidemic 2019 (COVID-19) continues to spread rapidly in the world, Taiwan, as a member of the world, is inevitably also affected by the epidemic, especially, after 180 new domestic infections were reported on 15 May this year, the alert level was raised to three in the four-tier system in the Taiwan area, which entailed shutting cinemas and entertainment spots, limiting gatherings to five indoors and 10 outdoors, making it mandatory for people to wear masks at all times when outside,<sup>1</sup> and an encouragement by the government to work and study from home, thus making the people of Taiwan very nervous and live in fear. However, my study work is not affected by the epidemic, field collection and study proceed as planed, once or twice a week and more than 50 times of this year (2021) for field collection and study, as usually.

Between Pitouchiao (鼻頭角) and Shicheng (石城), Northeast coast of Taiwan, one of most distinctive coast in Taiwan, with rocky terrain formed by the ancient settlement, 6-month- long northeaster monsoon blown, and more than 4000 mm average annual rainfall, the natural environment of this area has conceived its distinguished plant and resource structure, therefore forms its special flora and plant society development model. Hotung (猴硐), for example, a very tiny area, but owner the geographical distribution center of *Bretschneidera sinensis* Hemsl. a very rare tree species in Taiwan. *Maesa houtungensis*, a new species I described in this e-book and collected it on the roadsides around North 37 Houmu Highway (北 37 猴牡公路), between 300 and 350m elevation, Houtung (猴硐), for its 8-17 flowers in a contorted racemes appearing glomerate and polygamous (bisexual and female flowers) flowers. *Viola sanddaiojaoensis*, another new species, I collected it at Sanddaiojao (三貂角), the eastmost point of Taiwan, is characterized by its glandular-hairs at base of middle petals, ovary globose, 3-celled ovary and 18 ovules in each cell. *Lindernia sandaiolingensis* at Sanddaiolin (三貂嶺) and *Lindernia shichengensis*, *Parietaria taiwaniana* at Shicheng (石城) are also new to Taiwan flora. the genus *Parietaria* is a new record genus of flora of Taiwan.

*Disporopsis shaolinchiensis* is another new species of this e-book, the specific name, *Shaolinchiensis*, is in honor of Mrs. Shaolinchi (邵令淇女士), my mother. It is remarkable for its unique epiphytic habit of the genus *Disporopsis* of the world, growing on tree-canopy of sole evergreen broadleaved cloud forest of Taiwan at Siyuanakou (思源埡口). A discussion of

taxonomic status of *D. arisanensis* Hayata is also given in this e-book. ,

*Paraprenanthes nanhutashanensis* at Nanhutashan (南湖大山), northern Taiwan and *Paraprenanthes yangtoushanensis* at Yangtoushan (羊頭山), central Taiwan are two species of seven new asteraceous plants of this e-book. There are four species of the genus *Paraprenanthes* in Taiwan, *Paraprenanthes sororia*(Miq.) C.Shih.the species is common at low to medium altitudes of Taiwan, the other three species, *P.shaolinchiensis*, *P. nanhutashanensis* and *P. yangtoushanensis* , were described by myself in this e-book on this and last year, each has its own characteristics.

Hsuehshan (雪山), 3886 meters above sea level, second highest peak of Taiwan, and Nanhutashan (南湖大山) , 3742 meters above sea level, highest mountain of northern Taiwan. However, at my age unable to complete the whole field study and journey of 4 days and 3 nights each. So, I selected one day round field study and rich harvest. *Paraprenanthes nanhutashanensis*, *Galium nanhumontanum* , *Cerastium nanhutashanense*, *Epilobium nanhualpinum*, *Elatostema nanhumontanum*, *Tricyrtis uniflora*, *Lysimachia nanhutashanensis*, *Circaea hsuehshanensis*, *Brassica taiwanensis* and *Cirsium nanhutashanense* were all collected and described from those two mountains.

A total of 50 new species and 3 new combinations are proposed in this e-book, it is a bumper harvest year for me, however, I hope that this e-book will stimulate interest in the intriguing group of plants which mentioned in the book, whilst at the same time encourage more effort to help to protect the more species in the wild.

**Shao-shun Ying**

**Emeritus Professor, National Taiwan University**

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*Berberis yangtoushanensis* S.S. Ying

1.A New Species of Genus *Disporopsis* (Asparagaceae) from Taiwan and

discussed on the taxonomic status of *D. arisanense* Hayata

*A. Disporopsis shaolinchiensis* S.S. Ying

*Disporopsis shaolinchiensis* S.S. Ying, *sp. nov.* 邵氏假寶鐸花

TYPE:TAIWAN. I-Lan County, Tatung Township (大同鄉), Siyuanyakou (思源埡口) 1820 m alt.  
*S. S. Ying*, *s.n.* September 09, 2021. (holotype, NTUF).



Fig. 1. *Disporopsis shaolinchiensis* S.S. Ying, the habitat

**Morphology** : Annual small herbs epiphytic on tree-canopy, 5-15 cm tall; rhizome compressed





Fig. 2. *Disporopsis shaolinchiensis* S.S. Ying, the rhizomes



Fig. 3. *Disporopsis shaolinchiensis* S.S. Ying, plants with rhizomes



rounded to ovate, 6-8 mm thickened, fleshy, white to pale green, closely approximated; roots fleshy, 1-1.5 mm in diameter, white or nearly so. Stem simple, erect to ascending, 5-14 cm long, green, glabrous. Leaves 3-5, simple, alternate, oblong to ovate-oblong, 2.5-4.5 cm long, 1-1.5 cm wide, acute at apex, amplexual at base, chartaceous, entire at margins, glabrous on both surfaces. Lustrous green surface and pale green beneath, midrib impressed surface and elevated beneath, lateral veins inconspicuous.



Fig.4. *Disporopsis shaolinchiensis* S.S. Ying, plants with fruits

Flowers 1-3, solitary, axillary, white tinged with pink, 3-4 mm in diameter when opened; bracts absent; pedicels 2-4 mm long, green, glabrous; perianth tubular-like, 3-4.5 mm long, 6-lobed at apex; lobes imbricate, 1.6-2.5 mm long, 0.7 mm wide, obtuse at apex; corona attached closed to perianth sinus, about 2.5 mm long; anthers sessile on the corona, reniform, 2-celled, 0.5 mm long, shallowly sagittate; ovary ovoid, 1.5-2.0 mm across, glabrous, green, 3-locular; each cell with 3 ovules; style short, straight; stigma capitate.

Fruits berries, ovoid, 3-5 mm across, lustrous, with a mucro at apex, glabrous, red when mature; seeds 9, 3 in each cell, rounded, about 1.5 mm diameter, white in colour, glabrous, smooth.



Fig. 5. *Disporopsis shaolinchiensis* S.S. Ying, close-up of fruits



-4- Fig. 6. *Disporopsis shaolinchiensis* S.S. Ying, close-up of fruits and seeds





Fig. 7. *Disporopsis shaolinchiensis* S.S. Ying, close-up of seeds (just one fruit contained)

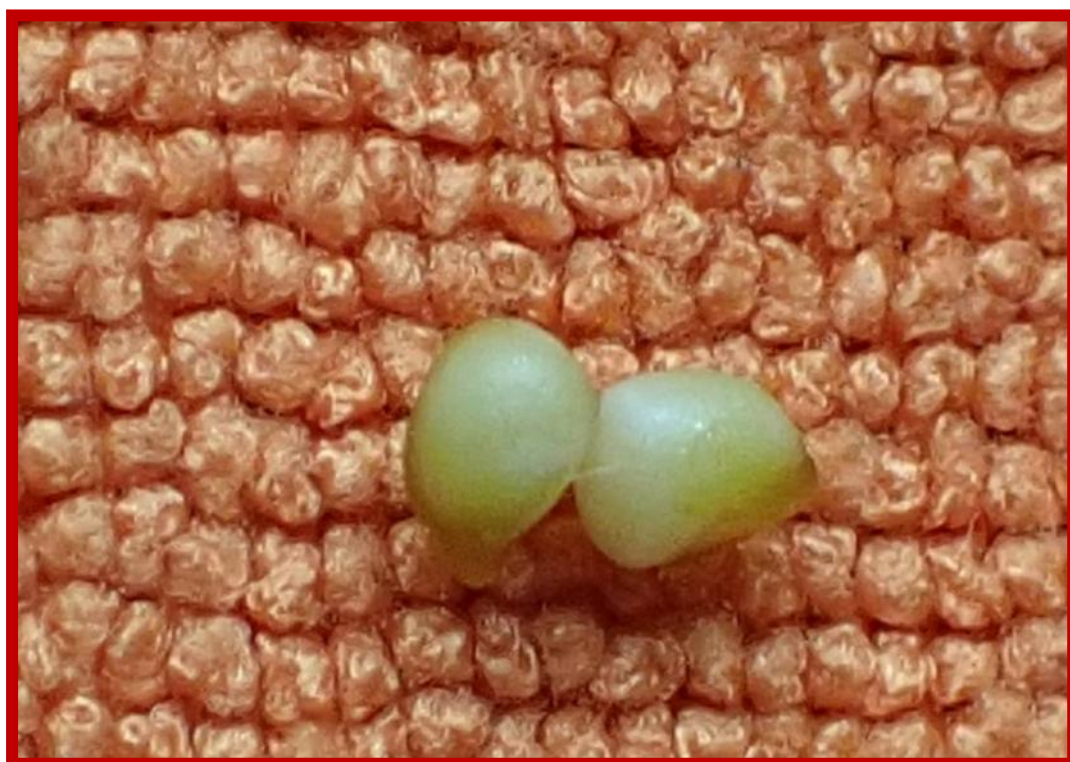


Fig. 8. *Disporopsis shaolinchiensis* S.S. Ying, close-up of seeds



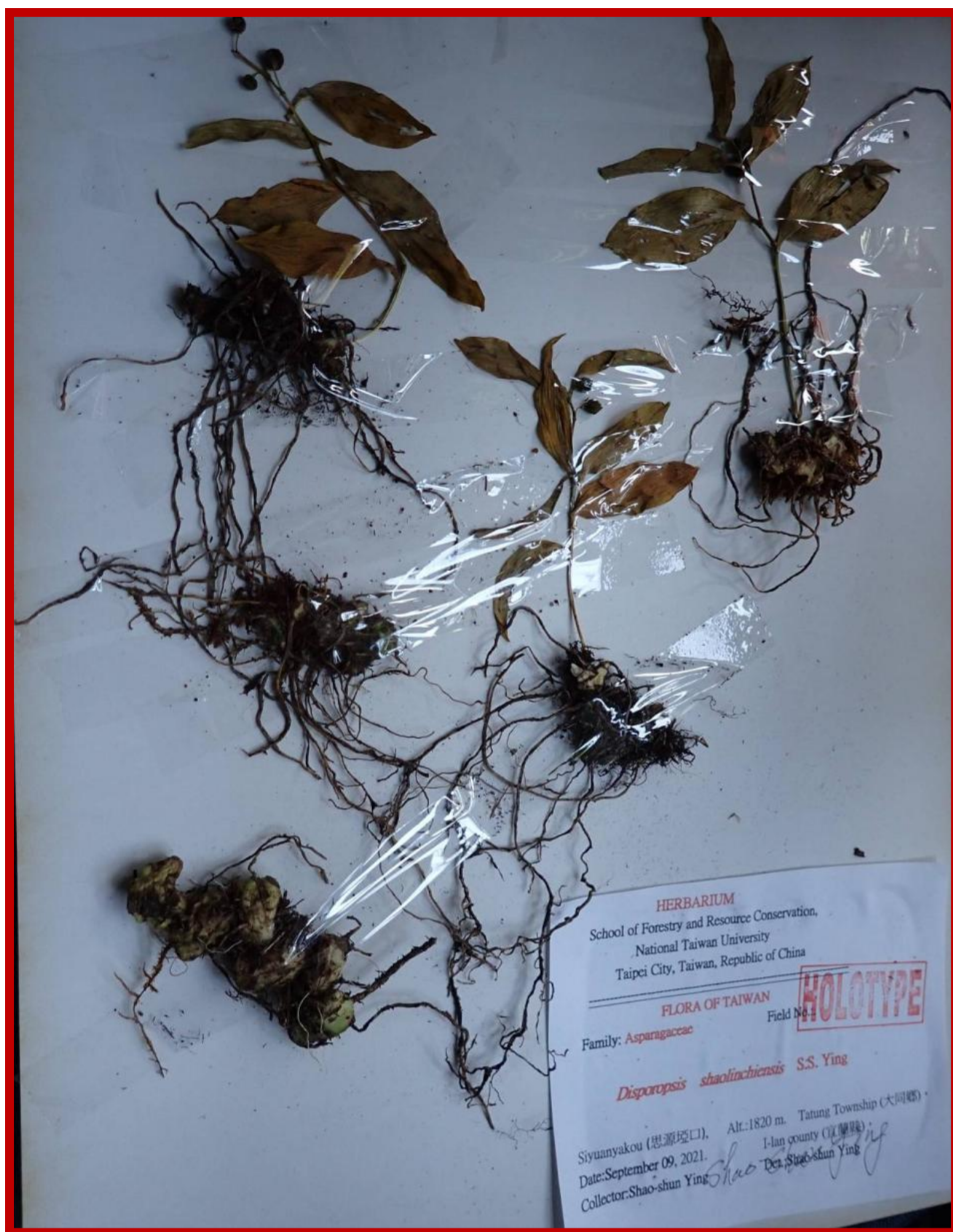


Fig. 9. *Disporopsis shaolinchiensis* S.S. Ying, the holotype (NTUF-110-001)





-7- Fig. 10. *Disporopsis shaolinchiensis* S.S. Ying, the isotype (NTUF-110-002)

### Diagnosis.

*Disporopsis shaolinchiensis* is characterized by:

1. The only species in epiphytic habit of the world *Disporopsis* species, it is always epiphytic on tree-canopy of cloud forest in northern Taiwan.

2. The specimens of the species were collected from a blow-down tree-canopy at Siyuanakou, I-lan county.

3. A small plant 5-15 cm tall; rhizome compressed rounded to ovate, 6-8 mm thickened, fleshy, white to pale green, closely approximated.

4. Leaves 3-5, simple, alternate, oblong to ovate-oblong, 2.5-4.5 cm long, 1-1.5 cm wide, acute at apex, amplexual at base

5. Flowers 1-3, solitary, axillary, white tinged with pink, 3-4 mm in diameter when opened; ovary ovoid, 1.5-2.5 mm across, glabrous, green, 3-locular; each cell with 3 ovules.

6. Fruits berries, ovoid, 3-5 mm across, lustrous, with a mucro at apex, glabrous, red when mature; seeds 9, 3 in each cell, rounded, about 1.5 mm diameter, white in colour, glabrous, smooth.

### Distribution and phenology.

The species is endemic in Taiwan. It is known from medium altitude of 1800-2100 m. of Siyuanyakou (思源埡口), Tatung Township (大同鄉), I-Lan County. Its flowering time is April to May, and fruiting time from September to October..





## B. Discussed on the correct name of *D. arisanense* Hayata



Fig. 12. *Disporopsis fuscopicta* var. *arisanense* (Hayata) S.S. Ying, the plant colony

1915, Professor B. Hayata described *Disporopsis arisanense* in his famous book 《Icones Plantarum Formosanum》 vol.5 page 230.

1978-83 A series of 《Flora Malesiana》 had been published, among those, in series 1, vol. 9, pages 219-220, they treated *D. arisanense* as conspecific with *D. fuscopicta* Hance

2000, Lang, S. Y. & Tamura, M.N. treated *D. arisanense* as a synonymy of *D. pernyi* (Hua) Diels. in 《Flora of China》 vol. 23, page 233.

At the same year (2000) S.S.Ying (the author of this book) proposed *D. arisanense* as a variety of *D. fuscopicta* in 《Flora of Taiwan, ed.2》 vol.5 page 43.

It is an interested thing to discuss on the status of *D. arisanense* and which name is acceptable.

## A. Geographic relationship

According to 《Flora Malesiana》, the distribution of *D. fuscopicta* is S.China, Taiwan, in Malesia; Philippines (N. Luzon; Lepanto, Bontoc, and Benguet Prov. );.

Lang and Tamura's *D. pernyi* (Hua) Diels., is endemic to Mainland China (Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang) and Taiwan.

As to geographic relationship of the whole genus *Disporopsis* species, I am sure, Taiwan species(*D. arisanense*) is close to *D. fuscopicta*.

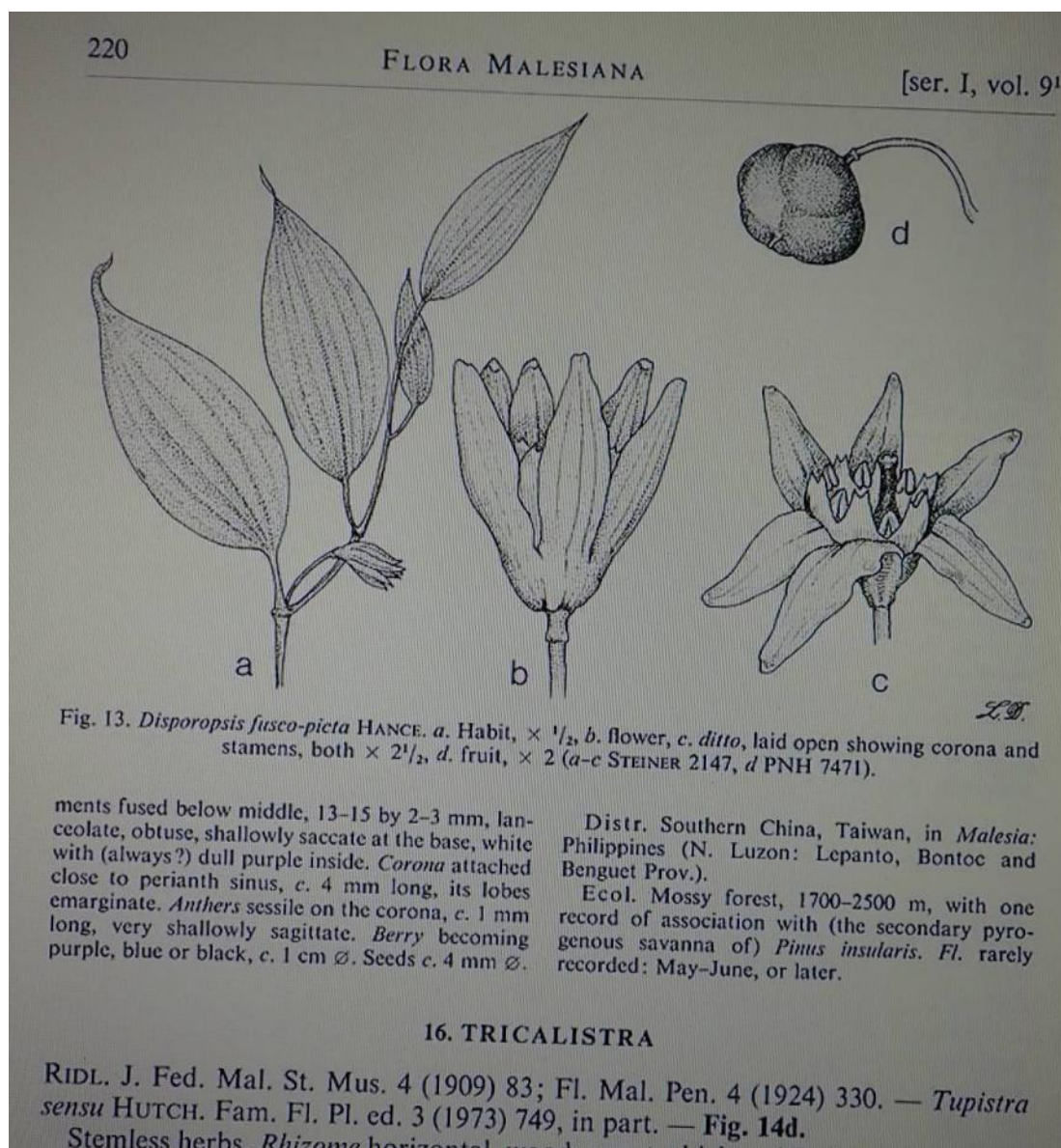


Fig. 13 Fig and partial description of *Disporopsis fuscopicta* (Reprinted from Fl. Malesiana)

## B. Morphology :

### 1.Laves:

*Disporopsis fuscopicta*, ovate or elliptic to oblong-lanceolate, 4--12 cm long, 1.6--5 cm





Fig. 14. *Disporopsis fuscopicta* var. *arisanense* (Hayata) S.S. Ying, flowering plants



Fig. 15. *Disporopsis pernyi* (Hua) Diels. flowering plants

[Disporopsis pernyi](#) BLUSHING SOLOMON'S SEAL - Country Farm Perennials



wide, acuminate at apex, obtuse to subcuneate, rarely slightly cordate at base.

*Disporopsis pernyi*, lanceolate to elliptic, 5-13 cm long, 1.5-6 cm wide, acuminate to attenuate-acuminate at apex, rounded to obtuse at base.

*Disporopsis arisanense*: ovate to oblong, 7-9 cm long, 3-4 cm wide, acuminate at apex, rounded at base.

In this case, *D. arisanense* is somewhat close to *D. fuscipicta* in leaf shape and size.

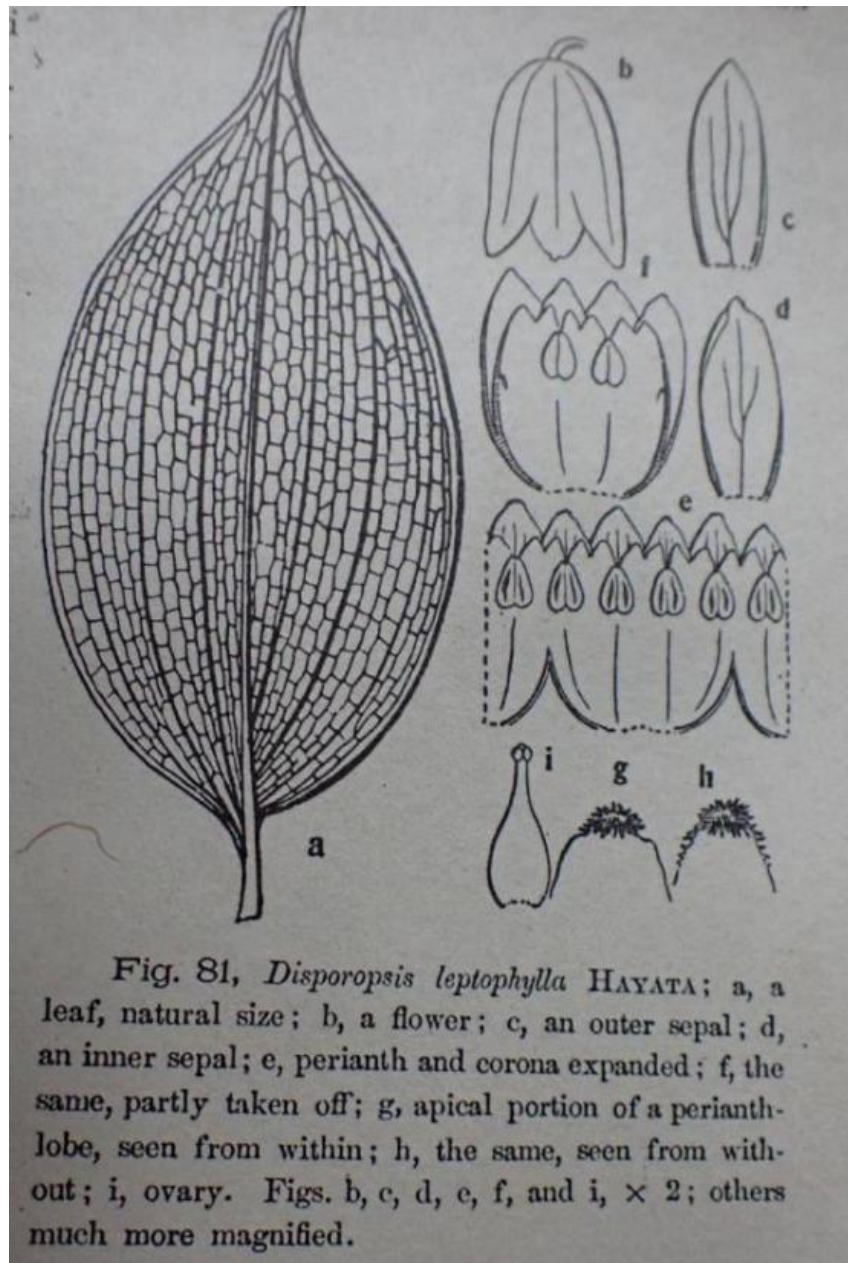


Fig. 16. Leaf and flower characters of *Disporopsis leptophylla* Hayata

(Reprinted from Hayata, (1915) Icon. Pl. Formos. Vol.5 page232)

(It is always considered *D. leptophylla* as a conspecific with *D. arisanense*)

**B. Flowers:**

*Disporopsis fuscopicta*, mostly 2 flowered in each leaf-axil.

*Disporopsis pernyi*, 1-3-flowered in ech leaf-axil.

*Disporopsis arisanense*. mostly 1- flowered in each leaf-axil.



**Fig. 17. *Disporopsis fuscopicta*. flowering plant**

2-1P62311415b09httpwww.fpcn.netayeshenghuahui20130930Disporopsis\_fuscopicta.html

**C. Perianth:**

*Disporopsis fuscipicta*, white and tinged with green at apex, and scattered red and purple spots and streaks in side. however, white with (always?) purple inside was described by Malesian flora.

*Disporopsis pernyi*, perianth pure white. Lang and Tamura's description is "Perianth white, occasionally dark reddish adaxially"; I speculate that they made this description is to match the characters of the perianth inside of our species (*D. arisanense*), and treated it as a synonymy of *Disporopsis pernyi*. Actually, the perianth colour of our species is always dark purple inside, not occasionally.

*Disporopsis arisanense*. white outside and dark purple in side, I examined some living plants of this species in the wild, the colour of perianth inside is always dark purple, not occasionally dark reddish.

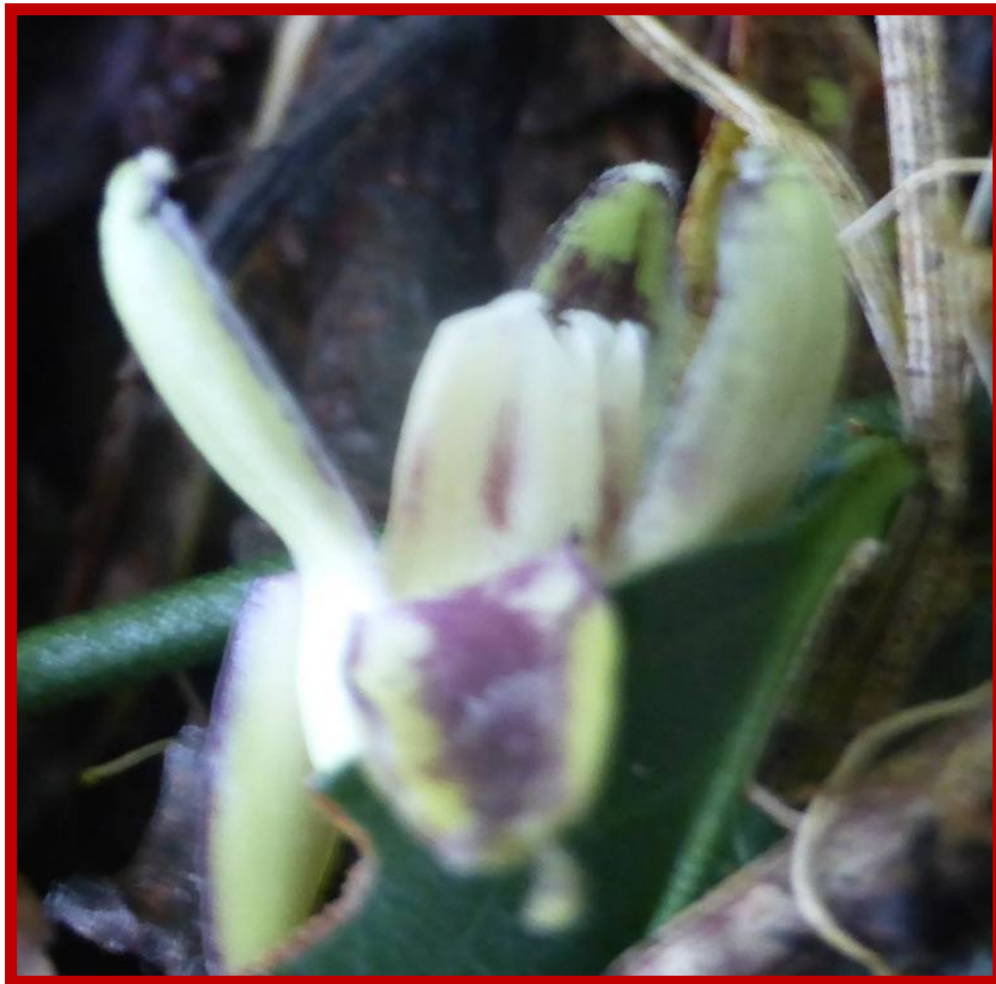


Fig. 18. *Disporopsis fuscipicta* var. *arisanense* (Hayata) S.S. Ying., the perianth segment in side

#### **D.Corona:**

*Disporopsis fuscipicta*, attached close to perianth sinus, about 4 mm long, its lobes



emarginate.

*Disporopsis pernyi*, . Corona lobes usually opposite perianth lobes, rarely alternate to them, lanceolate to linear-lanceolate, 3--4(--5) mm, membranous, apex deeply 2-cleft into lobelets.

*Disporopsis arisanense*.corona lobes alternate perianth lobes, oblong, 3-4 mm long, emarginate at apex, (please see fig.16,e.)

In summary, on the available evidence, I suggest that our species, *Disporopsis arisanense*, is better to treated it as a variety of *Disporopsis fuscipicta*, as I did in 《Flora of Taiwan vol.5 (2020)》 .

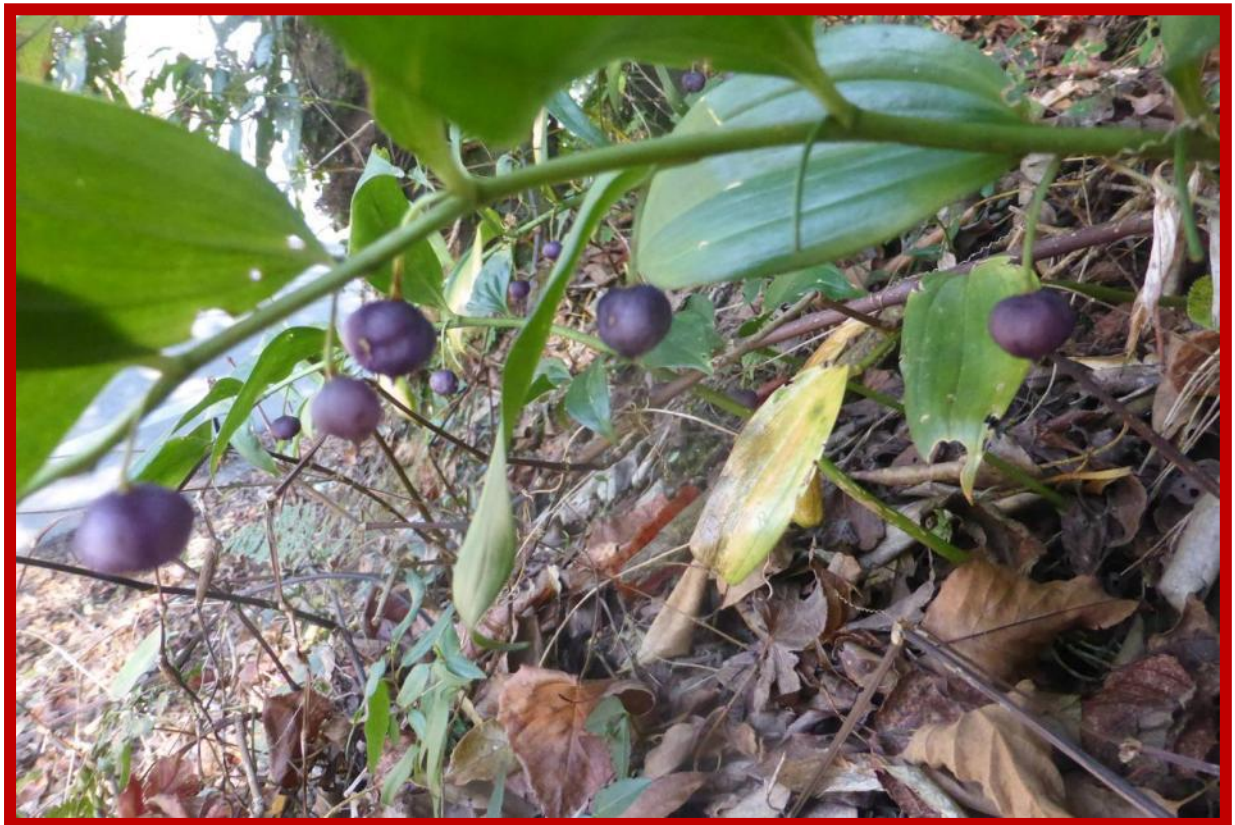


Fig. 19. *Disporopsis fuscipicta* var. *arisanense* (Hayata) S.S. Ying,,plant with fruits



## 2. Three New Species of Genus *Galium* (*Rubiaceae*) from Taiwan

### A. *Galium shengkuangense* S.S. Ying

*Galium shengkuangense* S.S. Ying, *sp. nov.* 勝光豬殃殃

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Shengkuang Nanhutashan Hiking Gate (勝光南湖大山登山口) 2150 m alt. S. S. Ying, *s.n.* December 17, 2020. (holotype, NTUF).



Fig. 20. *Galium shengkuangense* S. S. Ying the plant with flowers and fruits

**Morphology:** A erect, ascending to prostrate herb, stems elongate, 30-45 cm long, much-branched, pubescent, coarse when touch; the branches 4-angled, 2 mm in diameter, villous, often rough when touch. Leaves 6, verticillate, lanceolate to oblanceolate, 5-15 mm long, 1-2 mm wide, acuminate and with short-acicular at apex, narrowed and amplexual at base, chartaceous, entire and ciliate at margins, villous on both surfaces, feeling rough when touch, midrib impressed surface

and elevated beneath, lateral veins inconspicuous. petioles absent.



Fig. 21. *Galium shengkuanganense* S. S. Ying, branches and leaves

Flowers white, solitary, terminal on the branchlets, smaller, 1-2 mm in diameter when opened, pedicels 4-6 mm long, slender, hairy; bracts absent or minute; calyx 4-lobed, terminal on the ovary, the lobes triangular, 1-1.5 mm long, obtuse at apex, pubescent; corolla 1.5-2.5 mm long, 4-lobed at apex; the lobes oblong, 1-2 mm long, 1.2 mm wide, acute at apex, glabrous; stamens 4, alternate to the corolla-lobed; filaments shorter than lobed; anthers dorsifixed, yellow; ovary inferior, didymous, compressed ovoid, green, densely covered white trichomes; style short, stigma 2-lobed, short, caudate.

Fruits red when mature, scattered with granules surfaces, with 2 mericarps, the mericarps compressed ovoid, 2.5-3.5 mm long, 1.5-2 mm wide, with a dense cover of uncinulate trichomes 0.4-0.6 mm long from swollen base; the pedicels elongate, 8-13 mm long, hairy. .

#### **Diagnosis.**

*Galium shengkuanganense* is the species with one of with solitary flower species among the Taiwan *Galium* plants, it is characterized by:





Fig. 22. *Galium shengkuanganense* S. S. Ying, close-up of flowers

1. Leaves 6, verticillate, lancrolate to oblanceolate, 5-15 mm long, 1-2 mm wide, acuminate and with short-acicular at apex.
2. Flowers white, solitary, terminal on the branchlet, small, 1-2 mm in diameter when opened.
3. Fruits red when mature, scattered with granules surfaces, with 2 mericarps.

**Distribution and phenology.**

*Galium shengkuangense* S.S. Ying is endemic to Taiwan. It is known from Shengkuang, Nanhutashan hiking gate (勝光南湖大山登山口) 2150 m alt., Hoping District (和平區), Taichung City, Central Taiwan. It was collected on the roadsides of hiking trail, at elevations about 2150 m. and flowering time is December.

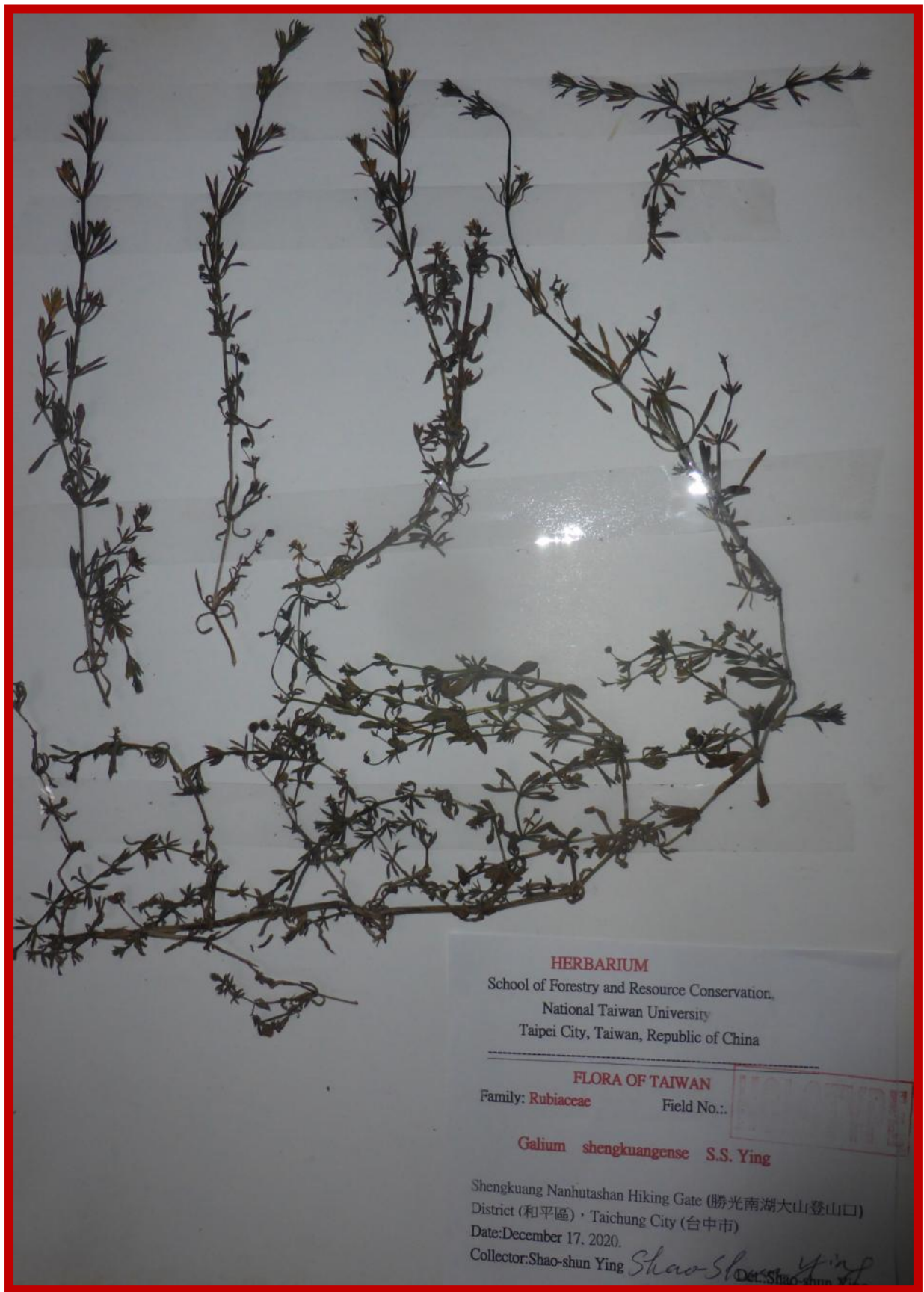


Fig. 23. *Galium shengkuanganense* S. S. Ying, close-up of fruits



-19- Fig. 24. *Galium shengkuanganense* S. S. Ying, plants with fruit





-20- Fig. 25. *Galium shengkuangense* S. S. Ying, the holotype (NTUF-110-003)



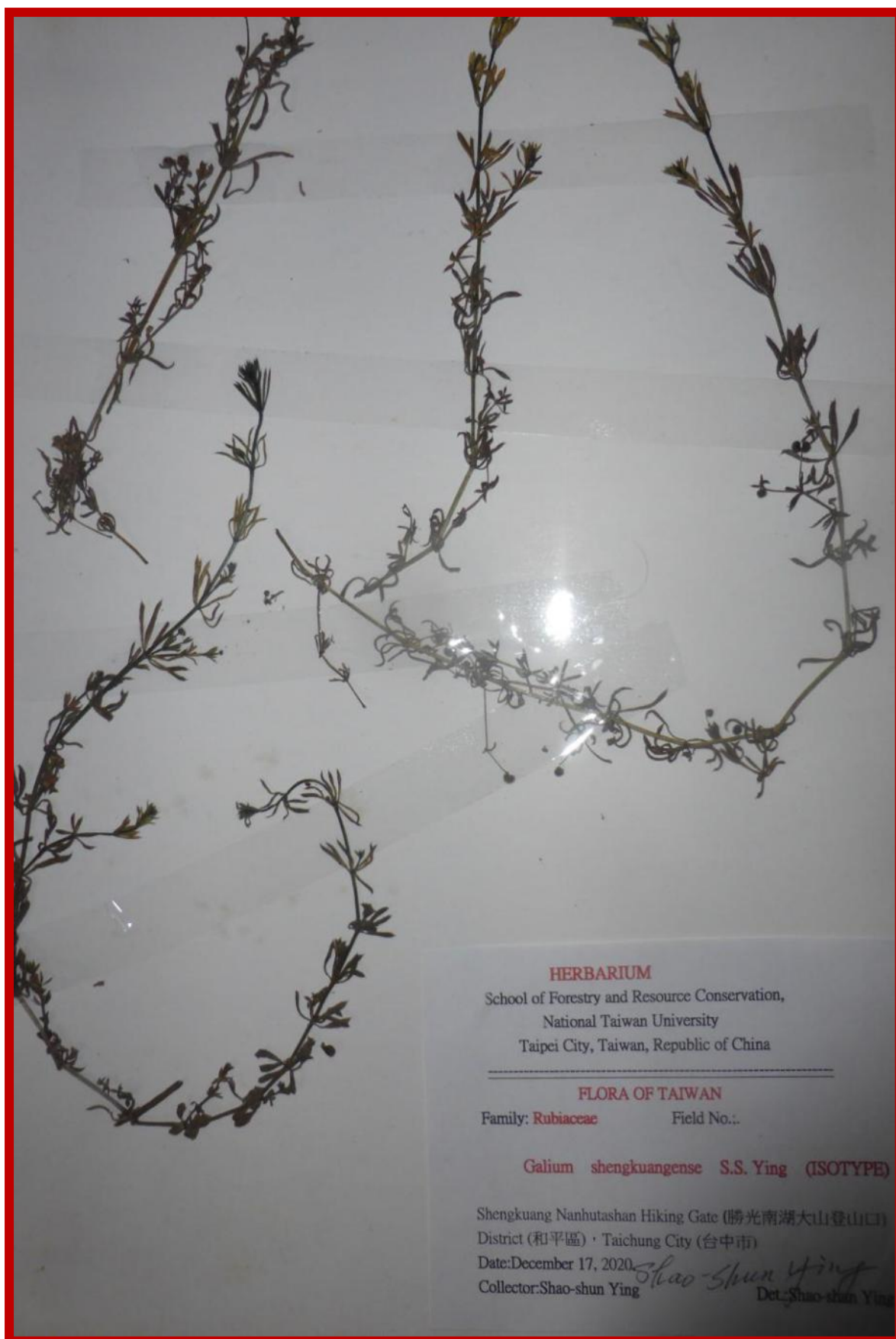


Fig. 26. *Galium shengkuanganense* S. S. Ying, plants with fruit



Fig. 27. *Galium shengkuanganense* S. S. Ying, the habitat





**B. *Galium nanhumontanum* S.S. Ying**

*Galium nanhumontanum* S.S. Ying, *sp. nov.* 南湖豬殃殃

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Nanhutashan (南湖大山) 2270 m alt.  
S. S. Ying , *s.n.* July 1, 2021 ° (holotype , NTUF) °



Fig. 29. *Galium nanhumontanum* S. S. Ying, the plants

**Morphology :** A somewhat climbing and prostrate annual herb, stems elongate, usually climbing on the base of trunk, 40-75 cm long, much-branched, bristly hairs, coarse when touch ; the branches 4-angled, 2.5 mm in diameter, bristly hairs,, often rough when touch. green to brownish green  
Leaves 6, verticillate, linear to linear-lanceolate , 8-15 mm long, 2-3 mm wide, acuminate and with short-acicular at apex, narrowed and truncate at base, chartaceous, entire at margins, midrib impressed surface and elevated beneath, lateral veins inconspicuous, scattered hirsute along midrib and lateral veins on both surfaces; petioles absent.

Flowers white tinged pink, 2-5 in a simple umbel, terminal on the branchlets, smaller, 1.5-2 mm in diameter when opened, 2-4 umbels to form a compound umbel on the branchlets; peduncles





Fig. 30. *Galium nanhumontanum* S. S. Ying, close-up of stem and leaves

3-6 cm long, slender, slender, hirsute, green; secondary peduncles 1.5-2.5 mm long, slender,



Fig. 31. *Galium nanhumontanum* S. S. Ying, inflorescence, mind compound umbels



-25- Fig. 32. *Galium nanhumontanum* S. S. Ying, compound umbels



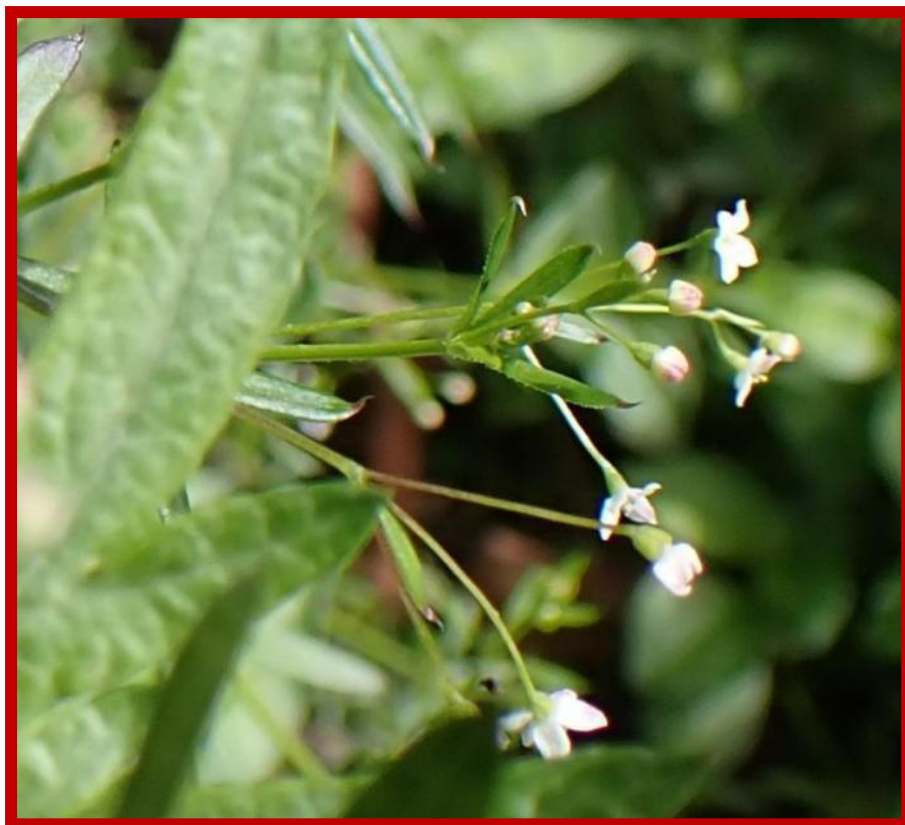


Fig. 33. *Galium nanhumontanum* S. S. Ying, pedicels, flowering buds



Fig. 34. *Galium nanhumontanum* S. S. Ying, close-up of flowers



Fig. 35. *Galium nanhumontanum* S. S. Ying, close-up of flowers

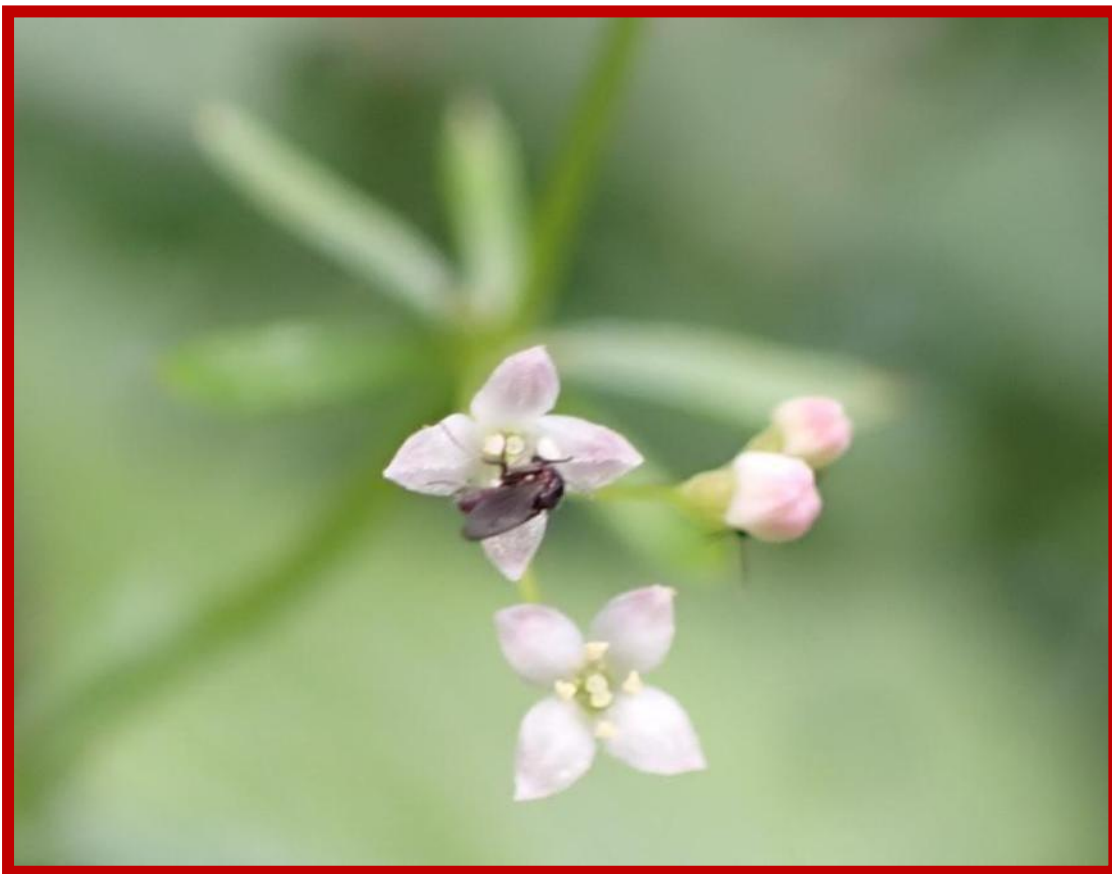
sattered hirsute; bracts linear, 3-4 mm long, 1-2 mm wide acute at apex; pedicels 9-21 mm long, slender, green tinged with red, nearly glabrous; calyx 4-lobed, terminal on the ovary, the lobes triangular, 1-1.5 mm long, acute at apex, green, glabrous; corolla 2.0-2.5 mm long, 4-lobed at apex; the lobes ovate, 1.5-2 mm long, 1.5 mm wide, white but pink at apex, acute at apex, glabrous; stamens 4, alternate to the corolla-lobed; filaments shorter than lobed; anthers dorsifixed, white; ovary inferior, didymous, compressed ovoid, green, glabrous, green; style short, stigma 2-lobed, short, cauduous.

Fruits green when mature, smooth surfaces, with 2 mericarps, the mericarps compressed



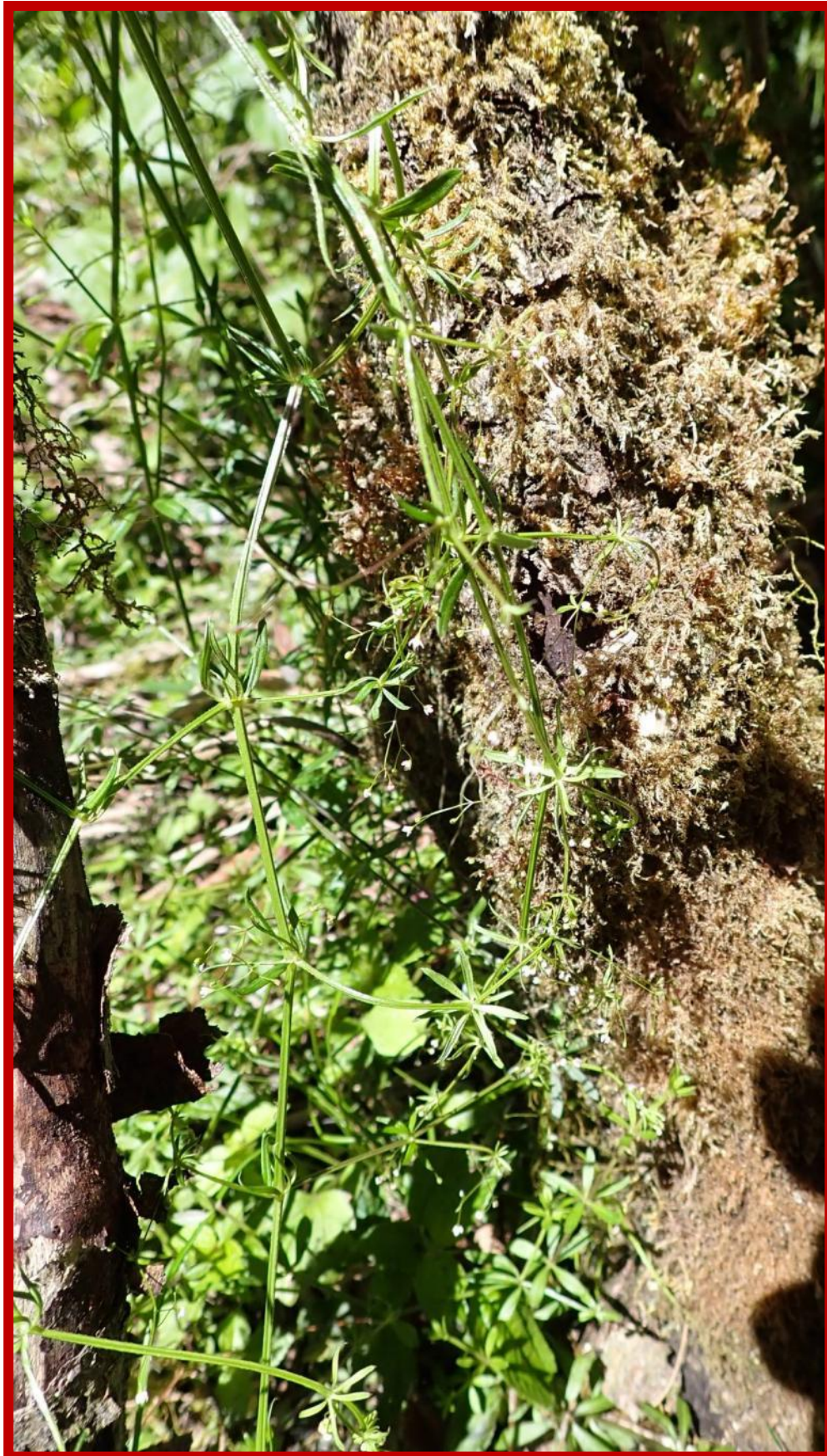


Fig. 36. *Galium nanhumontanum* S. S. Ying, close-up of flowers, ovary glabrous



-28- Fig. 37. *Galium nanhumontanum* S. S. Ying, close-up of flowers





-29- Fig. 38. *Galium nanhumontanum* S. S. Ying, the plants somewhat climbing on tree trunk



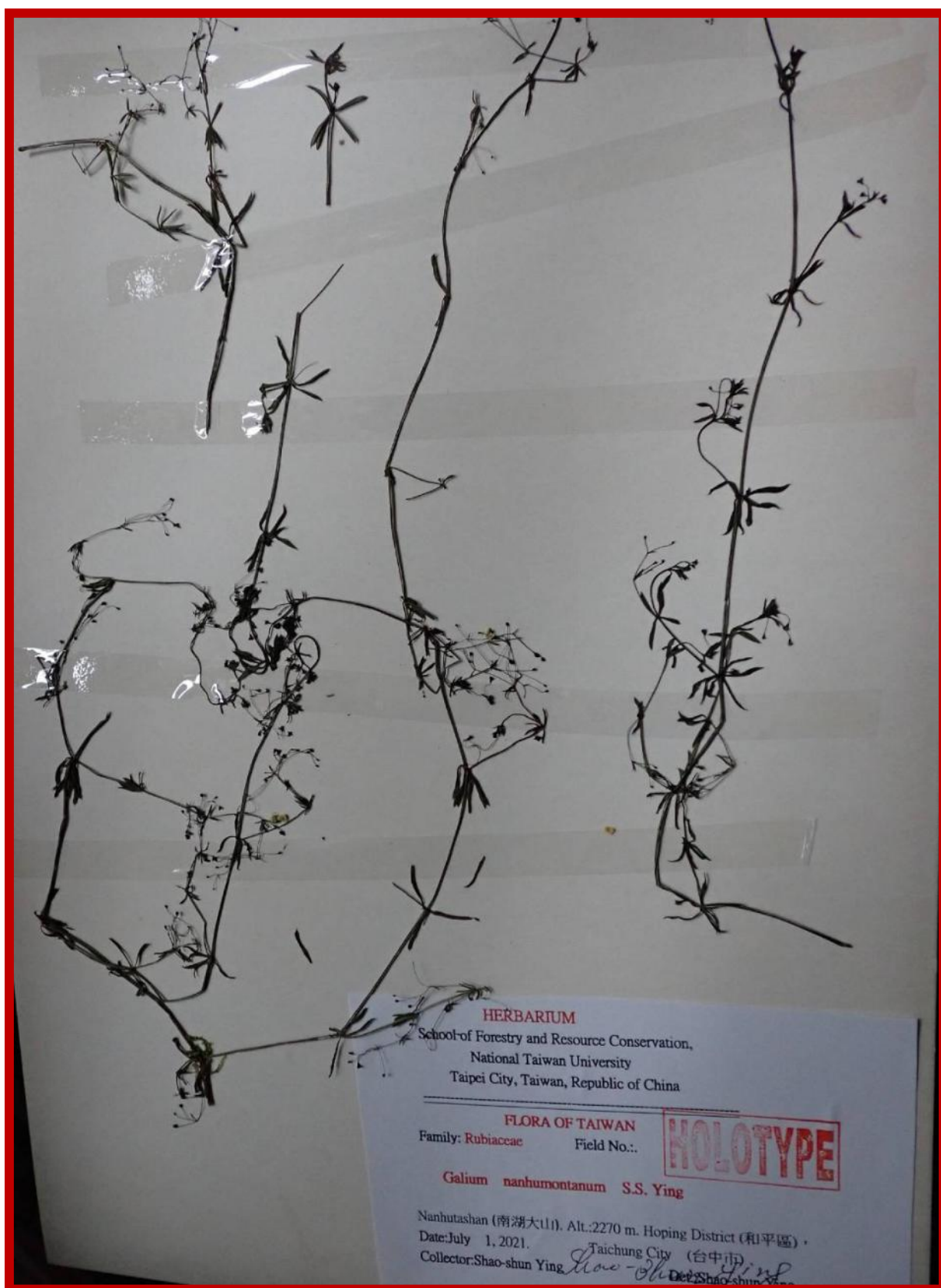
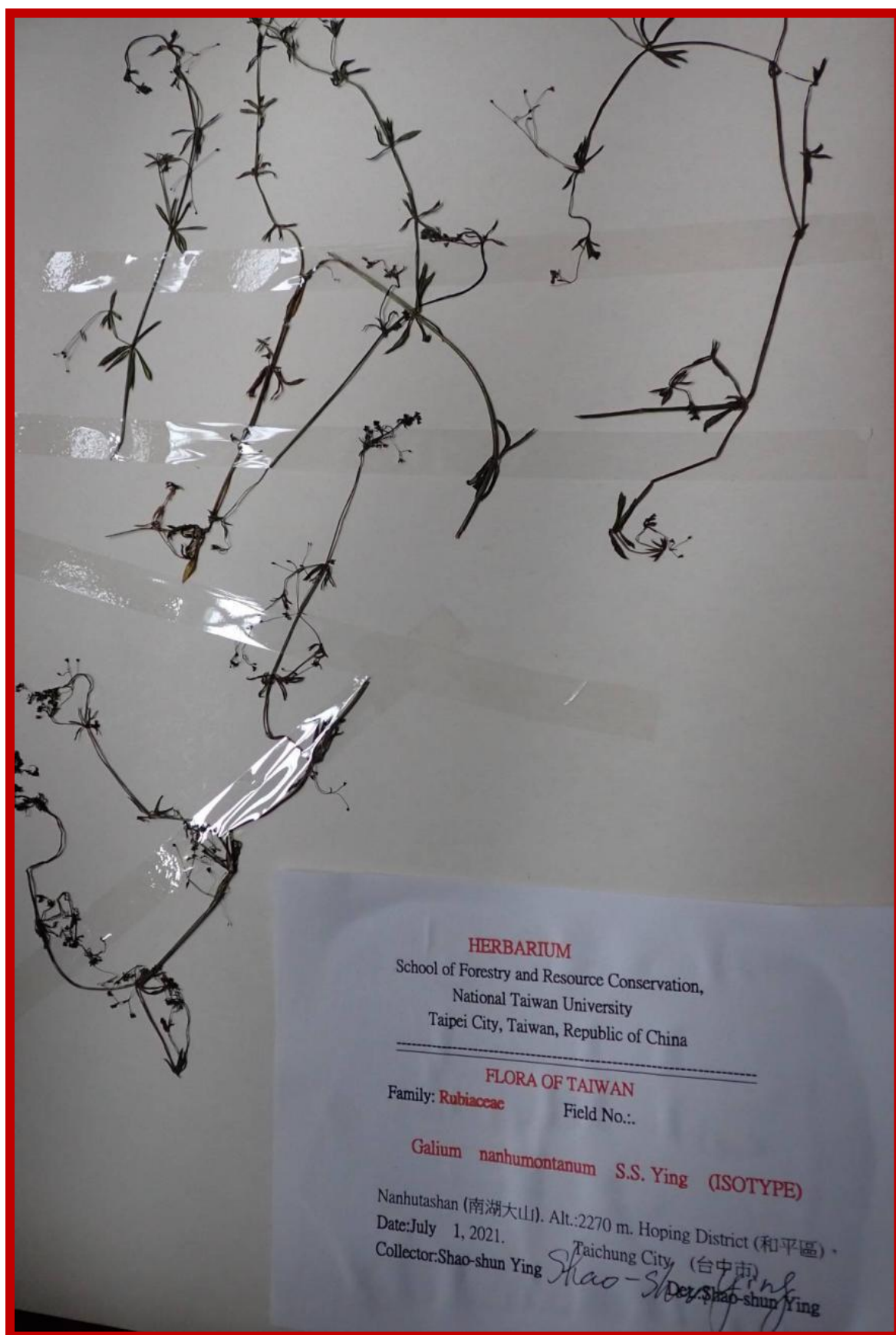


Fig. 39. *Galium nanhumontanum* S. S. Ying, the holotype NTUF-110-005.



-31- Fig. 40. *Galium nanhumontanum* S. S. Ying, the isotype NTUF-110-006.



ovoid, 1.5-2.5 mm long, 1-1.5 mm wide, without any hairy or trichomes, glabrous; pedicels slender, 5-8 mm long, green, glabrous or nearly so.



Fig. 41. *Galium nanhumontanum* S. S. Ying, the infructescence

### Diagnosis.

*Galium nanhumontanum* is characterized by:

1. A somewhat climbing and prostrate annual herb.
2. Leaves 6, verticillate, linear to linear-lanceolate, 8-15 mm long, 2-3 mm wide, acuminate and with short-acicular at apex, narrowed and truncate at base.
3. Flowers white tinged pink, 2-5 in a simple umbel, terminal on the branchlets, smaller, 1.5-2 mm in diameter when opened, 2-4 umbels to form a compound umbel on the branchlets.
4. Corolla 2.0-2.5 mm long, 4-lobed at apex; the lobes ovate, 1.5-2 mm long, 1.5 mm wide,,white but pink at apex, acute at apex, glabrous.
5. Ovary inferior, didymous, compressed ovoid, green, glabrous, green; style short, stigma



Fig. 42. *Galium nanhumontanum* S. S. Ying, close-up of infructescence

2-lobed, short, cauduous.

6. Fruits green when mature, smooth surfaces, with 2 mericarps, the mericarps compressed, ovoid, glabrous; pedicels slender, 5-8 mm long, green, glabrous or nearly so.

#### **Distribution and phenology.**

*Galium nanhumontanum* S.S. Ying is endemic to Taiwan ° It is known from Nanhutashan (南湖大山) 2150 m alt., Hoping District (和平區). Taichung City , Northern Taiwan ° It was collected on the forest floor , at elevations about 2270 m. and flowering time is July to August and fruiting from August to October..



**C. *Galium alboflorum* S.S. Ying**

*Galium alboflorum* S.S. Ying, *sp. nov.* 白花豬殃殃

TYPE:TAIWAN. Taichung City,Hoping District (和平區), Shengkuangshan (勝光山) 1860 m alt.  
*S. S. Ying* , *s.n. July 15, 2021* ° (holotype , NTUF) °



Fig. 43. *Galium alboflorum* S. S. Ying, the plants

**Morphology :** A somewhat prostrate annual herb, stems elongate, usually prostrate on the ground, 30-50 cm long, much-branched, striated, glabrous, green ; the branches erect to ascending, 4-angled, 2 mm in diameter, striated, glabrous to few hairy. Leaves 4, verticillate, oblong to ovate-lanceolate , 5-7 mm long, 1.5-2.5 mm wide, acuminate at apex, narrowed to obtuse at base, chartaceous, entire and ciliate at margins, midrib somewhat elevated on surface and elevated at



Fig. 44. *Galium alboflorum* S. S. Ying, the branches and leaves

beneath, lateral veins inconspicuous, scattered hirsute on both surfaces; petioles short, 1.5-2.5 mm long, hairy.

Flowers white, 2-5 in a simple raceme to umbel, terminal or upper leaf-axil on the branchlets, smaller, 1.5-2 mm in diameter when opened; peduncles 1-2.5 cm long, slender, green, glabrous; bracts ovate to lanceolate, 2-3 mm long, 1-2 mm wide acute at apex; pedicels 5-7 mm long, slender, green, glabrous; calyx 4-lobed, terminal on the ovary, the lobes triangular, 0.9-1.2 mm long, acute at apex, green, glabrous; corolla 2.2-2.6 mm long, 4-lobed at apex; the lobes ovate, 1.5-2 mm long, 1.5 mm wide, white, obtuse at apex, glabrous; stamens 4, alternate to the corolla-lobed; filaments shorter than lobed; anthers dorsifixed, yellow; ovary inferior, didymous, compressed ovoid, green, glabrous; style short, stigma 2-lobed, short, cauduous.

Fruits green when mature, smooth surfaces, with 2 mericarps, the mericarps compressed





Fig. 45. *Galium alboflorum* S. S. Ying, the inflorescences



Fig. 46. *Galium alboflorum* S. S. Ying, flowers



Fig. 47. *Galium alboflorum* S. S. Ying, close-up of fruits

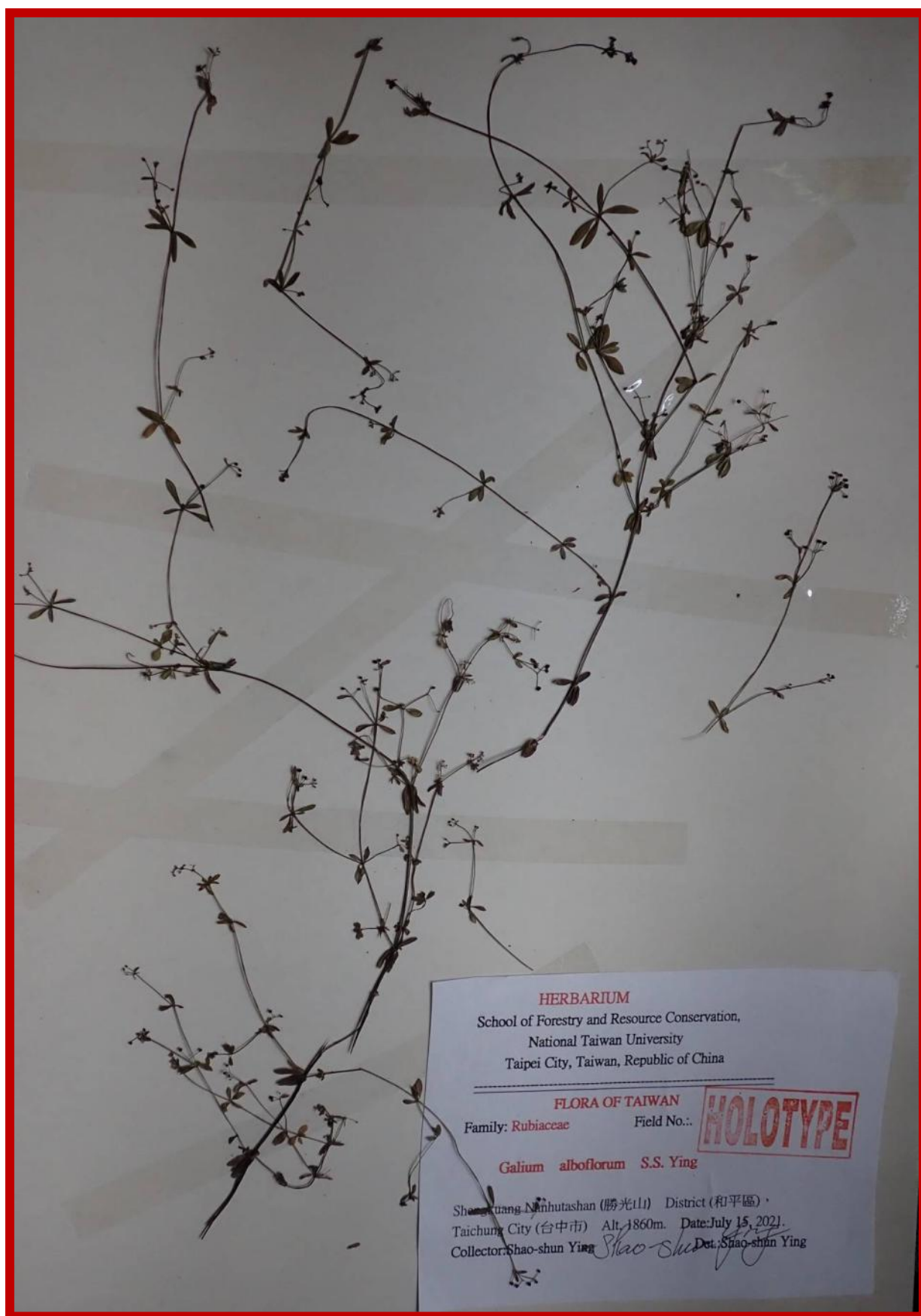
ovoid, 0.9-1.2 mm long, 0.8-10 mm wide, without any hairy or trichomes, glabrous; pedicels slender, 5-12 mm long, green, glabrous or nearly so.

### **Diagnosis.**

*Galium alboflorum* is characterized by:

1. A prostrate annual herb, stems elongate. much-branched, striated, glabrous, green.
2. Leaves 4, verticillate, oblong to ovate-lanceolate , 5-7 mm long, 1.5-2.5 mm wide, entire and ciliate at margins, midrib somewhat elevate surface and elevated at beneath, lateral veins inconspicuous, scattered hirsute on both surfaces
3. Flowers white, 2-5 in a simple raceme to umbel, terminal or upper leaf-axil on the branchlets, smaller, 1.5-2 mm in diameter when opened
4. corolla 2.2-2.6 mm long, 4-lobed at apex; the lobes ovate, 1.5-2 mm long, 1.5 mm wide,,white, obtuse at apex, glabrous.
5. Fruits green when mature, smooth surfaces, with 2 mericarps, the mericarps compressed ovoid, 0.9-1.2 mm long, 0.8-10 mm wide, without any hairy or trichomes, glabrous.





-38- Fig. 48. *Galium alboflorum* S. S. Ying, the holotype NTUF-110-007.

### Distribution and phenology.

*Galium alboflorum* S.S. Ying is endemic to Taiwan ° It is known from Shengkuangshan (勝光山) 1860 m alt., Hoping District (和平區). Taichung City , Northern Taiwan ° It was collected on the mouttain slope , at elevations about 1860 m. and flowering time is July to August and fruiting from August to October..



Fig. 49. *Galium alboflorum* S. S. Ying, the habitat



### 3. Three New Species of Genus *Viola* (Violaceae ) from Taiwan ----

A. *Viola pubipetala* S.S. Ying

*Viola pubipetala* S.S. Ying, *sp. nov.* 毛瓣三色堇

TYPE: TAIWAN. Hualien county, Xiulin Township (秀林鄉), Hohuanshan (合歡山) 2900 m alt.

*S. S. Ying*, *s.n.* April 29, 2020. (holotype, NTUF).



Fig. 50. *Viola pubipetala* S. S. Ying, close-up of flower

**Morphology** : Annual herbs, rhizome absent, taproot fleshy; roots few, 3-6 cm long, glabrous. Leaves radical, petioled, triangular to triangular-lanceolate, 2.5-4.5 cm long, 1.5-2.5 cm wide, acuminate at apex, truncate or slightly cordate at base, equal to somewhat unequal,

chartaceous, glabrous on both surfaces; crenate to serrulate at margins; midrib impressed surface and elevated beneath, lateral veins 2-4 per side, impressed surface and elevated beneath. Petioles 2-4.5 cm long, somewhat winged at upper part; stipules adnate with the base of petioles, lanceolate, 4-5 mm long, acuminate at apex, short remotely fimbriate ciliate at margins.



Fig. 51. *Viola pubipetala* S. S. Ying, plant conolly

Flowers solitary, terminal, 2.5-3.5 cm in diameter when opened; scape 6-10 cm long, erect to ascending, glabrous; bracts 2, linear, 5-7 mm long, about 1 mm wide; sepal 5, lanceolate, 6-8 mm long, 3-3.5 mm wide, acuminate at apex, green, glabrous or hirsute at base inside; petals unequal; 2 upper petals oblong, 1.5-2.0 cm long, 5-7 mm wide, obtuse at apex, light purple and with dark colour veins, slightly clawed at base; the claws 1-1.5 mm long; the lateral 2 petals oblong, 1.5-2.2 cm long, 6-7 mm wide, obtuse at apex, light purple with dark colour veins, white plaque and villous at base; lip oblong, 1.5-2.5 cm long, 6-8 mm wide, light purple with dark colour veins, white plaque at base, obtuse and slightly truncate at apex, obtuse at base; spur 4-5 mm long, 2-3 mm wide, inflate and obtuse at apex; stamens 5; ovary globose, 2-2.5 mm long; style slender, 2.5-3 mm long. Fruits capsules, 3-celled, valves opened when mature;





Fig. 52. *Viola pubipetala* S. S. Ying, the plant



Fig. 53. *Viola pubipetala* S. S. Ying, the flower, hairs on the petals can be visible



Fig. 54. *Viola pubipetala* S. S. Ying, the holotype NTUF-110-008.



seeds rounded , 0.5 mm in diameter °

**Diagnosis.**

*Viola pubipetala* is characterized by its pubescent petals, the character is only visible at this species among Taiwan *Viola* plants.

**Distribution and phenology.**

*Viola pubipetala* S.S. Ying is endemic to Taiwan ° It is known from Hohuanshan (合歡山) at 2900 m elevation Xiulin Township (秀林鄉) , Hualien county, Central Taiwan ° It was collected on the roadsides of highway , and flowering time is April to May.

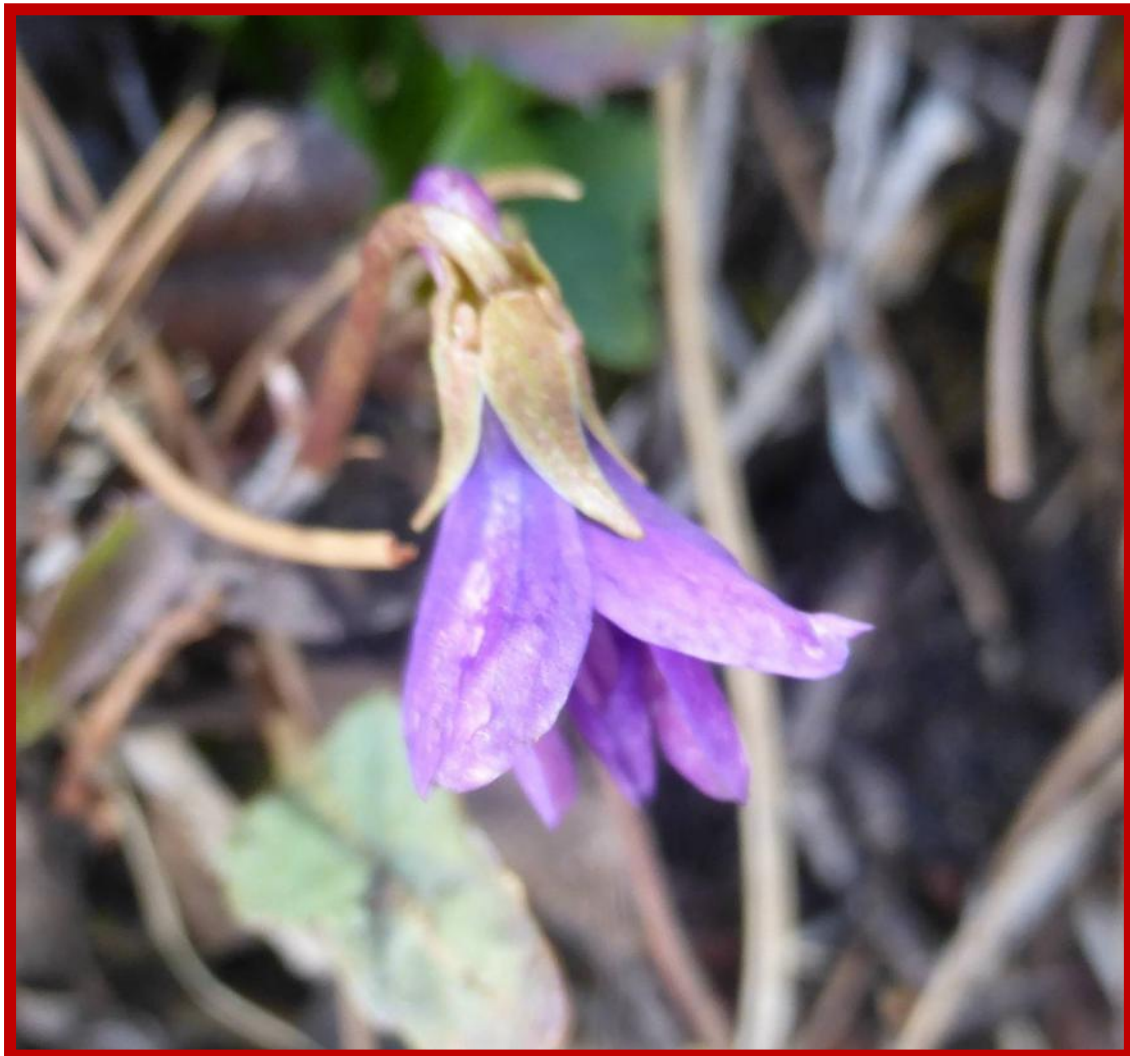


Fig. 55. *Viola pubipetala* S. S. Ying, the flower, ready to opened

*B. Viola xibaoensis* S.S. Ying

*Viola xibaoensis* S.S. Ying, *sp. nov.* 西寶三色堇

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉) , Xibao (西寶) 920 m alt. *S. S. Ying* , *s.n.* January 21, 2021 ° (holotype, NTUF) °



Fig. 56. *Viola xibaoensis* S. S. Ying, close-up of flower



**Morphology :** Annual herbs, rhizome absent; roots few, fibrous, 2-4 cm long, slender, glabrous. Leaves radical, petioled, ovate-triangular to triangular, 4-5.5 cm long, 2.5-4.5 cm wide , acuminate at apex, cordate at base, equal to somewhat unequal, chartaceous, glabrous on both surfaces; crenate at margins; midrib impressed surface and elevated beneath, lateral veins 3-5 per side, impressed surface and elevated beneath. lustrous green surface and pale green beneath. Petioles 3-6.5 cm long, narrowed winged , glabrous; stipules absent or very minute, cauduous °



Fig. 57. *Viola xibaoensis* S. S. Ying, the plants, mind the petioles with wings

Flowers solitary, terminal, 3-4.5 cm in diameter when opened; scape 5-9 cm long, erect to ascending, pubescent; bracts 5 at base of sepals, triangular, 2-4 mm long, about 1.5-2 mm wide, acute at apex; sepal 5, lanceolate, 5-7 mm long, 2.5-3.5 mm wide, acuminate at apex, green, glabrous or nearly so; petals nearly equal oblong, 1.3-2.2 cm long, 4-8 mm wide, obtuse at apex, light violet and with dark colour veins, slightly clawed at base; the claws 1-1.5 mm long; lip like the petals, 1.5-2.5 cm long, 5-7 mm wide, light purple with dark colour veins, white



Fig. 58. *Viola xibaoensis* S. S. Ying, flower-bud, showing the spur

plaque at base, obtuse at apex, obtuse at base; spur 5-7 mm long , 2-3 mm wide, not inflate and obtuse at apex, lightly purplish ; stamens 5, included ; ovary globose , 3-3.5 mm long, 3-celled; 8-10 ovules in each cell; style slender , included, 2.5-3.5 mm long ° Fruits capsules , oblong, 6-9 mm long, 2-3 mm across, calyx persistent; valves opened when mature ; seeds rounded , 0.5-0.6 mm in diameter, glabrous, lustrous, brownish °

#### **Diagnosis.**

*Viola xibaoensis* is characterized by its glabrous petals, the lip like the petals, 1.5-2.5 cm long, 5-7 mm wide, light purple with dark colour veins, white plaque at base, obtuse at apex; fruits capsules , oblong, 6-9 mm long, 2-3 mm across, calyx persistent.





Fig. 59. *Viola xibaoensis* S. S. Ying, close-up of fruits



Fig. 60. *Viola xibaoensis* S. S. Ying, close-up of dehiscent fruits

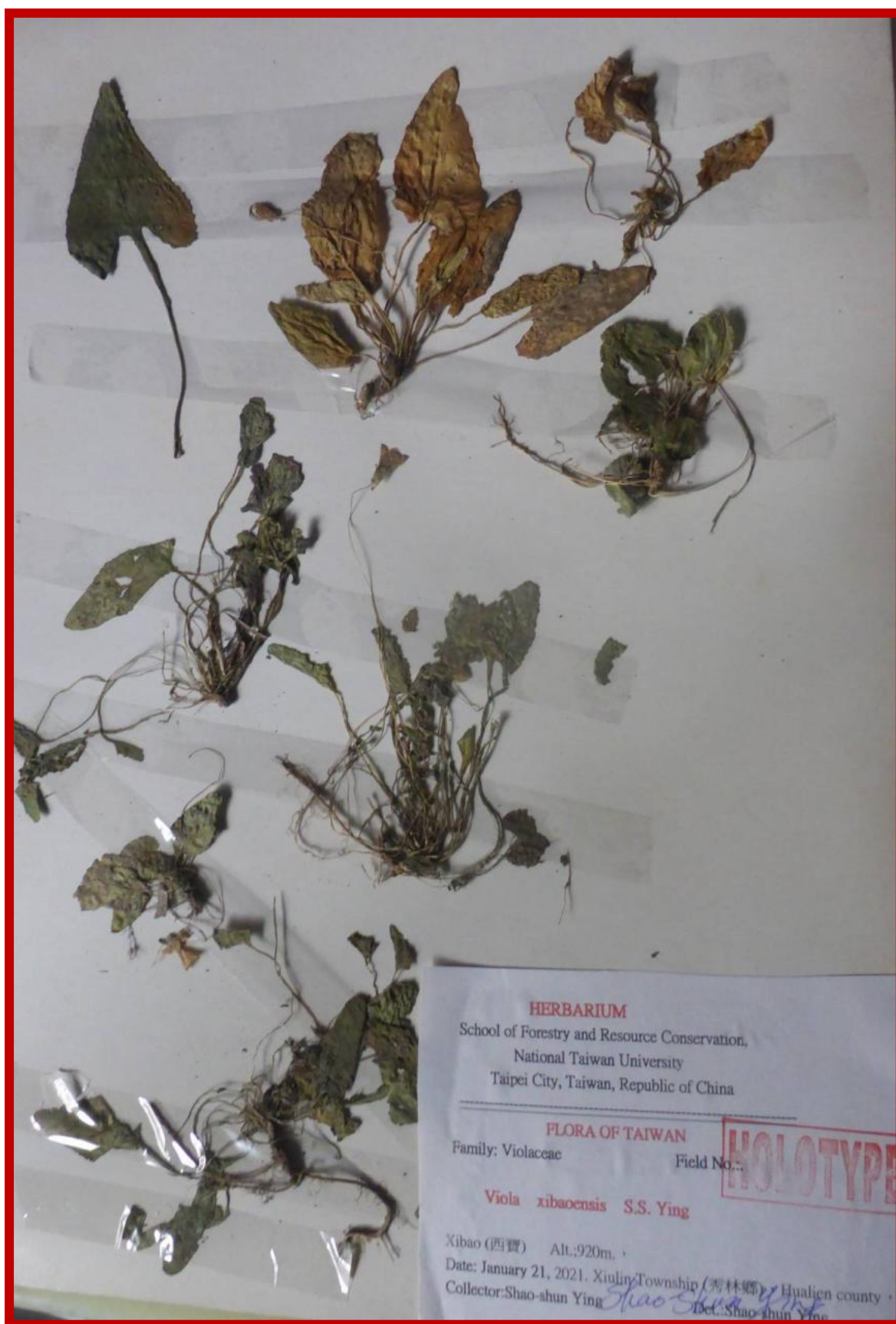


Fig. 61. *Viola xibaoensis* S. S. Ying, the holotype NTUF-110-009.



### Distribution and phenology.

*Viola xibaoensis* S.S. Ying is endemic to Taiwan ° It is known from Xibao (西寶) at 920 m elevation Xiulin Township (秀林鄉), Hualien county, Central Taiwan ° It was collected on the roadsides of highway , and flowering time is January to March.



Fig. 62. *Viola xibaoensis* S. S. Ying, the hanitat

### C. *Viola sandaiojiaoensis* S.S. Ying

*Viola sandaiojiaoensis* S.S. Ying, *sp. nov.* 三貂角三色堇

TYPE:TAIWAN. New Taipei City, Ruifang Distract (瑞芳區), Sandiaojiao(三貂角) 54 m alt. *S. S. Ying* , *s.n. Februry 28, 2021* ° (holotype, NTUF) ° 25°0´32″ N, 122°0´7″ E



Fig. 63. *Viola sandaiojiaoensis* S. S. Ying, close-up of flower

**Morphology :** Annual herbs, rhizome and stolon absent; tap root slightly fleshy, 4-5 cm long, 2.5-3 mm across; fibrous roots few, slender, 3-7 mm long,, glabrous. Leaves 6-9, radical, petioled, triangular, 3-5 cm long, 2-3.5 cm wide , acuminate to obtuse at apex, deeply cordate at base, chartaceous to slightly fleshy, glabrous on both surfaces; crenate at margins; midrib impressed surface and elevated beneath, lateral veins 3 per side, impressed surface and elevated beneath. lustrous green surface and pale green beneath. Petioles 4-7.5 cm long, narrowed winged , glabrous; stipules absent or very minute, cauduous °

Flowers solitary, white with blue veins, terminal, 2-3.5 cm in diameter when opened; scape 4-7 cm long, erect to ascending, glabrous; bracts 3 at base of sepals, triangular, 2-3 mm long, about 1.5-2 mm wide, acute at apex; sepal 5, lanceolate, 4-7 mm long, 2-3 mm wide, acuminate at apex, green, glabrous ; petals white with blue veins, nearly equal, oblong, the dorsal ones 2-2.5 cm long, 4-8 mm wide, obtuse at apex; the middle ones 1.8-2.2 cm long, 4-5.5 mm wide, obtuse at apex, scattered glandular-hairs at base, obtuse at apex, slightly clawed at base; the claws 1-1.5 mm long;





Fig. 64. *Viola sandaiojiensis* S. S. Ying, close-up of flower, mind glandular hairs at base of petals



-52- Fig. 65. *Viola sandaiojiensis* S. S. Ying, close-up of flower, see from lateral side

lip wedge-like, 1.5-2 cm long, 6-8 mm wide, white with blue veins, obtuse and emarginate at apex, narrowed at base; spur 4-5 mm long , 2 mm wide, not inflate and obtuse at apex, lightly grayish white ; stamens 5, included ; ovary globose , 2-3 mm long, 3-celled; 18 ovules in each cell; style slender , included, 3.5-4.5 mm long ° Fruits capsules , oblong, 6-8 mm long, 2.5-3.5 mm across, calyx persistent; valves opened when mature, 18 seeds in each cell ; seeds rounded , 0.5-1 mm in diameter, glabrous, lustrous, brownish °



Fig. 66. *Viola sandaiojiaoensis* S. S. Ying, the capsules

#### **Diagnosis.**

*Viola sandaiojiaoensis* is characterized by its glandular-hairs at base of middle petals, the lip wedge-shaped, 1.5-2 cm long, 6-8 mm wide, white with blue veins, obtuse and emarginate at apex; ovary globose , 2-3 mm long, 3-celled; 18 ovules in each cell; style slender , included, 3.5-4.5 mm long ° Fruits capsules , oblong, 6-8 mm long, 2.5-3.5 mm across, calyx persistent; valves opened when mature, 18 seeds in each cell ; seeds rounded , 0.5-1 mm in diameter, glabrous, lustrous, brownish °





Fig. 67. *Viola sandaiojiaoensis* S. S. Ying, the opened capsules, showing the seeds



-54- Fig. 68. *Viola sandaiojiaoensis* S. S. Ying, the habitat (1)



-55- Fig. 69. *Viola sandaiojiaoensis* S. S. Ying, the holotype NTUF-110-010.





Fig. 70. *Viola sandaiojiensis* S. S. Ying, the habitat (2)

#### **Distribution and phenology.**

*Hypericum eastmostianum* S.S. Ying is endemic to Taiwan ° It is known from Sandiao Cape (三貂角), the eastmost point of Taiwan , Ruifang Distract (瑞芳區) , New Taipei City, northern Taiwan ° It was collected on the side of hiking trail , at elevations of 54 meters and flowering and fruiting time from January to February °

#### 4.A New Species of Genus *Amaranthus* (Amaranthaceae) from Taiwan

*Amaranthus shengkuangensis* S.S. Ying

*Amaranthus shengkuangensis* S.S. Ying, *sp. nov.* 勝光莧

TYPE:TAIWAN. Taichung City,Hoping District (和平區), Shengkuang Nanhutashan Hiking Gate (勝光南湖大山登山口) 2050 m alt. *S. S. Ying*, *s.n.* December 17, 2020. (holotype, NTUF).



Fig. 71. *Amaranthus shengkuangense* S. S. Ying, the part of inflorescence

**Morphology** : Annual herbs, stem short, robust, about 3-4 cm long, glabrous, purplish red, much branched; branches spreading, tetragonal or nearly so, 20-45 cm long, 2-3 mm across, glabrous, purplish red. Leaves simple, alternate, ovate to ovate-oblong, 2-4.5 cm long, 1.5-2.5 cm wide,





Fig. 72. *Amaranthus shengkuangense* S. S. Ying, the branchlets, leaves and inflorescence

acuminate at apex. attenuate at base, chartaceous, entire at margins, glabrous on both surfaces, midrib and lateral vein (4-5 per side) impressed surface and elevated beneath, lustrous green surface and slightly glaucous and purplish along midrib and lateral vein beneath. Petioles 1-2.5 cm long, glabrous, concave surface, purplish red or nearly so.

Flowers unisexual, dioecious, small, numerous, densely arranged on an elongate spike. The female spikes axillary and terminal, 3-14 cm long, 8-12 mm across; several female flowers (mostly 4-6) fascicled in a group on the peduncles, subtended by several bracts at base; bracts ovate-lanceolate to lanceolate, 4-6 mm long, 2-3 mm wide, acuminate and slightly caudate at apex, obtuse at base, membranous, tinged with purplish, glabrous on both surface; bracteoles 2 at base of each flower, lanceolate, 3-4.5 mm long, 1.5-2 mm wide, acuminate at apex, membranous, glabrous; tepal 5, somewhat connated at base, oblong to oblong-lanceolate, 2-3.5 mm long, 1-2 mm wide, acuminate at apex, glabrous, ovary globose, 1-1.5 mm across, glabrous or nearly so; style elongate, 3.5-4.5 mm long, exserted; stigma 2, slender, reflexed or not. Utricles obovoid to globose, 2-2.5 mm



Fig. 73. *Amaranthus shengkuangense* S. S. Ying, 4-6 flowers forming a group



-59- Fig. 74. *Amaranthus shengkuangense* S. S. Ying, close-up of female flowers



in diameter, smooth, dehiscent regularly circumscissile; seeds black, compressed globose, 1 mm across, glabrous. smooth.



Fig. 75. *Amaranthus shengkuangense* S. S. Ying, old plant, usually leafless

#### Diagnosis.

*Amaranthus shengkuangense* is characterized by:

1. Stem short, much-branched; branchlets spreading, tetragonal or nearly so, glabrous, purplish red.
2. Leaves ovate to ovate-oblong, entire at margins, glabrous on both surfaces, lustrous green surface and slightly glaucous and purplish along midrib and lateral vein beneath.
3. Flowers unisexual, dioecious, small, numerous, densely arranged on an elongate spike. The female spikes axillary and terminal, 3-14 cm long, 8-12 mm across; several female flowers (mostly 4-6) fascicled in a group on the peduncles, subtended by several bracts at base.
4. Tepal 5, somewhat connate at base, oblong to oblong-lanceolate, 2-3.5 mm long, 1-2 mm wide, acuminate at apex, glabrous.
5. Utricles obovoid to globose, 2-2.5 mm, in diameter, smooth, dehiscent regularly circumscissile;



-61- Fig. 76. *Amaranthus shengkuangense* S. S. Ying, the holotype NTUF-110-011.



seeds black, compressed globose, 1 mm across, glabrous. smooth.

**Distribution and phenology.**

*Amaranthus shengkuangense* S.S. Ying is endemic to Taiwan ° It is known from Shengkuang Nanhutashan Hiking Gate (勝光南湖大山登山口) Hoping District (和平區) , Taichung City, Central Taiwan ° It was collected on the roadsides of hiking trail , and flowering time is November to December.



## 5. Two New Species of Genus *Lindernia* (Linderniaceae) from Taiwan

A. *Lindernia sandaiolingensis* S.S. Ying

*Lindernia sandaiolingensis* S.S. Ying, *sp. nov.* 三貂嶺母草

TYPE: TAIWAN. New Taipei City, Ruifang District (瑞芳區), Sandiaoling (三貂嶺) 205 m alt. S. S. Ying, s. n. January 24, 2021. (holotype, NTUF).



Fig. 78. *Lindernia sandaiolingensis* S. S. Ying, plant colony, accompanying with *Pilea microphylla* (Linn.) Liebm., mind some flowers just opening

**Morphology :** Annual or biennial herbs, stem prostrate to ascending, 3-10 cm long, white pubescent, simple to branched; branches 2.4-5 cm long, ascending. Leaves simple, opposite, ovate to ovate-oblong, 6-8 mm long, 4-6.5 mm wide, acute at apex, obtuse and slightly cordate at base, serrate at margins, lustrous green surface and pale green beneath, glabrous surface and pubescent



beneath; midrib and lateral veins (3-5 per side) impressed surface and elevated beneath. petioles 4.5-6 mm long, pubescent, somewhat groove surface.



Fig. 79. *Lindernia sandaiolingensis* S. S. Ying, leaves, a corolla just fall off

Flowers solitary, axillary on the upward leaf-axils, purplish, very smaller, not widely opened, 2-3 mm in diameter when opened; pedicels 1-2 mm long, pubescent; bracts absent; calyx tubular, 4-5 mm long, 3-4 mm across, 5-lobed at apex, white hairy without and glabrous within; the lobes triangular, 1-1.5mm long, acute at apex; corolla tubular, slightly longer than calyx, 5-6 mm long, 2.5-3.5 mm across, white but purplish on corolla-lip, slightly swollen at base; upper lip erect, 0.3 mm long, acute at apex; lower lip slightly longer than the upper ones, 0.5 mm long, slightly 3-lobed, acute at apex; stamens 4, filaments slender, included, minute geniculum at base. style slender, included, lobed at apex. ,

**Diagnosis.**

*Lindernia sandaiolingensis* is characterized by:



Fig. 80. *Lindernia sandaiolingensis* S. S. Ying, close-up of calyx



-65- Fig. 81. *Lindernia sandaiolingensis* S. S. Ying, close-up of flower





Fig. 82. *Lindernia sandaiolingensis* S. S. Ying, the habitat, mind the ballasts

1. Annual or biennial herbs; stem prostrate to ascending, 3-10 cm long, white pubescent, simple to branched.
2. Leaves simple, opposite, ovate to ovate-oblong, 6-8 mm long, 4-6.5 mm wide, acute at apex, obtuse and slightly cordate at base.
3. Flowers solitary, axillary on the upward leaf-axils, purplish, very smaller, not widely opened, 2-3 mm in diameter when opened; pedicels 1-2 mm long, pubescent; bracts absent;
4. Calyx tubular, 4-5 mm long, 3-4 mm across, 5-lobed at apex.
5. Corolla tubular, slightly longer than calyx, 5-6 mm long, 2.5-3.5 mm across, white but purplish on corolla-lip, slightly swollen at base.

#### **Distribution and phenology.**

*Lindernia sandaiolingensis* S.S. Ying is endemic to Taiwan ° It is known from Sandiaolin area (三貂嶺), and is confined to Sandiaolin station (三貂嶺火車站) along rail road , and grows from ballasts accompanying with *Pilea microphylla* (Linn.)Liebm., Gongliao Distract (貢寮區), New Taipei City, Northern Taiwan. and flowering time from January to March °

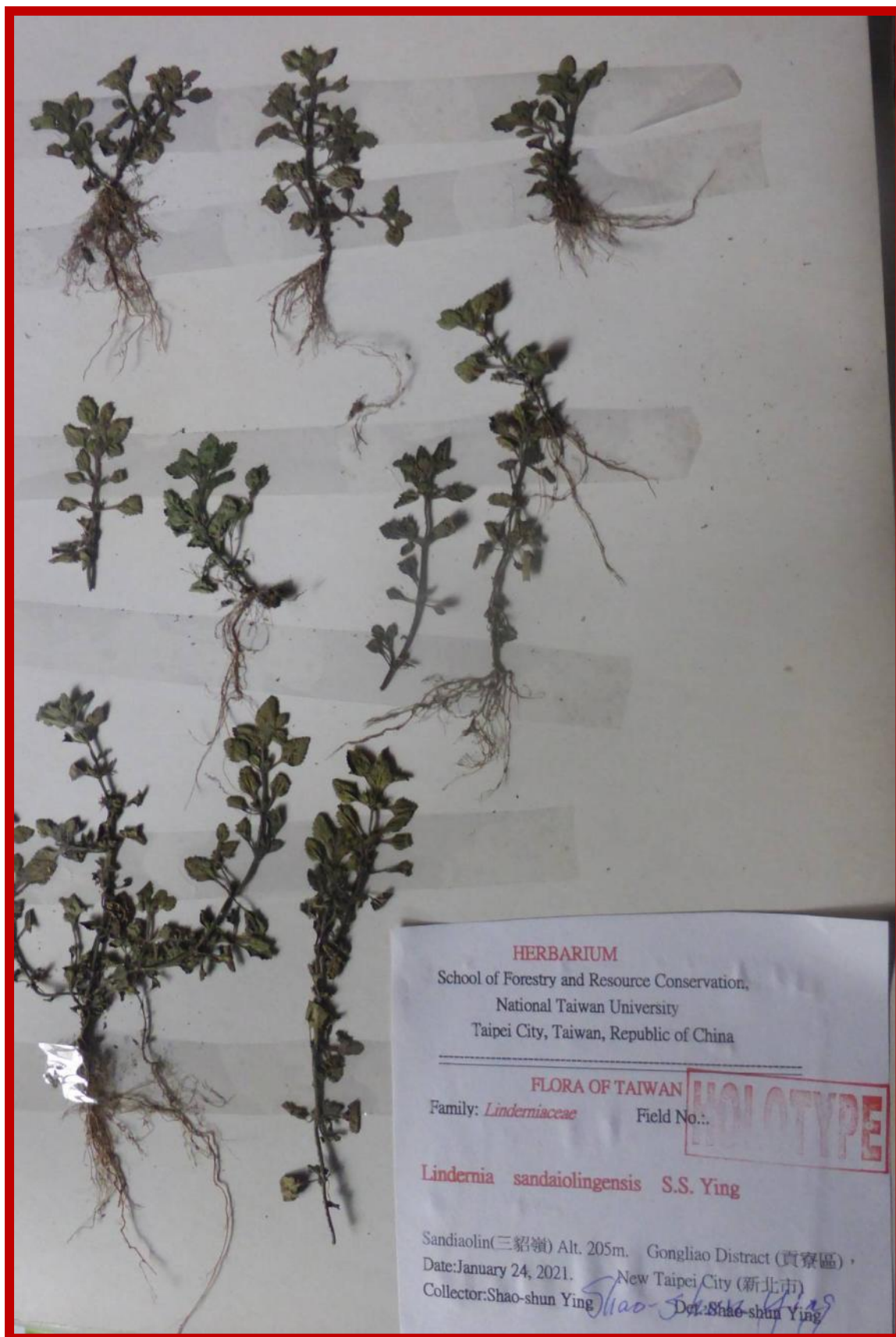


Fig. 83. *Lindernia sandaiolingensis* S. S. Ying, the holotype NTUF-110-012.





Fig. 84. *Lindernia sandaiolingsensis* S. S. Ying, the plants

B. *Lindernia shichengensis* S.S. Ying

*Lindernia shichengensis* S.S. Ying, *sp. nov.* 石城母草

TYPE:TAIWAN. I-Lan County,Toucheng Township (頭城鎮) , Shicheng (石城) 15 m alt. *S. S. Ying* , *s. n.* *October 02, 2021* ° (holotype, NTUF) °



Fig. 85. *Lindernia shichengensis* S. S. Ying, the plants

**Morphology :** Annual rosette herbs, stem prostrate , spreading, 12-20 cm long, densely white glandular pubescent, slightly fleshy, branched; branches 5-12 cm long, spreading. Leaves simple, opposite, oblong, 8-15 mm long, 4-8.5 mm wide, obtuse at apex, obtuse at base, slightly flesh, serrate and ciliate at margins, lustrous green surface and pale green and glaucous beneath, pubescent along veins surface and slightly pubescent beneath; midrib and lateral veins (2-3 per side) impressed surface and elevated beneath. petioles 3.5-5 mm long, white glandular pubescent, green, somewhat fleshy.

Flowers solitary, opposite, axillary on each leaf-axils, violet, very smaller, not widely opened, 0.8-1.2 mm in diameter when opened; pedicels 0.5-1 mm long, fleshy, pale green, glabrous or nearly so; bracts absent; calyx shallowly campanulate, 1-1.5 mm long, 3-4 mm across, 5- deeply lobed at apex, white hairy without and glabrous within; the lobes linear to lanceolate, 2-2.5 mm long, about 1 mm wide, acuminate at apex; corolla tubular, slightly longer than calyx, 2-3 mm long, 0.8-1.2 mm across; slightly swollen at base; upper lip erect, 0.2 mm long, obtuse at apex; lower lip slightly longer than the upper ones, 0.6 mm long, slightly 3-lobed at apex, middle lobe obtuse at apex; stamens 4, filaments slender, included, minute geniculum at base. style slender, included, lobed at apex.

Fruit a capsule, ovoid to ellipsoid, 2-3 mm across, pale brown, 4-valved dehiscent when mature; seeds numerous, reniform, 0.2-0.3 mm long, transparent, glabrous.





Fig. 86. *Lindernia shichengensis* S. S. Ying, branch and leaves



-70- Fig. 87. *Lindernia shichengensis* S. S. Ying, close-up of flower



Fig. 88. *Lindernia shichengensis* S. S. Ying, close-up of flower



Fig. 89. *Lindernia shichengensis* S. S. Ying, fruiting branch

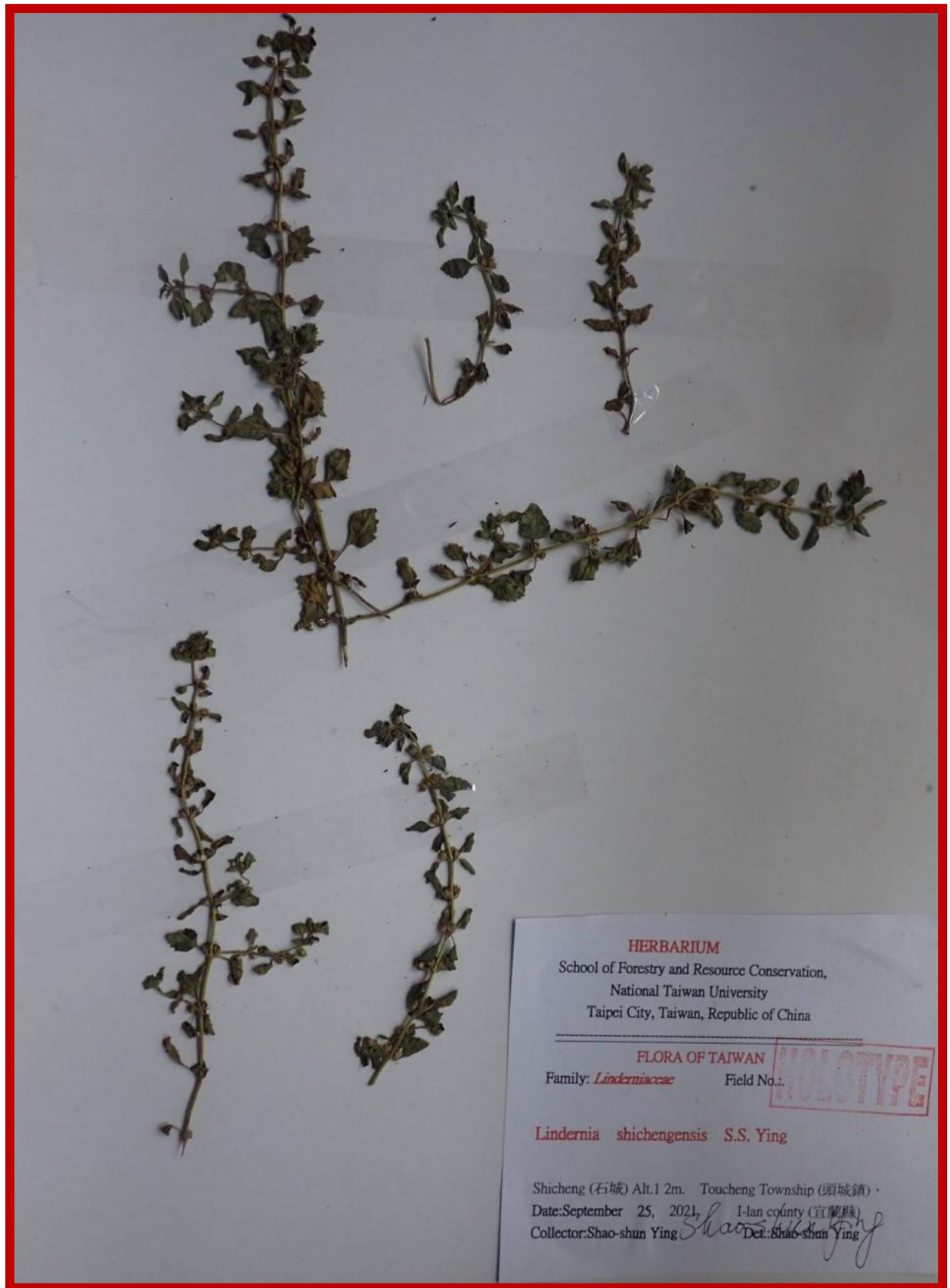




Fig. 90. *Lindernia shichengensis* S. S. Ying, close-up of fruiting branch



Fig. 91. *Lindernia shichengensis* S. S. Ying, close-up of fruits and seeds



*Lindernia shichengensis* S. S. Ying, the holotype NTUF-110-013.



### Diagnosis.

*Lindernia shichengensis* is near to *L. sandaiolingensis*, but it differ from it in having smaller flowers, and flowers slotart in each leaf-axil and shallowly campanulate with linear to lanceolate lobes.



Fig. 92. *Lindernia shichengensis* S. S. Ying, another plant on coastal area

### Distribution and phenology.

*Lindernia shichengensis* S.S. Ying is endemic to Taiwan ° It is known from Shicheng area (石城), Toucheng Township (頭城鎮), I-Lan County (宜蘭縣) and grows on rocky coastal area. and flowering time from September to October, and fruiting time from late September to October °

### Referemce

Liang, Y.S., C. H. Chen & J. C. Wang (2012). Taxonomic Revision of *Lindernia* All. (Scrophulariaceae sensu lato) In Taiwan. Taiwan J. For. Sci. **27**(1): 95-116.

6.A New species of Genus *Euphorbia* (Euphorbiaceae) from Taiwan

*Euphorbia* (*Chamaesyce*) *tzitanshaniana* S.S. Ying

*Euphorbia tzitanshaniana* S.S. Ying, *sp. nov.* 直潭山地錦

TYPE:TAIWAN. New Taipei county , Hsintien District (新店區) , Tzitanshan (直潭山) 245 m alt. S. S. Ying , *s.n.* February 16, 2021 ° (holotype, NTUF) °



Fig. 93. *Euphorbia tzitanshaniana* S. S. Ying, the cyathia



**Morphology** : Perennial herbs, stem erect to ascending, much branched, 30 cm tall; branches elongate, 10-25 cm long, erect to ascending, green, glabrous. Leaves simple, opposite, obovate to obovate-oblong, 3.5-5.5 cm long, 2-3 cm wide, acuminate at apex, obtuse at base, chartaceous, entire at margins, lustrous green surface and pale green beneath, glabrous on both surface, midrib impressed surface and elevated beneath; petioles slender, 2.5-5 cm long, green, glabrous.



Fig. 94. *Euphorbia tzitanshaniana* S. S. Ying, the plant colony



-76- Fig. 95. *Euphorbia tzitanshaniana* S. S. Ying, the inflorescences

Cyathia many, small, in terminal or axillary cymes with elongate peduncled; involucre leaves 2, lanceolate, 1.5-2.5 cm long, 5-7 mm wide, acuminate at apex, glabrous. green; peduncles 5-10 cm long, slender, erect to ascending, green, glabrous; pedicels slender, 1.5-3 cm long, green, glabrous; involucre turbinate, 3-4 mm long, about 3 mm across, green; marginal lobes 5, ovate, 1-2 mm long, about 1.5 mm wide, white, obtuse at apex; female flowers: glands 4, white, globose; pedicels 2-3 mm long, green-white; ovary somewhat 3-angular, 2-3 mm across, green, glabrous; style column-like, 0.5 mm long, white, 3-lobed at apex; male flowers: glands absent; stamens many, filaments slender, exserted from involucre, 3-3.5 mm long, white; anthers spot-like.

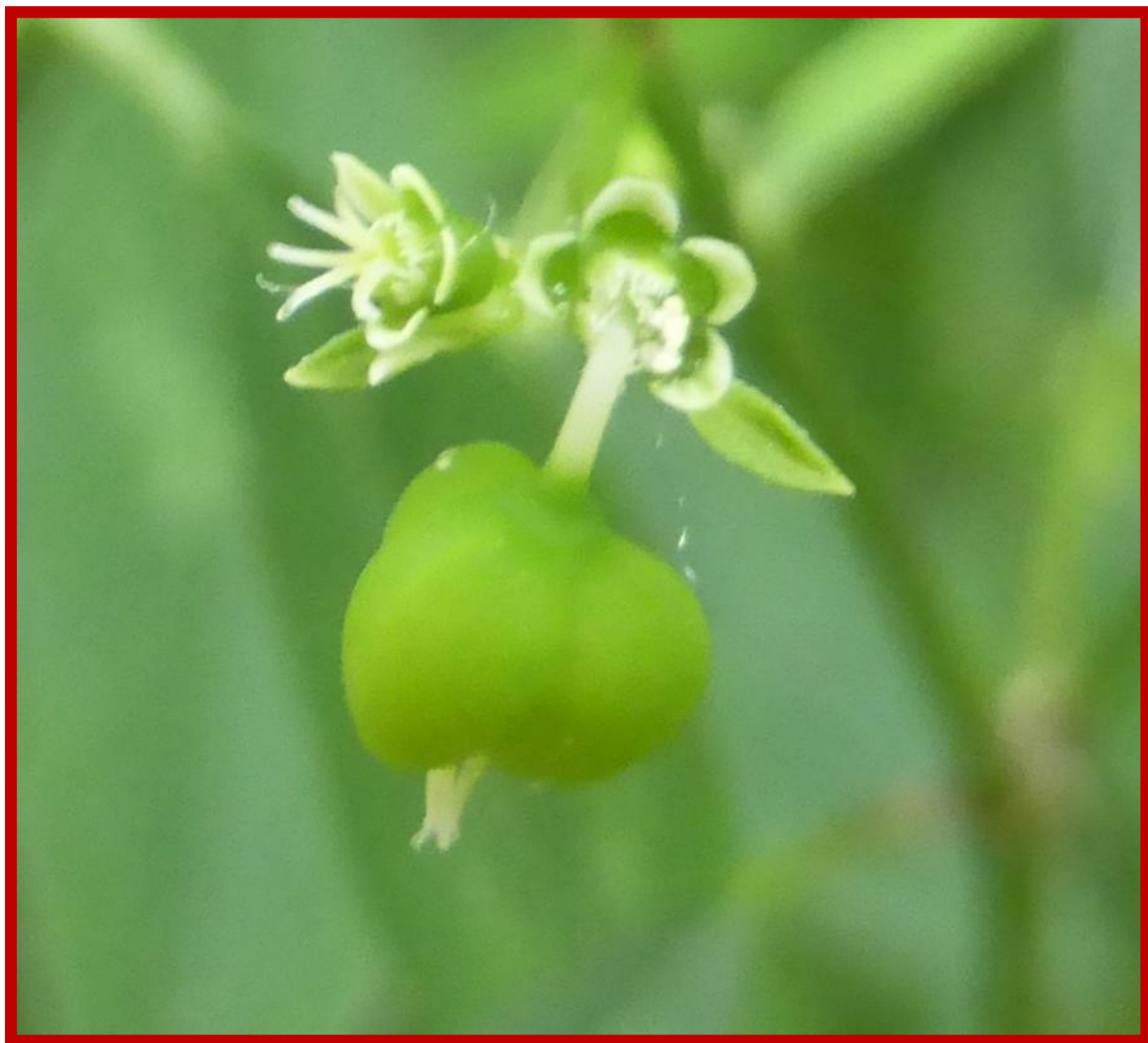


Fig. 96. *Euphorbia tzitanshaniana* S. S. Ying, the male and female flowers (1)

#### **Diagnosis.**

*Euphorbia tzitanshaniana* is characterized by:

1. Plants rather larger and robust, about 20-30 cm tall, much branched; stem and branches





Fig. 97. *Euphorbia tzitanshaniana* S. S. Ying, the male and female flowers (2)



Fig. 98. *Euphorbia tzitanshaniana* S. S. Ying, the female flowers showing style

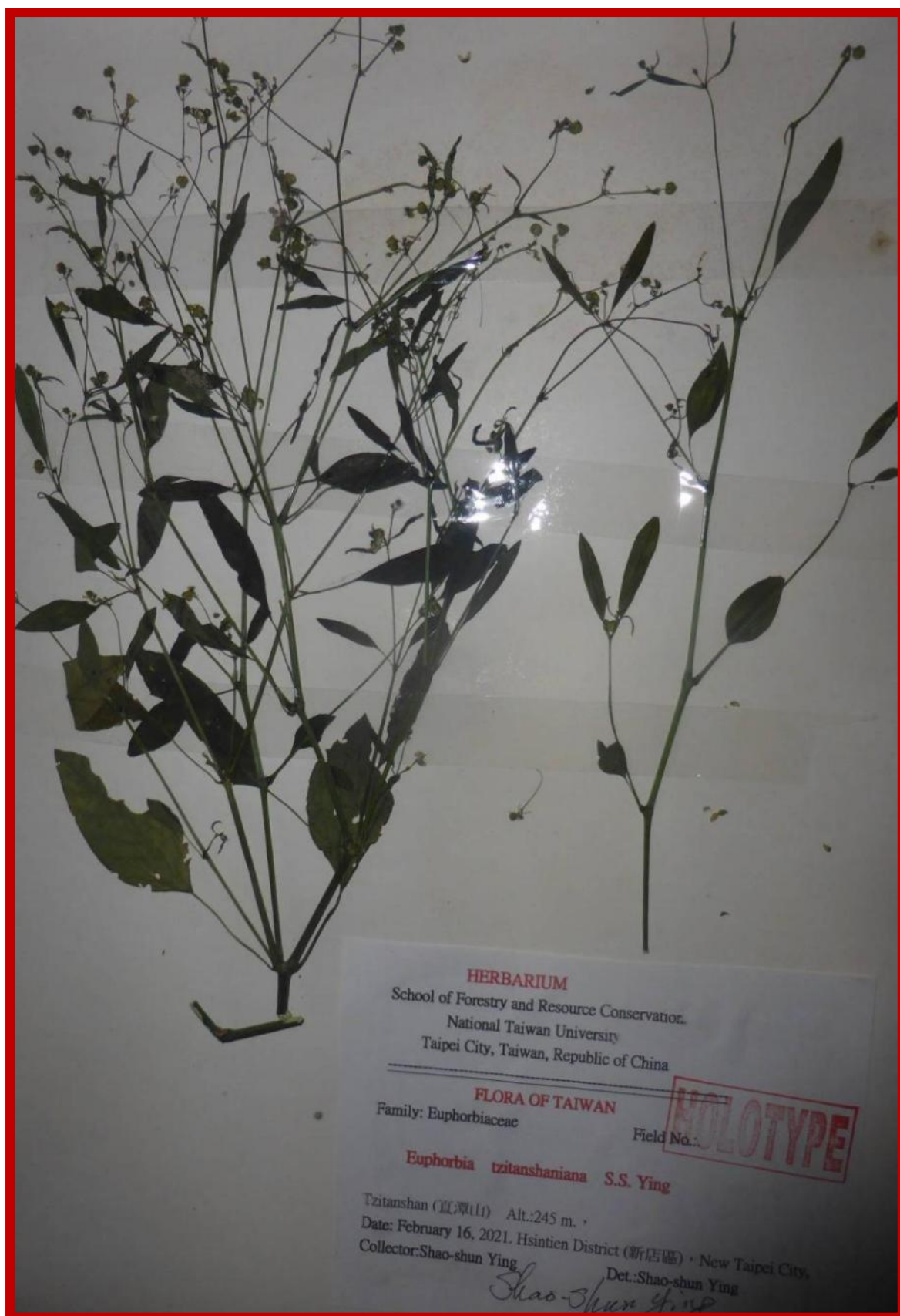
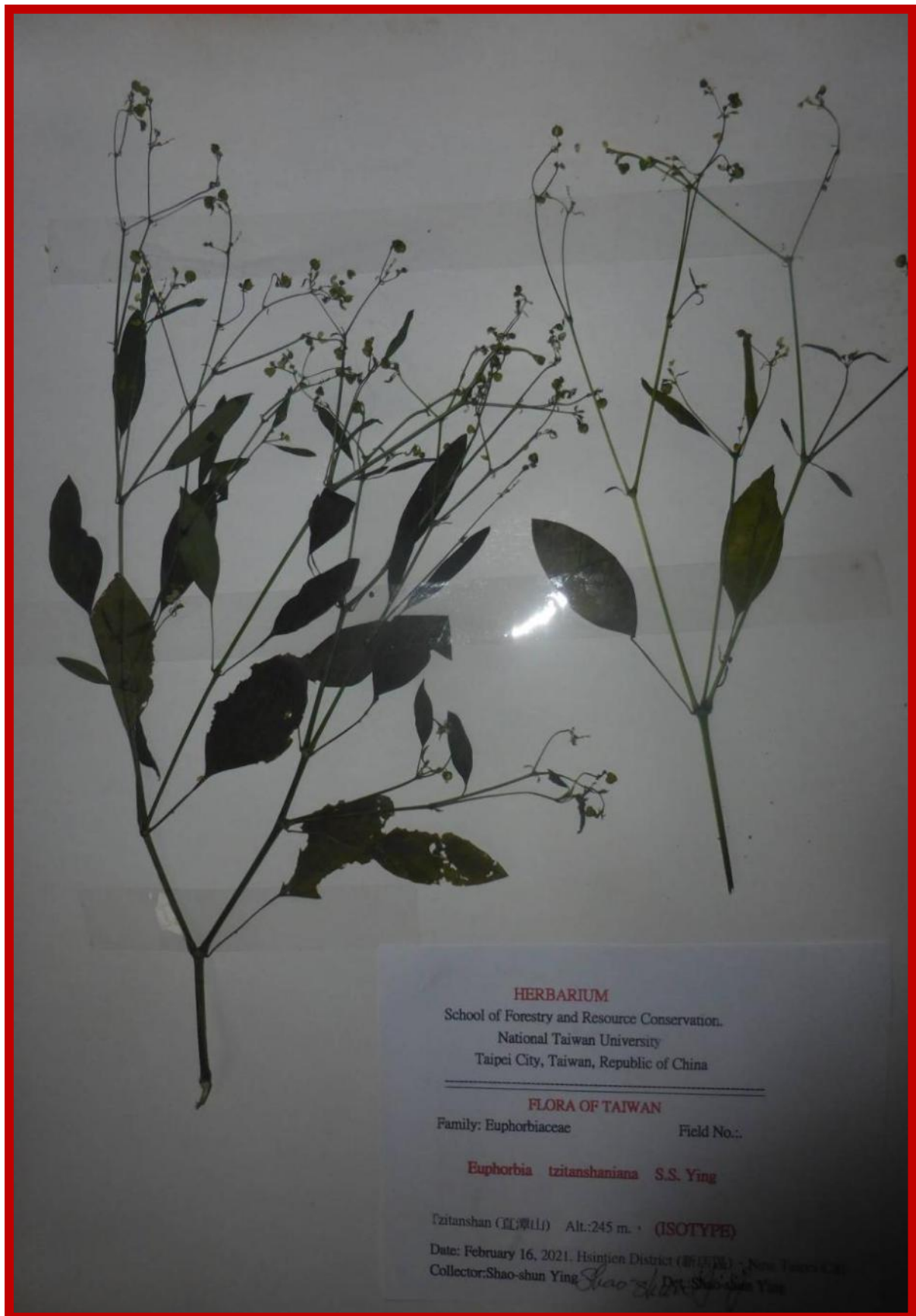


Fig. 99. *Euphorbia tzitanshaniana* S. S. Ying, the holotype NTUF-110-014.





-80- Fig. 100 *Euphorbia tzitanshaniana* S. S. Ying, the Isotype NTUF-110-015.

green and glabrous.

2. Cyathia many, in terminal or axillary cymes with elongate peduncled; involucral leaves 2, lanceolate green.

3. Male and female flowers in different cyathia.



Fig. 101 *Euphorbia tzitanshaniana* S. S. Ying, plant colony

#### **Distribution and phenology.**

*Euphorbia tzitanshaniana* S.S. Ying is endemic to Taiwan ° It is known from Tzitanshan (直潭山) area, about 245 m elevation, Hsintien District (新店區) , along roadsides , New Taipei City, Northern Taiwan. and flowering time from January to March °



7.A New species of Genus *Peperomia* (Piperaceae) from Taiwan

*Peperomia tairukouensis* S.S. Ying

*Peperomia tairukouensis* S.S. Ying, *sp. nov.* 太魯閣椒草

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉) , Shakadang Trails (砂卡礑步道)  
60 m alt. *S. S. Ying* , *s.n.* March 18, 2021 ° (holotype, NTUF) °



-82- Fig. 102 *Peperomia tairukouensis* S. S. Ying, spike and 3-verticillate leaves

**Morphology :** Perennial small herbs, rhizome elongate, creeping, fleshy, woody, glabrous, glabrous; fibrous roots few, slender; stem simple, branched at base, 3-5 cm long, erect to ascending, white pubescent, fleshy, pale green. Leaves regular 3-verticillate, never 4 or 5, ovate to broadly round, 1.5-2.5 cm long, 1.5-2 cm wide, obtuse at apex, somewhat cuneate at base, fleshy, entire and ciliate at margins, lustrous green surface and pale green beneath, glabrous on both surfaces; midrib impressed surface and slightly elevated beneath, lateral veins not see. Petioles 2-3 mm long, fleshy, groove above pubescent.



Fig. 103 *Peperomia tairukouensis* S. S. Ying, close-up of spike

Spike terminal, solitary , 2-5cm long; peduncles 6-9 mm long, fleshy, glabrous; flowers numerous, remotely arranged, sunken into rachis; bracts minute, rounded, 0.5 mm across, green, obtuse at apex; stamens 2, filament slender, about 0.8-1 mm long; anthers rounded, white, 0.5 mm across; ovary globose, 1-celled, 1-ovule; stigma simple.

**Diagnosis.**

*Peperomia tairukouensis* is characterized by:





Fig. 104 *Peperomia tairukouensis* S. S. Ying, plant colony



Fig. 105 *Peperomia tairukouensis* S. S. Ying, the plant

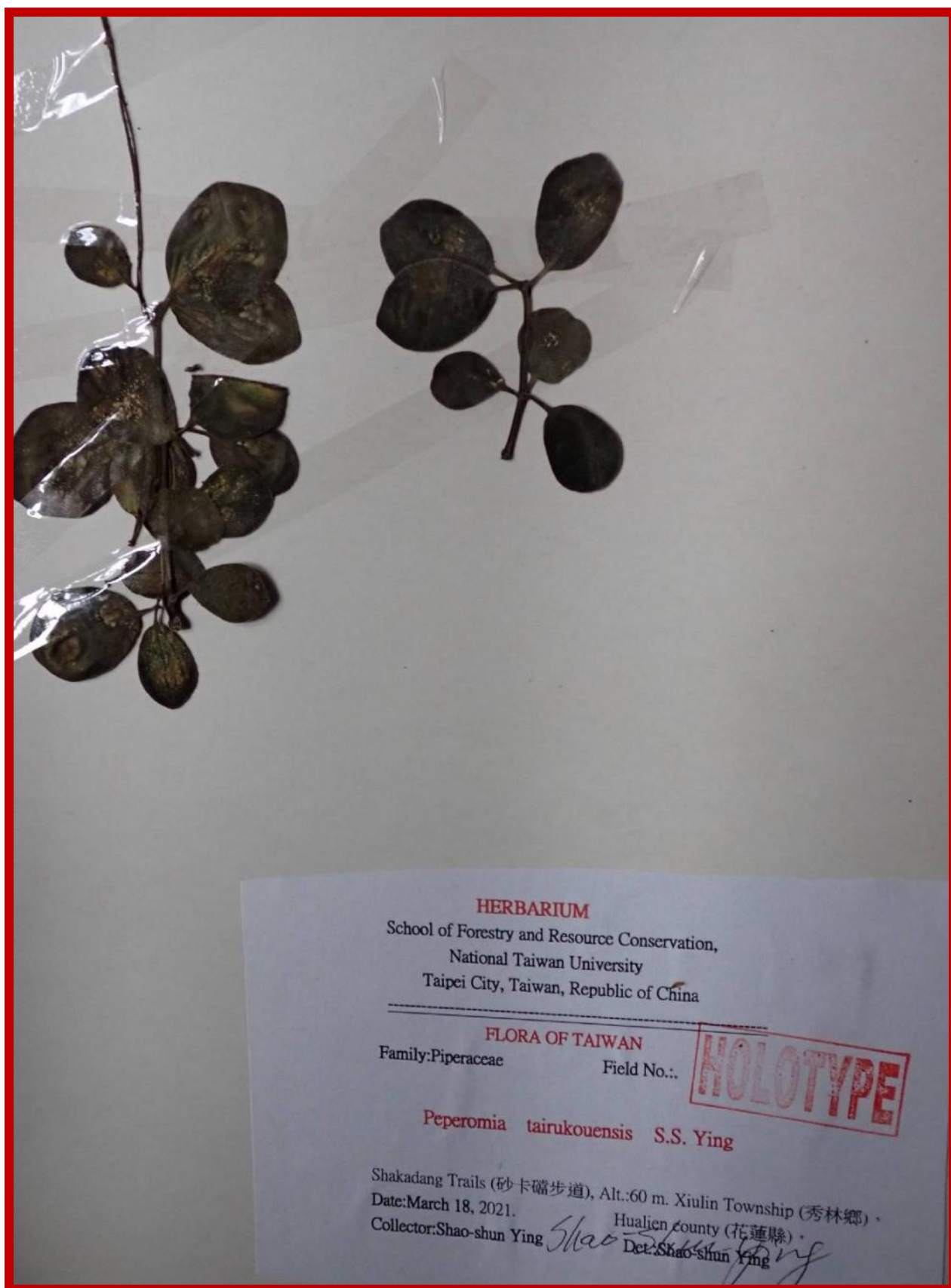


Fig. 106 *Peperomia tairukouensis* S. S. Ying, the holotype NTUF-110-016.



1. The species grows on the limestones about 50m elevation, Shakadang Trails (砂卡礑步道), the lowest elevation of the species growth in the genus *Peperomia* of Taiwan.

2. Leaves regular 3-verticillate, never 4 or 5, ovate to broadly round, 1.5-2.5 cm long, 1.5-2 cm wide, obtuse at apex.

2. Spike terminal, solitary, 2-5 cm long.

3. Flowers numerous, remotely arranged, sunken into rachis.

4. Stamens 2, filament slender, about 0.8-1 mm long; anthers rounded, white, 0.5 mm across.

#### **Distribution and phenology.**

*Peperomia tairukouensis* S.S. Ying is endemic to Taiwan. It is known from Shakadang Trails (砂卡礑步道), Tairukou (太魯閣) area, about 50 m elevation, Xiulin Township (秀林鄉), on cliff of limestones, Hualien county, Eastern Taiwan. and flowering time from March to May.



Fig. 107. *Peperomia tairukouensis* S. S. Ying, fruiting spike

#### **Reference**

Lu, Y. C. et T.Y. Aleck Yang (2020). Taxonomy of *Peperomia* (Piperaceae) in Taiwan. *Taiwania* 65(4): 500–516.

#### **8. Four New species of Genus *Sedum* (Crassulaceae) from Taiwan**

*A.Sedum cirenianum* S.S. Ying

*Sedum cirenianum* S.S. Ying, *sp. nov.* 慈恩佛甲草

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Ciren (慈恩) 1995 m alt. *S. S. Ying*, *s.n.* October 24, 2020. (holotype, NTUF).



Fig. 108. *Sedum cirenianum* S. S. Ying, the plant

**Morphology** : Perennial herbs, rhizome absent; fibrous roots slender; stem simple to branched upward, 8-15 cm long, ascending to pending, fleshy, green, glabrous; branches 4-9 cm long, fleshy, green to pale green, glabrous. Leaves dimorphic, the lower ones alternate, opposite to 4-5-verticillated at branched point; spatulate, remote, 6-8 mm long, 4-6 mm wide, about 1.5 mm thick, obtuse at apex, attenuate at base, entire at margins, lustrous green surface and pale green beneath, glabrous on both surfaces; midrib and lateral veins inconspicuous on both surfaces; petioles 5-7 mm long, glabrous, pale green; the upper ones, densely arranged, ovate, 4-5.5 mm long, 3.5-4 mm wide, obtuse and with a mucro at apex, attenuate at base, dotted surface, smoothed beneath;





Fig. 109. *Sedum cirenianum* S. S. Ying, lower leaves alternate, opposite and vericillate



Fig. 110. *Sedum cirenianum* S. S. Ying, densely arranged leaves with dotted leaf-surface

petioles 2-3 mm long, pale green glabrous.

Flowers solitary, terminal on the branched, subtend by densely arranged leaves, 5-6 mm in diameter when opened, sessile; sepals 6, free, smaller, ovate, 2.5-3 mm long, 2-2.5 mm wide, acute at apex, membranous, glabrous; petals 6, lanceolate, 3-4 mm long, 2.5 mm wide, pale yellow and tinged with purplish after anthesis, acuminate at apex, truncate at base; stamens 6, opposited to petals; filaments slender, same length with petals; anthers white to pale yellow, rounded or nearly so, 0.5 mm across; nectar scales opposite, 0.4-0.5 mm across, emarginate at apex; carpels 6, free, connate at base, oblong, 3-4 mm long, glabrous; styles short, 0.8 mm long.

Fruit a follicle, 2.5-4 mm long, opened when mature; seeds numerous, rounded, 0.5 mm across, smooth.



Fig. 111. *Sedum cirenianum* S. S. Ying, the flowers

### Diagnosis.

*Sedum cirenianum* is characterized by:

- 1.The only species of genus *Sedum* with 6-merous flowers in Taiwan.
- 2.Leaves dimorphic, the lower ones alternate, opposite to 4-5 -verticillated at branched point; spatulate.
- 3.The upper leaves densely arranged, ovate, 4-5.5 mm long, 3.5-4 mm wide, obtuse and with a mucro at apex, attenuate at base, dotted surface.



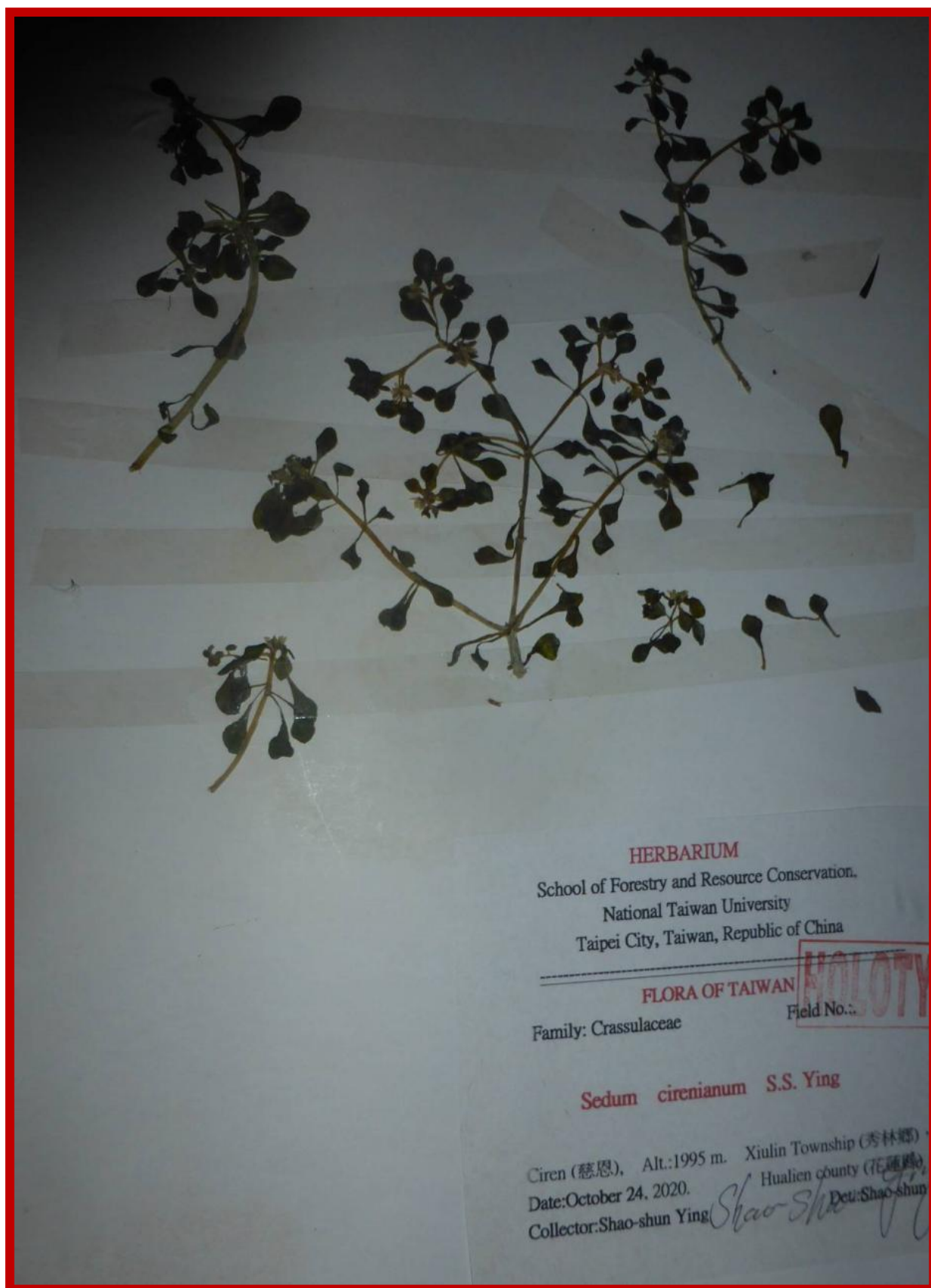


Fig. 112. *Sedum cirenianum* S. S. Ying, the holotype NTUF-110-017.



Fig. 113. *Sedum cirenianum* S. S. Ying, the plant

3. Flowers solitary, terminal on the branched, subtend by densely arranged leaves, 5-6 mm in diameter when opened, sessile.

4. Sepals and petals 6, stamens 6.

#### **Distribution and phenology.**

*Sedum cirenianum* S.S. Ying is endemic to Taiwan ° It is known from Ciren (慈恩) area, about 1995 m elevation, Xiulin Township (秀林鄉) , on cliff of limestones, Hualien county , Eastern Taiwan. and flowering time from March to May °



*B.Sedum nanshanchunense* S.S. Ying

*Sedum nanshanchunense* S.S. Ying, *sp. nov.* 南山村佛甲草

TYPE:TAIWAN. I-lan county , Tatung Township (大同鄉) , Nanshanchun (南山村) 1155 m alt.  
*S. S. Ying* , *s.n. June 5 , 2021* ° (holotype, NTUF) °



Fig. 114. *Sedum nanshanchunense* S. S. Ying, the flowering plant

**Morphology** : Perennial creeping herbs, roots slender, fibrous; stem creeping, much branched, purplish, white hairy; branches spreading, usually rooting at nodes, purplish, white hairy. Leaves simple, opposite, ovate to rounded, 8-13 mm long, 5-7 mm wide, obtuse at apex, obtuse to rounded at base, fleshy, entire and ciliate at margins, lustrous green and scattered white spots (small waxy matters) surface, pale green beneath; shortly hairy on both surfaces, midrib and lateral veins inconspicuous on both surfaces; petioles 3-5 mm long, green, white hairy all over.



Fig. 115. *Sedum nanshanchunense* S. S. Ying, branches and leaves, mind rooting at nodes



Fig. 116. *Sedum nanshanchunense* S. S. Ying, branches and leaves,





Fig. 117. *Sedum nanshanchunense* S. S. Ying, close-up of flowers

Flower solitary, terminal or on axil of the upward leaf, white, 5-6 mm in diameter when opened, scentless; pedicels 8-15 mm long, purplish red, white hairy; sepals 5, free, smaller, linear, 3.2-3.8 mm long, about 2 mm wide, acuminate to obtuse at apex, membranous, hairy outside, persistent when fruit; petals 5, oblong to ovate-oblong, 4-7 mm long, 3-3.5 mm wide, white, obtuse at apex, attenuate at base, glabrous on both surfaces; stamens 5, opposited to petals; filaments slender, shorter than the petals; anthers yellow, rounded or nearly so, 0.4 mm across; nectar scales



Fig. 118. *Sedum nanshanchunense* S. S. Ying, close-up of one flower



Fig. 119. *Sedum nanshanchunense* S. S. Ying, close-up of fruits



opposite, 0.4-0.5 mm across, emarginate at apex; carpels 5, white, free, connate at base, oblong, 4-5 mm long, glabrous; styles short, 0.6 mm long.

Fruit a follicle, cylindrical, 3.2-3.8 mm long, brownish, opened when mature, subtended by persistent sepals; seeds numerous, rounded or nearly so, 0.3 mm across, smooth.



Fig. 120. *Sedum nanshanchunense* S. S. Ying, close-up of fruits

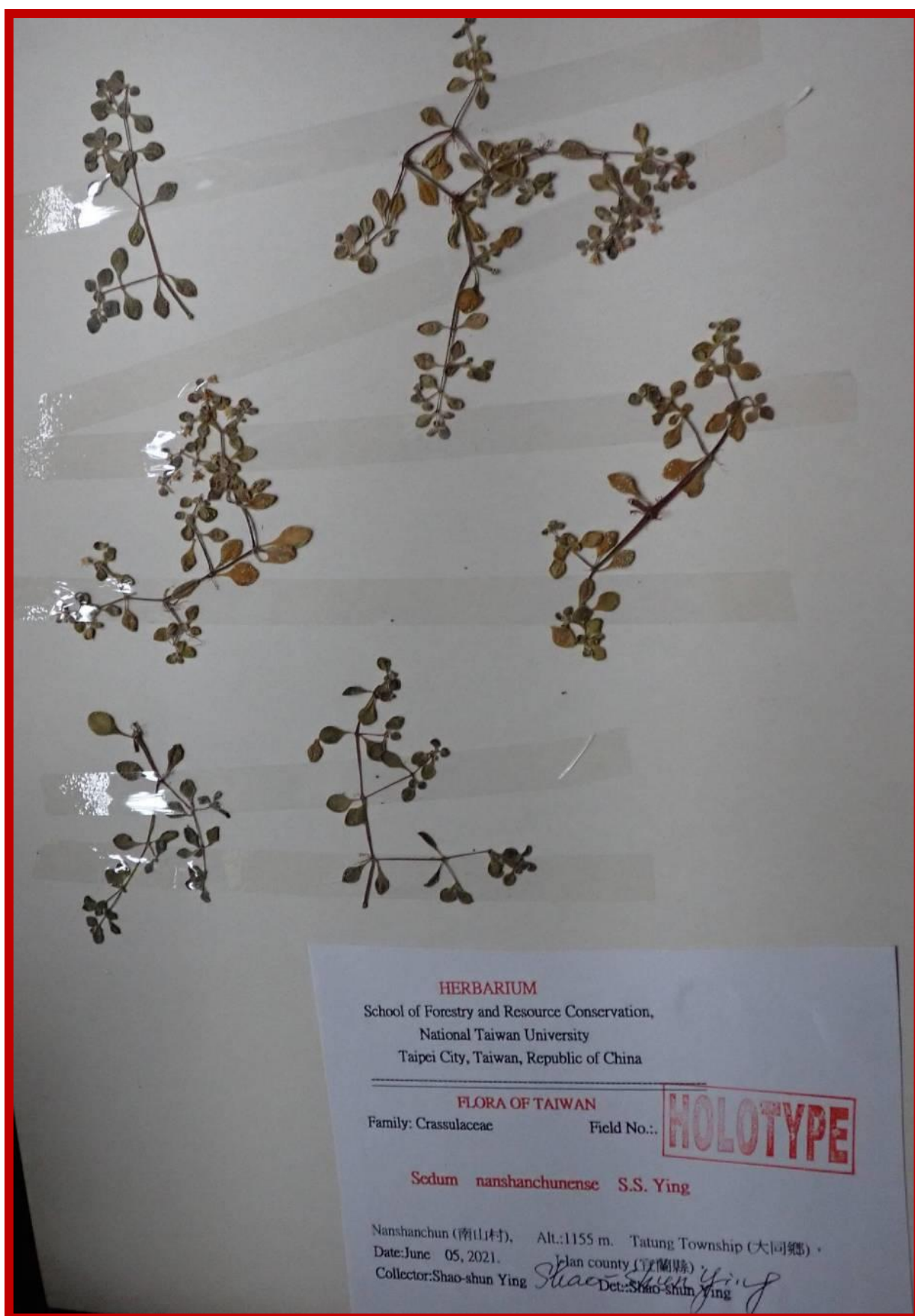
#### Diagnosis.

*Sedum nanshanchunense* is characterized by:

1. Stem creeping on ground, branches spreading, all purplish red in color and densely white hairy. .

2. Leaves smaller, ovate to rounded, fleshy, scattered short hairy on both surface, ciliate at margins, lustrous green and scattered white spots (small waxy matters) surface.

3. Flower solitary, white, the only species with white flowers among Taiwan *Sedum* species.



-97- Fig. 121. *Sedum nanshanchunense* S. S. Ying, the holotype NTUF-110-018.



4. Fruit a follicle, cylindrical, 3.2-3.8 mm long, brownish, opened when mature, subtended by persistent sepals.

**Distribution and phenology.**

*Sedum cirenianum* S.S. Ying is endemic to Taiwan ° It is known from Nanshanchun (南山村) area, about 1155 m elevation, Tatung Township (大同鄉) , on cliff of limestones, I-lan county , Northern Taiwan. and flowering time from May to June, and Fruiting in July °

***C.Sedum shaoakouense* S.S. Ying**

*Sedum shaoakouense* S.S. Ying, *sp. nov.* 小埡口佛甲草

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Shaoakou (小埡口) 1850 m alt. *S. S. Ying* , *s.n.* June 17, 2021 ° (holotype , NTUF) °



**Fig. 122. *Sedum shaoakouense* S. S. Ying, flowering plants**

**Morphology :** Perennial erect herbs, usually forming a mass clustered; rhizome elongate, 5-9 cm long, horizontal, fleshy, stems sprout from it; roots slender, fibrous; stems simple, erect to ascending, 5-12 cm long, fleshy, purplish red, glabrous. Leaves simple, opposite, closely approach each other, ovate to oblong, 4-7 mm long, 3-4.5 mm wide, obtuse to acute at apex, attenuate to obtuse at base, fleshy, pale green tinged brown surface and purplish red beneath, entire, glabrous on both surfaces, midrib and laterals inconspicuous on both surfaces. Petioles 3-4 mm long, glabrous, fleshy.

Flowers several, yellow, 8-12 mm in diameter when opened, scentless, in terminal to



Fig. 123. *Sedum shaoakouense* S. S. Ying, plants in Winter

upward leaf-axils solitary to 2-3 flowered spike; peduncles 1-2 cm long, somewhat fleshy, purplish, glabrous; pedicels 0; bracts linear, 3-4 mm long, about 1 mm wide; obtuse at apex, glabrous; sepals 5, smaller, linear, 3-4 mm long, about 2 mm wide, obtuse at apex, dark green, glabrous; petals 5, lanceolate, 8-10 mm long, 2-3 mm wide, acuminate and with needle-tip at apex, truncate at apex,





Fig. 124. *Sedum shaoakouense* S. S. Ying, plants in Spring



Fig. 125. *Sedum shaoakouense* S. S. Ying, mind flowering buds





Fig. 126. *Sedum shaoakouense* S. S. Ying, inflorescences



Fig. 127. *Sedum shaoakouense* S. S. Ying, flowers



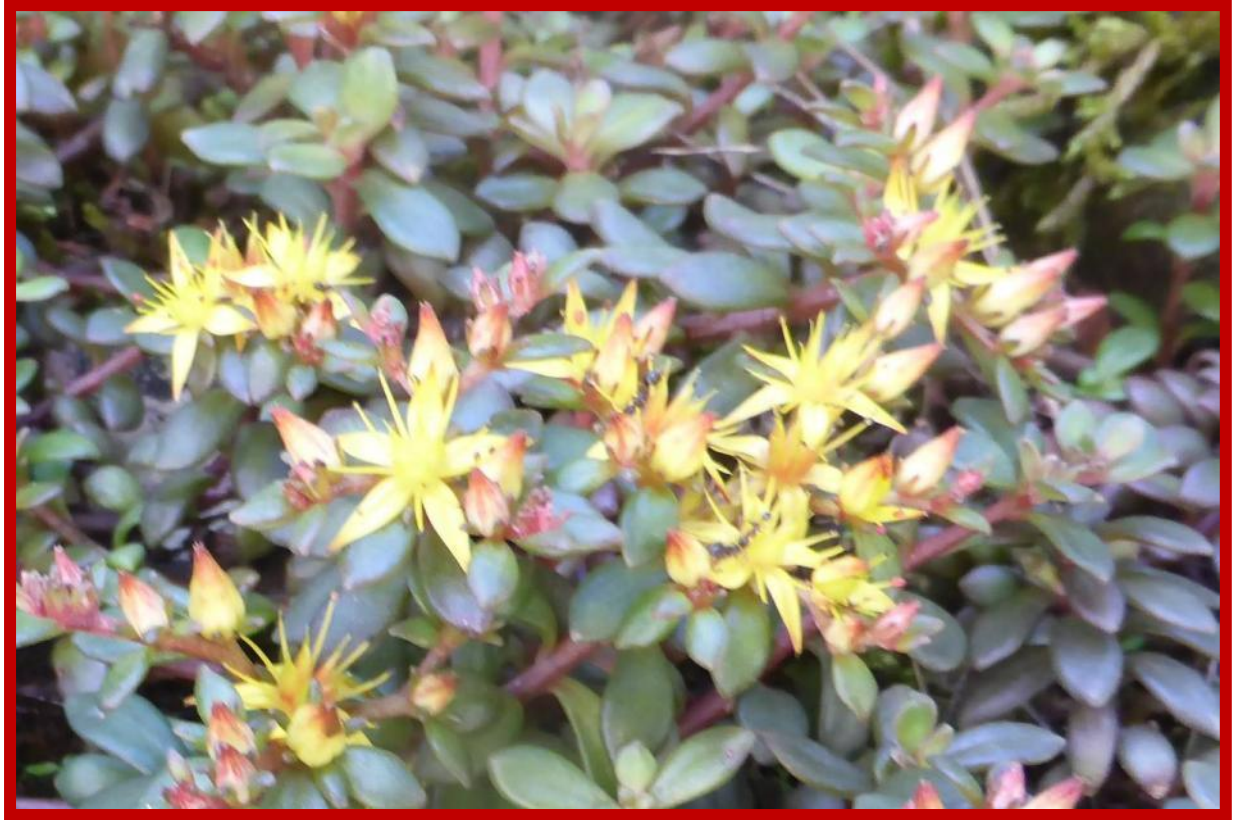


Fig. 128. *Sedum shaoakouense* S. S. Ying, mind spicate inflorescence and small sepals

yellow tinged with red at apex, glabrous on both surfaces; stamens 10, 5 fertilized, 5 stamoides; filaments slender, as long as or slightly shorter than petals, yellow; anthers rounded, 0.5 mm long and wide, purplish red; stamoides ones with and without anthers (the anthers usually smaller); nectar scales opposite, 0.5-0.6 mm across, emarginate at apex; carpels 5, red, free, connate at base, oblong, 3-3.5 mm long, glabrous; styles slender, 5-6 mm long, yellowish.

Fruit a follicle, cylindrical, 4.5-5.0 mm long, red, needle tip at apex, opened when mature, subtended by persistent sepals; seeds numerous, rounded or nearly so, 0.3-0.4 mm across, smooth, glabrous.

### Diagnosis.

*Sedum shaoakouense* is characterized by:

1. Perennial erect herbs, usually forming a mass clustered; rhizome elongate, 5-9 cm long, horizontal, fleshy, stems sprout from it.
2. Leaves simple, opposite, closely approach each other, ovate to oblong, 4-7 mm long,

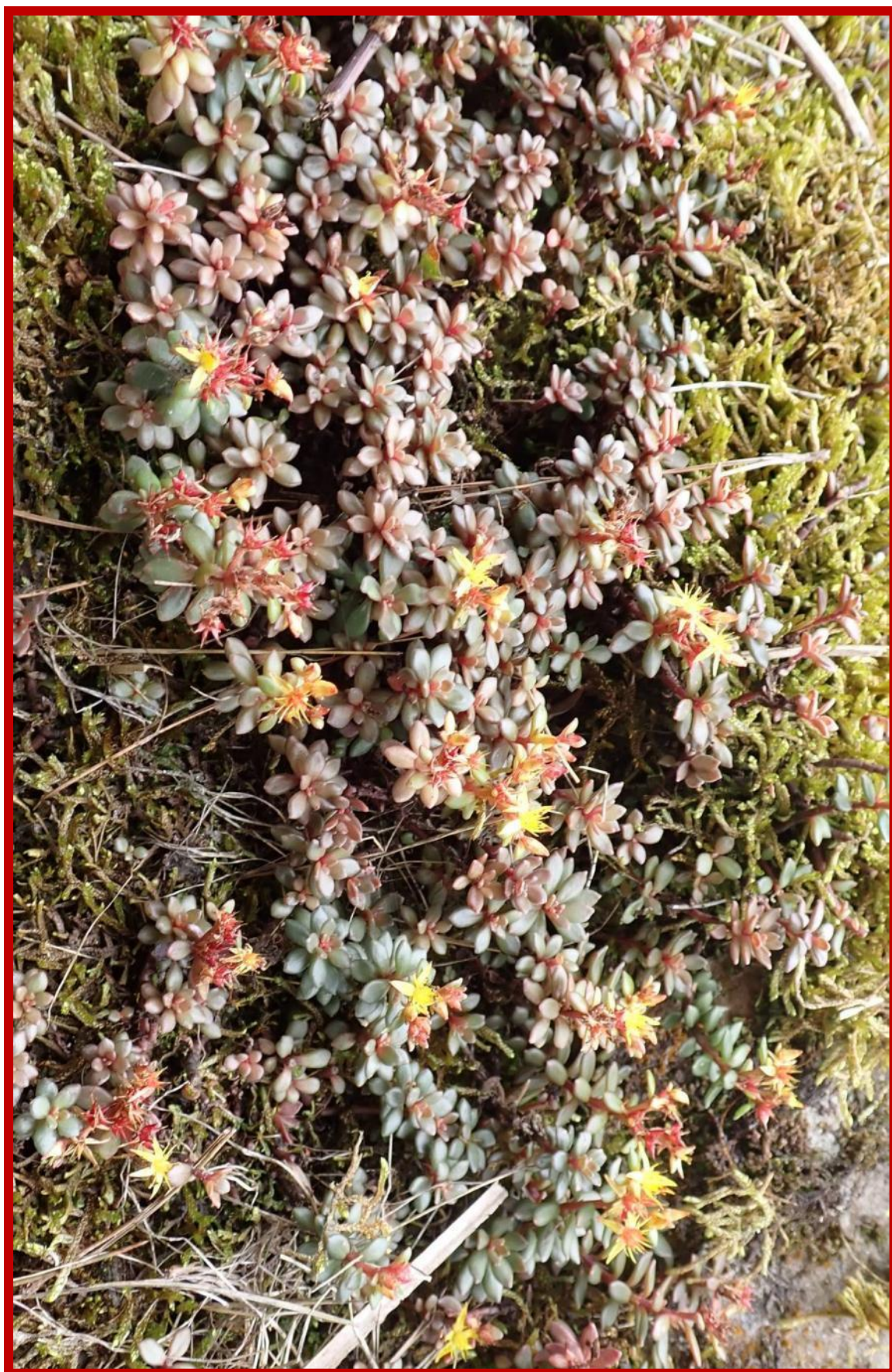


Fig. 129. *Sedum shaoakouense* S. S. Ying, close-up of fruits



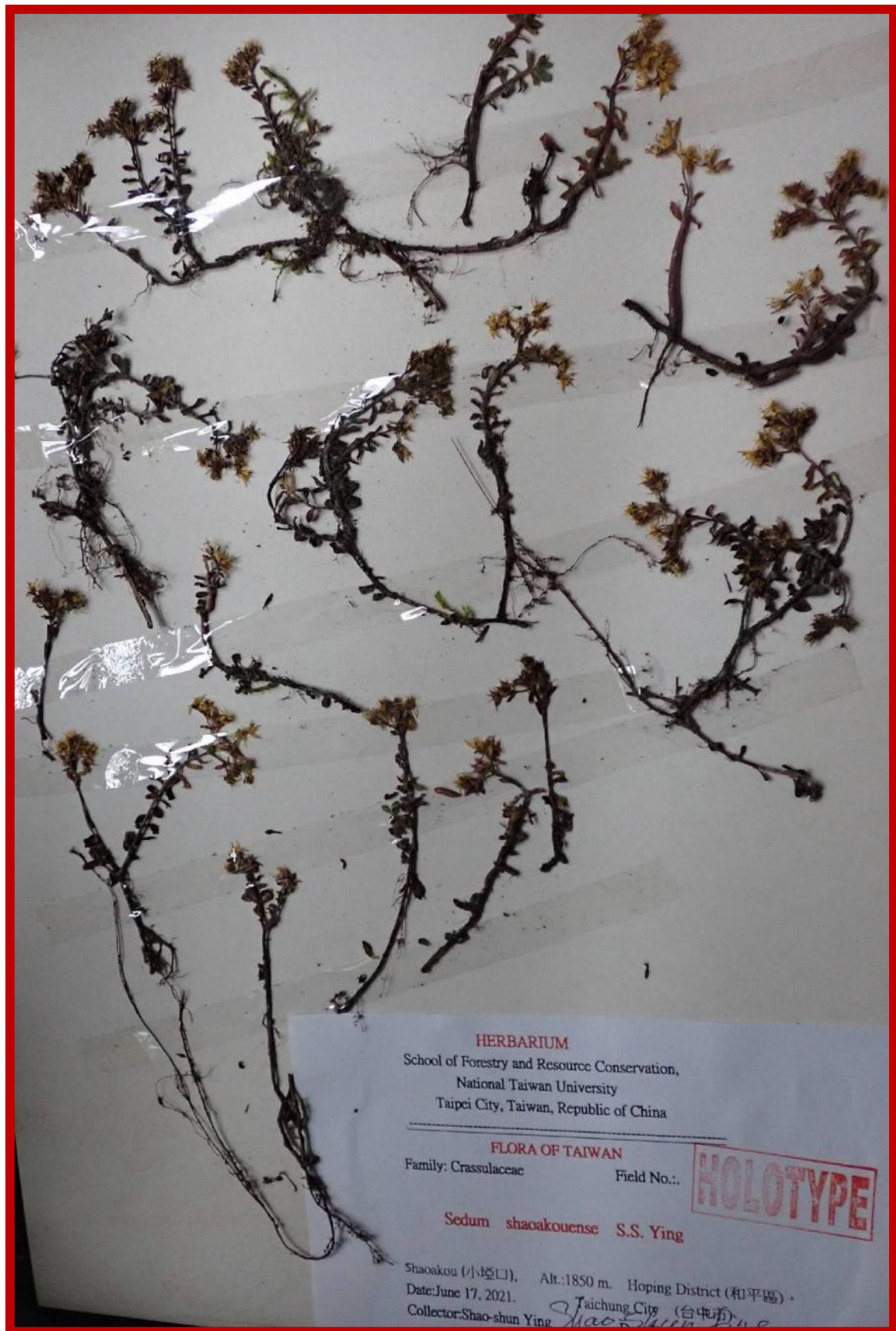
-103- Fig. 130. *Sedum shaoakouense* S. S. Ying, plants in Winter





-104- Fig. 131. *Sedum shaoakouense* S. S. Ying, the plants





-105- Fig. 132. *Sedum shaoakouense* S. S. Ying, the holotype NTUF-110-019.



3-4.5 mm wide, obtuse to acute at apex, attenuate to obtuse at base, fleshy.

3. Flowers several, yellow, 8-12 mm in diameter when opened in terminal to upward leaf-axils solitary to 2-3 flowered spike.

4. Stamens 10, 5 fertilized, 5 stamens; filaments slender, as long as or slightly shorter than petals, yellow;

5. Fruit a follicle, cylindrical, 4.5-5.0 mm long, red, needle tip at apex, opened when mature, subtended by persistent sepals.

### Distribution and phenology.

*Sedum shaoakouense* S.S. Ying is endemic to Taiwan. It is known from Shaoakou (小堙口) area, about 1850 m elevation, Hoping District (和平區), on mountain slope, Taichung City, Central Taiwan. and flowering time from May to July, and Fruiting in July to September

### *D.Sedum shengkuangense* S.S. Ying

*Sedum shengkuangense* S.S. Ying, *sp. nov.* 勝光佛甲草

TYPE:TAIWAN. Taichung City, Hoping District (和平區), Shengkuang (勝光) 1670 m alt. *S. S. Ying*, *s.n.* July 15, 2021. (holotype, NTUF).

**Morphology** : Annual smaller, erect herbs, roots fibrous, slender; stems simple to branched at base, erect to ascending, 3-6 cm long, fleshy, green tinged with purplish red, glabrous. Leaves simple, opposite, spatulate, 6-10 mm long, 3-5 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 2-3 mm long, glabrous, fleshy.

Flowers solitary, yellow, 4-6 mm in diameter when opened, scentless, terminal on the very shorter branchlets; branchlets 6-10 mm long, fleshy, green tinged with purplish, glabrous; pedicels 0; bracts ovate, 2-3 mm long, about 1.5 mm wide; obtuse at apex, glabrous; sepals 5, smaller, ovate-linear, 2.5-3.5 mm long, about 2-2.5 mm wide, obtuse at apex, green, glabrous;



Fig. 133 *Sedum shengkuangense* S. S. Ying, plants colony



Fig. 134 *Sedum shengkuangense* S. S. Ying, close-up of leaves





Fig. 135. *Sedum shengkuangense* S. S. Ying, flower solitary on branchlet apex



Fig. 136. *Sedum shengkuangense* S. S. Ying, close-up of flower, mind a smaller plant



Fig. 137. *Sedum shengkuangense* S. S. Ying, close-up of flower,



Fig. 138. *Sedum shengkuangense* S. S. Ying, fruiting plant



petals 5, ovate-lanceolate, 6-7 mm long, 2-3 mm wide, acuminate at apex, truncate at base, yellow, glabrous on both surfaces; stamens 10, all fertilized; filaments slender, slightly shorter than petals, 4-5 mm long, yellow; anthers rounded, 0.3 mm long and wide, brownish; nectar scales opposite, 0.3-0.4 mm across, emarginate at apex; carpels 5, yellow, free, connate at base, cylindrical, 4-4.5 mm long, glabrous; styles slender, 0.5-0.6 mm long, yellowish; stigma disc-like, pale yellow.

Fruit a follicle, cylindrical, 3.5-4.0 mm long, pale brown, mucro tip at apex, opened when mature; seeds numerous, rounded or nearly so, 0.25-0.3 mm across, smooth, glabrous.



Fig. 139. *Sedum shengkuangense* S. S. Ying, close-up of fruits

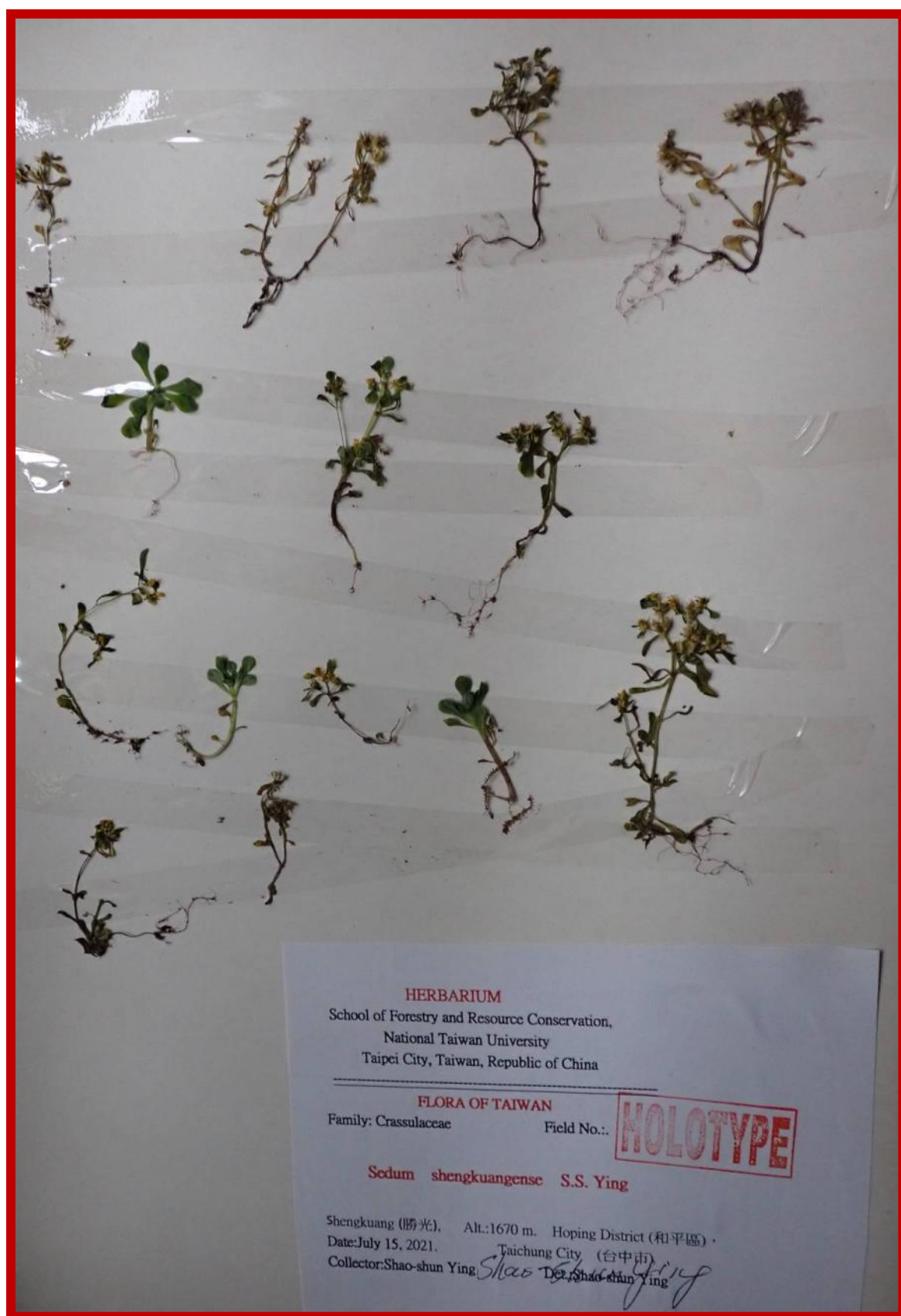


Fig. 140. *Sedum shengkuangense* S. S. Ying, the holotype NTUF-110-020.





Fig. 141. *Sedum shengkuangense* S. S. Ying, plant colony

### Diagnosis.

*Sedum shengkuangense* is characterized by:

1. The plants usually grow with mossy rocks at sunny mountain slope.
2. Annual smaller, erect herbs, stems simple to branched at base, 3-6 cm long, fleshy, green tinged with purplish red, glabrous.
3. Leaves simple, opposite, spatulate, 6-10 mm long, 3-5 mm wide, obtuse at apex, attenuate at base, fleshy.,
4. Flowers solitary, yellow, 4-6 mm in diameter when opened, terminal on the very shorter branchlets.
5. Petals 5, ovate-lanceolate, 6-7 mm long, 2-3 mm wide, acuminate at apex, truncate at base, yellow, glabrous on both surfaces; stamens 10, all fertilized. \_

### Distribution and phenology.

*Sedum shengkuangense* S.S. Ying is endemic to Taiwan. It is known from Shengkuang (勝光) area, about 1670 m elevation, Hoping District (和平區), on mountain slope, Taichung City, Central Taiwan. and flowering time from April to July, and Fruiting in July to September

## 9. A New species of Genus *Maesa* (Primulaceae) in Taiwan

*Maesa houtungensis* S.S. Ying

*Maesa houtungensis* S.S. Ying, *sp. nov.* 猴硐山桂花

TYPE:TAIWAN. New Taipei City, Ruifang District (瑞芳區), Hotung (猴硐), around North 37 Houmu Highway (北 37 猴牡公路), 325 m alt. *S. S. Ying*, *s. n.* April 3, 2021. (holotype, NTUF).



Fig. 142. *Maesa houtungensis* S. S. Ying, the flowering branches

**Morphology** : Small trees up to 4.5 m high, much branched, glabrous, wrinkled, with lenticels; branches erect to ascending, slender, with brownish lenticels; pith solid. Leaves simple, alternate, oblong to ovate-oblong, 5-9 cm long, 2-3.5 cm wide, acuminate at apex, obtuse at base, chartaceous, dentate with dot at margin, lustrous green surface and pale green beneath; midrib and lateral veins (5-8 per side) elevated on both surfaces, glabrous on both surfaces. Petioles slender, 1-1.5 cm long, subterete to terete, slightly groove above and elevated beneath.





Fig. 143. *Maesa houtungensis* S. S. Ying, leaves and inflorescence



Fig. 144. *Maesa houtungensis* S. S. Ying, the inflorescences

Flowers 8-17 in a contorted racemes appearing glomerate, polygamous (bisexual and female flowers), white, 1.5-2 mm in diameter when opened, scentless; inflorescence axillary, short, 8-12 mm long, glabrous; pedicels very short, about 1 mm long, pale green, glabrous; bracts not seen; calyx campanulate, adnate to ovary, 1.5-2 mm wide, glabrous, 5-lobed at apex; lobes triangular, 0.7-0.9 mm long, obtuse at apex; corolla white, campanulate, 0.9-1.5 mm long, about 2 mm wide, 5-lobed at apex; the lobes ovate, 0.3-0.4 mm long, obtuse at apex; bisexual flowers with 5 stamens and ovary, style and stigma, female flowers with ovary, style and stigma; stamens 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, 0.4 mm long; stigma entire, head-like, pale yellow.

Fruits globose, 1-1.5 mm across, graish brown to ight brownish, the infuctescence 1.5-2.5 cm long, glabrous; calyx persistent, ovate-triangular, cover with the fruit. Seeds 7-10 in each fruit, oblong, 0.3 mm long, 0.2 mm wide, white, transparent.



Fig. 145. *Maesa houtungensis* S. S. Ying, close-up of inflorescences

### Diagnosis.

*Maesa hotungensis* is characterized by:

1. A small tree, up to 4.5 m high, much branched, glabrous, wrinkled, with lenticels.





Fig. 146. *Maesa houtungensis* S. S. Ying, close-up of flowers, mind biennial flowers mixed with female flowers (1)



-116- Fig. 147. *Maesa houtungensis* S. S. Ying, close-up of flowers, mind biennial flowers

2. Leaves simple, alternate, oblong to ovate-oblong, 5-9 cm long, 2-3.5 cm wide, acuminate at apex, obtuse at base,
3. Flowers 8-17 in a contorted racemes appearing glomerate, polygamous (bisexual and female flowers), white, 1.5-2 mm in diameter when opened
4. corolla white, campanulate, 0.9-1.5 mm long, about 2 mm wide, 5-lobed at apex; the lobes ovate, 0.3-0.4 mm long, obtuse at apex
5. Fruits globose, 1-1.5 mm across, graish brown to ight brownish, the infuctescence 1.5-2.5 cm long, glabrous; calyx persistent, ovate-triangular, cover with the fruit.
6. Seeds 7-10 in each fruit, oblong, 0.3 mm long, 0.2 mm wide, white, transparent.

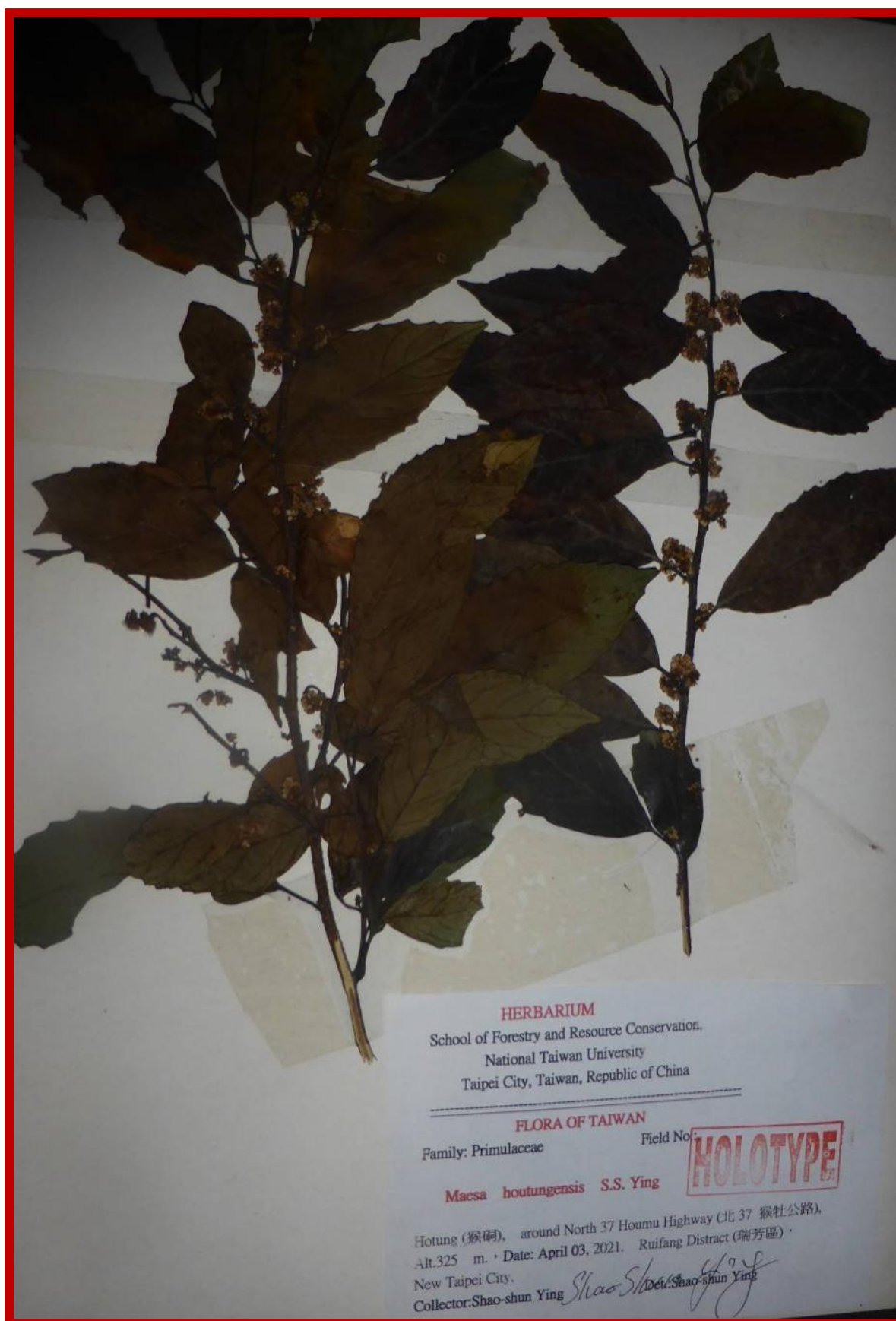


Fig. 148. *Maesa houtungensis* S. S. Ying, a small tree in habit

#### **Distribution and phenology.**

*Maesa houtungensis* S.S. Ying is endemic to Taiwan ° It is known from Houtung (猴硐) area, on the roadsides around around North 37 Houmu Highway (北 37 猴牡公路), about 300-350m elevation, Ruifang Distract (瑞芳區) , New Taipei City , Northern Taiwan. and flowering time from March to May, and fruiting time from May to July °





-118- Fig. 149. *Maesa houtungensis* S. S. Ying, the holotype NTUF-110-021.

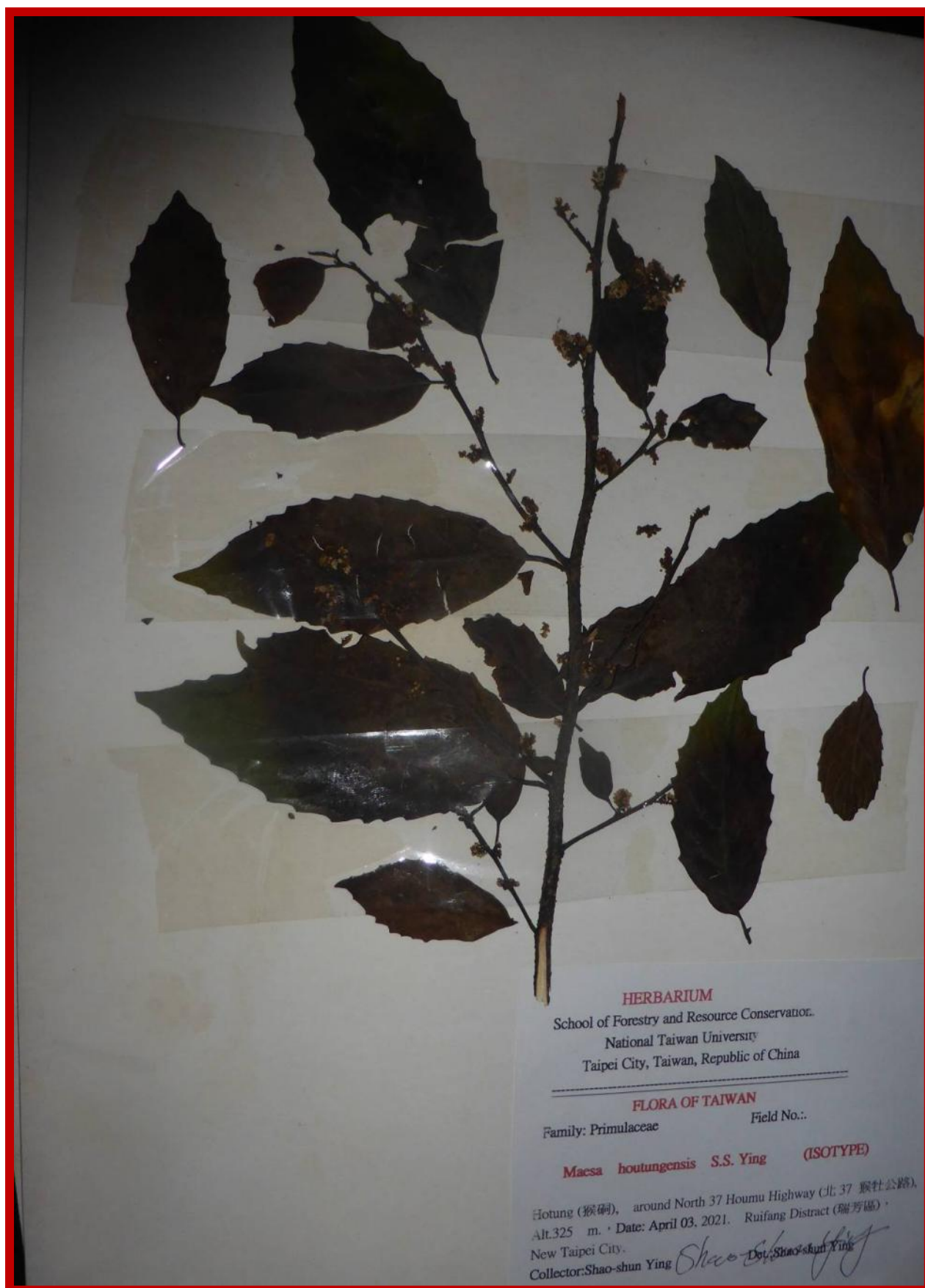


Fig. 150. *Maesa houtungensis* S. S. Ying, close-up of flowers, mind biexual flowers mixed with female flowers (2)



-119- Fig. 151. *Maesa houtungensis* S. S. Ying, inflorescences and leaf-beneth





-120- Fig. 152. *Maesa houtungensis* S. S. Ying, the isotype NTUF-110-022.



Fig. 153. *Maesa houtungensis* S. S. Ying, infructescences



-121- Fig. 154. *Maesa houtungensis* S. S. Ying, close-up of fruits





-122- Fig. 155. *Maesa houtungensis* S. S. Ying, the syntype NTUF-110-023.

## 10. A New species of Genus *Cotoneaster* (Rosaceae) in Taiwan

*Cotoneaster siyuanensis* S.S. Ying 思源鋪地蜈蚣

*Cotoneaster siyuanensis* S.S. Ying, *sp. nov.* 思源鋪地蜈蚣

TYPE:TAIWAN. Taichung City,Hoping District (和平區), Siyuan (思源) 1890 m alt. *S. S. Ying*,  
*s.n. April 8, 2021* ° (holotype , NTUF) °



Fig. 156. *Cotoneaster siyuanensis* S. S. Ying, branches with flowers

**Morphology :** Evergreen lower spreading shrubs, about 50-80 cm tall; stem short, 8-12 cm long, robust, 3-4 mm across, glabrous, much branched; branches ascending to spreading, terete, elongate, 50-70 cm long, brownish, usually densely brown pubescent and glabrous when adult, with lenticels. Leaves simple alternate, ovate to oblong, 8-15 mm long, 5-10 mm long, obtuse at apex, obtuse and slightly cordate at base,





Fig. 157. *Cotoneaster siyuanensis* S. S. Ying, the plant, photo on 8th April 2021

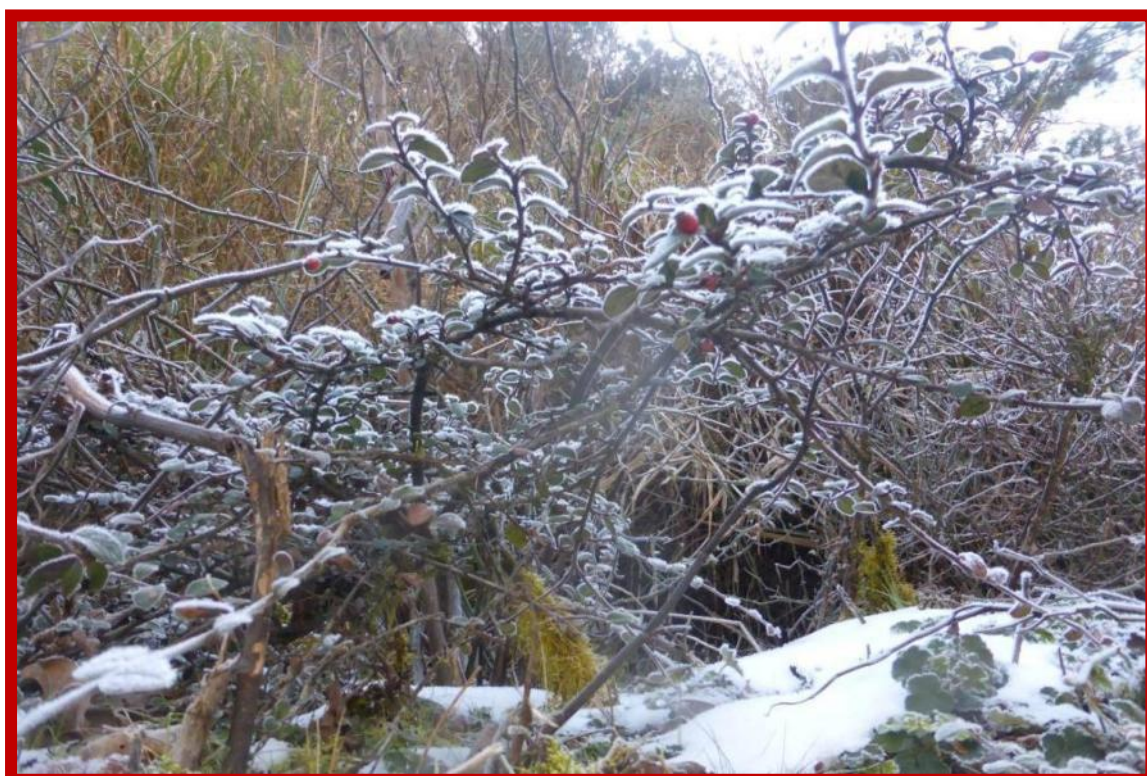


Fig. 158. *Cotoneaster siyuanensis* S. S. Ying, the plant, photo on 14th January, 2021





Fig. 159. *Cotoneaster siyuanensis* S. S. Ying, close-up of leaves



Fig. 160. *Cotoneaster siyuanensis* S. S. Ying, the leaves, photo on 14th January, 2021



coriaceous, entire, lustrous green scattered with dots surfaces, pale green to slightly brown beneath; midrib and lateral veins (2-3-4 per side) impressed surface and elevated beneath, glabrous surface and pubescent along midrib and lateral veins. petioles short, 2-3 mm long, groove above, glabrous or nearly so.



Fig. 161. *Cotoneaster siyuanensis* S. S. Ying, mind flower-buds terminal on short-branched



Fig. 162. *Cotoneaster siyuanensis* S. S. Ying, close-up of flower buds, pedicel and short-branched



Fig. 163. *Cotoneaster siyuanensis* S. S. Ying, close-up of calyx, stamens and pistil

Flowers solitary, rarely 2 fascicled, red turned to pink when adult, terminal on the short-branched, smaller, 4-5 mm in diameter; pedicels short, 5-7 mm long, densely brownish pubescent; bracts ovate, minute, 3-4 mm long, 2.5-3 mm wide, deciduous, densely brownish pubescent; hypanthium yellow-green tinged with red, campanulate,, adnate to ovary; sepals 5, ovate, 4-5 mm long, 3-4 mm wide, acute at apex, truncate at base, white pubescent outside and scattered villose inside, brownish red outside and red inside; petals 5, alternate to sepals, erect to spreading, broadly ovate, 5.5-6 mm long, 4-5 mm wide, obtuse at apex, clawed at base, red turning to pink when adult, glabrous; stamens 10-15, shorter than petals; filament slender, 2-3 mm long, red to pink; anthers oblong, brown; ovary oblong, villous; style 3, not exceeding stamens.

Fruit a drupe-like pome, oblong, 9-10 mm long, 3-4 mm wide, red when mature, short villous, with 5 persistent, not enlarged sepals at apex, containing pyrenes; pyrenes 1 to 2, bony, 1-seeded; seeds oval, 0.5-0.7 mm across, somewhat compressed.





Fig. 164. *Cotoneaster siyuanensis* S. S. Ying, close-up of flower



Fig. 165. *Cotoneaster siyuanensis* S. S. Ying, the fruits, photo on 14th January, 2021



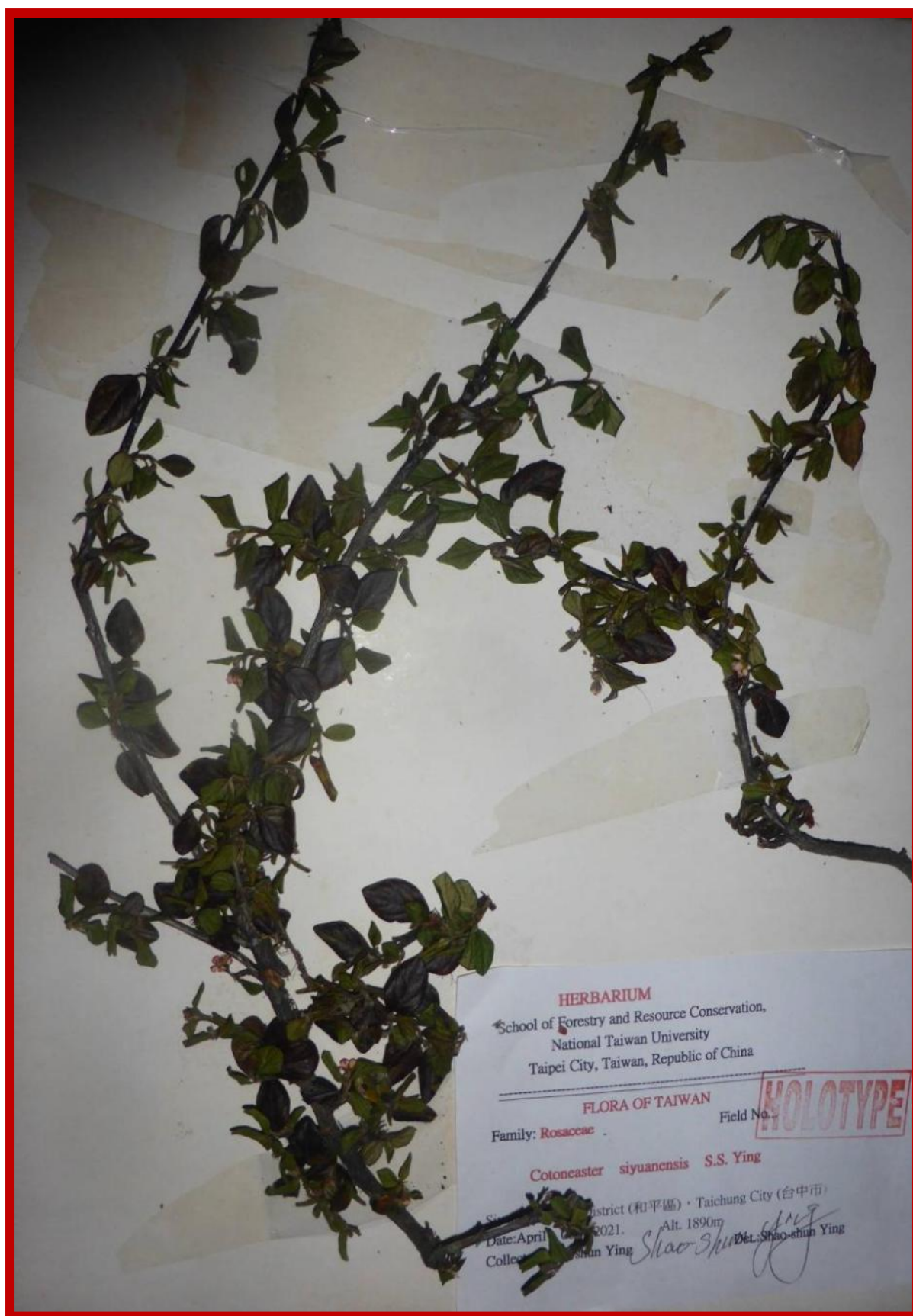
Fig. 166. *Cotoneaster siyuanensis* S. S. Ying, the plant

**Diagnosis.**

*Cotoneaster siyuanensis* is characterized by:

1. The plant grows on the roadsides around Tai Seven A highway (台七線甲) between Siyuanakou (思源埡口) and Shaoakou (小埡口), the elevations between 1800 and 1950m. the lowest elevation where the *Cotoneaster* species growing in Taiwan.





-130- Fig. 167. *Cotoneaster siyuanensis* S. S. Ying, the holotype NTUF-110-024.



Fig. 168. *Cotoneaster siyuanensis* S. S. Ying, the short branches elongate and fruits inserted



Fig. 169. *Cotoneaster siyuanensis* S. S. Ying, the fruits, photo on 13th May, 2021





Fig. 170. *Cotoneaster siyuanensis* S. S. Ying, the fruits, photo on 13th May, 2021

2. Evergreen lower spreading shrubs, about 50-80 cm tall.
3. Flowers solitary to 2 fascicled, red, smaller.
4. Fruit a drupe-like pome, oblong, 9-10 mm long, 3-4 mm wide, red when mature.

#### **Distribution and phenology.**

*Cotoneaster siyuanensis* S.S. Ying is endemic to Taiwan. It is known from roadsides around Tai Seven A highway (台七線甲) between Siyuanakou (思源埡口) and Shaoakou (小埡口), the elevations between 1800 and 1950m. the lowest elevation where the *Cotoneaster* species growing in Taiwan. Hoping Distract (和平區) · **Taichung City** · Northeastern Taiwan. and flowering time from April to May, and fruiting time from June to February

## 11. Three New species of Genus *Rhododendron* (Ericaceae) in Taiwan

A. *Rhododendron nantouense* S.S. Ying 南投杜鵑

*Rhododendron nantouense* S.S. Ying, *sp. nov.* 南投杜鵑

TYPE: TAIWAN. Nantou county, Renai Township (仁愛鄉), Chingjing (清境) 1890m alt. *S. S. Ying*, *s.n.* April 22, 2021. (holotype, NTUF).



Fig. 171. *Rhododendron nantouense* S. S. Ying, the flowering branchlets

**Morphology** : Trees, up to 6 m high, trunk straight, smooth, grayish, branched above 2.5 m high, much branched; branchlets erect to ascending, terete, glabrous, grayish brown. Leaves simple, alternate, somewhat clustered at branchlet apex, oblong, 3-5.5 cm long, 1.5-2.5 cm wide, acuminate at apex, attenuate at base, chartaceous, obscurely crenulate and ciliate at margins, appressed



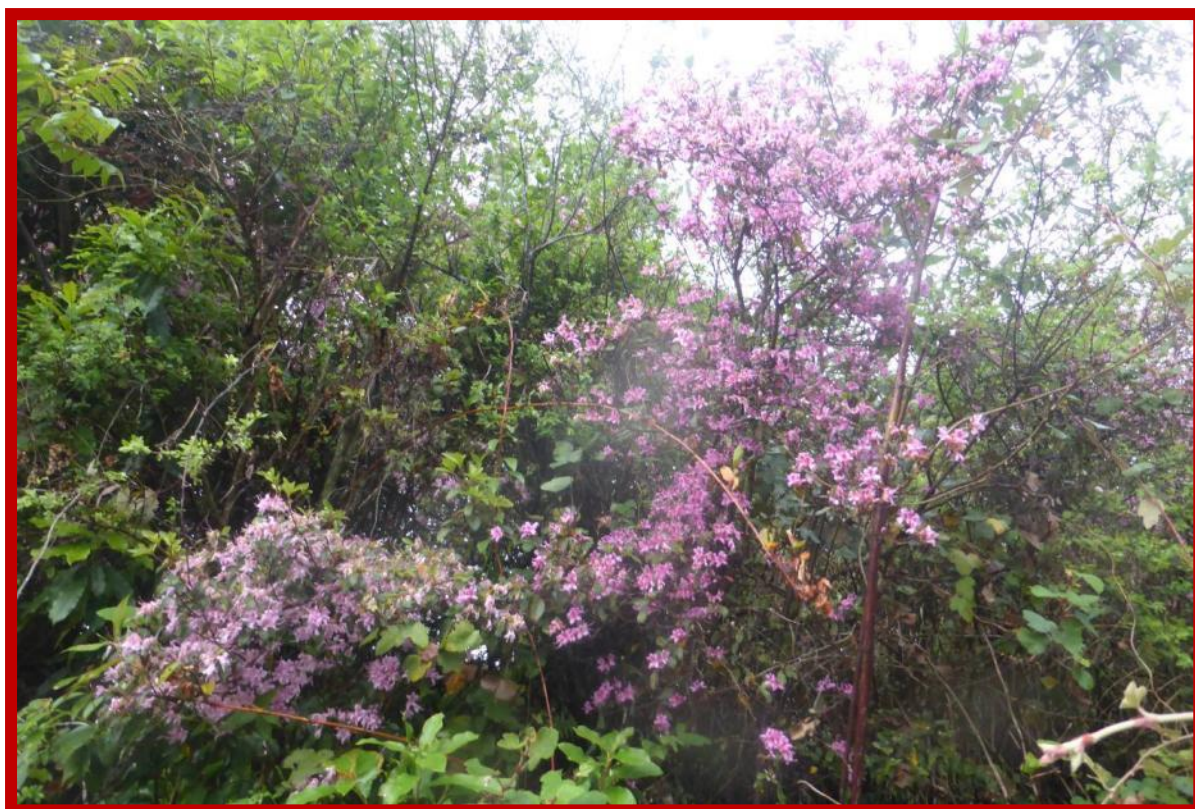


Fig. 172. *Rhododendron nantouense* S. S. Ying, A tree, mixed with other trees at Chingjing area (1)

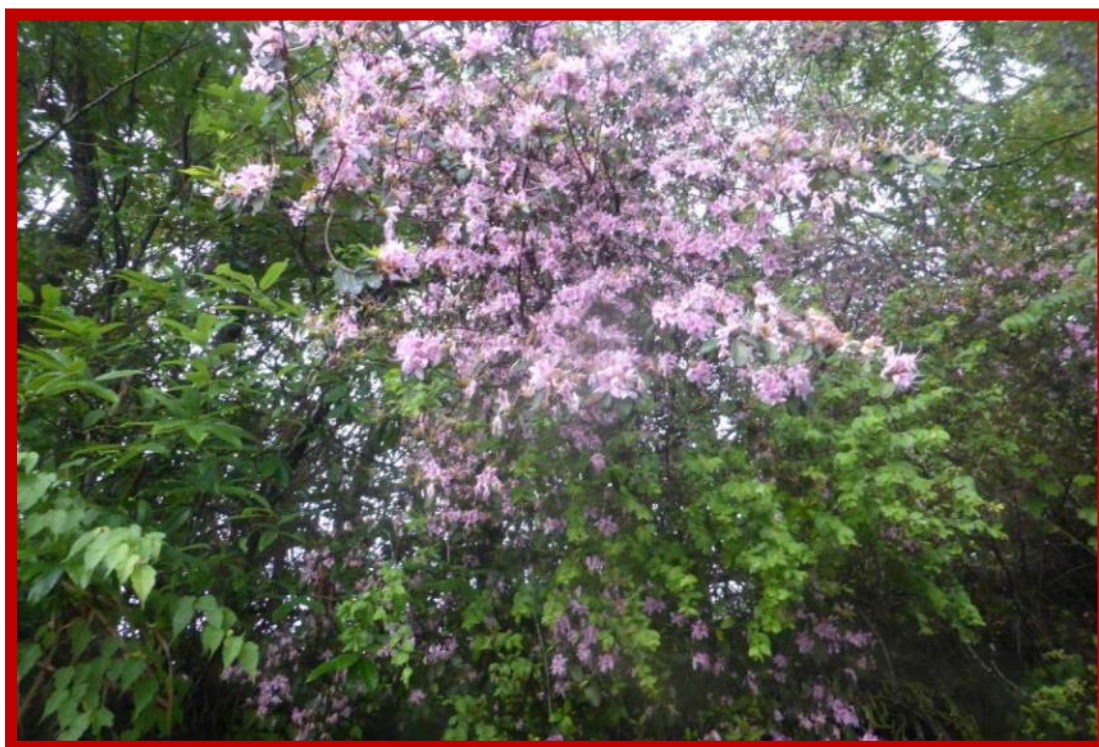


Fig. 173. *Rhododendron nantouense* S. S. Ying, A tree, mixed with other trees at Chingjing area (2)





Fig. 174. *Rhododendron nantouense* S. S. Ying, branches and leaves

pubescent surface, nearly glabrous beneath; midrib and lateral veins (5-6 per side) impressed surface and elevated beneath. Petioles short, terete, 4-6 mm long, glabrous to scattered appressed pubescent upward.

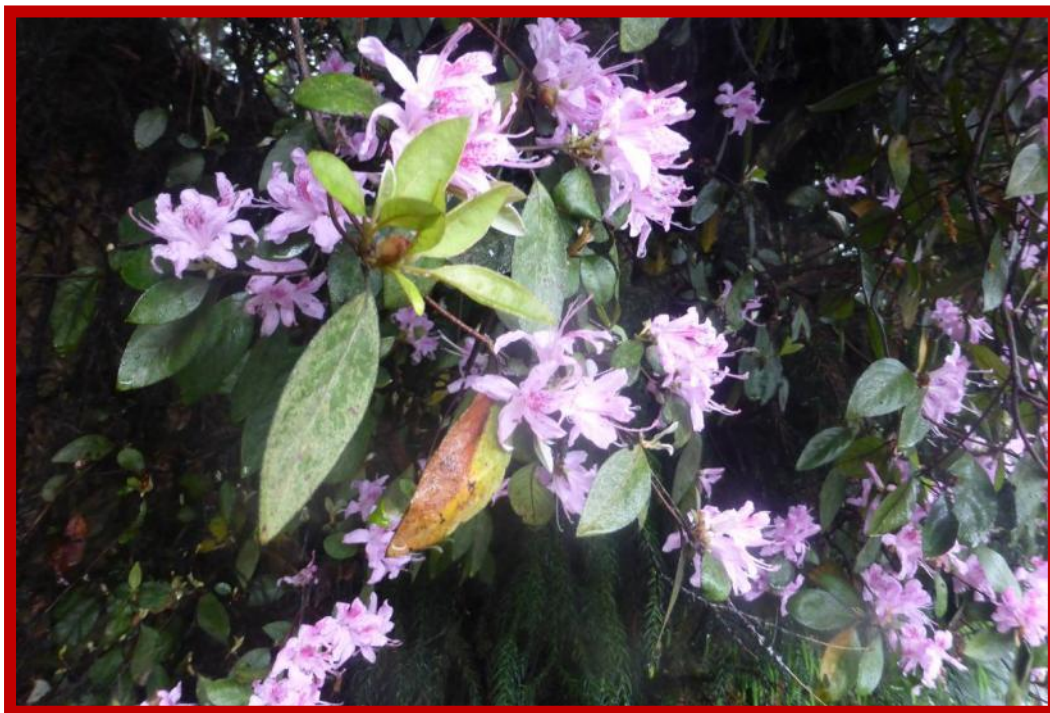


Fig. 175. *Rhododendron nantouense* S. S. Ying, the flowers





Fig. 176. *Rhododendron nantouense* S. S. Ying, flowers 3-6 terminal on branchlets



Fig. 177. *Rhododendron nantouense* S. S. Ying, flowers

Flowers 3-6, mostly 3- fascicled on the terminal of branchlets, rather smaller, 3.5-4 cm in diameter when opened, pink with dark red specks and plaques; pedicels 3-5 mm long, red, scattered pubescent, scaly; scales lanceolate, 1-2 mm long, acute at apex; calyx smaller, 4-5 mm wide, green, pubescent, 5-lobed at apex; lobes triangular, 2-4 mm long, acute at apex, truncate at base; corolla widely 5-lobed ; the lobes oblong, 1.5-2.5 cm long, 5-8 mm wide, obtuse at apex, glabrous; the lower 3 lobes always tinged with dark red specks and plaques ; stamens 5, filaments slender, 2.5-3.5 cm long, pink, villous but glabrous upward; anthers 2-celled, cylindrical, 2-3 mm long, pale brown, opening by terminal pore; style slender, 3.5-4.5 cm long, pink, villous but glabrous upward; stigma capitate, about 2 mm across, dark red; ovary globose, densely scattered white pubescent, 2mm across.

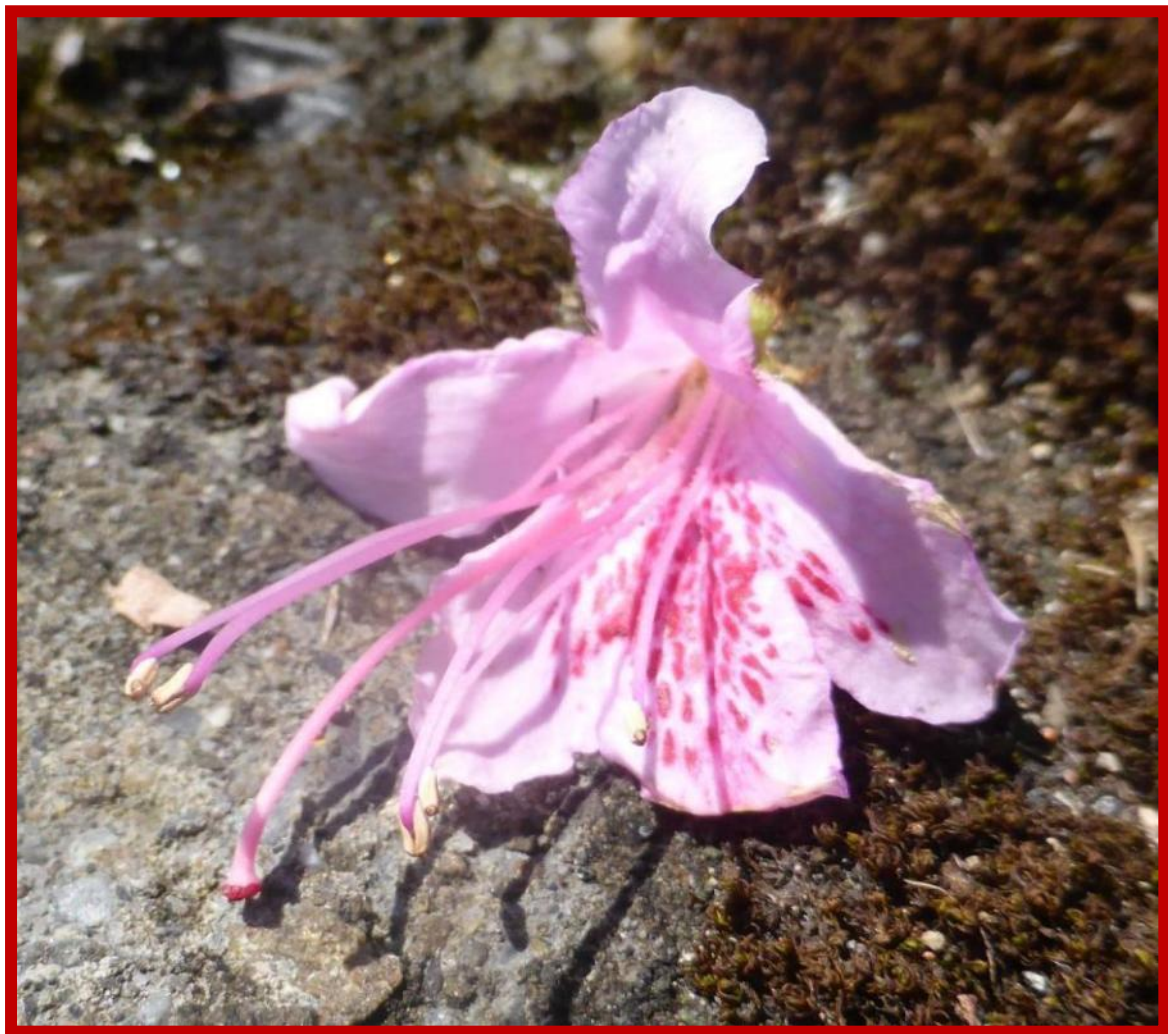


Fig. 178. *Rhododendron nantouense* S. S. Ying, corolla-lobed, stamens and pistil

Fruits capsules, ovoid, 0.5-0.7 cm long, about 3 mm across, dehiscent from top when mature, septicidal; valves thick, straight; seeds numerous, minute, fusiform.



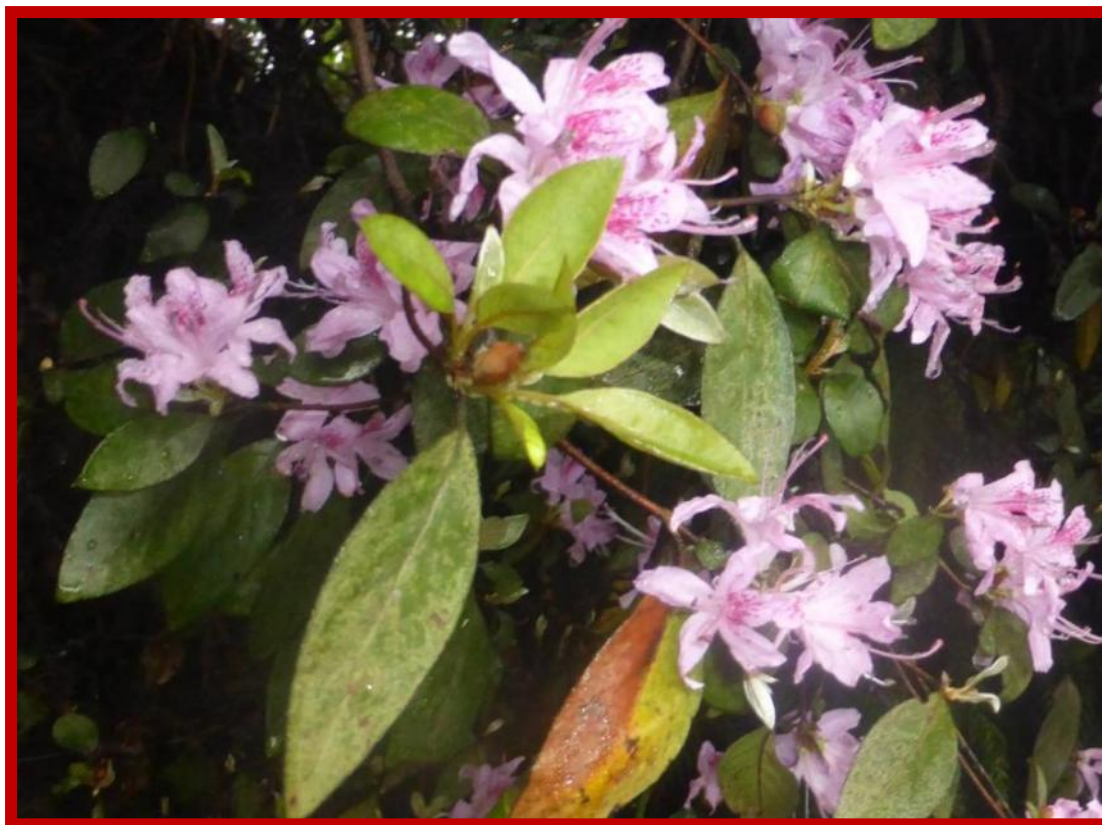


Fig. 179. *Rhododendron nantouense* S. S. Ying, flowers

### Diagnosis.

*Rhododendron nantouense* is characterized by:

1. The plant is flowering in late February to early May, one of early flowering species of *Rhododendron* in Taiwan.
2. The plant is a tree, up to 5 m high, not a shrub; usually mixed with other trees at Chingjing (清境) area, and it grows up to Songgang (松崗) area, elevation between 1700 and 2000 m.
3. Flowers 3-6, mostly 3 fascicled on the terminal of branchlets, rather smaller, 3.5-4 cm in diameter when opened, pink with dark red specks and plaques.
4. Corolla widely 5-lobed; the lobes oblong, 1.5-2.5 cm long, 5-8 mm wide, obtuse at apex, glabrous; the lower 3 lobes always tinged with dark red specks and plaques.
5. Stamens 5, filaments slender, 2.5-3.5 cm long, pink, villous but glabrous upward; anthers 2-celled, cylindrical, 2-3 mm long, pale brown, opening by terminal pore.

### Distribution and phenology.



Fig. 180. *Rhododendron nantouense* S. S. Ying, the holotype NTUF-110-025.





-140- Fig. 181. *Rhododendron nantouense* S. S. Ying, the isotype NTUF-110-026.

*Rhododendron nantouense* S.S. Ying is endemic to Taiwan ° It is known from roadsides around Chingjing (清境) area, and it grows up to Songgang (松崗) area, elevation between 1700 and 2000 m. Renai Township (仁愛鄉) , Nantou county , **Central Taiwan**, and flowering time from late February to May, and fruiting time from June to August.



Fig. 182. *Rhododendron nantouense* S. S. Ying, close-up of flowers



**B.***Rhododendron shaoakouense* S.S. Ying 小埤口杜鵑

*Rhododendron shaoakouense* S.S. Ying, *sp. nov.* 小埤口杜鵑

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Shaoakou (小埤口) 1850 m alt. *S. S. Ying* , *s.n.* May 13, 2021 ° (holotype , NTUF) °



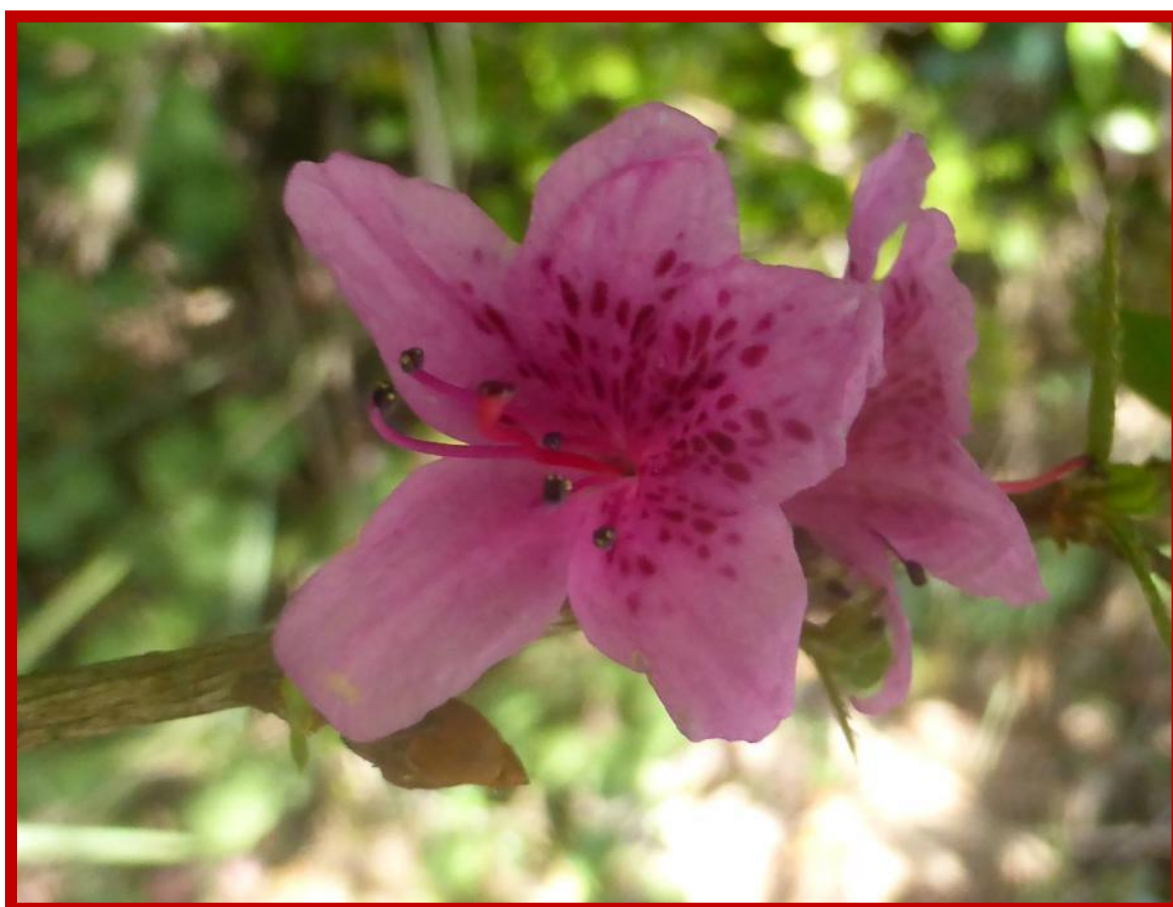
Fig. 183. *Rhododendron shaoakouense* S. S. Ying, flowering plant

**Morphology** : Shrubs, up to 2 m high, trunk inconspicuous, much branched at base; branches erect to ascending, terete, glabrous, grayish. Leaves simple, alternate, somewhat clustered at branch apex, ovate-oblong to obovate, 0.7-1.5 cm long, 0.5-1.0 cm wide, acuminate at apex, attenuate at base, thinly coriaceous, entire to obscurely crenulate at margins, scattered appressed pubescent surface, pubescent along midrib, lateral veins and basal margins beneath; midrib and lateral veins (3-4 per side, inconspicuous) impressed surface and elevated beneath. Petioles short, terete, 2-4 mm long, nearly glabrous to scattered few appressed pubescent upward.

Flowers solitary to 2-3- fascicled on the terminal of branches, smaller, 2.5-3 cm in diameter when opened, pruplish to pink with dark red specks and plaques on the four corolla-lobes, only one



Fig. 184. *Rhododendron shaoakouense* S. S. Ying, the leaves



-143- Fig. 185. *Rhododendron shaoakouense* S. S. Ying, the flowers



lobe without dark red specks and plaques ; pedicels 2-4 mm long, scattered pubescent, scaly; scales ovate, 3-4 mm long, acute at apex, white somewhat long-pubescent outside and glabrous inside; calyx 5 deeply lobed at apex, 5-6 mm long, pale green; lobes linear, 4.5-5.5 mm long, acuminate at apex, truncate at base, pubescent outside, lacerated at margins; corolla widely 5-lobed ; the lobes somewhat irregular, the 3 upper lobes ovate to ovate-oblong, 1.5-1.8 cm long, 5-6 mm wide, obtuse at apex' the lower 2 lobes oblong, 1.5-1.7cm long, 4-5 mm wide, obtuse at apex; stamens 5, filaments slender, 2.5-3 cm long, pink, villous but glabrous upward; anthers 2-celled, cylindrical, 1.5-2 mm long,dark brown, opening by terminal pore; style slender, 3.5-4 cm long, pink, villous but glabrous upward; stigma capitate, about 2 mm across, dark red; ovary globose, densely scattered white pubescent, 1.5 mm across.



Fig. 186. *Rhododendron shaoakouense* S. S. Ying, the flowers, mind the calyx



Fig. 187. *Rhododendron shaoakouense* S. S. Ying, close-up of calyx

Fruits capsules, ovoid to ellipsoid, 0.4-0.67 cm long, about 2.5 mm across, dehiscent from top when mature, septicidal; valves thick, straight; seeds numerous, minute, linear or nearly so.

### **Diagnosis.**

*Rhododendron shaoakouense* is characterized by:

1. The plant is flowering in late February to May, one of early flowering species of *Rhododendron* in Taiwan.

2. The plant is a shrub, up to 2 m high, much branched

3. Leaves rather smaller, ovate-oblong to obovate, 0.7-1.5 cm long, 0.5-1.0 cm wide, thinly coriaceous, scattered appressed pubescent surface, pubescent along midrib, lateral veins and basal margins beneath;



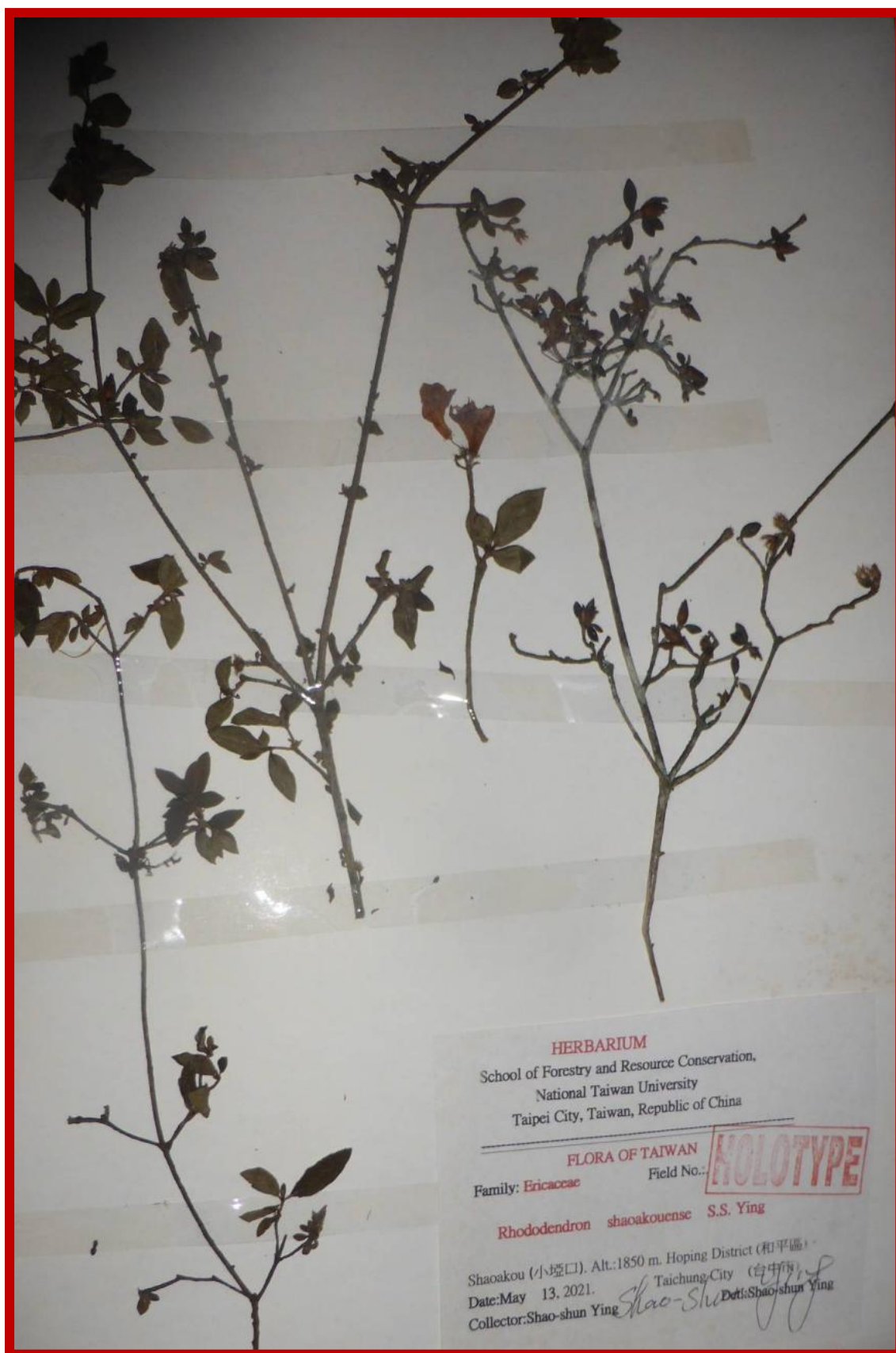


Fig. 188. *Rhododendron shaoakouense* S. S. Ying, the holotype NTUF-110-027.



Fig. 189. *Rhododendron shaoakouense* S. S. Ying, the isotype NTUF-110-028.





Fig. 190. *Rhododendron shaoakouense* S. S. Ying, in the wild

4. Flowers solitary to 2-3- fascicled on the terminal of branches, smaller, 2.5-3 cm in diameter when opened, purplish to pink with dark red specks and plaques on the four corolla-lobes, only one lobe without dark red specks and plaques.

5. Calyx 5 deeply lobed at apex, 5-6 mm long, pale green; lobes linear, 4.5-5.5 mm long, acuminate at apex, truncate at base, pubescent outside, lacerated at margins.

6. Corolla widely 5-lobed ; the lobes somewhat irregular, the 3 upper lobes ovate to ovate-oblong, 1.5-1.8 cm long, 5-6 mm wide, obtuse at apex' the lower 2 lobes oblong, 1.5-1.7cm long, 4-5 mm wide

#### **Distribution and phenology.**

*Rhododendron shaoakouense* S.S. Ying is endemic to Taiwan . It is known from mountaun slope around Shaoakou (小埡口) area, and it grows upfrom Siyuanakou (思源埡口) to Shaoakou (小埡口) area, elevation between 1850 and 2000 m. Hoping District (和平區) , Taichung City , Central Taiwan, and flowering time from late February to May, and fruiting time from June to August.

**C.***Rhododendron huanshanense* S.S. Ying 環山杜鵑

*Rhododendron huanshanense* S.S. Ying, *sp. nov.* 環山杜鵑

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , between Huanhsin (環興) and huanshan (環山) 1850 m alt. *S. S. Ying* , *s.n. September 23, 2021* . (holotype , NTUF) .



Fig. 191. *Rhododendron huanshanense* S. S. Ying, the flowers

**Morphology** : Shrubs to small trees, up to 4 m high, trunk inconspicuous, much branched at base; branches erect to ascending, terete, densely scattered brownish hirsute. Leaves simple, alternate, , ovate to ovate-oblong , 3-5.5 cm long, 1.2-3.2 cm wide, obtuse ans with an arista at apex, obtuse at base, thinly coriaceous, entireand ciliate at margins, densely scattered brosnish hirsutes on both surfaces, especially on midrib and lateral veins of both surfaces; midrib and lateral veins (3-5 per side), impressed surface and elevated beneath. Petioles terete, 6-10 mm long, densely scattered brosnish hirsutes.

Flowers solitary to 2-4- fascicled on the terminal of branches, 3.2-4.5 cm in diameter when opened, red, only one lobe wih dark red specks and plaques on the base corolla-lobes, orther 4-lobed without dark red specks and plaques on the base corolla-lobes; pedicels 8-15 mm long,





Fig. 192. *Rhododendron huanshanense* S. S. Ying, branches, petioles and leaves

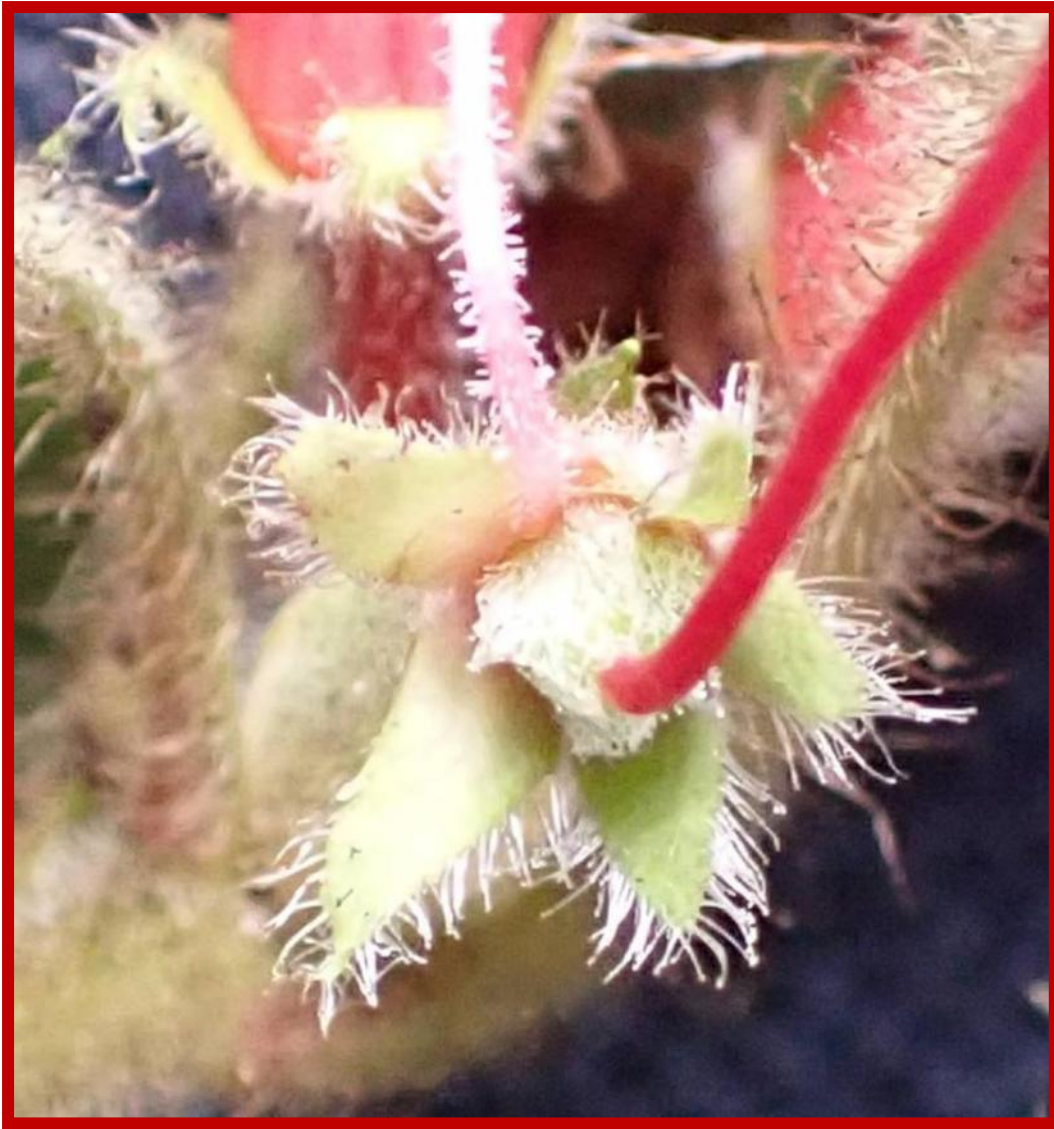


Fig. 193. *Rhododendron huanshanense* S. S. Ying, close-up of pedicel, calyx-lobes, ovary and style

pink to red, densely scattered white pubescent, scaly; scales ovate to ovate-lanceolate, 8-15 mm long, 3-4 mm wide, acuminate at apex, brownish, somewhat long-pubescent outside and glabrous inside; calyx 5 deeply lobed at base, green; the lobes triangular, 3-5 mm long, 1.5-2 mm wide, acute at apex, truncate at base, densely scattered white glandular outside and glabrous inside, elongate glandular-hairs at margins; corolla widely 5-lobed; the lobes somewhat irregular, the 3 upper lobes oblong to ovate-oblong, 1.8-2.3 cm long, 5-6 mm wide, obtuse at apex' the lower 2 lobes narrowly oblong, 1.5-2.1 cm long, 3.5-4 mm wide, obtuse at apex; stamens 10, filaments slender, 2.5-3.5 cm long, red, villous but glabrous upward; anthers 2-celled, cylindrical, 1.5-2 mm long, dark blackish brown, opening by terminal pore; style slender, 4.2-5.2 cm long, red, villous but glabrous upward; stigma capitate, about 2.5 mm across, dark red; ovary globose, green, densely scattered elongate white glandular hairs, 2.5-3 mm across.





Fig. 194. *Rhododendron huanshanense* S. S. Ying, close-up of corollas

### Diagnosis.

*Rhododendron huanshanense* is an extraordinary species of the genus, its flowering time is late September to October, calyx-lobes triangular, acute at apex, truncate at base, densely scattered white glandular outside and glabrous inside, elobgate glandular-hairs at margins; corolla widely 5-lobed, the lobes somewhat irregular and ovary with densely scattered elongate white glandular hairs.

### Distribution and phenology.

*Rhododendron huanshanense* S.S. Ying is endemic to Taiwan. It is known from mountain slope between Huanhsin (環興) and huanshan (環山), the elevation between 1750 and 1900 m. Hoping District (和平區), Taichung City, Central Taiwan, and flowering time from late September to October, and fruiting time from November to December.

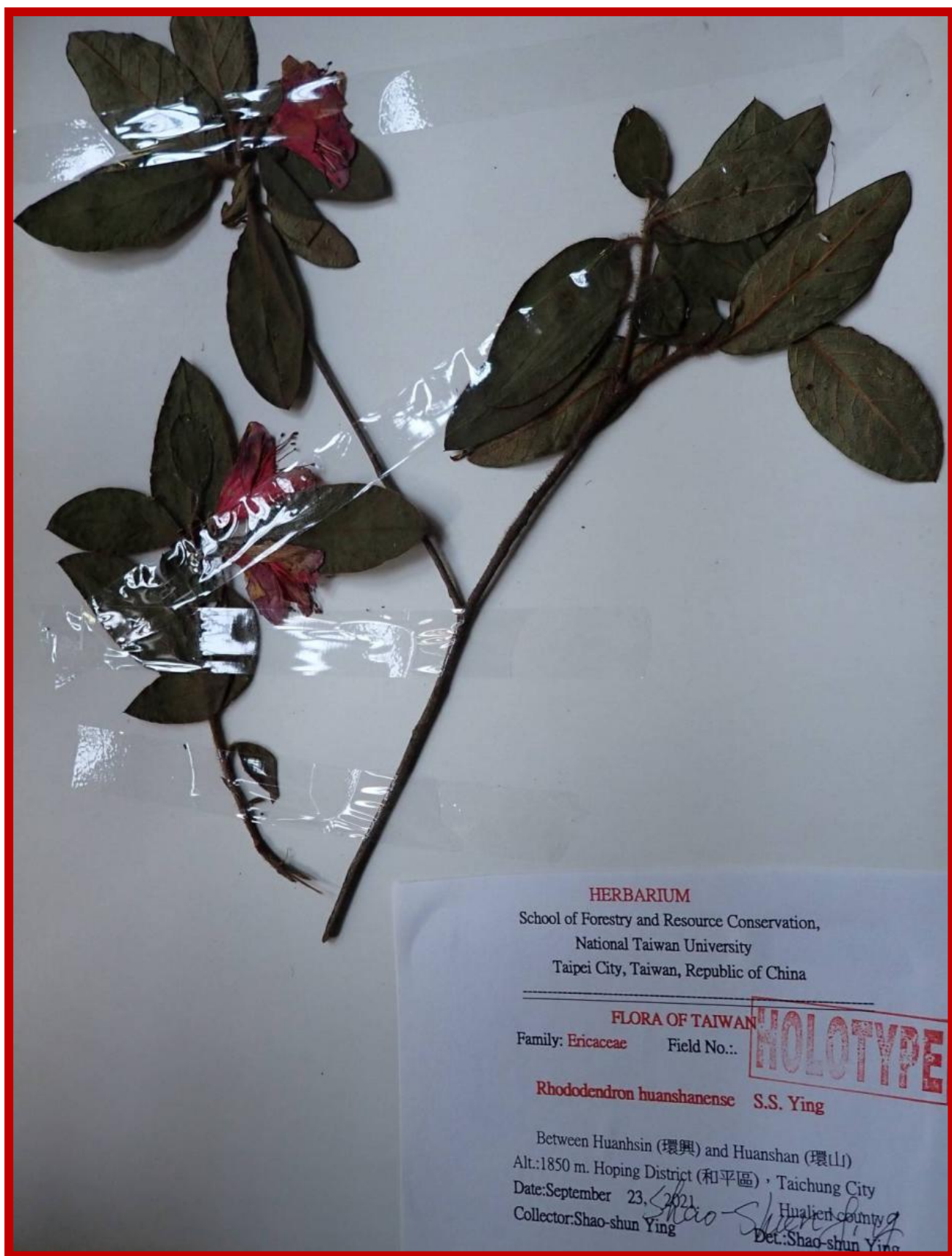


Fig. 195. *Rhododendron huanshanense* S. S. Ying, the holotype NTUF-110-029.





Fig. 196. *Rhododendron huanshanense* S. S. Ying, the isotype NTUF-110-030.





Fig. 197. *Rhododendron huanshanense* S. S. Ying, flowers are blooming in late September



Fig. 198. *Rhododendron huanshanense* S. S. Ying, flowers are blooming in late September



## 12. A New species of Genus *Maianthemum* (Asparagaceae) in Taiwan

*Maianthemum* (Smilacina) *shaolinchii* S.S. Ying 邵氏鹿藥

*Maianthemum* (Smilacina) *shaolinchii* S.S. Ying, *sp. nov.* 邵氏鹿藥

TYPE:TAIWAN. Nantou county, Renai Township (仁愛鄉), Yuanfeng (鳶峰) 2670m alt. *S. S. Ying*, *s.n. May 06, 2021* ° (holotype, NTUF) °



Fig. 199. *Maianthemum shaolinchii* S. S. Ying, the flowering plant

**Morphology** : Annual herbs, about 15- 30 cm tall; rhizome thickened, fleshy, creeping, tuberous-moniform for year persistent, 5-7 cm long, 8-11 mm across, brownish; roots elongate, 3-5.5 mm long, somewhat white; stem ascending, 25-30 cm long, white pubescent, usually less pubescent at base. Leaves 4-6, simple, alternate, oblong-lanceolate to broadly lanceolate, 5.5-7 cm long, 1.5-2 cm wide, acuminate at apex, obtuse to slightly cordate and to the petioles at base, chartaceous,



Fig. 200. *Maianthemum shaolinchii* S. S. Ying, the plant showing rhizome and roots



Fig. 201. *Maianthemum shaolinchii* S. S. Ying, rhizome and roots



entire and ciliate at margin; lustrous green surface and pale green beneath, scattered bristle surface and nearly so beneath; veins 5-6 impressed surface and elevated beneath ; petioles short, 3-6 mm long, hirsute outside and nearly glabrous inside, greenish.



Fig. 202. *Maianthemum shaolinchii* S. S. Ying, the leaves



Fig. 203. *Maianthemum shaolinchii* S. S. Ying, bristles on the leaf-surface



Fig. 204. *Maianthemum shaolinchii* S. S. Ying, the plant with flowering buds

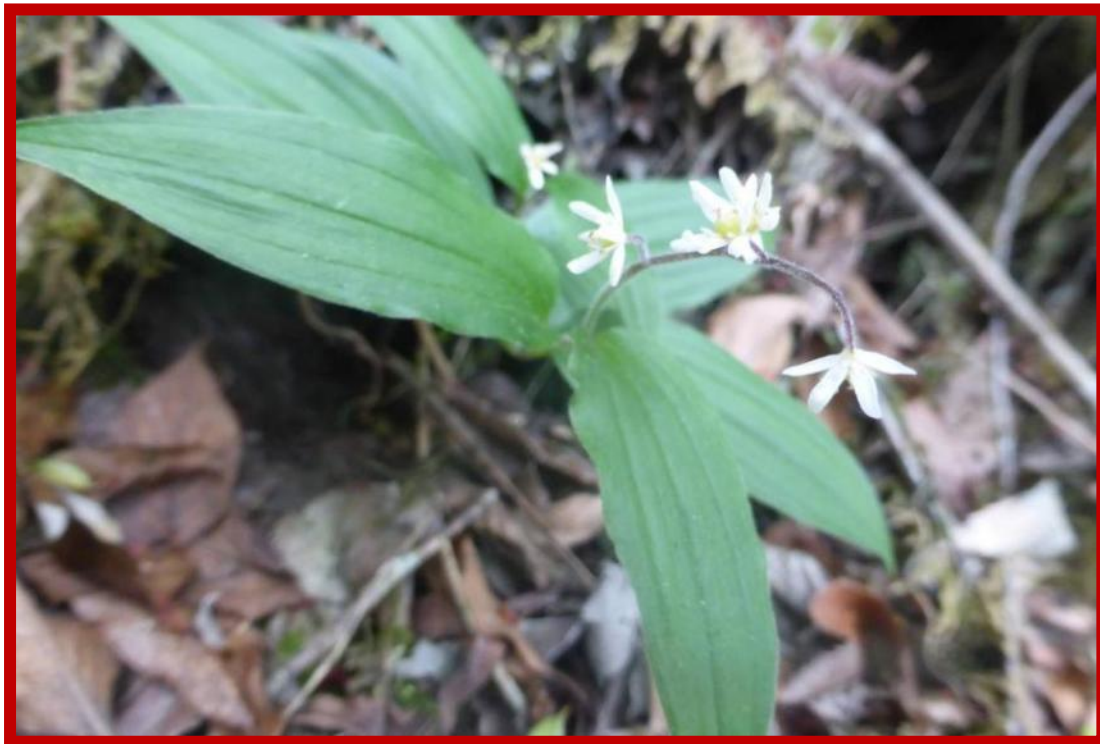


Fig. 205. *Maianthemum shaolinchii* S. S. Ying, flowering in the wild





Fig. 206. *Maianthemum shaolinchii* S. S. Ying, flowers soon turning to light brownish

Flowers 6-9, sometimes up to 12, smaller, 4-5 mm in diameter when opened, white and soon turned to lightly brownish, in a terminal raceme; inflorescence 4-7cm long, erect to ascending, white villous, purplish; pedicels slender, 8-12 mm long, purplish, white villous; bracts ovate, 3-4 mm long, about 2.5 mm wide, acuminate at apex, truncate at base, somewhat transparent, white; perianth-segment 6, nearly completely free, oblong, 4-5 mm long, about 2.5 mm wide, obtuse at apex, truncate at base, glabrous, entire; stamens 6, filament slender, 1.5-2 mm long, white, glabrous; anthers 2-celled, dorsifixed, 0.5 mm long; ovary superior, somewhat like a spinning top, about 1 mm across, broaden at top and narrowed at base, glabrous, white; style very short; stigmas 3, about 0.3 mm long, white glabrous.

Fruit a berry, globose, 2.5-3 mm across, usually covered by withering perianth-segments, glabrous; pedicels 5-7 mm long, purplish, white villous.

**Diagnosis.**

*Maianthemum shaolinchii* is characterized by:



Fig. 207. *Maianthemum shaolinchii* S. S. Ying, close-up of inflorescence

1.The plant grows at the elevation between 2500 and-2700 m in central Taiwan, the lowest elevation among Taiwan *Maianthemum* species growing.

2.The plant is somewhat dwarf, about 15- 30 cm tall; rhizome thickened, fleshy, creeping, tuberous- moniform for year persistent.

3.Flowers 6-9, in a simple terminal racemose; flowers smller tow, 4-5 mm in diameter, white and turning to lightly brownish.

4.Inflorescence and pedicels purplish, all with white villous.





Fig.208. *Maianthemum shaolinchii* S. S. Ying, close-up of flower, a bract aside

5. Perianth-segment 6, nearly completely free, oblong, obtuse at apex, truncate at base, glabrous, entire; stamens 6, filament slender, 1.5-2 mm long, white.

6. Ovary superior, somewhat like a spinning top, about 1 mm across, broaden at top and narrowed at base, glabrous, white, ; style very short; stigmas 3, about 0.3 mm long, white glabrous.

7. Fruit a berry, globose, 2.5-3 mm across, usually covered by withering perianth-segments, glabrous.

### **Distribution and phenology.**

*Maianthemum shaolinchii* S.S. Ying is endemic to Taiwan . It grows in the shade under forest, where the ground is thick with fallen leaves and damp grey-brown humus around Yuenfeng (鳶峰), area, elevation between 2500 and 2700 m. Renai Township (仁愛鄉) , Nantou county , Central Taiwan, and flowering time from late April to May, and fruiting time from June to August.



Fig. 209. *Maianthemum shaolinchii* S. S. Ying, the holotype NTUF-110-031.





Fig. 210. *Maianthemum shaolinchii* S. S. Ying, immature fruits,  
mind covered by withering perianth-segmentsd



Fig. 211. *Maianthemum shaolinchii* S. S. Ying, close-up of immature fruits,

### 13. A Revision to the Scientific Names of Genus *Cerastium* (Caryophyllaceae) in Taiwan

Based on S.S. Ying (1996). *Cerastium*, 《Flora of Taiwan, secondary edition》 2:346-351.

Those species were treated by S.S. Ying in Flora of Taiwan Vol. 2.

1. *Cerastium formosanum* Ohwi, 台灣捲耳
2. *Cerastium holosteoides* Fries var. *hallaisanense* (Nakai) Mizushima 捲耳
3. *Cerastium parvipetalum* Hosokawa 小瓣捲耳
4. *Cerastium trigynum* var. *morrisonense* (Hayata) Hayata, 玉山捲耳

### **Cerastium** Linn. 捲耳屬

Sp. Pl. 1:437 (1753).

The genus name is a accepted name , about 100 species worldwide , but mainly north-temperate region. **4 species and 1 subspecies are recognized in Taiwan in this study.**

#### 1. *Cerastium fontanum* subsp. *vulgare* (Hartm.) Greuter & Burdet 卷耳

Willdenowia. 12: 37. 1982.

The subspecific name is an accepted name,

**Basionym:** *Cerastium vulgare* Hartman, Handb. Skand. Fl. 182. 1820

#### **54 Synonyms are recorded:**

*Cerastium viscosum* Linn., Sp. Pl. 437 1753. [Illegitimate]

*Cerastium vulgatum* Linn., Fl. Suec. ed. 2: 158 1755. [Illegitimate]

*Cerastium caeastium* Gilib., Fl. Lit. Inch. 2: 159 1782. [Invalid]

*Cerastium viscidum* Christm., Vollst. Pflanzensyst. 6: 668 1780.





Fig. 212. *Cerastium fontanum* subsp. *vulgare* (Hartm.) Greuter & Burdet, plant colony



Fig. 213. *Cerastium fontanum* subsp. *vulgare* (Hartm.) Greuter & Burdet, inflorescence

*Stellaria triviale* (Link) Link, Diss. Bot. Suerin 62 1795. [Illegitimate]

*Stellaria viscosa* Link, Diss. Bot. Suerin 62 1795.

*Cerastium murale* Desp.ex DC., Fl. Franç. ed. 3, 6: 609 1815.

*Cerastium vulgare* Hartman, Handb. Skand. Fl. 182. 1820

*Cerastium triviale* Link, Enum. Hort. Berol. Alt. 1: 433 1821. [Illegitimate]

*Cerastium viscosum* var. *glandulosum* Boenn., Prodr. Fl. Monast. Westphal. 133 1824.

*Cerastium vulgatum* var. *americanum* Ser., Prodr. 1: 416 1824.

*Cerastium connatum* L.C. Beck, Bot. North Middle States 55 1833.

*Cerastium viscosum* var. *elongatum* Hook., J. Bot. (Hooker) 1: 196 1834.

*Cerastium viscosum* var. *glabrescens* G. Mey., Chloris Han. 201 1836.

*Cerastium uliginosum* Hegetschw., Fl. Schweiz 437 1839.

*Cerastium macrocarpum* Steven ex Ledeb., Fl. Ross. 1: 407 1842. [Illegitimate]

*Cerastium vulgatum* var. *grandiflorum* Fenzl, Fl. Ross. 1: 410 1842.

*Cerastium syvaticum* Opizr, Seznam 28 1852. [Illegitimate]

*Cerastium vulgatum* var. *andinum* A Gray, U.S. Expl. Exped., Phan. 1: 120 1854.

*Cerastium vulgatum* var. *peruvianum* A. Gray, U.S. Expl. Exped., Phan. 1: 120 1854.

*Cerastium caespitosum* Asch., Fl. Brandenburg 1: 102 1860.

*Cerastium pseudosylvaticum* Schur, Oesterr. Bot. Z. 21: 46 1871.

*Cerastium vulgatum* var. *montevidense* Rohrb., Fl. Bras. 14(2): 284 1872.

*Cerastium vulgatum* var. *tibeticum* Edgew. & Hook.f. Fl. Brit. India 1: 228 1874.

*Cerastium alpestre* Schur, Verh. Naturf. Vereins Brünn 15(2): 151 1877.

*Cerastium alpinum* Schur, Verh. Naturf. Vereins Brünn 15(2): 149 1877.

*Cerastium malachiforme* Schur, Verh. Naturf. Vereins Brünn 15(2): 149 1877.

*Alsine trivialis* E.H.L. Krause, Deutschl. Fl. ed. 2, 5: 66 1901.

*Cerastium caespitosum* f. *serpentini* Novak, Preslia 5: 85 1927.

*Cerastium vulgatum* f. *gracile* Hayek, Oesterr. Bot. Z. 53: 298 1903.

*Cerastium caespitosum* subsp. *alpinum* (Mert. & W.D.J.Koch) Bech., Repert. Spec. Nov. Regni Veg. 25: 12 1928.

*Cerastium caespitosum* var. *pseudoalpestre* Bech., Repert. Spec. Nov. Regni Veg. 25: 12 1928.

*Cerastium caespitosum* var. *montevidense* (Rohrb.) Malme, Ark. Bot. 23A(4): 3 1930.

*Cerastium caespitosum* subsp. *triviale* (E.H.L. Krause) Hiitonen, Suom. Kasvio 334



1933.

*Cerastium fontanum* subsp. *balcanum* Gartner, Repert. Spec. Nov. Regni Veg. Beih. **113**: 76  
1939.

*Cerastium fontanum* var. *eglandulosum* Gartner, Repert. Spec. Nov. Regni Veg. Beih. **113**:69  
1939.

*Cerastium fontanum* subsp. *pyrenaicum* Gartner, Repert. Spec. Nov. Regni Veg.  
Beih. **113**:74 1939.

*Cerastium fontanum* subsp. *hispanicum* Gartner, Gartner, Repert. Spec. Nov. Regni Veg.  
Beih. **113**:77 1939.

*Cerastium caespitosum* var. *mauretanicum* Maire, Bull. Soc. Hist. Nat. Afrique N. **36**: 95  
1945.

*Cerastium holosteoides* var. *glabrescens* (G.Mey) Hyl., Uppsala Univ. Årsskr. **7**: 151 1945.

*Cerastium vulgatum* var. *kajanense* Kotil. & Salmi., Ann. Bot. Soc. Zool.-Bot. Fenn.  
"Vanamo" **5**: 64 1950.

*Arenaria anomala* (Waldst. & Kit. ex Willd.) Shinnars, Sida **1**: 50 1962.

*Cerastium fontanum* subsp. *triviale* (E.H.L.Krause) Jalas, Arch. Soc. Zool. Bot. Fenn.  
"Vanamo" **18**: 63 1963.

*Cerastium syvaticum* subsp. *torneroi* P. Monts., Bol. Soc. Esp. Hist. Nat. **65**: 120 1967.

*Dichodon viscidum* (M.Bieb.) Holub., Folia Geobot. Phytotax. **9**: 273 1974.

*Cerastium fontanum* subsp. *holosteoides* (Fr.) Salman, Ommering & de Voo, Gorteria **8**: 104  
1976 publ. 1977. *a*

*Cerastium fontanum* var. *tibeticum* (Edgew. & Hook.f.) C.Y.Wu & L. H. Zhou, Fl. Xizangica  
**1**: 663 1983.

*Cerastium fontanum* f. *glutinosum* (Möschl) M.B.Wyse Jacks, Nordic J. Bot. **20**: 534 2000  
publ. 2001.

*Cerastium fontanum* f. *holosteoides* (Fr.) M.B.Wyse Jacks, Nordic J. Bot. **20**: 534 2000  
publ. 2001.

*Cerastium fontanum* var. *tvulgare* (Hartm) M.B.Wyse Jacks, Nordic J. Bot. **20**: 532 2000  
publ. 2001.

*Cerastium holosteoides* subsp. *glandulosum* (Boenn.) I.V. Sokolova, Fl. Vostoch. Evropy **11**:  
163 2004.

*Cerastium fontanum* var. *holosteoides* (Fr.) Jalas,

*Cerastium vulgatum* subsp. *caespitosum* (Asch.) Dostal,

*Cerastium vulgatum* var. *hirsutum* Fr.,

Cosmopolitan weed, Taiwan, known from forest margins, roadsides, grassland and sandy soils from 10 to 1800 m. throughout the island, rather common.

**2. *Cerastium formosana* (Ohwi) Ohwi**

Repert. Spec. Nov. Regni Veg. **36**: 47 1934.

The specific name is a synonym of *Cerastium morrisonense* Hayata

**3. *Cerastium morrisonense* Hayata 玉山卷耳**

J. Coll. Sci. Imp. Univ. Tokyo **25**(19): 57 1908.

The specific name is an accepted name,

**4 Synonyms are recorded:**

*Cerastium trigynum* var. *morrisonense* (Hayata) Hayata, J. Coll. Sci. Imp. Univ. Tokyo **30**(1): 36 1911.

*Cerastium morrisonense* var. *formosanum* Ohwi,



Fig. 214. *Cerastium morrisonense* Hayata, flowers in full bloom



*Cerastium formosanum* (Ohwi) Ohwi, Repert. Spec. Nov. Regni Veg. **36**: 47 1934.

*Cerastium morrisonense* var. *taiwanianum* S.S. Ying, Alp. Pl. Taiwan Color **2**: 174 1978.

Endemic to Taiwan, known from high altitudes from 2500 to 3800 m throughout the island, often grows exposed hillside and mountain slopes

### 3. *Cerastium nanhutashanense* S. S. Ying 南湖大山卷耳

*Cerastium nanhutashanense* S. S. Ying, *sp. nov.* 南湖大山卷耳

TYPE: TAIWAN. Taichung City, Hoping District (和平區), Nanhutashan (南湖大山) 2500 m alt. S. S. Ying, *s.n.* May 13, 2021. (holotype, NTUF).



Fig. 215. *Cerastium nanhutashanense* S. S. Ying, close-up of inflorescence

**Morphology** : Annual small herbs, about 10- 25 cm tall; fibrous roots slender, delicate; stem elongate, 10-20 cm long, decumbent, densely white villous, light purplish. Leaves simple, opposite, oblong to oblong-lanceolate, 5-12 mm long, 2.5-side, acute and with a puncta at apex, clasping the stem at base, chartaceous, lustrous green surface and pale green beneath, densely white villous on

both surfaces, midrib impressed surface and elevated beneath, lateral veins inconspicuous. Petioles absent.



Fig. 216. *Cerastium nanhutashanense* S. S. Ying, stem and leaves

Flowers white, few, 3-5 in terminal raceme to cymose, 3-4 mm in diameter when opened; the inflorescences from upward leaf-axils, 3.5-4.5 cm long, erect to ascending, densely white villous; pedicels slender, 3-8 mm long, pubescent; sepals 5, oblong-lanceolate to lanceolate, 4-6 mm long, 1.5-2.5 mm wide, acute at apex, green, glabrous inside and pubescent outside; petals 5, oblong, 4-6 mm long, 2-3 mm wide, shallowly 2-lobed at apex, white, glabrous, alternate to the sepals; stamens 8-10, filaments slender, 3mm long, white; anthers kidney-like, about 1.5mm long, white; style 3, short, about 1.5 mm long; ovary globose 1mm across, glabrous.

### **Diagnosis.**

*Cerastium nanhutashanense* is characterized by:

1. A small annual herb, about 10-25 cm tall; stem decumbent, simple.
2. Leaves oblong to oblong-lanceolate, acute and with a puncta at apex, lateral veins inconspicuous,

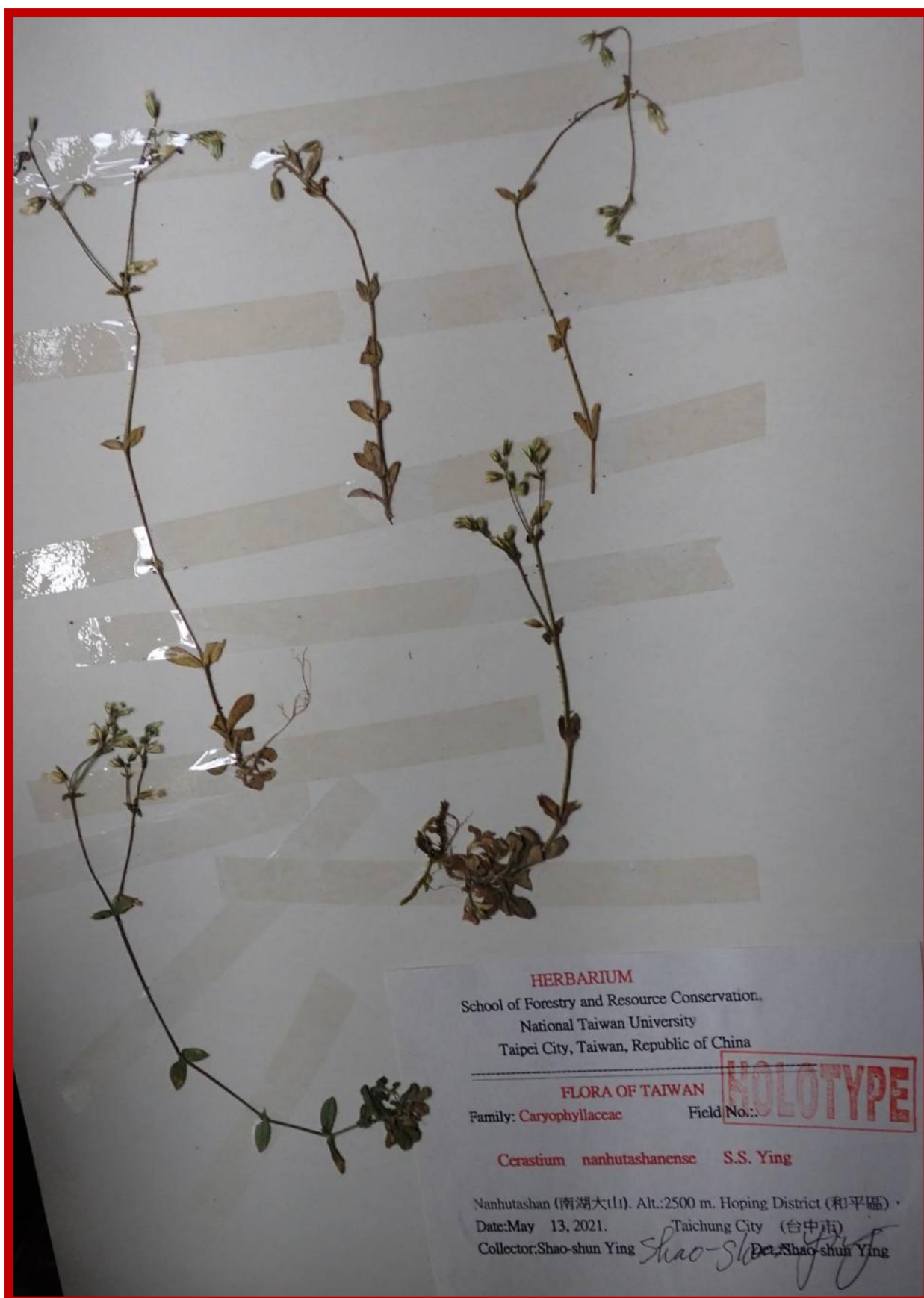




Fig. 217. *Cerastium nanhutashanense* S. S. Ying, close-up of inflorescence



-172- Fig. 218. *Cerastium nanhutashanense* S. S. Ying, close-up of flower



-173- Fig. 219. *Cerastium nanhutashanense* S. S. Ying, the holotype NTUF-110-032.



white villous on both surfaces.

3. Flowers few, white, on terminal racemes or cymose, white.

4. The length of sepals same as the petals or slightly shorter.

5. Stamens 8-10, filaments and anthers white.

### Distribution and phenology.

*Cerastium nanhutashanense* S.S. Ying is endemic to Taiwan. It grows in the shade on the damp woodland floor and roadsides around Nanhutashan (南湖大山) area, elevation between 2300 and 2500 m. Hoping District (和平區), Taichung City, Central Taiwan, and flowering time from May to July.

### 3. *Cerastium parvipetalum* Hosok. 小瓣卷耳

Trans. Nat. Hist. Soc. Taiwan **22**: 227 1932.

The specific name is an accepted name,

No synonyms are recorded for this name.

Endemic, known from 1000-1500 m in southern part of the island, roadsides or in thickets, rather rare.

#### 14. Two New species of Genus *Rosa* (Rosaceae) in Taiwan

*A.Rosa shaolinchiensis* S.S. Ying 邵氏薔薇

*Rosa shaolinchiensis* S.S. Ying, *sp. nov.* 邵氏薔薇

TYPE:TAIWAN. Taichung City,Hoping District (和平區), Shengkuang (勝光) 1780 m alt. *S. S. Ying*, *s.n.* July 15, 2021. (holotype, NTUF).



-175- Fig. 220. *Rosa shaolinchiensis* S. S. Ying, close-up of flower



**Morphology :** A straggly shrub about 100-250 cm high, stem sprawling, elongate, prickled, green, branched, glabrous; branches terete, erect or ascending, green, scattered hooked and short spines, glabrous; prickles single, grayish green, 2.5-4.5 mm long, broad at base and acicular at apex.

Leaves including petiole 3.5-7 cm long; stipules adnate to the petiole, 3-4 mm long, green, amplexical at base, acute at apex, green, ciliate at margins; rachis glabrous or rarely pubescent, green, shortly prickly; leaflets mostly 5-7, elliptica to elliptica-lanceolate; the terminal ones 1-2.5 cm long, 8-10 mm wide, chartaceous, obtuse at apex, obtuse at base, serrate at margins, lustrous green surface, pale green beneath, glabrous on both surfaces, midrib impressed surface and elevated beneath, lateral veins inconspicuous; petiolules 7-9 mm long, green, glabrous; lateral leaflets paired, same shaped with terminal one, but gradually smaller, 5-17 mm long, 4-9 mm wide, glabrous; the petioles 1-1.4 cm long, 1/3 adnate to stipule; the petiolules of lateral leaflets 0.4-1 mm long, tinged with red.





Fig. 222. *Rosa shaolinchiensis* S. S. Ying, inflorescence



Fig. 223. *Rosa shaolinchiensis* S. S. Ying, inflorescence



Flowers solitary to 2-4 in a terminal remotely raceme, white, 3-4 cm in diameter when opened; inflorescence 1.5-2.5 cm long, pubescent, green; pedicels slender, 1.5-2.5 cm long, erect to ascending, green, villous; bracts caduous, ovate-oblong, 3-4 mm long, 2.5 mm wide, scattered pubescent outside, obtuse at apex, tinged with red along margins. Hypanthium globose, 3-3.5 mm across, green, scattered pubescent; sepals 5, lanceolate, 5-6mm long, 2-2.5 mm wide, acuminate at apex, truncate at base, glabrous to pubescent without and glabrous within, entire at margins; petals 5, cunate-oblong, 1.5-2.0 cm long, 4-6 mm wide, truncate and 2-5-dentated at apex, attenuate and truncate at base, glabrous; stamens numerous, in several whorls, inserted at disc; filaments slender, 3-5 mm long, pale yellow, glabrous; anthers yellow, versatile; carpels numerous, free, inserted at margin of hypanthium; styles connate into column, shortly exserted, pale yellow, glabrous, shorter than the stamens.

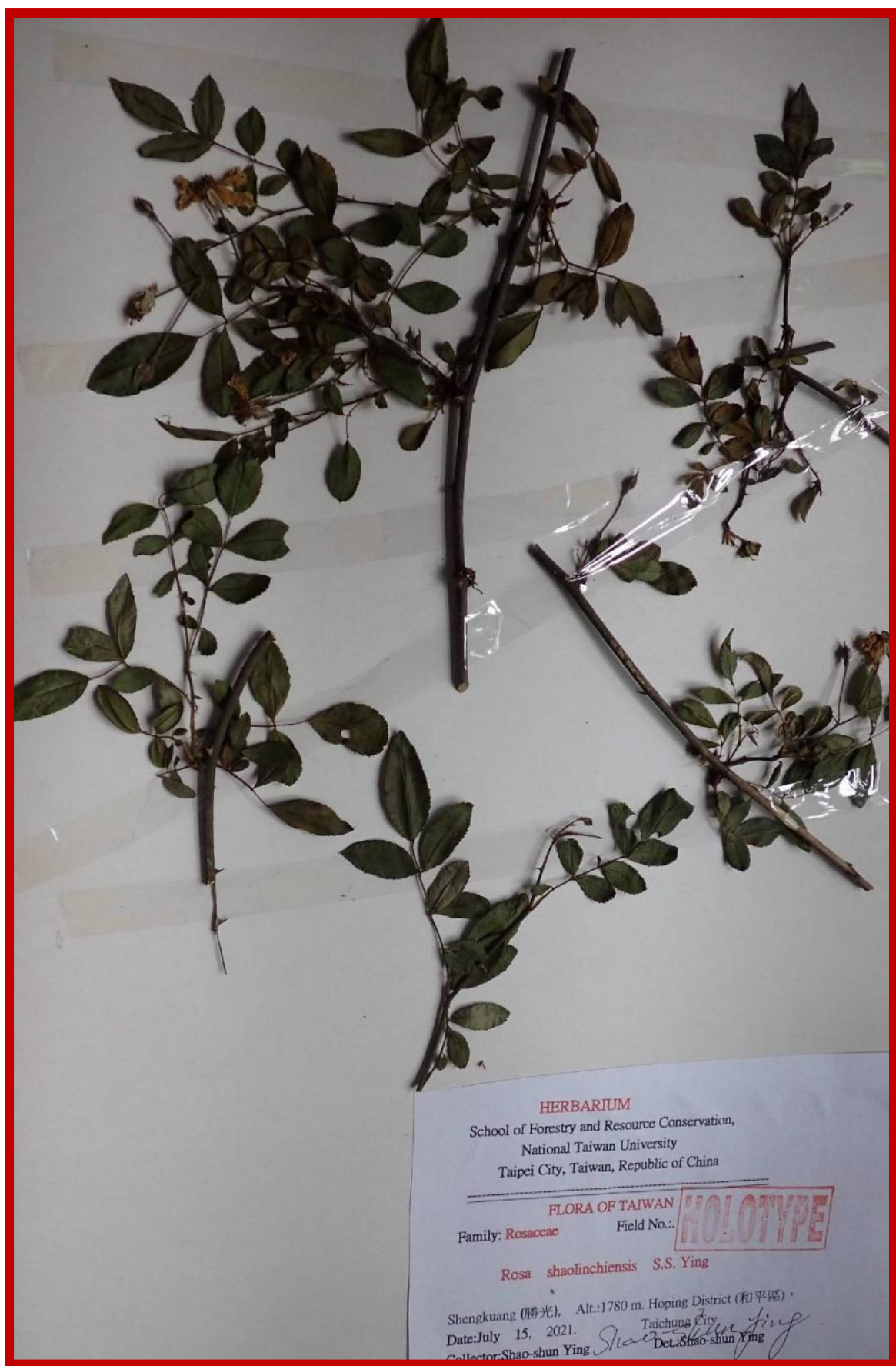
Fruits a hip, formed from fleshy hypanthium, globose-like, 3.5-4.5 mm across, smooth, calyx-sepals nearly cauduous. Achenes few, on adaxial surface of fleshy hypanthium. '



Fig. 224. *Rosa shaolinchiensis* S. S. Ying, the habitat (on edge of *Pinus taiwanensis* forests)

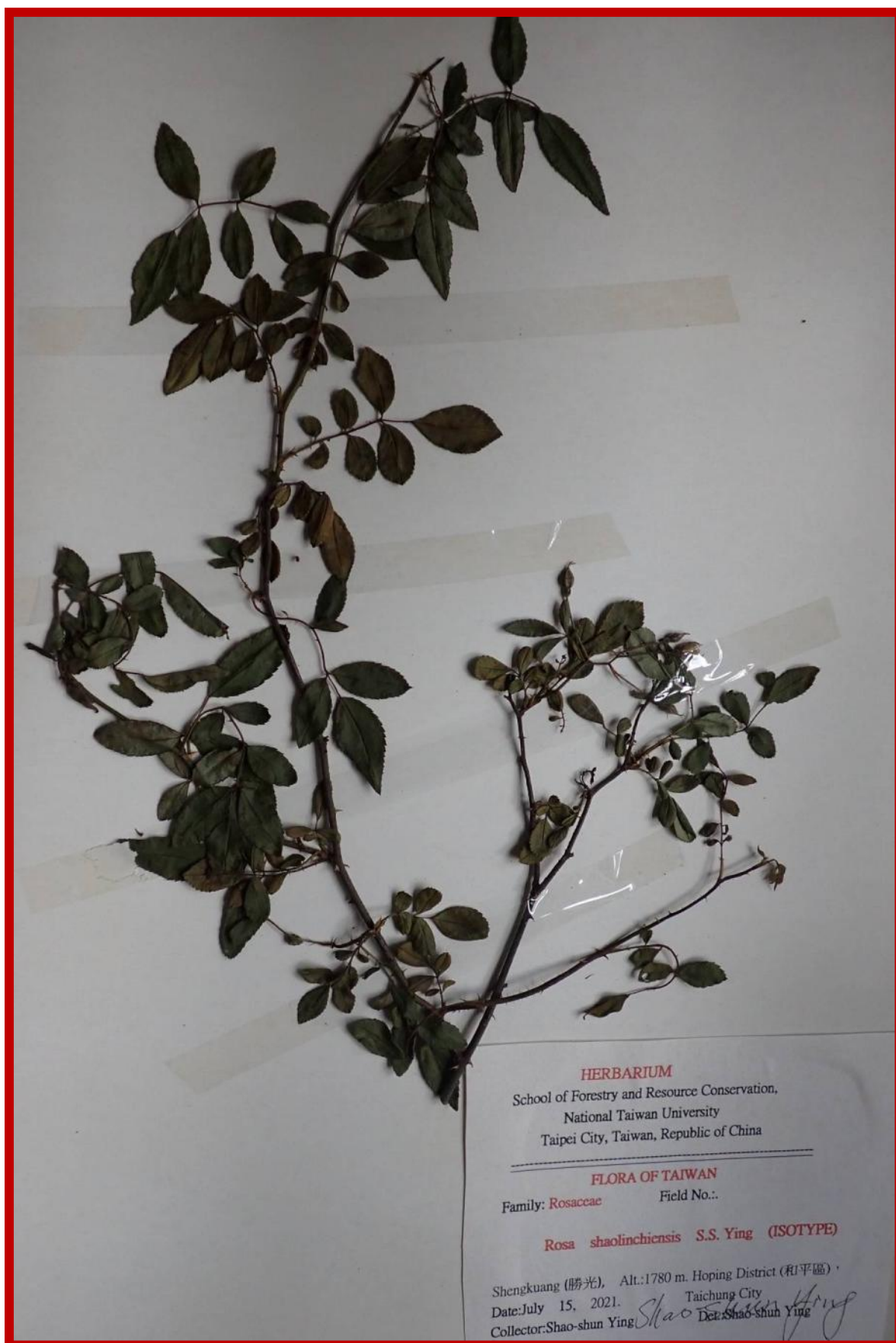
### Diagnosis.

The species is characterized by:

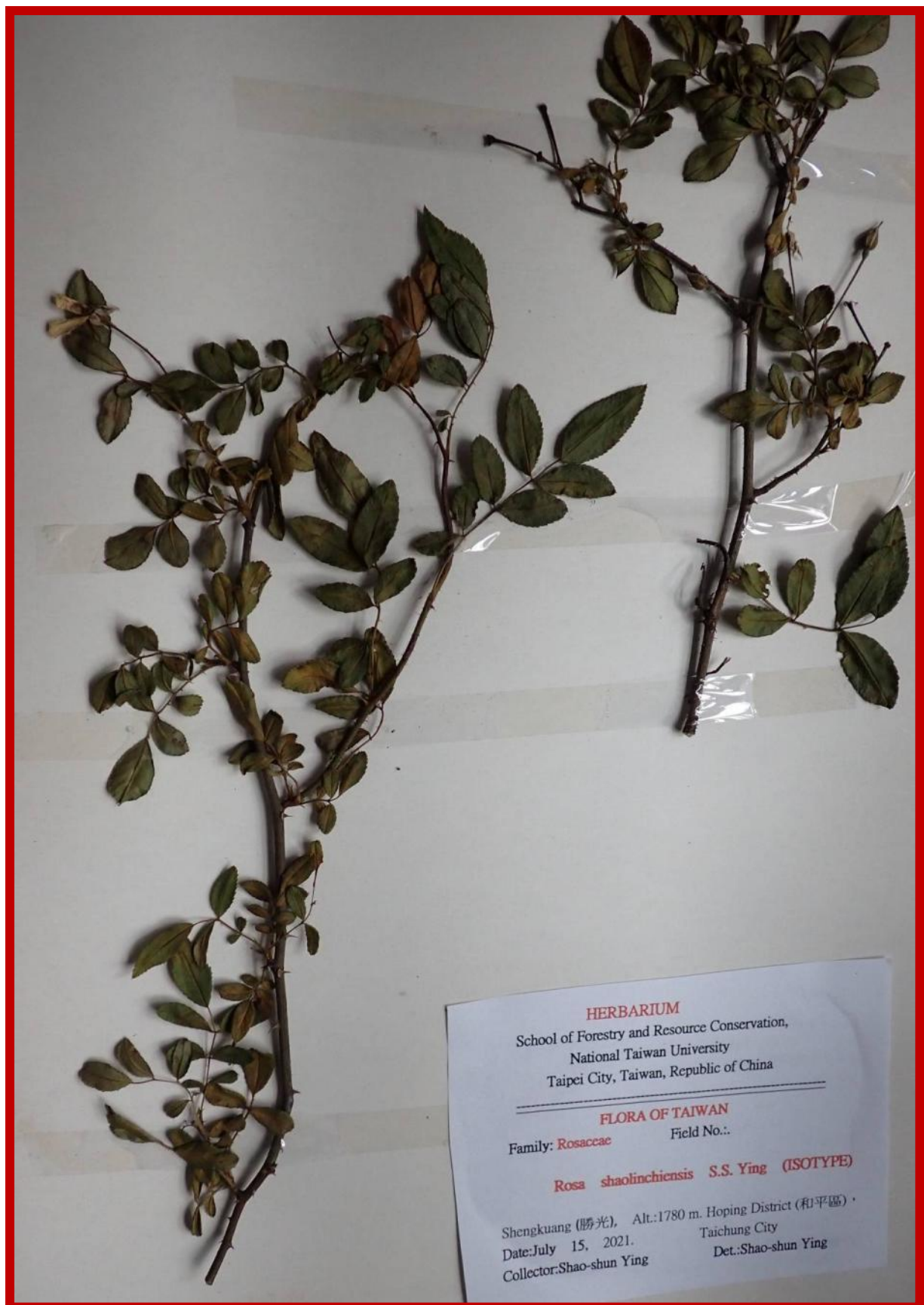


-179- Fig. 225. *Rosa shaolinchiensis* S. S. Ying, the holotype NTUF-110-033.





-180- Fig. 226. *Rosa shaolinchiensis* S. S. Ying, the isotype (1) NTUF-110-034



-181- Fig. 227. *Rosa shaolinchiensis* S. S. Ying, the isotype (2) NTUF-110-035.



1. A straggly shrub about 100-250 cm high, stem sprawling, elongate, prickled.
2. Leaves including petiole 3.5-7 cm long; stipules adnate to the petiole, 3-4 mm long, green, amplexicaul at base, acute at apex, green, ciliate at margins
3. Leaflets mostly 5-7, elliptical to elliptic-lanceolate; the terminal ones 1-2.5 cm long, 8-10 mm wide; lateral leaflets paired, same shaped with terminal one, but gradually smaller, 5-17 mm long, 4-9 mm wide, glabrous.
4. Flowers solitary to 2-4 in a terminal remotely raceme, white, 3-4 cm in diameter when opened.
5. Hypanthium globose, 3-3.5 mm across, green, scattered pubescent.
6. Sepals 5, lanceolate, 5-6 mm long, 2-2.5 mm wide, acuminate at apex, truncate at base.,
7. Petals 5, cuneate-oblong, 1.5-2.0 cm long, 4-6 mm wide, truncate and 2-5-dentate at apex, attenuate and truncate at base.
8. Its flowering time from mid-July to August; the latest blooming species among Taiwan *Rosa*.



Fig. 228. *Rosa shaolinchiensis* S. S. Ying, the habitat (on edge of *Pinus taiwanensis* forests)

#### **Distribution and phenology.**

*Rosa shaolinchiensis* S.S. Ying is endemic to Taiwan. It is known between Shaoakou (小埡口) and Shengkuang (勝光), Hoping District (和平區), Taichung City, central Taiwan. The holotype was collected near to Shengkuang (勝光), at elevations of 1780 meters, and flowering time from middle July to August and fruiting time from August to September.



Fig. 229. *Rosa shaolinchiensis* S. S. Ying, the fruits

B.*Rosa yilanalpina* S.S. Ying 宜蘭高山薔薇

*Rosa yilanalina* S.S. Ying, *sp. nov.* 宜蘭高山薔薇

TYPE:TAIWAN. Ilan County, Tatung Township (大同鄉), Mimotanchi (米摩登溪) 1760 m alt.  
*S. S. Ying*, *s.n.* May 13, 2021. (holotype, NTUF).

**Morphology**: A straggly shrub about 100-185 cm high, stem sprawling, elongate, prickled, green, much branched, glabrous; branches terete, erect or ascending, green, prickled, glabrous; prickles scattered, single, purplish red, straight, 2.5-3.5 mm long, broad at base and acicular at apex.

Leaves including petiole 6-10 cm long; stipules adnate to the petiole, 7-15 mm long, pink, amplexicaul at base, caudate at apex, ciliate at margins, sparsely glandular-pubescent; rachis pubescent, purplish red, shortly prickly; leaflets mostly 9, rarely 7, oblong to ovate-oblong, 1-3 cm long, 8-15 mm wide, chartaceous, acuminate at apex, obtuse at base, serrate at margins, lustrous green surface, pale green beneath, glabrous on both surfaces, midrib impressed surface and





Fig. 230. *Rosa yilanalpina* S.S. Ying , the plant



-184- Fig. 231. *Rosa yilanalpina* S.S. Ying , the pinnate leaves

elevated beneath, lateral veins 3-6, somewhat inconspicuous; the petioles 1.5-1.8 cm long,  $\frac{2}{3}$  adnate to stipule, petioles of terminal leaflet 6-10 mm long, tinged with red, glabrous to pubescent; the petioles of lateral leaflets 1.5-3 mm long.

Flowers solitary to 2-4 in a terminal raceme, white, large, 4-5 cm in diameter when opened; inflorescence 2-4 cm long, glandular hairs scattered; pedicels 1-2.5 cm long, erect to ascending, tinged with red, glandular-pubescent; bracts caduous, ovate-lanceolate, 4-5 mm long, 2 mm wide, scattered glandular-pubescent, caudate at apex. Hypanthium subglobose, 5-6 mm across, green tinged with red, scattered glandular-pubescent; epicalys 5, linear, 4-5 mm long, about 1 mm wide, acuminate at apex, caudous; sepals 5, ovate, 6-7 mm long, 3-4 mm wide, acute at apex, truncate at base, red glandular-hairs without and glabrous within, entire at margins; petals 5, ovate-oblong, 1.2-1.8 cm long, 1-1.2 cm wide, obliquely bilobed at apex, narrowed and truncate at base, glabrous; stamens numerous, in several whorls, inserted at disc; filaments slender, 3-5 mm long, pale yellow, glabrous; anthers yellow, versatile; carpels numerous, free, inserted at margin of hypanthium; styles connate into column, exserted, pink, glabrous, shorter than the stamens.





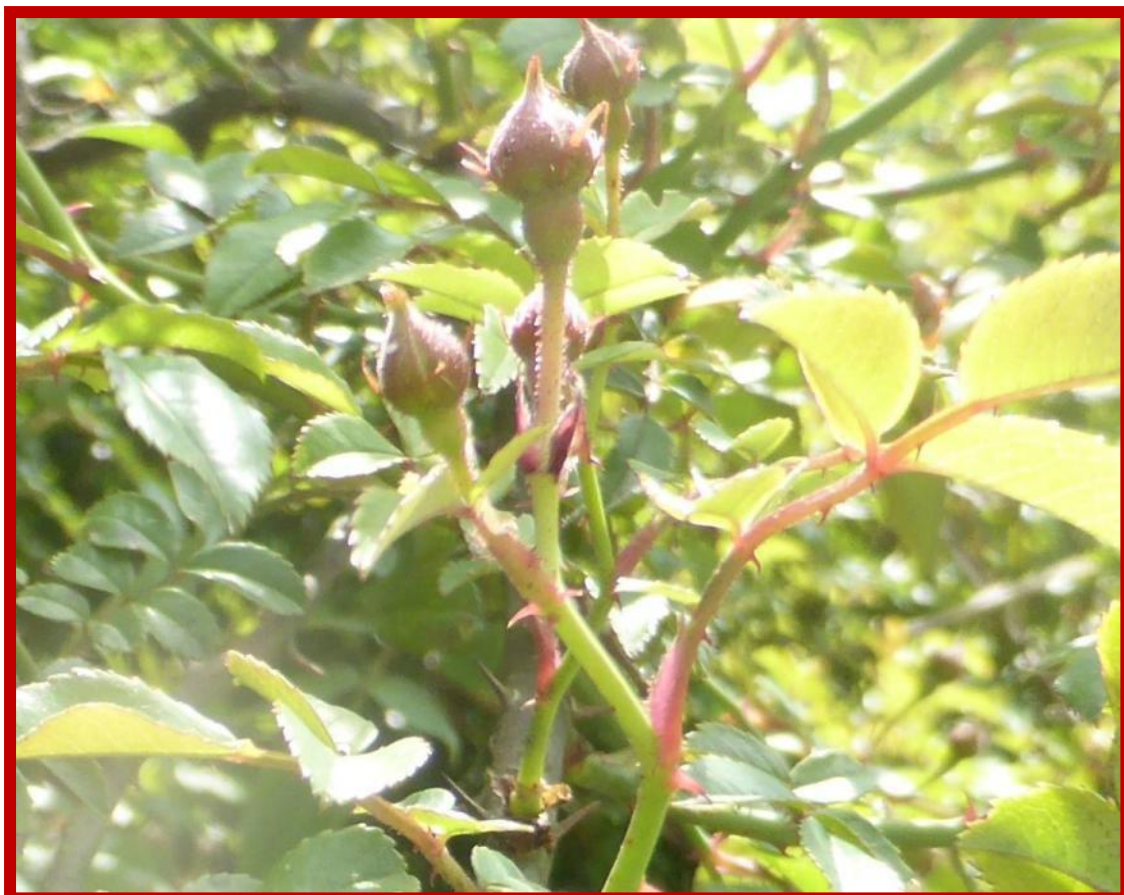


Fig. 233. *Rosa yilanalpina* S.S. Ying , flower-buds, mind epicalyx at base of calyx



-186- Fig. 234. *Rosa yilanalpina* S.S. Ying , the flowers



Fig. 235. *Rosa yilanalpina* S.S. Ying , close-up of flower

Fruits a hip, formed from fleshy hypanthium, globose-like, 5-6.5 mm across, smooth, black when mature, calyx-sepals nearly cauduous. Achenes few, on adaxial surface of fleshy hypanthium.

#### **Diagnosis.**

The species is characterized by:

1. A straggler shrub about 100-185 cm high, stem sprawling, elongate, prickled.
2. Leaves including petiole 6-10 cm long; stipules adnate to the petiole, 7-15 mm long, pink; leaflets mostly 9, rarely 7, oblong to ovate-oblong, 1-3 cm long, 8-15 mm wide,
3. Flowers solitary to 2-4 in a terminal raceme, white, large, 4-5 cm in diameter when opened.
4. Hypanthium subglobose, 5-6 mm across, green tinged with red, scattered glandular-pubescent; epicalys 5, linear, 4-5 mm long, about 1 mm wide, acuminate at apex,



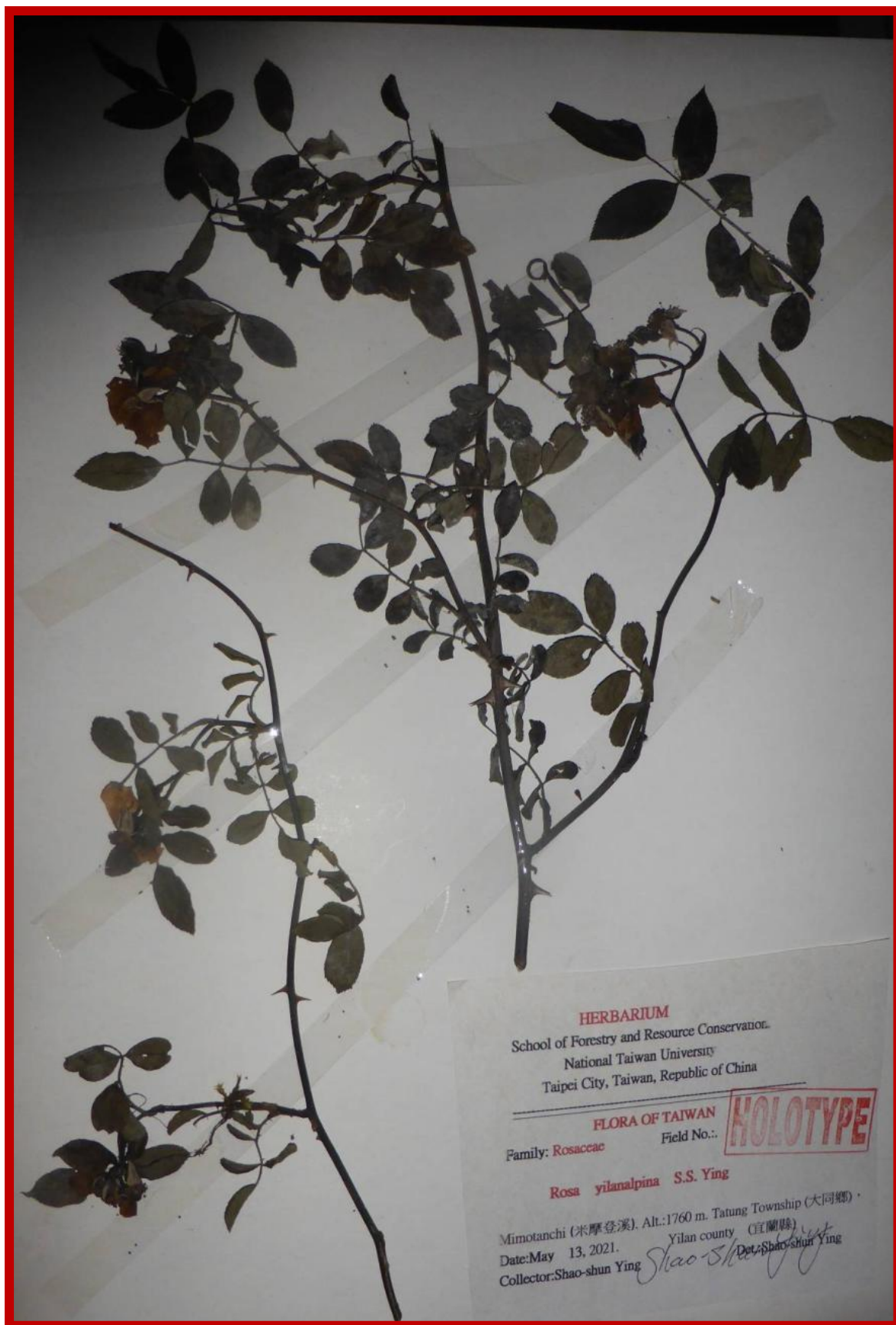


Fig. 236. *Rosa yilanalpina* S.S. Ying, the holotype NTUF-110-036.



Fig. 237. *Rosa yilanalpina* S.S. Ying, the isotype NTUF-110-037.





Fig. 238. *Rosa yilanalpina* S.S. Ying , the plant with fruits



-190- Fig. 239. *Rosa yilanalpina* S.S. Ying , close-up of fruits





Fig. 240. *Rosa yilanalpina* S.S. Ying , the habitat (1)



Fig. 241. *Rosa yilanalpina* S.S. Ying , the habitat (2)



cauduous.

5. Ssepals 5, ovate, 6-7mm long, 3-4 mm wide, acute at apex, truncate at base, red glandular-hairs without and glabrous within, entire at margins.

6. Petals 5, ovate-oblong, 1.2-1.8 cm long, 1-1.2 cm wide, obliquely bilobed at apex, narrowed and truncate at base, glabrous.

7. Fruits a hip, formed from fleshy hypanthium, globose-like, 5-6.5 mm across, smooth, black when mature.

### **Distribution and phenology.**

*Rosa yilanalpina* S.S. Ying is endemic to Taiwan. It is known from Mimotanchi (米摩登溪) to Shaoakou (小埕口), Tatung Township (大同鄉), Ilan County, and Hoping District (和平區), Taichung City, northern and central Taiwan. The holotype was collected on the Mimotanchi (米摩登溪), at elevations of 1760 meters, and flowering time from April to July and fruiting time from July to September.



Fig. 242. *Rosa yilanalpina* S.S. Ying, the flowers

## 15. A New species of Genus *Epilobium* (Onagraceae) in Taiwan

*Epilobium nanhualpinum* S.S. Ying 南湖高山柳葉菜

*Epilobium nanhualpinum* S.S. Ying, *sp. nov.* 南湖高山柳葉菜

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Nanhutashan (南湖大山) 2550 m alt.  
*S. S. Ying* , *s.n.* May 13, 2021 ° (holotype , NTUF) °



Fig. 243. *Epilobium nanhualpinum* S.S. Ying , close-up of flowers

**Morphology** : Annual erect herbs, about 140-185 cm high, stem erect, elongate, smooth, green tinged with purplish, branched upward, villous; branches terete, erect or ascending, green tinged with purplish,villous.



Leaves simple, opposite, lanceolate, linear-lanceolate to linear, 1.5-7 cm long, 7-15 mm wide, acuminate, amplexicaul at base, chartaceous, serrate at margins, lustrous green surface and pale green beneath, glabrous on both surfaces, midrib and lateral veins (5-7 per side) impressed surface and elevated beneath. Petioles 0 to very short, 1-2 mm long if it present, glabrous or nearly so.



Fig. 244. *Epilobium nanhualpinum* S.S. Ying , stem and leaves

Flowers pale pink, protandrous, 4-6 mm in diameter when opened, solitary on the each leaf-axil upward of stem, and forming a raceme; the inflorescence 2-4 cm long, 5-8 cm in infructescence , pale purple, villous; bracts linear, 4-7 mm long, 1.5-2 mm wide, acuminate at apex, white villous, remotely serrulate at margins; sepals 4, adnate to ovary, ovate, 3-4 mm long, 2-3 mm wide, acute at apex, green, pubescent outside and glabrous inside; petals 4, oblong, 7-9 mm long, 3-4 mm wide, deeply bilobed at apex; the lobes 1/2 of the petal-length, obtuse at apex, usually with 7-longitudinal veins impressed surface, glabrous; stamens 8 in two series; filaments 1-2 mm long, white; anthers white, 0.5 mm long; ovary cylindrical, 1.5-2.5 cm long, 2-3 mm across, pubescent, more or less 4-angular; style erect.

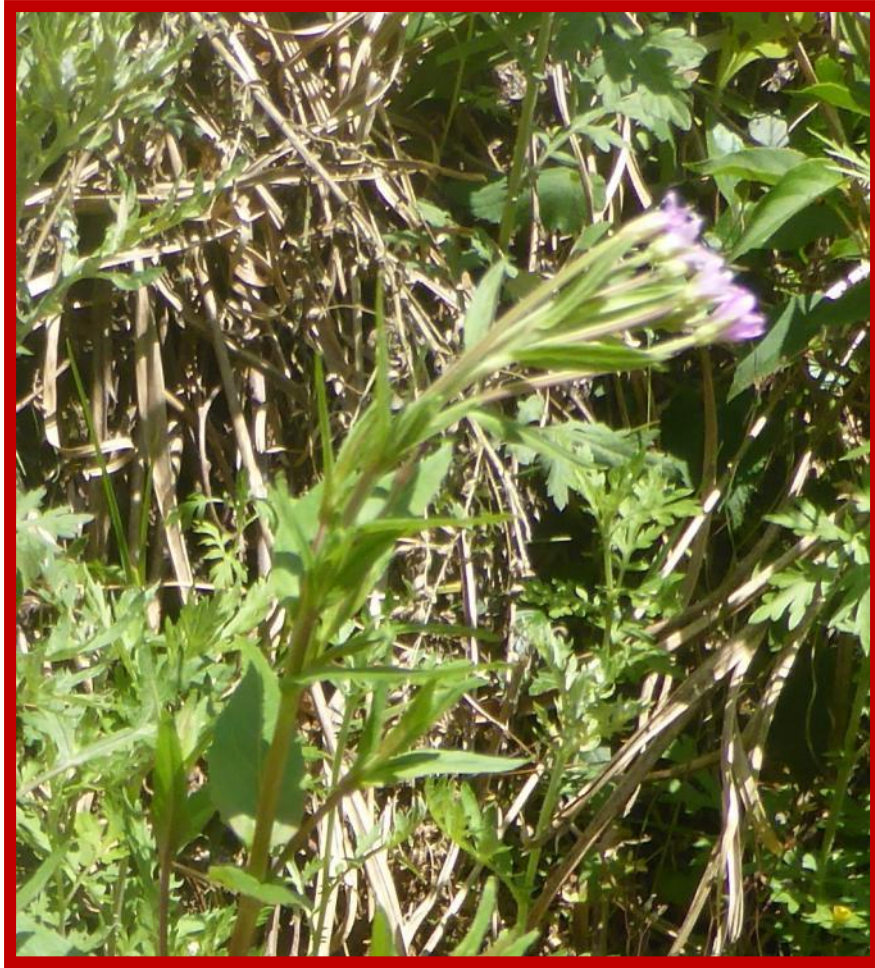


Fig. 245. *Epilobium nanhualpinum* S.S. Ying , inflorescence



Fig. 246. *Epilobium nanhualpinum* S.S. Ying , flowers



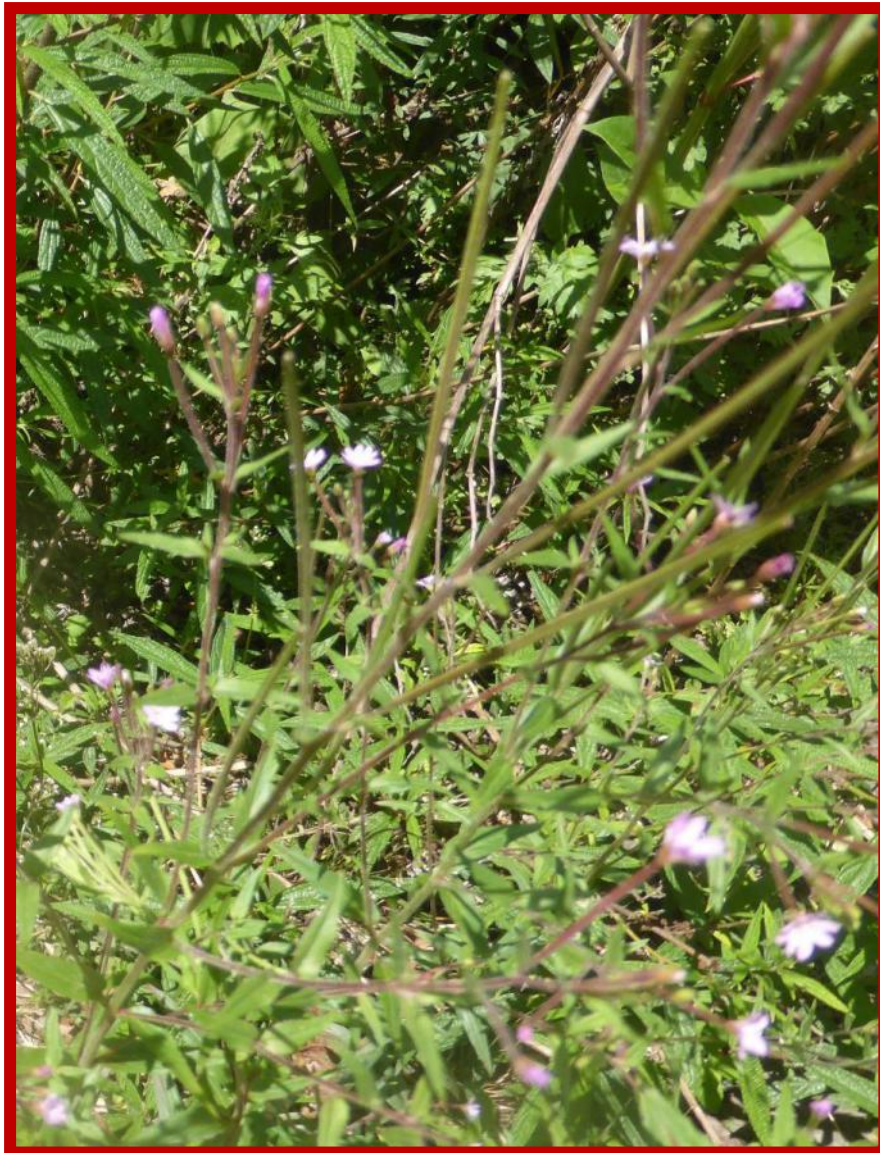


Fig. 247. *Epilobium nanhualpinum* S.S. Ying , fruits

Fruits capsule, cylindrical, 4.5-8 cm long, 2-3 mm across, erect to ascending, green tinged with purplish, pubescent, 4-celled, loculidical when mature. Seeds numerous, small, ellipsoid, 1.5-2 mm long, with terminal white coma; coma 3-4 mm long, detaching readily.

#### **Diagnosis.**

The species is characterized by:

1. A erect herb about 140-185 cm high, stem erect, smooth, green tinged with purplish, villous.
2. Leaves lanceolate, linear-lanceolate to linear, , 1.5-7 cm long, 7-15 mm wide, acuminate, amplexicaul at base.



-197- Fig. 248. *Epilobium nanhualpinum* S.S. Ying, the holotype NTUF-110-038.



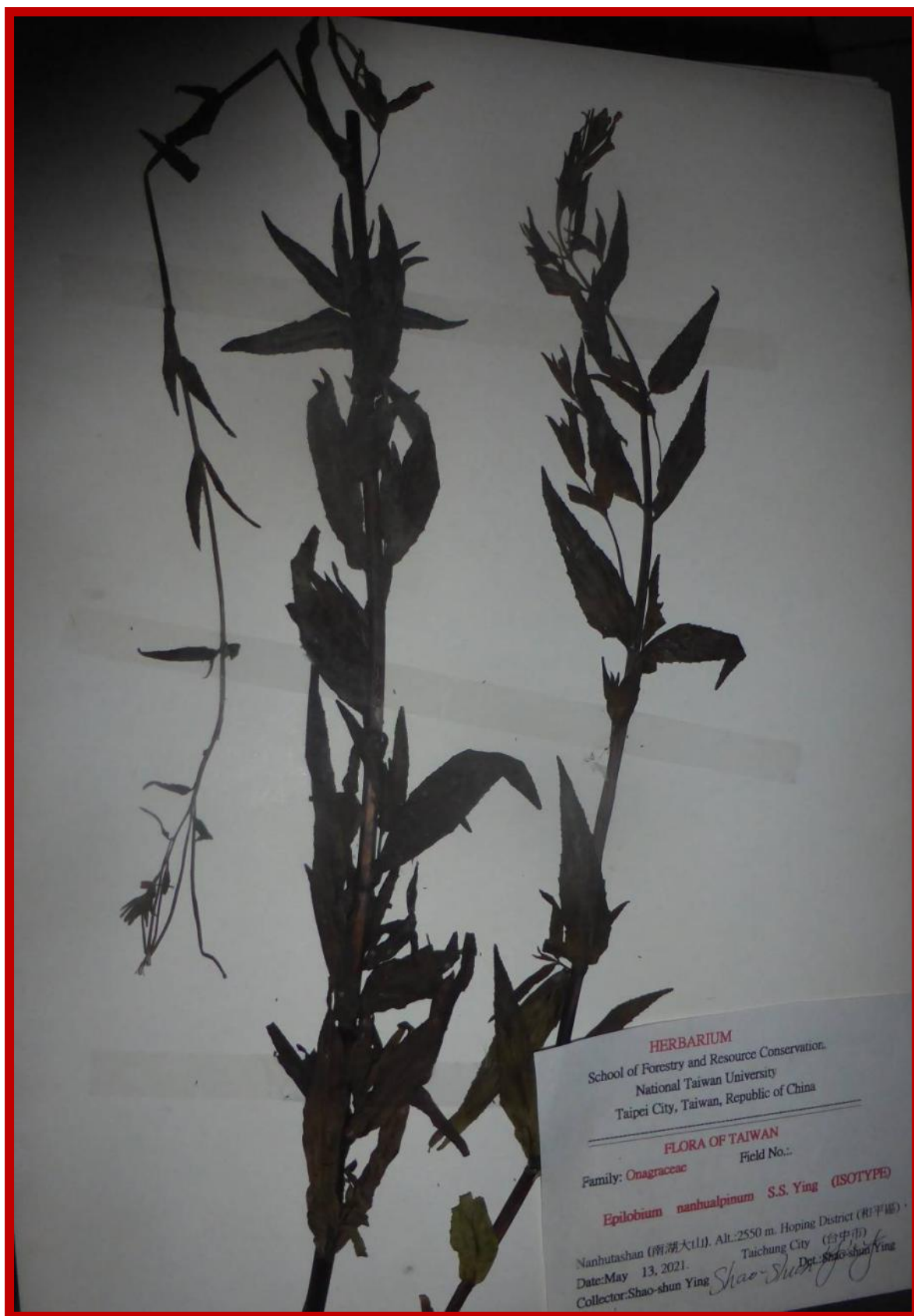


Fig. 249. *Epilobium nanhualpinum* S.S. Ying, the isotype NTUF-110-039.



Fig. 250. *Epilobium nanhualpinum* S.S. Ying , habitat

3. Flowers pale pink, protandrous, 4-6 mm in diameter when opened, solitary on the each leaf-axil upward of stem, and forming a raceme.

4. Sepals 4, adnate to ovary, ovate, 3-4 mm long, 2-3 mm wide, acute at apex, green, pubescent outside and glabrous inside.

5. Petals 4, oblong, 7-9 mm long, 3-4 mm wide, deeply bilobed at apex; the lobes 1/2 of the petal-length, obtuse at apex.

6. Fruits capsule, cylindrical, erect to ascending, green tinged with purplish, pubescent, 4-celled, loculicidal when mature. Seeds numerous, small, ellipsoid, 1.5-2 mm long, with terminal white coma; coma 3-4 mm long, detaching readily.



**Distribution and phenology.**

*Epilobium nanhualpinum* S.S. Ying is endemic to Taiwan ◦ It is known from Nanhutashan (南湖大山) 2550 m alt. , Heping District (和平區) , Taichung City, central Taiwan ◦ The holotype was collected at elevations of 2500 meters, and flowering time from April to June and fruiting time from April to July.

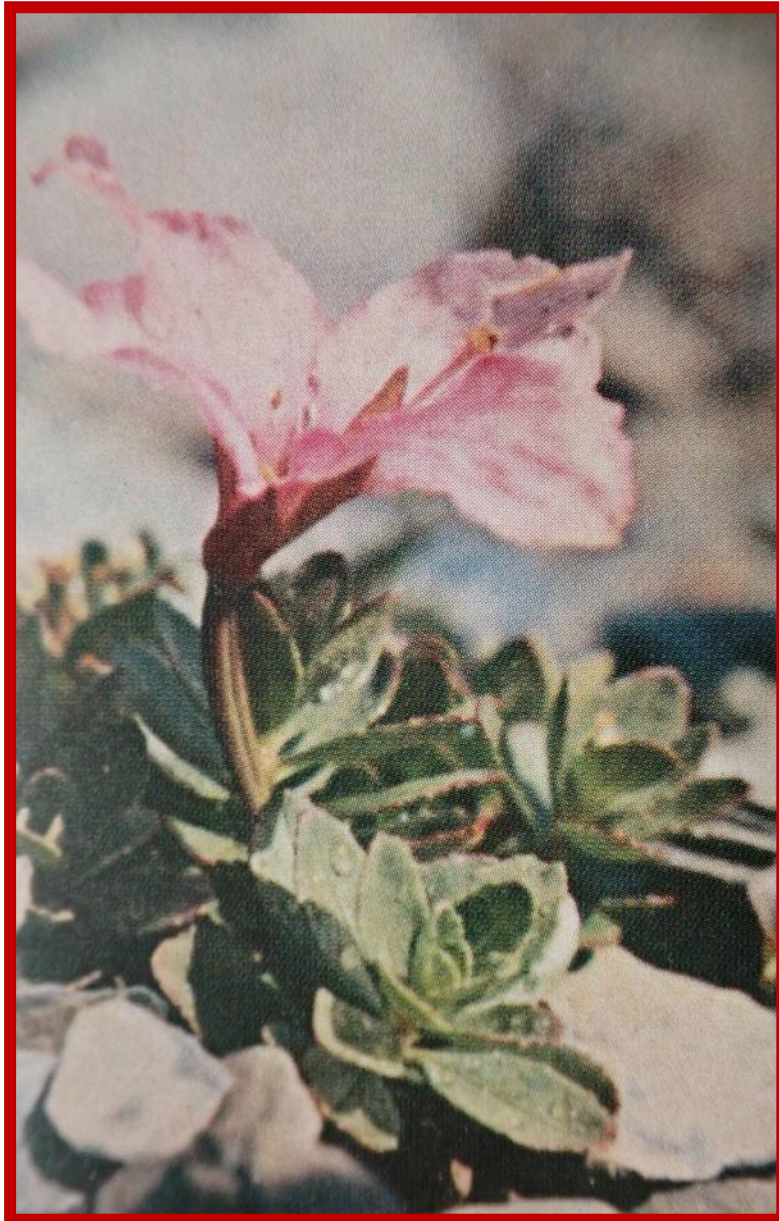


Fig. 251. *Epilobium nankotaizanense* Yamamoto

## 16. Two New species of Genus *Rubus* (Rosaceae) in Taiwan

*A. Rubus yuenfengensis* S.S. Ying 鳶峰懸鉤子

*Rubus yuenfengensis* S.S. Ying, *sp. nov.* 鳶峰懸鉤子

TYPE:TAIWAN. Nantou county , Renai Township (仁愛鄉) , Yuanfeng (鳶峰) 2670m alt. *S. S. Ying* , *s.n. May 06, 2021* ° (holotype, NTUF) °



Fig. 252. *Rubus yuenfengensis* S.S. Ying , the plant

**Morphology** : Erect shrubs up to 1.5 m high, stem short, glabrous or nearly so, much-branched; the branches ascending to erect, 10-45 cm long, green, sparse prickles, pubescent; hairs 2-2.3 mm long. Leaves 3-7, terminal leaflet pelioulate, oblong to ovate- oblong, 3.5-5 cm long, 2-2.5cm wide, chactaceous, acuminate at apex, obtuse to truncate at base, rough serrate at margins, lustrous green





Fig. 253. *Rubus yuenfengensis* S.S. Ying , the leaves

surface, pale green beneath, midrib deeply impressed surface and elevated, prickled beneath, lateral veins 7-9 per side deeply impressed surface and elevated beneath, nearly glabrous surface, scattered pubescent beneath; lateral leaflets in pairs, somewhat small, 1.2-3.5 cm long, 8-20 mm wide. Petioles slender, 2-3 cm long, pubescent; the petioles of terminal leaflet 5-15 mm long, pubescent; petioles of lateral leaflets 0 or sessile..

Flowers rather larger, solitary or pairs, terminal or axillary on the upward leaf-axils , white, 3.5-4 cm in diameter when opened; peduncles 1-1.5 cm long, pubescent; pedicels 2-3 cm long, ascending to erect, scattered pubescent ; bracts lanceolate, 3-6 mm long, pubescent; calyx green, pubescent without and glabrous within; sepals 5, broadly ovate , 5-7 mm long, 4-5 mm wide, acute and elongate- caudate at apex, truncate at base; petals 5, rounded, 9-14 mm long, 5-7 mm wide, obtuse to rounded at apex, short-clawed at base, glabrous on both surfaces; stamens many, several-seriate around the pistil; filaments connated at base, white to grayish, linear, 5-7 mm long, glabrous; anthers gray to light brownish, didymous; pistils globose-like, about 1 cm across, with a short gynophore at base; gynophore 2-3 mm long; carpels numerous, style filiform, red, 2-4 mm long, glabrous; stigma capitate, red, 1 mm wide. Aggregate unknown.



Fig. 254. *Rubus yuenfengensis* S.S. Ying , the flowers

**Diagnosis.**

*Rubus yuenfengensis* grows in the medium altitude of central Taiwan, The characteristics of the species state as follows:

1.A shrub up to 1.5 m. high, stem short, much branched at base; the branches ascending to erect, 10-45 cm long, green, sparse prickles, pubescent.





Fig. 255. *Rubus yuenfengensis* S.S. Ying , the flowers after perals withering

2. Leaves 3-7 terminal leaflet pelioulate, lateral leaflets sessile; the blade of terminal leaflet oblong to ovate- oblong, 3.5-5 cm long, 2-2.5cm wide, the lateral one smaller.
3. Flowers rather larger, solitary or pairs, terminal or axillary on the upward leaf-axils , white, 3.5-4 cm in diameter when opened.
4. Petals 5,rounded, 9-14 mm long, 5-7 mm wide, obtuse to rounded at apex, short-clawed at base, glabrous on both surfaces.
5. Pistils globose-like, about 1 cm across, with a short gynophore at base; gynophore 2-3 mm long; carpels numerous, style filiform, red, 2-4mm long,glabrous; stigma capitate, red, 1mm wide.

#### **Distribution and phenology.**

The species is endemic in Taiwan, It is known between Yuenfeng and Cuifeng (翠峰), Renai Township (仁愛鄉) , Nantou county , central Taiwan. ° It was discovered at mountain slope at elevations of 2670 meters. Its flowering time is May to June.









Fig. 257. *Rubus yuenfengensis* S.S. Ying , the holotype NTUF-110-040.

**B.***Rubus tayulinensis* S.S. Ying 大禹嶺懸鈎子

*Rubus tayulinensis* S.S. Ying, *sp. nov.* 大禹嶺懸鈎子

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉), Tayulin (大禹嶺) 2655 m alt. *S. S. Ying* , *s.n.*September 16 , 2021 ° (holotype, NTUF) °



Fig. 258. *Rubus tayulinensis* S.S. Ying , the plant, mind the inflorescence

**Morphology** : Somewhat woody perennial rosette herbs, stolon elongate, somewhat woody, green, glabrous; stem short, 0.5-2 cm long, green, prickles, glabrous. Leaves pinnate, many, radical to closely approximately alternate like a rosette plant, 6-12 cm long;; rachis 5-10 cm long, green sometimes tinged red, prickles, glabrous; leaflets mostly 7, rarely 5, terminal leaflet pelioulate, lanceolate to linear-lanceolate, 1.5-2.5 cm long, 5-6.5 mm wide, chactaceous, acuminate at apex, obtuse at base, serrate at margins, lustrous green surface, pale green beneath, midrib impressed surface and elevated beneath, lateral veins 6-8 per side impressed surface and elevated beneath, glabrous on both surfaces; petioules 3-6 mm long,slender, glabrous; lateral leaflets in pairs,



oblong to ovate-oblong, somewhat small, 1.2-1.8 cm long, 5-7 mm wide, obtuse at apex, truncate to slightly cordate at base, serrate at margins, glabrous on both surfaces, sessile; petioles 2.5-4 cm long, groove above, glabrous, prickles.



Fig. 259. *Rubus tayulinensis* S.S. Ying, the pinnate leaves

Flowers rather larger, 2-4 in pairs, terminal on an elongate scape, white, 2.5-3 cm in diameter when opened; scape produced from leaf-fascicled, 5-8 cm long, red, glabrous, leafy; peduncles 1.5-2 cm long, red, glabrous; pedicels 1.5-2.5 cm long, ascending to erect, glabrous; bracts lanceolate, 3-6 mm long, glabrous; calyx green, glabrous on both surfaces; sepals 5, broadly ovate, 5-6 mm long, 4-5 mm wide, acuminate at apex, truncate at base, purplish red, glabrous, ciliate at margins; petals 5, white, ovate-oblong, 8-12 mm long, 4-6 mm wide, obtuse at apex, narrowed at base, glabrous on both surfaces; stamens many, several-seriate around the pistil;





Fig. 260. *Rubus tayulinensis* S.S. Ying , the inflorescences

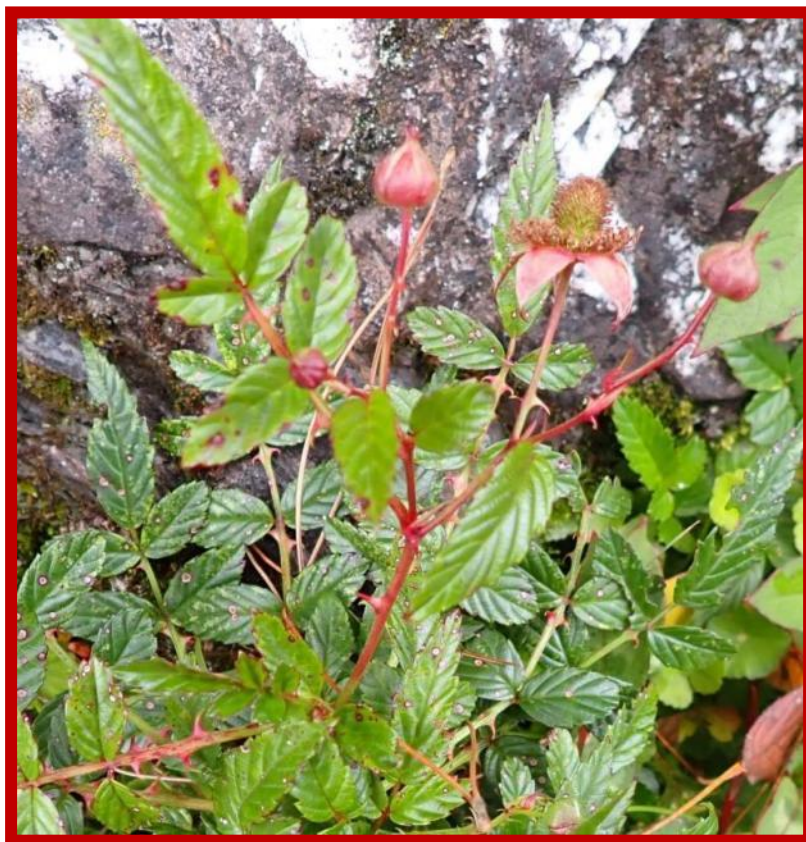


Fig. 261. *Rubus tayulinensis* S.S. Ying , the inflorescences





Fig. 262. *Rubus tayulinensis* S.S. Ying , the flower

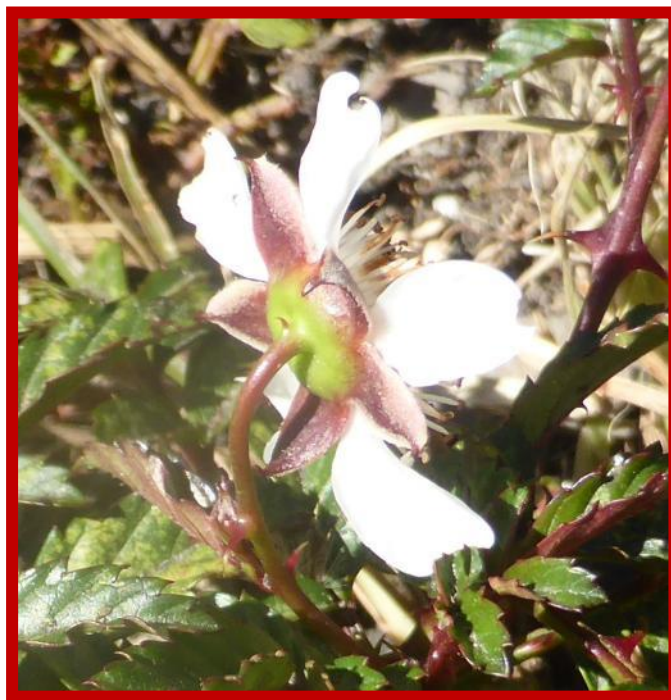


Fig. 263. *Rubus tayulinensis* S.S. Ying , the flower



Fig. 264. *Rubus tayulinensis* S.S. Ying , the flower

filaments connated at base, white, linear, 3-6 mm long, glabrous; anthers light brownish, didymous; pistils globose-like, about 1.2 cm across, with a short gynophore at base; gynophore 3-4 mm long; carpels numerous, style filiform, green, 4-5 mm long, glabrous; stigma dot-like, green, 0.1mm wide.



-211- Fig. 265. *Rubus tayulinensis* S.S. Ying , the immature aggregate fruits





Fig. 266. *Rubus tayulinensis* S.S. Ying , the mature aggregate fruit



-212- Fig. 267. *Rubus tayulinensis* S.S. Ying , the mature aggregate fruit

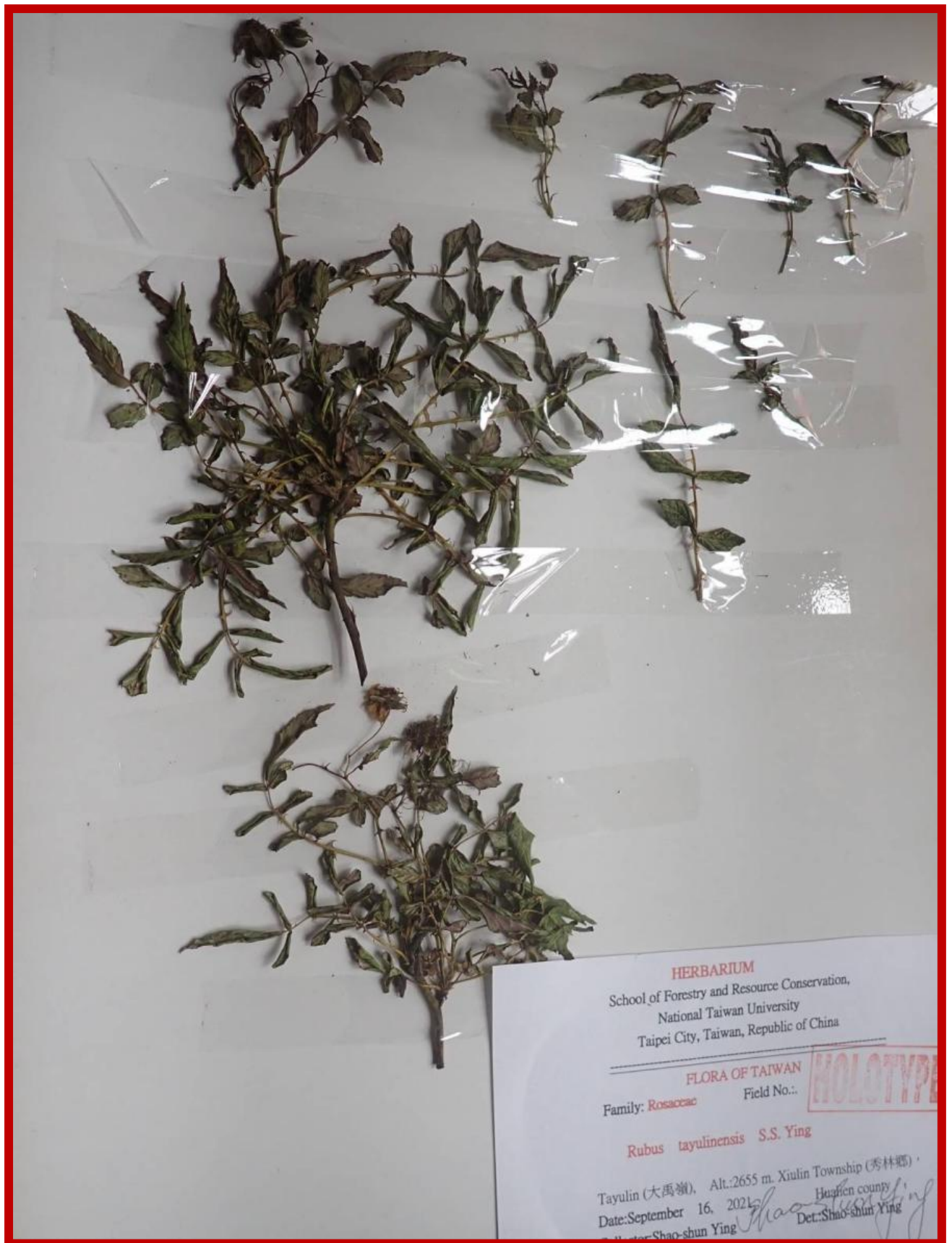


Fig. 268. *Rubus tayulinensis* S.S. Ying, the holotype NTUF-110-041



Aggregate fruits red, globose, 0.9-1.3 cm indiameter, glabrous; seeds globose, pendulous, 0.1 mm across, testa membranous.

### Diagnosis.

*Rubus tayulinensis* is near to *R. taiwanicola* Hayata, but it is characterized by its more large plant, with stolon to spread plant body, terminal leaflet and lateral leaflets unequal and 2-4 flowers in terminal of the scape.



Fig. 269. *Rubus tayulinensis* S.S. Ying , the habitat

### Distribution and phenology.

The species is endemic in Taiwan, It is known between Tayulin (大禹嶺), Xiulin Township (秀林鄉), Hualien county , central Taiwan. ° It was discovered at sunny exposed mountain slope at elevations between 2550 and 2700 meters. Its flowering time is August to September, and fruiting time from October to December..

## 17. A New species of Genus *Elatostema* (Urticaceae) in Taiwan

*Elatostema nanhumontanum* S.S. Ying 南湖高地樓梯草

*Elatostema nanhumontanum* S.S. Ying , *sp. nov.* 南湖高地樓梯草

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Nanhutashan (南湖大山) 2320 m alt.  
*S. S. Ying* , *s.n. June17, 2021* ° (holotype , NTUF) °



Fig. 270. *Elatostema nanhumontanum* S.S. Ying , the plants

**Morphology** : Annual small herbs, about 10-16 cm high, stem erect, simple, not branched, smooth, green, white shortly villous. Leaves 5-8, simple, alternate, distichous, sessile, nanophyll absent; lamina ovate to oblong, 0.5-4 cm long, 0.5-2 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 4-5 per side, glabrous surface and scattered sparsely puberulent beneath; stipules spatulate-like, 3-5 mm long, 2-3 mm wide, obtuse at apex, cauduous.





Fig. 271. *Elatostema nanhumontanum* S.S. Ying , close-up of the plants

Flowers dioecious, small, many; the male flowers in an axillary discoid inflorescence;



the peduncles slender, 1.5-2.5 cm long, green, white pubescent; inflorescence discoid, 5-6 mm in diameter; bracts 1-2 series, linear, 2.5-3.5 mm long, about 1 mm wide, obtuse at apex, greenish;



Fig. 262. *Elatostema nanhumontanum* S.S. Ying , close-up of male inflorescence

each inflorescence with 7-12 flowers; pedicels 2-2.5 mm long, pale green to white, glabrous; sepals 4-5, ovate, 1.5-2.0 mm long, 0.6-1.2 mm wide, acute at apex, white; stamens 4-5, filaments spread, 1-1.5 mm long, glabrous; anthers 0.1 mm long. Pistillate inflorescence unknown.

#### **Diagnosis.**

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

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



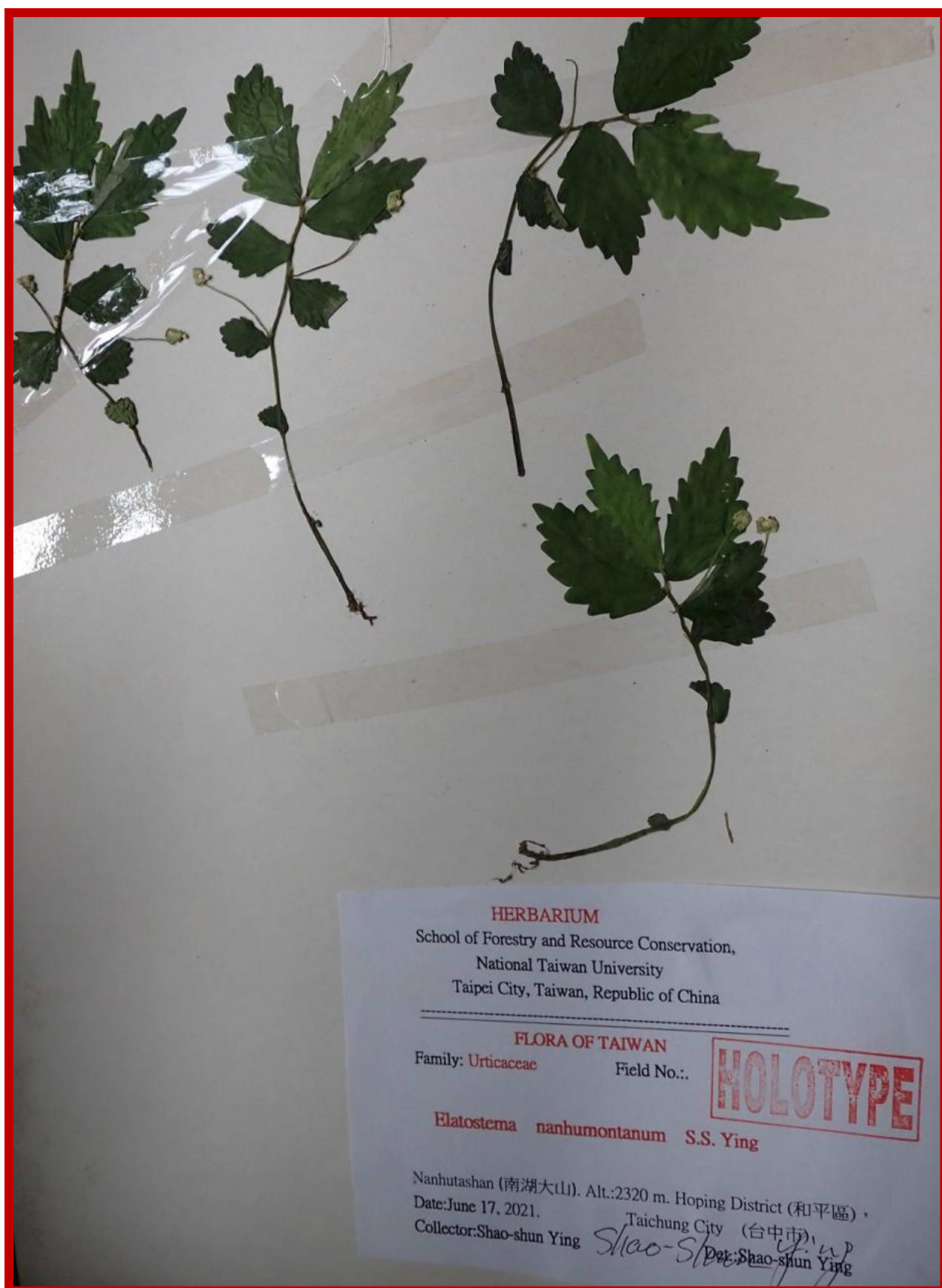


Fig. 273. *Elatostema nanhumontanum* S.S. Ying , close-up of male inflorescence and male flowers



Fig. 274. *Elatostema nanhumontanum* S.S. Ying , close-up of unopened male flowers

2.the species grows on the edges of river banks and forests in leaf litter and humus at elevations of 2100 to 2500 meters of Nanhutashan, very rare, the populations eastimate less than 30.



-219- Fig. 275. *Elatostema nanhumontanum* S.S. Ying the holotype NTUF-110-042.





Fig. 276. *Elatostema nanhumontanum* S.S. Ying , the plants

3. Annual small herbs, about 10-16 cm high, stem erect, simple, not branched.
4. Leaves 5-8, simple, alternate, distichous, sessile, nanophyll absent; lamina ovate to oblong, 0.5-4 cm long, 0.5-2 cm wide.
- 5.. Flowers dioecious, small, many; the male flowers in an axillary discoid inflorescence; the peduncles slender, 1.5-2.5 cm long, green, white pubescent.
6. Eachmale inflorescence with 7-12 flowers; pedicels 2-2.5 mm long, pale green to white, glabrous; sepals 4-5, ovate, 1.5-2.0 mm long, 0.6-1.2 mm wide, acute at apex, white.

#### **Distribution and phenology.**

The species is endemic in Taiwan, It is known from Nanhutashan (南湖大山) , Hoping District (和平區) , Taichung City , northern Taiwan. ° It was discovered the species at edges of river banks at elevations of 2320 meters. Its flowering time is June to July.

## 18. A New species of Genus *Parietaria* (Urticaceae) in Taiwan

*Parietaria taiwaniana* S.S. Ying 台灣牆草

*Parietaria taiwaniana* S.S. Ying, *sp. nov.* 台灣牆草

TYPE:TAIWAN. I-Lan County, Toucheng Township (頭城鎮), Shicheng (石城) 10 m alt. *S. S. Ying*, *s. n. October 30, 2021* ° (holotype, NTUF) °



Fig. 277. *Parietaria taiwaniana* S.S. Ying, the plant colony

**Morphology** : Perennial herbs, about 10-30 cm high, stem short, much branched, smooth, green, glabrous; branches diffuse, 10-25 cm long, horizontal to ascending, green, usually densely white pubescent at young, and then become glabrous or nearly so. Leaves simple, alternate, not distichous, ovate to ovate-rounded, 8-18 mm long, 6-12 mm wide, obtuse to acuminate at apex,





Fig. 278. *Parietaria taiwaniana* S.S. Ying , the branch and leaves

obtuse and slightly cordate at base, chartaceous, entire and ciliate at margins, green and scattered yellow specks surface, pale green beneath, white pubescent on both surface, espically on veins, 3-nerved at base, impressed surface and elevated beneath; stipules absent. Petioles 3-5 mm long, terete, white pubescent.



-222- Fig. 279. *Parietaria taiwaniana* S.S. Ying , the male flowers



Fig. 280. *Parietaria taiwaniana* S.S. Ying , close-up of male and female flowers



-223- Fig. 281. *Parietaria taiwaniana* S.S. Ying , close-up of male flowers



Flowers minute, unisexual, monoecious, 1-2 mm across when opened, pale yellow to transparent white, 2-4 clustered on leaf-axil and from a short-branched leaf-axil; bracts lanceolate, 1.5-2 mm long, 0.5 mm wide, acute at apex, transparent green, pubescent; male flowers: perianth 4, oblong to oblong-lanceolate, 1-1.5 mm long, 0.5 mm wide, obtuse at apex, pale green, pubescent, membranous; stamens 4, filament 1.5-2.5 mm long, transparent white, excurvature; anthers oblong to reniform, about 0.4 mm long, dorsifixed; female flowers: perianth 3-4, oblong, 0.6-0.8



Fig. 282. *Parietaria taiwaniana* S.S. Ying , close-up of a male flowers

mm long, 0.3 mm wide obtuse at apex, membranous, pubescent; staminodes absent; ovary globose, 0.3 mm across, glabrous; style elongate, 1.5-2 mm long, transparent green, glabrous; stigma spot-like, minute. ,

### Diagnosis.

*Parietaria taiwaniana* grows in the coastal region of northern Taiwan, It is somewhat near to *P. micrantha* Ledebour. but our species is characterized by its monoecious flowers, 2-4 flowers in cluster and elongate style.



Fig. 283. *Parietaria taiwaniana* S.S. Ying , close-up of female flowers



-225- Fig. 284. *Parietaria taiwaniana* S.S. Ying , branches with flowers



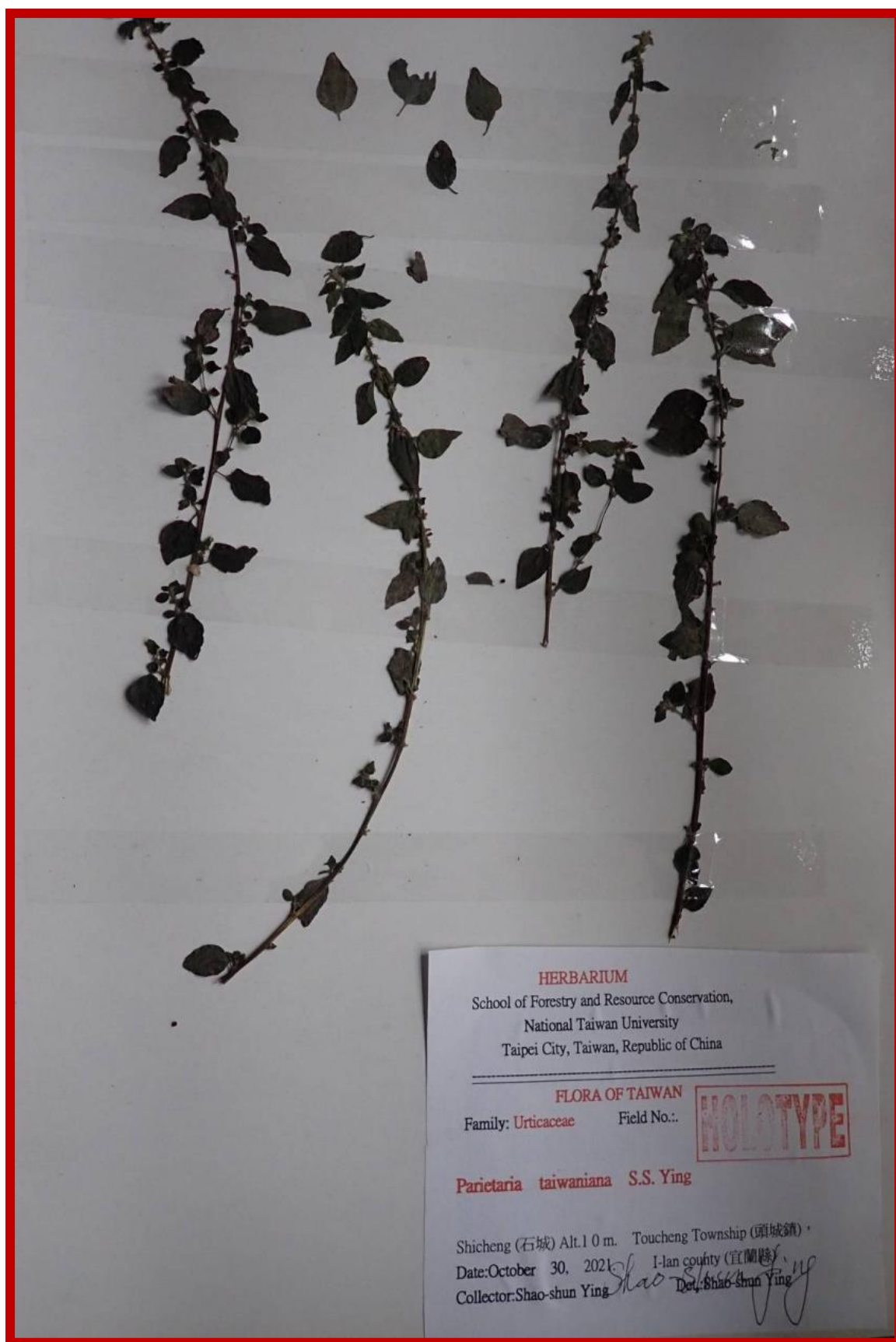


Fig. 285. *Parietaria taiwaniana* S.S. Ying, the holotype NTUF-110-043.

**Distribution and phenology.**

The species is endemic in Taiwan, It is known from Shicheng (石城) , Toucheng Township (頭城鎮) , I-lan County , northern Taiwan. ° It was discovered the species at coastal region at elevations between 10 and 15 meters. Its flowering time is October to November.



Fig. 286. *Parietaria taiwaniana* S.S. Ying , the habitat



## 19. A New species of Genus *Clinopodium* (Lamiaceae) in Taiwan

*Clinopodium cirenianum* S.S. Ying 慈恩光風輪

*Clinopodium cirenianum* S.S. Ying, *sp. nov.* 慈恩光風輪

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Ciren (慈恩) 1895 m alt. *S. S. Ying*, *s.n. June 24, 2021* ° (holotype, NTUF) °



Fig. 287. *Clinopodium cirenianum* S.S. Ying, the plant

**Morphology :** Annual prostrate herbs, stem several produced from the root system, elongate, 15-35 cm long, creeping on ground, green, glabrous or nearly so, sometimes rooting at branched points; branches short, 1.5-2.5 cm long, green to green tinged with purple, glabrous. Leaves simple, opposite, ovate, 1.2-2.2 cm long, 8-15 mm wide, obtuse to acuminate at apex, obtuse to slightly cordate at base, dentate at margins, chartaceous, lustrous green surface and pale green beneath;  
-228-





Fig. 288. *Clinopodium cirenianum* S.S. Ying , the habitat



-229- Fig. 289. *Clinopodium cirenianum* S.S. Ying , branches and leaves



glabrous or nearly so on both surfaces; midrib impressed surface and elevated beneath; lateral veins 4-5 per side. Petioles 2-4 mm long, glabrous or nearly so.



Fig. 290. *Clinopodium cirenianum* S.S. Ying , close-up of leaves



Fig. 291. *Clinopodium cirenianum* S.S. Ying , the inflorescence

Flowers small, pink, numerous, 2-3 mm in diameter when opened, usually 7-14 flowers forming a verticillaster, 5-9 verticillaster to form the inflorescence; inflorescence erect to ascending, 4-10 cm long, scattered glandular hairs, green; bracts linear to narrowly lanceolate, 5-8 mm long, 1-2 mm wide, acuminate at apex; pedicels 3-4 mm long, green, scattered hairs; calyx



Fig. 292. *Clinopodium cirenianum* S.S. Ying , the part of inflorescence



-231- Fig. 293. *Clinopodium cirenianum* S.S. Ying , close-up of a verticillaster





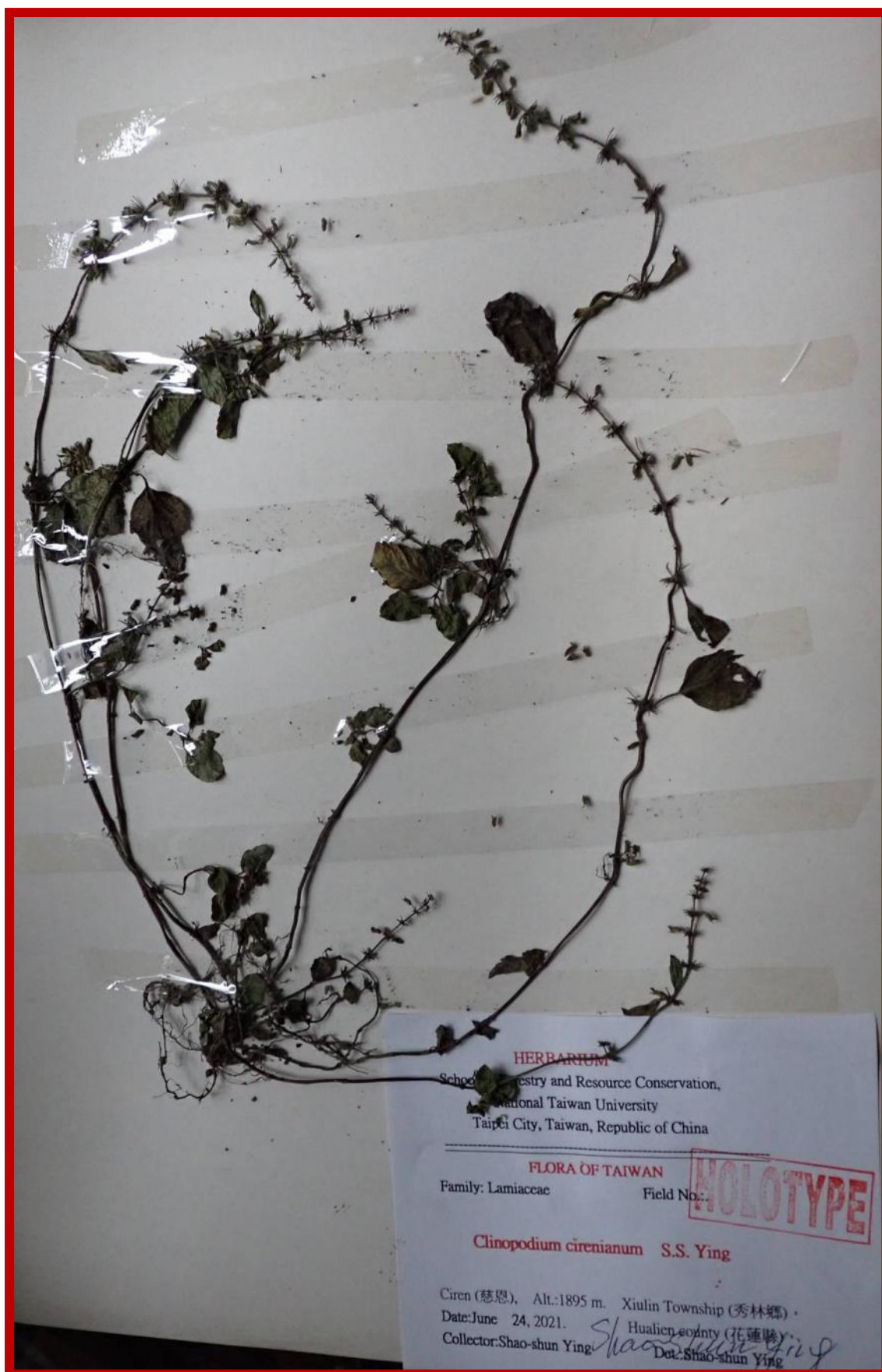
Fig. 294. *Clinopodium cirenianum* S.S. Ying , close-up of calyx and corolla

tubular, 3-4 mm long, about 2.5 mm wide, green, usually throat sparsely hairy, 6-11-nerved, limb 2-lipped; upper lip 3-toothed, the middle longest, 0.6-1 mm long, 0.7 mm wide, acuminate at apex, ciliate at margins; lower lip 2-toothed, triangular, 0.4-0.7 mm long, acute at apex, ciliate at margins; corolla pink, 2-3 mm in diameter when opened, 2-lipped, tube exserted, gradually dilated upward to throat, with 2 rows of hairs; upper lip straight, 0.4-0.5 mm long, emarginate at apex; lower lip 3-lobed, 0.3-0.5 mm long, lateral lobes smaller, obtuse at apex; middle lobe somewhat large, obtuse at apex; stamens 4, anterior 2 longer than posterior 2, included, filaments slender, 0.7-1.7 mm long; anther cells 2, divaricate,  $\pm$  obliquely inserted on dilated connectives; style slender, included, 0.8-2.7 mm long, unequally 2-cleft; ovary globose, 0.5 mm across, glabrous. Fruit a nutlet, cylindrical, 0.2-0.3 mm long, black .

### **Diagnosis.**

*Clinopodium cirenianum* grows in the medium altitude of eastern Taiwan, The characteristics of the species states as follows:

1. Annual prostrate herbs, stem several produced from the root system, elongate, 15-35 cm long, creeping on ground.



-233- Fig. 295. *Clinopodium cirenianum* S.S. Ying, the holotype NTUF-110-044.



2. Leaves simple, opposite, ovate, 1.2-2.2 cm long, 8-15 mm wide.
3. Flowers small, pink, numerous, 2-3 mm in diameter when opened, usually 7-14 flowers forming a verticillaster, 5-9 verticillaster to form the inflorescence.
4. Calyx tubular, 3-4 mm long, about 2.5 mm wide, green, usually throat sparsely hairy, 6-11-nerved, limb 2-lipped.
5. corolla pink, 2-3 mm in diameter when opened, 2-lipped.

#### **Distribution and phenology.**

The species is endemic in Taiwan, It is known from Ciren (慈恩), Xiulin Township (秀林鄉), Hualien county, eastern Taiwan. ° It was discovered at edges of forests at elevations of 1890 meters. Its flowering time is May to June.



**Fig. 296. *Clinopodium wulinianum* S.S. Ying,**

## 20. A New species of Genus *Arabis* (Brassicaceae) in Taiwan

*Arabis shengkuangshanensis* S.S. Ying 勝光山筷子芥

*Arabis shengkuangshanensis* S.S. Ying, *sp.nov.* 勝光山筷子芥

TYPE:TAIWAN. Taichung City,Hoping District (和平區), Shengkuangshan (勝光山) 1870 m alt.  
*S. S. Ying* , *s.n.* July15, 2021 ° (holotype , NTUF) °



Fig. 297. *Arabis shengkuangshanensis* S. S. Ying, the plants

**Morphology** : Annual herbs about 25-32 cm tall; taproots elongate, 4-6 cm long, somewhat fleshy, glabrous, pale yellow; fibrous roots slender, not many; stem erect to ascending, green, glabrous to pubescent at base. Leaves simple, radical and cauline; the radical ones spatulate to ovate, 1.5-4 cm long, 1.2-2.5 cm wide, obtuse at apex, attenuate at base, chartaceous, dentate at margins, pubescent on both surfaces, lustrous green surface and pale green beneath, midrib and lateral





Fig. 298. *Arabis shengkuangshanensis* S. S. Ying, taproot and leaves



-236- Fig. 299. *Arabis shengkuangshanensis* S. S. Ying, close-up of radical leaves

veins inconspicuous on both surfaces; petioles 8-15 mm long, scattered long-white hairs all over, green to pale green. The cauline leaves alternate, lanceolate to linear-lanceolate, 2-4 cm long, 6-8 mm wide, obtuse at apex, attenuate, remotely dentate and ciliate at margins, chartaceous, scattered pubescent on both surfaces, lustrous green surface and pale green beneath, midrib and lateral veins inconspicuous; petioles sgor to clasped the branches.



Fig. 300. *Arabis shengkuangshanensis* S. S. Ying, close-up of caulineleaves

Flowers few, usually 3-5, white, in a terminal raceme, not widely opened; the inflorescence terminal, 5-12 cm long, erect to ascending, glabrous or nearly so, green; bracts linear, 7-13 mm long, 2-3 mm wide, obtuse at apex; pedicels short, 1.7-3.2 mm long, glabrous; sepals erect, oblong, 2.5-3.5 mm long, about 2.5 mm wide, obtuse at base, entire and membranous at margins; petals white, oblong, 6-8 mm long, about 2.5-4 mm wide, obtuse at apex, slightly clawed at base, glabrous; stamens 6, tetradynamous, included; filaments 1.2-2.5 mm long, anthers dotted, minute, ovule many per ovary; ovary linear 3-3.5 mm long.





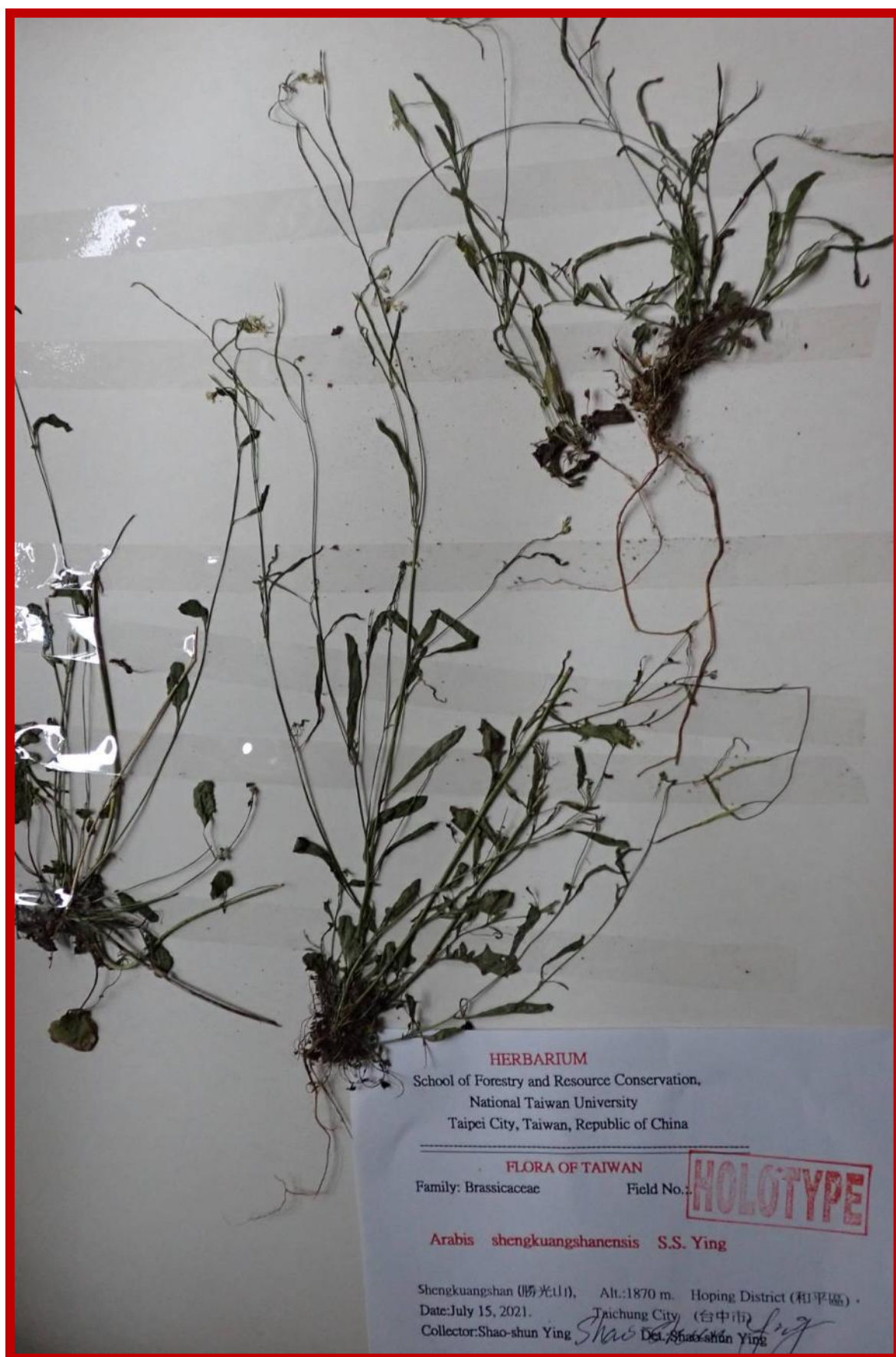
Fig. 301. *Arabis shengkuangshanensis* S. S. Ying, inflorescence

Silique elongate, cylindrical, 2.5-3.5 cm long, about 1.5 mm across, slightly torulose, with a articulation at the base; seeds many, rounded, 0.4-0.6 mm across.

**Diagnosis.**

*Arabis shengkuangshanensis* is characterized by:

1. Annual herbs about 25-32 cm tall; taproots elongate, somewhat fleshy, glabrous, pale yellow.



-239- Fig. 302. *Arabis shengkuangshanensis* S. S. Ying, the holotype NTUF-110-045.



2. Leaves simple, radical and cauline; the radical ones spatulate to ovate; the cauline leaves alternate, lanceolate to linear-lanceolate.

3. Flowers few, usually 3-5, white, in a terminal raceme, not widely opened; the inflorescence terminal, 5-12 cm long.

4. Sepals erect, oblong, 2.5-3.5 mm long, about 2.5 mm wide; petals white, oblong, slightly clawed at base, glabrous.

5. Silique cylindrical, 2.5-3.5 cm long, about 1.5 mm across, slightly torulose, with a articulation at the base; seeds many, rounded, 0.4-0.6 mm across.



Fig.303. *Arabis shengkuangshanensis* S. S. Ying, flowers and fruits

#### **Distribution and phenology.**

*Arabis shengkuangshanensis* S.S. Ying is endemic to Taiwan. It is known from Shengkuangshan (勝光山) Hoping District (和平區), Taichung City, Central Taiwan. It was collected on the mountain slope, and flowering time is June to August and fruiting time July to September. somewhat rare.



## 21. Two New species of Genus *Tricyrtis* (Liliaceae) in Taiwan

A.*Tricyrtis bilushenmulata* S.S. Ying 碧綠神木油點草

*Tricyrtis bilushenmulata* S.S. Ying, *sp. nov.* 碧綠神木油點草

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Bilushenmu (碧綠神木) 2265 m alt. S. S. Ying, *s.n.* July 29, 2021. (holotype, NTUF).



Fig.304. *Tricyrtis bilushenmulata* S. S. Ying, plant with flowering buds



**Morphology :** Perennial herbs about 30-40 cm tall; rhizome creeping, horizontal, 5-7 cm long, somewhat fleshy; roots fibrous, slender. Stem simple, erect to ascending, 20-25 cm long, green, glabrous. Leaves simple, alternate, ovate-lanceolate, 8.5-12 cm long, 3.5-4.5 cm wide, acuminate at apex, cordate to perfoliate at base, chartaceous, entire and very short red ciliate at margins, glabrous surface and short hirsute beneath, especially on midrib and veins, lustrous green and sometime whit dark green specks surface and pale green beneath, midrib and lateral veins (3-5 per side) impressed surface and elevated beneath; stipules cordate, 1.5-2 cm long, 4-6 mm wide, acute at apex, cordate at base, ciliate at margins, glabrous on both surfaces.



Fig.305. *Tricyrtis bilushenmulata* S. S. Ying, stem, leaves and stipules

Flowers 8-14, white densely with red spots inside, medium sized, 3.5-4 cm in diameter when opened, usually opened one by one, not opening simultaneously, in terminal thyse; the inflorescence 6-10 cm long, densely covered white glandular hairs; bracts ovate, 5-7 mm long, 3-4 mm wide, acute at apex, densely covered glandular-hairs outside and nearly glabrous inside, ciliate at margins, often cauduous when flowering; pedicels slender, 6-15 mm long, densely covered glandular-hairs, green to green-purplish; tepals 6, 2-series; the outer ones ovate-oblong, 2-2.5 cm



Fig.306. *Tricyrtis bilushenmulata* S. S. Ying, pedicels, bracts and flowering buds



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Fig.307. *Tricyrtis bilushenmulata* S. S. Ying, close-up of flower



long, 6-6.5 mm wide, acute at apex, saccate at base, white with densely red spots inside and white outside, glabrous inside and densely covered with white glandular-hairs outside; inner ones spatulate, 2-2.5 cm long, 3-4 mm wide, acuminate apex, with a small sac at base, white with densely red spots inside and white outside, glabrous inside and densely covered with white glandular-hairs outside; stamens 6, inserted at base of tepal; filaments slender, 1.8-2.3 cm long, pale yellow scattered with red spots; anther oblong, 2.5-3 mm long, about 1 mm wide, dorsifixed; ovary cylindric, 8-10 mm long, 3-celled, green, glabrous; ovules many in each cell; style column-like, 4-6 mm long, pale yellow, scattered with white transparent glands; stigmatic lobes 3, spreading, 6-7 mm long, 1-2 mm wide, pale yellow scattered with red spots and white to yellow transparent glands, 2-clefted apex, often reflexed.

Fruit a capsule, cylindric, 3-4.5 cm long, 3-4 mm wide, 3-angled, septicidal open when mature; seeds many, orbicular, flattened, brownish.

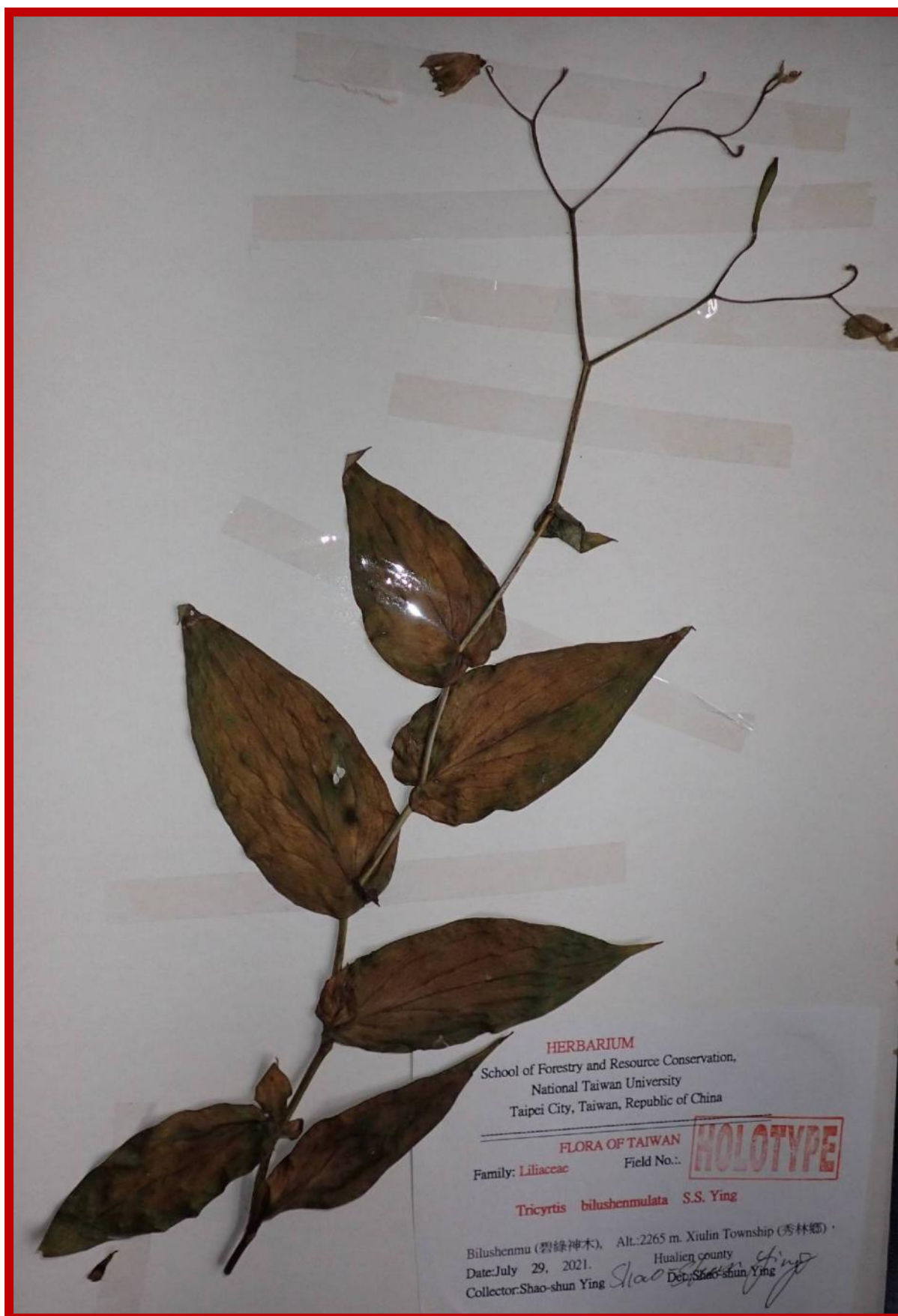


Fig.308. *Tricyrtis bilushenmulata* S. S. Ying, the habitat

#### Diagnosis.

*Tricyrtis bilushenmulata* is characterized by:

1. Perennial herbs about 30-40 cm tall; stem simple, erect to ascending, 20-25 cm long,



-245- Fig.309. *Tricyrtis bilushenmulata* S. S. Ying, the holotypet NTUF-110-046.





Fig.310. *Tricyrtis bilushenmulata* S. S. Ying, flower just opening

green, glabrous.

2. Leaves simple, alternate, ovate-lanceolate, 8.5-12 cm long, 3.5-4.5 cm wide, acuminate at apex, cordate to perfoliate at base.

3. Flowers 8-14, white densely with red spots inside, medium sized, 3.5-4 cm in diameter when opened, usually opened one by one, not opening simultaneously, in terminal thyrse.

4. Tepals 6, 2-series; the outer ones ovate-oblong, 2-2.5 cm long, 6-6.5 mm wide, acute at apex, saccate at base; inner ones spatulate, 2-2.5 cm long, 3-4 mm wide, acuminate apex, with a small sac at base.

5. stigmatic lobes 3, spreading, 6-7 mm long, 1-2 mm wide, pale yellow scattered with red spots and white to yellow transparent glands, 2-clefted apex, often reflexed.

**Distribution and phenology.**

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The species is endemic in Taiwan, It is known from Bilushenmu (碧綠神木), Xiulin Township (秀林鄉), Hualien county, eastern Taiwan. ° It was discovered at edges of *Pinus taiwanensis* Hayata forests at elevations of 2250-2500 meters. Its flowering time is July to September and fruiting July to October. .

**B.***Tricyrtis uniflora* S.S. Ying 單花油點草

*Tricyrtis uniflora* S.S. Ying, *sp. nov.* 單花油點草

TYPE:TAIWAN. Taichung City,Hoping District (和平區),Nanhutashan (南湖大山) 1880 m alt. S. S. Ying, *s.n. August 12, 2021* ° (holotype, NTUF) °



Fig.311. *Tricyrtis uniflora* S. S. Ying, the plants, at Nanhutashan, elevation 1900m

**Morphology** : Annual herbs about 10-15 cm tall; rhizome creeping, horizontal, 3-5 cm long,  
-247-



somewhat fleshy; roots fibrous, slender. Stem simple, erect to ascending, 8-12 cm long, pale purplish to green tinged with purple, scattered shortly hairy. Leaves 4-5, simple, alternate, oblong, ovate to ovate-oblong, 3-4.5 cm long, 2-3 cm wide, acuminate at apex, cordate to perfoliate at base, chartaceous, entire, scattered short white hairs surface, glabrous or nearly so beneath, lustrous green surface and pale green beneath, 5-palmated veins impressed surface and elevated beneath; stipules none or cauduous.



Fig.312. *Tricyrtis uniflora* S. S. Ying, stem and leaves

Flowers solitary, white densely with purplish red spots inside, medium sized, 2.5-3 cm in diameter when opened, terminal; the peduncle slender, 3-4 cm long, erect to ascending, pubescent; bracts 0; tepals 6, 2-series; the outer ones ovate-oblong, 1-1.5 cm long, 4.5-5 mm wide, acuminate and sac at apex, nectary saccate at base, white with purplish red spots inside and white outside, glabrous on both surfaces; inner ones spatulate to lanceolate, 1-1.5 cm long, 2.5-3.5 mm wide, acuminate and with a small sac at apex, with a small sac at base, white with densely purplish red spots inside and white outside, glabrous on both surface; stamens 6, staminal tube 1-1.2 cm long, covered with red spots and some red streaks at base; filaments slender, 4-5 cm long, pale yellow;

anther oblong, 3-4 mm long, about 1.5 mm wide, dorsifixed; ovary cylindric, 8-10 mm long, 3-celled, green, glabrous; ovules many in each cell; style slender, 4-6 mm long, pale yellow;; stigmatic lobes 3, spreading, 5-6 mm long, 1-2 mm wide, pale yellow scattered with red spots and, 2-clefted at half length at apex, often reflexed.

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



Fig.313. *Tricyrtis uniflora* S. S. Ying, the flower, trnasplanted at my home garden

#### Diagnosis.

*Tricyrtis uniflora* is characterized by:

1. Two more sites of Taiwan as known the species is growing
  - A. Nanhutashan, at mountain slopes at elevation 1800-2300 meter.
  - B. On the way between Guanyuan (關原) and Bilushenmu (碧綠神木), at the elevation 2150-2300 meters.
2. Annual small herbs about 10-15 cm tall.
3. Leaves 4-5, simple, alternate, oblong, ovate to ovate-oblong, 3-4.5 cm long, 2-3 cm wide, acuminate at apex, cordate to perfoliate at base.





Fig.314. *Tricyrtis uniflora* S. S. Ying, at Guanyuan, elevstion 2200m



-250- Fig.315. *Tricyrtis uniflora* S. S. Ying, habitat at Guanyuan, elevstion 2200m



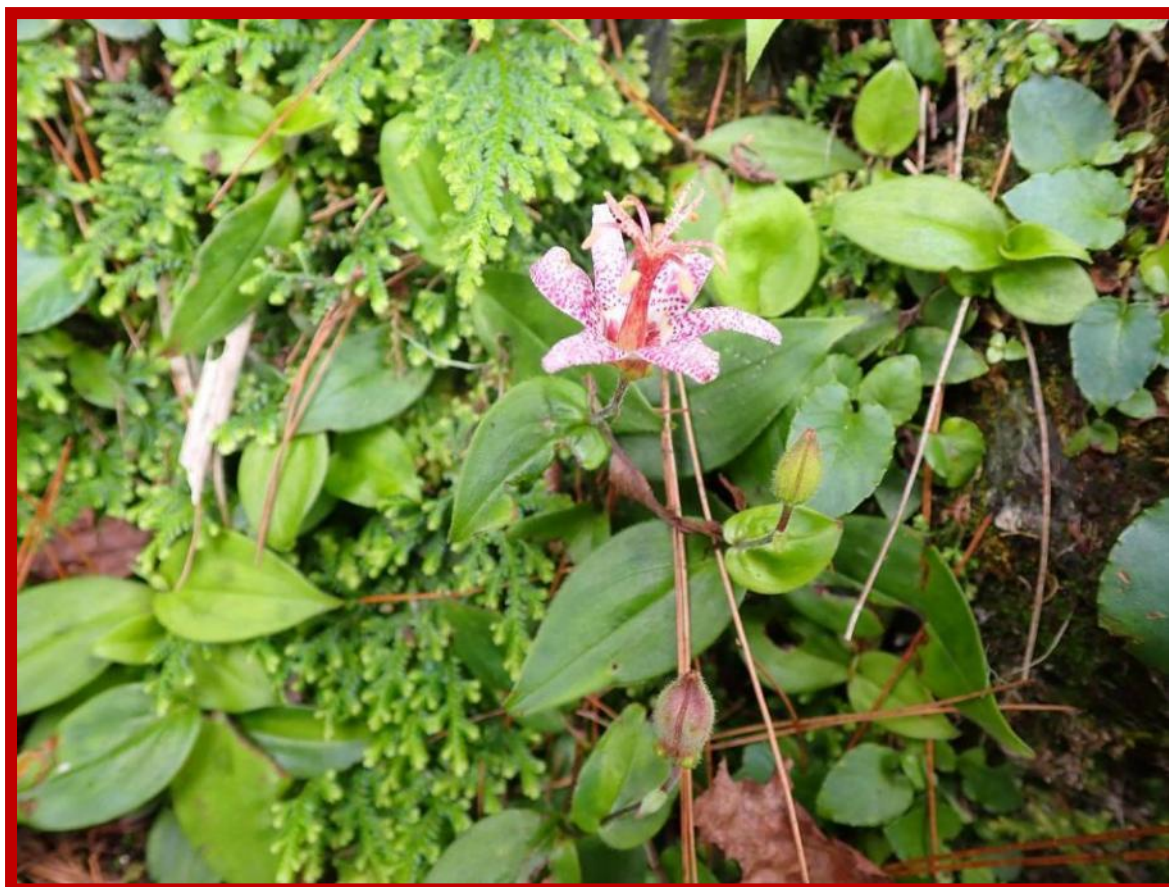
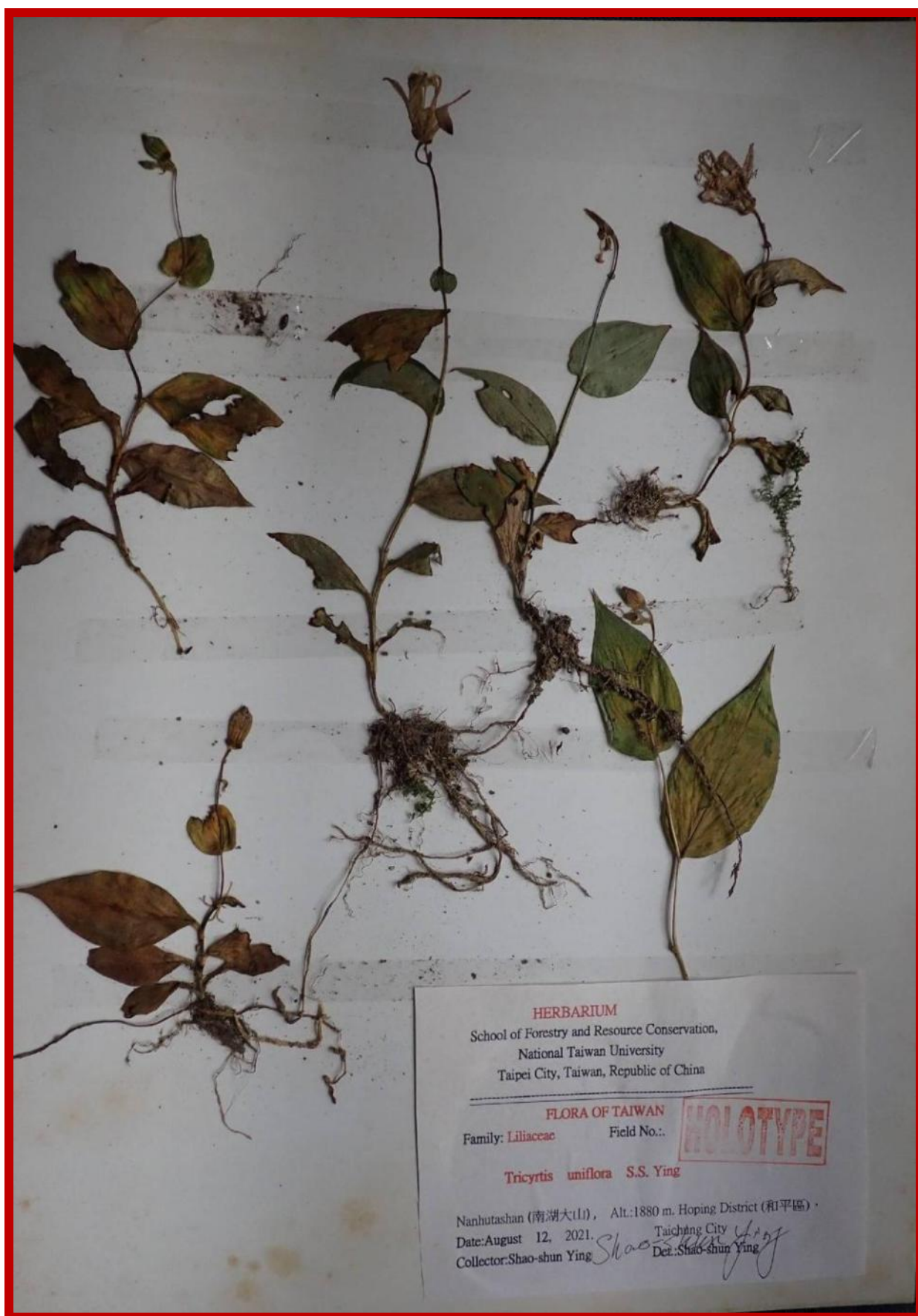


Fig.316. *Tricyrtis uniflora* S. S. Ying, flowering, at Guanyuan, elevstion 2100m



-251- Fig.317. *Tricyrtis uniflora* S. S. Ying, habitat at Guanyuan, elevstion 2100m





-252- Fig.318. *Tricyrtis uniflora* S. S. Ying, the holotype NTUF-110-047.

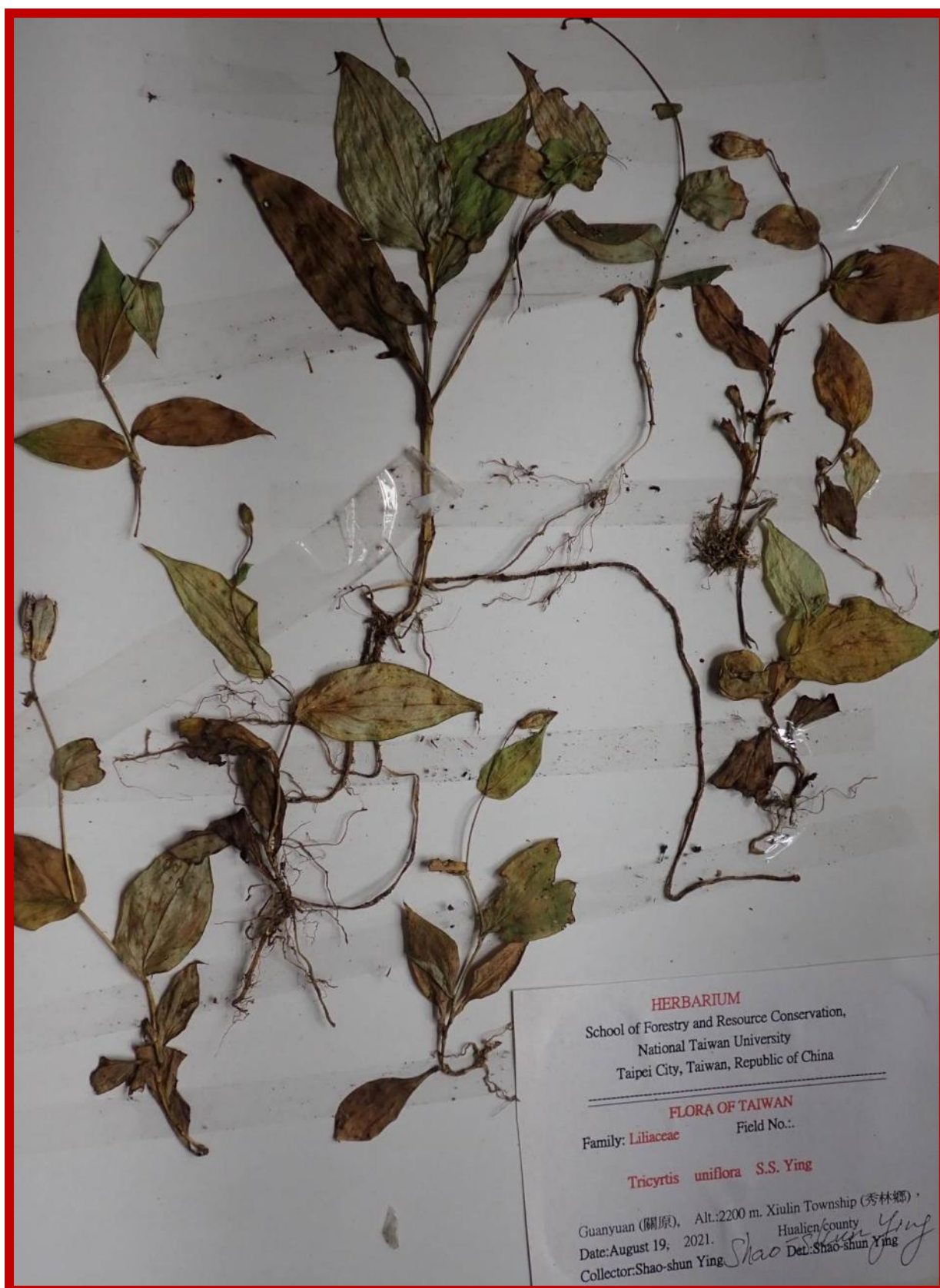


Fig.319., *Tricyrtis uniflora* S. S. Ying, A specimen was collected at Goanyuan area  
on 2200 meters elevation NTUF-110-048.





Fig.320. *Tricyrtis uniflora* S. S. Ying, flowering in wildfields

4. Flowers solitary, white densely with purplish red spots inside, medium sized, 2.5-3 cm in diameter when opened, terminal.

5. Tepals 6, 2-series; the outer ones ovate-oblong, acuminate and sac at apex, nectary saccate at base, white with purplish red spots inside and white outside, glabrous on both surfaces; inner ones spatulate to lanceolate.

6. stamens 6, staminal tube 1-1.2 cm long, covered with red spots and some red streaks at base; filaments slender, 4-5 cm long, pale yellow.

#### **Distribution and phenology.**

The species is endemic in Taiwan, It is known from Nanhutashan (南湖大山), at mountain slopes at elevation 1800-2300 meter, Hoping District (和平區), Taichung City northern Taiwan and on the way between Guanyuan (關原) and Bilushenmu (碧綠神木), at the elevation 2150-2300 meters. Xiulin Township (秀林鄉), Hualien county, eastern Taiwan. °. Its flowering time is August to September and fruiting September to October.

## 22. A New species of Genus *Lysimachia* (Primulaceae) in Taiwan

*Lysimachia nanhutashanensis* S.S. Ying 南湖大山珍珠菜

*Lysimachia nanhutashanensis* S.S. Ying, *sp. nov.* 南湖大山珍珠菜

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Nanhutashan (南湖大山)1980 m alt.  
*S. S. Ying* , *s.n. August 12, 2021* ° (holotype , NTUF) °



Fig.321. *Lysimachia nanhutashanensis* S. S. Ying, the habitat

**Morphology :** Annual herbs about 20-30 cm long; rhizome creeping, horizontal, 3-7 cm long, somewhat fleshy; roots fibrous, slender. Stem few branchede, prostrate on ground, 15-25 cm long, pale purplish, fleshy, scattered white somewhat long hairs. Leaves simple, opposite, ovate to ovate-rounded, 1.5-2 cm long, 1.0-1.5 cm wide, acute to obtuse at apex, obtuse at base, chartaceous, entire and ciliate at margins, scattered white hairy surface and glabrous or nearly so beneath, lustrous green surface and pale green beneath, midrib impressed surface and elevated beneath, lateral veins inconspicuous; petioles 8-16 mm long, slender, scattered white hairy and ciliate at margins.





Fig.322. *Lysimachia nanhutashanensis* S. S. Ying, branches, leaves and one flower



Fig.323. *Lysimachia nanhutashanensis* S. S. Ying, the flower, mind subtended by 4 leaf-like bracts



Fig.324. *Lysimachia nanhutashanensis* S. S. Ying, the flowers



Fig.325. *Lysimachia nanhutashanensis* S. S. Ying, the flowers, pedicels, calyx and corolla



Flower yellow, solitary, rarely 2, terminal on the branches, 8-9 mm in diameter when opened, usually subtended by 4 leaf-like bracts; bracts 4, leaf-like, verticillate, 2 large and 2 small opposite, ovate, 8-20 mm long, 8-18 mm wide, acute to obtuse at apex, hairy, ciliate at margins; pedicels short, 4-5 mm long, densely with long and white hairs; calyx 5-deeped lobed; the lobes linear to lineat-lanceolate, 6-7 mm long, 1.5 mm wide, acuminate at apex, densely white long-hairs outside, nearly glabrous inside; corolla yellow, deeply 5-parted; lobes oblong, 6-7 mm long, 2.5-3.5 mm wide, obtuse at apex; stamens 5, lean on style; filaments connate into a ring, 4-5 mm long, yellow; anthers elliptic, 2-3 mm long, white, dorsifixed; ovary cylindric, 3mm long, pale yellow; style straight, slender, 3mm long; stigma capitate, smooth, yellow.



Fig.326. *Lysimachia nanhutashanensis* S. S. Ying, the flowers, stamens and pistil

### Diagnosis.

*Lysimachia nanhutashanensis* is characterized by:

1. Annual herbs about 20-30 cm long; rhizome creeping; stem few branchede, prostrate on ground.
2. Leaves simple, opposite, ovate to ovate-rounded, 1.5-2 cm long, 1.0-1.5 cm wide.
3. Flower yellow, solitary, rarely 2, terminal on the branches, 8-9 mm in diameter when opened, usually subtended by 4 leaf-like bracts.
4. Bracts 4, leaf-like, verticillate, 2 large and 2 small opposite, ovate, 8-20 mm long, 8-18 mm wide, acute to obtuse at apex, hairy, ciliate at margins.
5. Calyx 5-deeped lobed; the lobes linear to lineat-lanceolate, 6-7 mm long, 1.5 mm wide,



-259- Fig.327. *Lysimachia nanhutashanensis* S. S. Ying, the holotype NTUF-110-049.



acuminate at apex, densely white long- hairs outside, nearly glabrous inside.

6. Corolla yellow, deeply 5-parted; lobes oblong, 6-7 mm long, 2.5-3.5 mm wide, obtuse at apex

### **Distribution and phenology.**

The species is endemic in Taiwan, It is known from Nanhutashan (南湖大山) , Heping District (和平區) Taichung City, northern Taiwan. ° It was discovered at mountain slope and forest floors at elevations of 1980-2300 meters. Its flowering time is July to September.



Fig.328. *Lysimachia nanhutashanensis* S. S. Ying, the habitat

### 23. A New species of Genus *Polygala* (Polygalaceae) in Taiwan

*Polygala taiwanensis* S.S. Ying 台灣遠志

*Polygala taiwanensis* S.S. Ying, *sp. nov.* 台灣遠志

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Between 53KM and 55 KM. Central Cross-Island Highway, I-lan Branch (53 公里至 55 公里,中部橫貫公路宜蘭支線) 1850 m alt. S. S. Ying , *s.n.* August 26, 2021 ° (holotype , NTUF) °



Fig.329. *Polygala taiwanensis* S. S. Ying, the habitat

**Morphology :** Perennials herbs often caespitosa . Stem woody at base, short, much-branched, glabrous; branches many, 8-16cm long, spread around, stretch horizontal, terete, densely scattered with short hairs. Leaves simple, alternate, lineat to linear-lanceolate, 0.8-2 cm long, 3-4 mm wide, acute to acuminate at apex, attenuate at base, chartaceous, entire and ciliate at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib impressed surface and



elevated beneath, lateral veins inconspicuous; petioles 2-3 mm long, glabrous.



Fig.330. *Polygala taiwanensis* S. S. Ying, branches, leaves and flower



Fig.331. *Polygala taiwanensis* S. S. Ying, flowers smaller, pink and not opened



Fig.332. *Polygala taiwanensis* S. S. Ying, close-up of flower

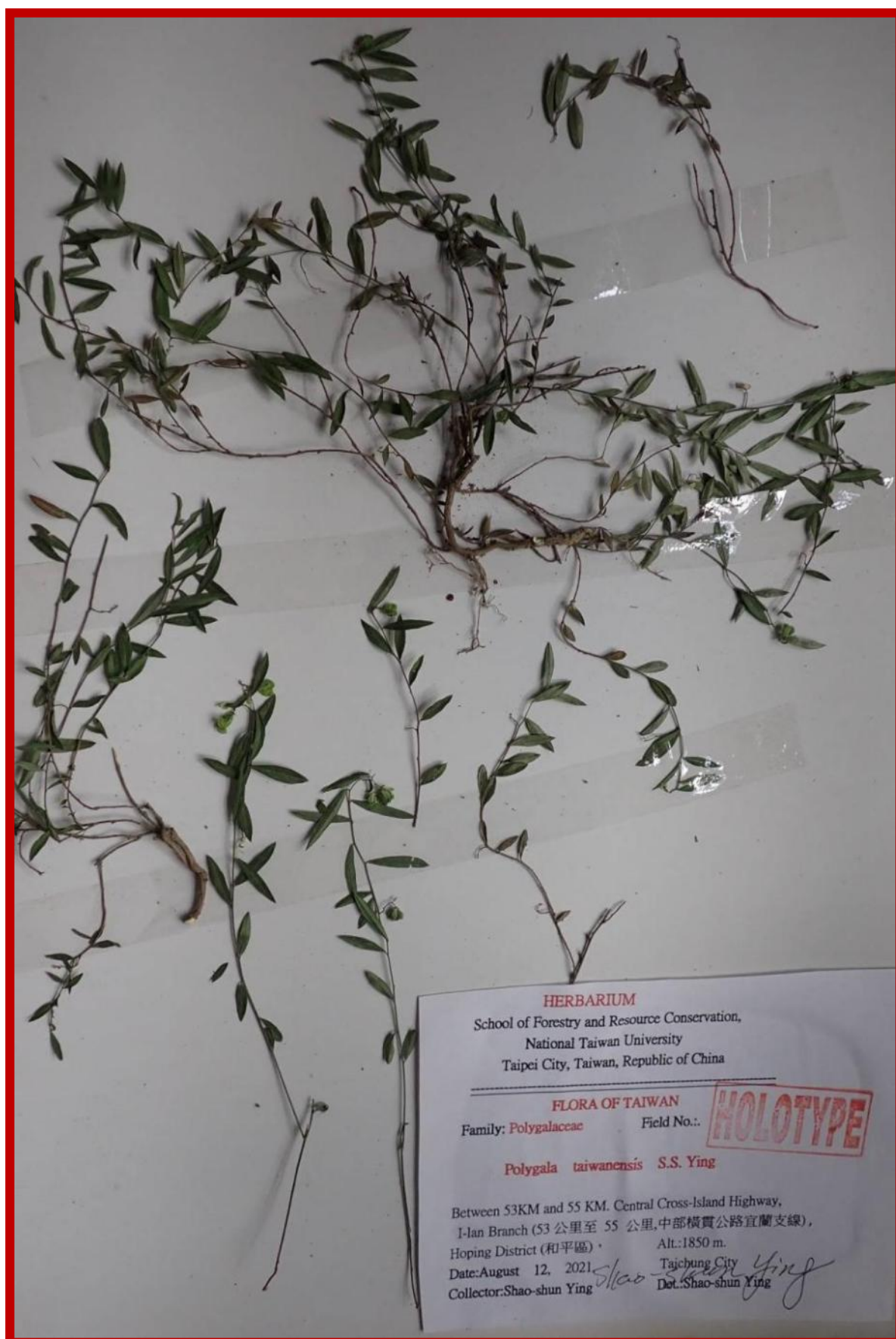
Flowers 1-3, terminal to axillary, usually solitary to racemose, smaller, 3-4 mm long, pink, not widely opened; peduncle 8-12 mm long, pubescent; bracts opposite, ovate, 0.5-1 mm long, 0.6 mm wide, acute at apex; pedicels 4-5 mm long, hairy; sepals 5, persistent, outer sepals 3, linear, 0.5-0.7 mm long, acute at apex; inner 2, petaloid, oblong, 3-3.5 mm long, 3-nerved, green tinged with pink, glabrous; upper petals broadly rhombic, 1.5-2 mm long, 1-1.5 mm wide, obtuse at apex, free from staminal column and keel for 1-1.3 mm, 1-nerved at base; keel-petal 1.5-2.5 mm long excluding the crest, the adaxial margins of the saccate portion truncate at base; the apical crest 0.6-0.8 mm long with each half composed of 2-4 fringerlike lobes including a shorter, thicker lateral one; stamens 8, the filaments free for 0.3-0.4 mm; the anthers 0.3-0.4 mm long.

Capsule ovoid to rounded, 4-4.5 mm long and wide, winged at margins, emarginate at apex, truncate at base, without pellucid sepal glands; the wing 0.2-0.3 mm wide, membranous, slightly undulated at margins, glabrous; seeds alike in both locules, ellipsoid, 1-1.5 mm long, 0.7-1.0 mm wide, pubescent, narrowly obliquely rounded to an apiculum ca.0.1-0.2 mm long; aril 1/3 time as long as the seed body.

### **Diagnosis.**

*Polygala taiwanensis* is characterized by its smaller pink and not widely opened flowers,





-264- Fig.333. *Polygala taiwanensis* S. S. Ying, the holotype NTUF-110-050.





Fig.334. *Polygala taiwanensis* S. S. Ying, close-up of flower and fruits



-265- Fig.335. *Polygala taiwanensis* S. S. Ying, close-up of fruits





Fig.336. *Polygala taiwanensis* S. S. Ying, close-up of fruit, one sepal attached in the middle

3-4 mm long; petals very small, keel-petal 1.5-2.5 mm long excluding the crest, the adaxial margins of the saccate portion truncate at base; the apical crest 0.6-0.8 mm long with each half composed of 2-4 fringerlike lobes including a shorter, thicker lateral one. It is a unique species among Taiwan *Polygala* species .

#### **Distribution and phenology.**

The species is endemic in Taiwan, It is known from Between 53KM and 55 KM. Central Cross-Island Highway, I-lan Branch (53 公里至 55 公里,中部橫貫公路宜蘭支線) , Hoping District (和平區) Taichung City, northern Taiwan . It was discovered at mountain slope at elevations between 1850 m and 1950 m.. Its flowering time is August to September, and fruiting time from September to October. .

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

*Arenaria siyuanakouensis* S.S. Ying

*Arenaria siyuanakouensis* S.S. Ying, *sp. nov.* 思源埡口無心菜

TYPE:TAIWAN. I-Lan County,Tatung Township (大同鄉), Siyuanyakou (思源埡口) 1920 m alt.  
*S. S. Ying*, *s.n. May 13, 2021* ° (holotype , NTUF) °



Fig.337. *Arenaria siyuanakouensis* S.S. Ying, the habitat

**Morphology** : A small annual herb, stem creeping and prostrate, much brached; branches elongate, 7-23 cm long, green, terete, densely scattered with white villose. Leaves simple, opposite, oblong to oblong-lanceolate, 7-15 mm long, 4-7.5 mm wide, acuminate at apex, obtuse at base,





Fig.338. *Arenaria siyuanakouensis* S.S. Ying, branches and leaves



-268- Fig.339. *Arenaria siyuanakouensis* S.S. Ying, the inflorescence

chartaceous, entire and ciliate at margin, midrib and lateral veins inconspicuous on both surfaces, white pubescent on both surface. Petioles 2-3 mm long, white pubescent, groove on surface.



Fig.340. *Arenaria siyuanakouensis* S.S. Ying, close-up of a opened flower

Flowers white, smaller, solitary, terminal and axillary, rarely widely opened, when opened 2.5-3.0 mm diameter; pedicels slender, elongate, erect or ascending, 10-25 mm long, densely scattered white hairs; sepals 5, green, lanceolate, 2.5-3 mm long, about 1 mm wide, acuminate at apex, truncate at base, with white membranous wing at margins, scattered with white hairs outside and nearly glabrous inside; petals 5, white, oblong, 1.5-2 mm long, about 1 mm wide, usually as 2/3 length of the sepals, obtuse at apex, slightly clawed at base; stamens 5, filaments short, 0.5-1 mm long, glabrous; anthers reniform; ovary ovoid, about 0.6 mm across, glabrous, style slender,



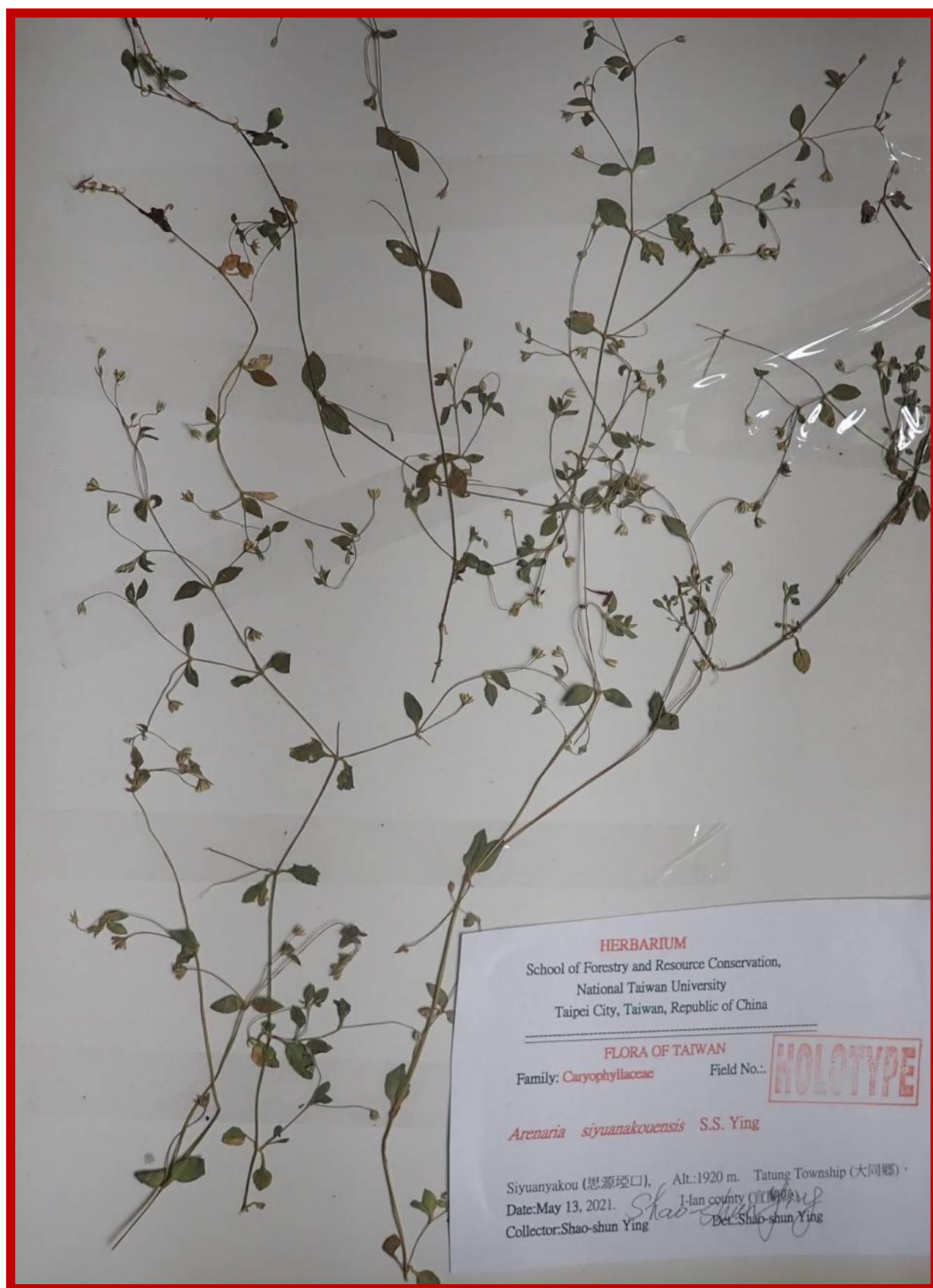


Fig.341. *Arenaria siyuanakouensis* S.S. Ying, the holotype NTUF-110-051.

about 1 mm long, white, not lobed at apex' stigma capitate, 0.3 mm across.



Fig.342. *Arenaria siyuanakouensis* S.S. Ying, plant colony

#### **Diagnosis.**

*Arenaria siyuanakouensis* S.S. Ying is characterized by its smaller leaves, flowers rarely to opened, if opened, about 2.5-3 mm in diameter; sepals with white membranous wing at margins petals usually as 2/3 length of the sepals, obtuse at apex, slightly clawed at base.

#### **Distribution and phenology.**

*Arenaria siyuanakouensis* S.S. Ying is endemic to Taiwan. It is known from medium altitudes from 1700-1950m between Siyuanakou (思源埡口) and Wulin (武陵), northern Taiwan. It was collected at Siyuanyakou (思源埡口), at elevations between 1920 meters and flowering time nearly all year round.



25.A New Species of Genus *Circaea* (*Onagraceae*) from Taiwan ----

*Circaea hsuehshanensis* S.S. Ying

*Circaea hsuehshanensis* S.S. Ying, *sp. nov.* 雪山露珠草

TYPE:TAIWAN. Taichung City,Hoping District (和平區), Hsuehshan (雪山) 1950 m alt. *S. S. Ying*, *s.n.* September 02, 2021. (holotype, NTUF).



Fig.343. *Circaea hsuehshanensis* S.S. Ying, plant colony

**Morphology** : Annual herbs; taproot somewhat lignifous, 5-8 cm long, fibrous roots numerous, slender, rhizome absent. Stem simple, erect to ascending, 10-20 cm long, pubescent. Leaves

opposite, simple, cordate to ovate-oblong, 3-4.5 cm long, 2.5-4.0 cm wide, chartaceous, acuminate and slightly caudate at apex, cordate at base, remotely dentate at margins, dark green surface and pale green beneath, glabrous surface and some pubescent beneath, midrib and lateral veins (5-7 per side) impressed surface and elevated beneath. Stipules paired, at base of petioles, ovate, 3-4 mm long, 2-3.5 mm wide, acuminate at base, cauduous or persistent. Petioles slender, 3-5 cm long, pubescent, groove above.



Fig.344. *Circaea hsuehshanensis* S.S. Ying, leaves and inflorescence

Flowers small, many, white, 2.5-3.5 mm in diameter when opened, in a remotely elongate raceme.; the racemes 5-7, terminal and axillary (often from leaf-axil) 6-11.5 cm long, ascending, white hairy; bracts 1-2, at base of inflorescence, ovate-lanceolate, 9-15 mm long, 4-4.5 mm wide, acuminate at apex, pubescent all over; pedicels 3-4 mm long, pubescent; bracteole absent; sepals 2, opposite, ovate to oblong-ovate, 4-4.5 mm long, about 3.5 mm wide, widely opened, green, obtuse at apex, concave, pubescent outside and glabrous inside; petals 2, alternate to sepals, much smaller than sepals, ovate, 1.5-2 mm long, about 1.5 mm wide, white, 2-lobed at apex; the lobes as long as the 1/2 of the length of petals, glabrous; stamens 2, shorter than style, filaments slender, 2-2.5 mm long, white; anthers 2-celled, oblong, about 0.3-2 mm long, grayish black; style slender, filiform 4-5.5 mm long, white, glabrous; stigma shield-like, 3.5 mm wide, 2.5 mm long, white; ovary ovoid, 1-2 mm in diameter, densely scattered with elongate white hairs.

Fruits many in each infructescence, ellipse, 3.5-4.0 mm in diameter, dark green, scattered with elongate whiter hairs, with 2 longitudinal ribs; infructescence 8-12 cm long, green, white





Fig.345. *Circaea hsuehshanensis* S.S. Ying, close-up of flowers



Fig.346. *Circaea hsuehshanensis* S.S. Ying, close-up of fruits

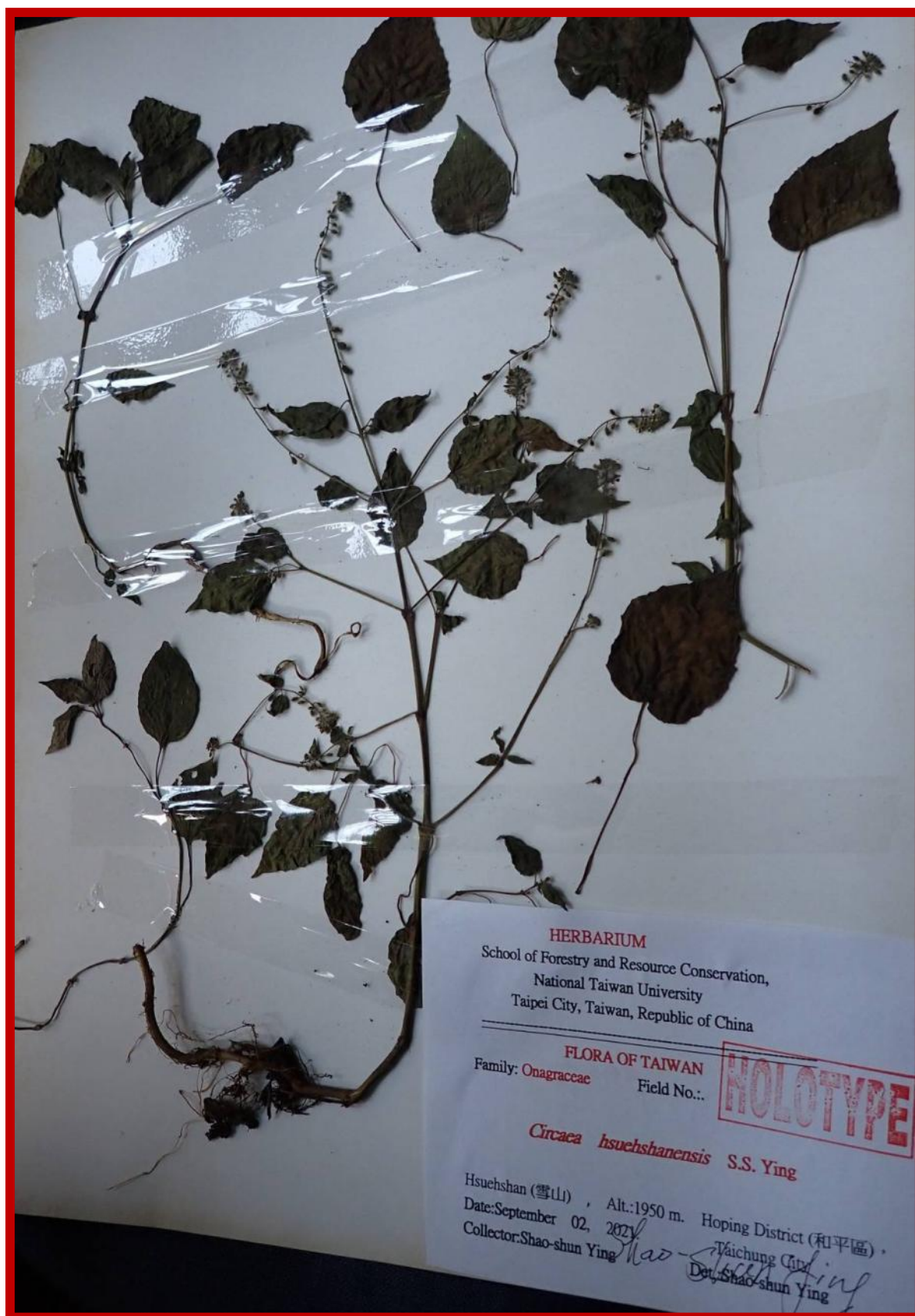


Fig.347. *Circaea hsuehshanensis* S.S. Ying, the holotype





Fig.348. *Circaea hsuehshanensis* S.S. Ying, the infructescences

pubescent all over, erect to ascending; fruiting pedicels 3-4.5 mm long, pubescent; locule 1, but with trace of a second locule in cross-section; seed 1, globose, 2.5-3 mm in diameter, smooth, glabrous.

#### **Diagnosis.**

*Circaea hsuehshanensis* is characterized by its cordate to ovate-oblong leaves, a remotely elongate raceme and petals much smaller than sepals, white, 2-lobed at apex; the lobes as long as the 1/2 of the length of petals; infructescence 8-12 cm long, green, white pubescent all over, ellipse fruits with 2 longitudinal ribs.

#### **Distribution and phenology.**

The species is endemic in Taiwan, It is known from medium altitude of 1800-2100 m. of Hsuehshan (雪山) area, Hoping District (和平區), Taichung City, central Taiwan. It was collected at fields along a stream edge. Its flowering time is September to October, and fruiting time from September to November.

## 26.A New Species of Genus *Hypericum* (Hypericaceae) from Taiwan

*Hypericum gouanyuanianum* S.S. Ying

*Hypericum gouanyuanianum* S.S. Ying, *sp. nov.* 關原金絲桃

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Guanyuan (關原) 2555 m alt. *S. S. Ying*, *s.n.* September 16, 2021. (holotype, NTUF).



Fig.349. *Hypericum gouanyuanianum* S.S. Ying, the inflorescence

**Morphology** : Perennial herbs about 20 cm tall; stem many, produced from a woody, 1.5 cm across, corm-like rhizome, 10-18 cm long, terete, glabrous, green and somewhat purplish at base. Leaves simple, opposite, oblong to ovate-oblong, 1.5-2.5 cm long, 7-15 mm wide, obtuse at apex, cordate and amplexual at base, chartaceous to thinly coriaceous, entire and black glands dots at margins, lustrous green surface and pale green beneath, scatters black glands dot all over, glabrous on both surfaces, midrib impressed surface and slightly elevated beneath, lateral veins 3-4 per side and impressed surface and elevated beneath, the surface sometimes forming distinct intramarginal vein; stipules alternate to the leaf, linear, 8-9 mm long, 1-1.5 mm wide, obtuse at apex, caudate. Petioles 0.





Fig.350. *Hypericum gouanyuanianum* S.S. Ying, stems and leaves



Fig.351. *Hypericum gouanyuanianum* S.S. Ying, close-up of a leaf



Fig.352. *Hypericum gouanyuanianum* S.S. Ying, close-up of a flower-bud



Fig.353. *Hypericum gouanyuanianum* S.S. Ying, close-up of bracts, sepals and unopened petals





Fig.354. *Hypericum gouanyuanianum* S.S. Ying, close-up of a inflorescence



-280- Fig.355. *Hypericum gouanyuanianum* S.S. Ying, close-up of a flower

Flowers solitary, very rarely in pairs, yellow, 1.5-2 cm in diameter when opened, usually 2-3 from uppermost leaf-axil ; pedicels 7-15mm long, erect to ascending, green, nearly glabrous; bracts paired,opposite, linear to lanceolate, 5-9 mm long, 2-4 mm wide, entire and black glands dots at margins, lustrous green surface and pale green beneath, scatters black glands dots all over; sepals 5, free, green, ovate-lanceolate, 4-7 mm long, 2-3 mm wide, obtuse at apex, truncate at base, gland dots at margins, 3-4 black gland lines at base, scatters black glands dots and glabrous on both surfaces; petals ovate-oblong, 8-14 mmlong, 5-7 mm wide, yellow inside, 4-6 black stripess at base, obtuse at apex, black glandular at margins; stamens many, in 5 fascicled; filaments connated at 1/3 part of length, the free part slender, yellow, about 3-5 mm long; anthers , anthers small, 2-celled, yellow, dorsifixed; ovary ellipsoid, 2-3 mm long, about 1.5 mm wide, 3-celled, glabrous; style 3, slender, 7-9 mm long, stigmas 3, capitate, red.



Fig.356. *Hypericum gouanyuanianum* S.S. Ying, close-up of petals (outside surface)

#### Diagnosis.

*Hypericum gouanyuanianum* is an unique species of the genus of Taiwan, it is characterized by its flowers solitary or rarely pairs, axillary on the uppermost leaf-axils, leaves, bract and sepals all black gland dots at margins, petals with 4-6 stripes at outside surfaces.



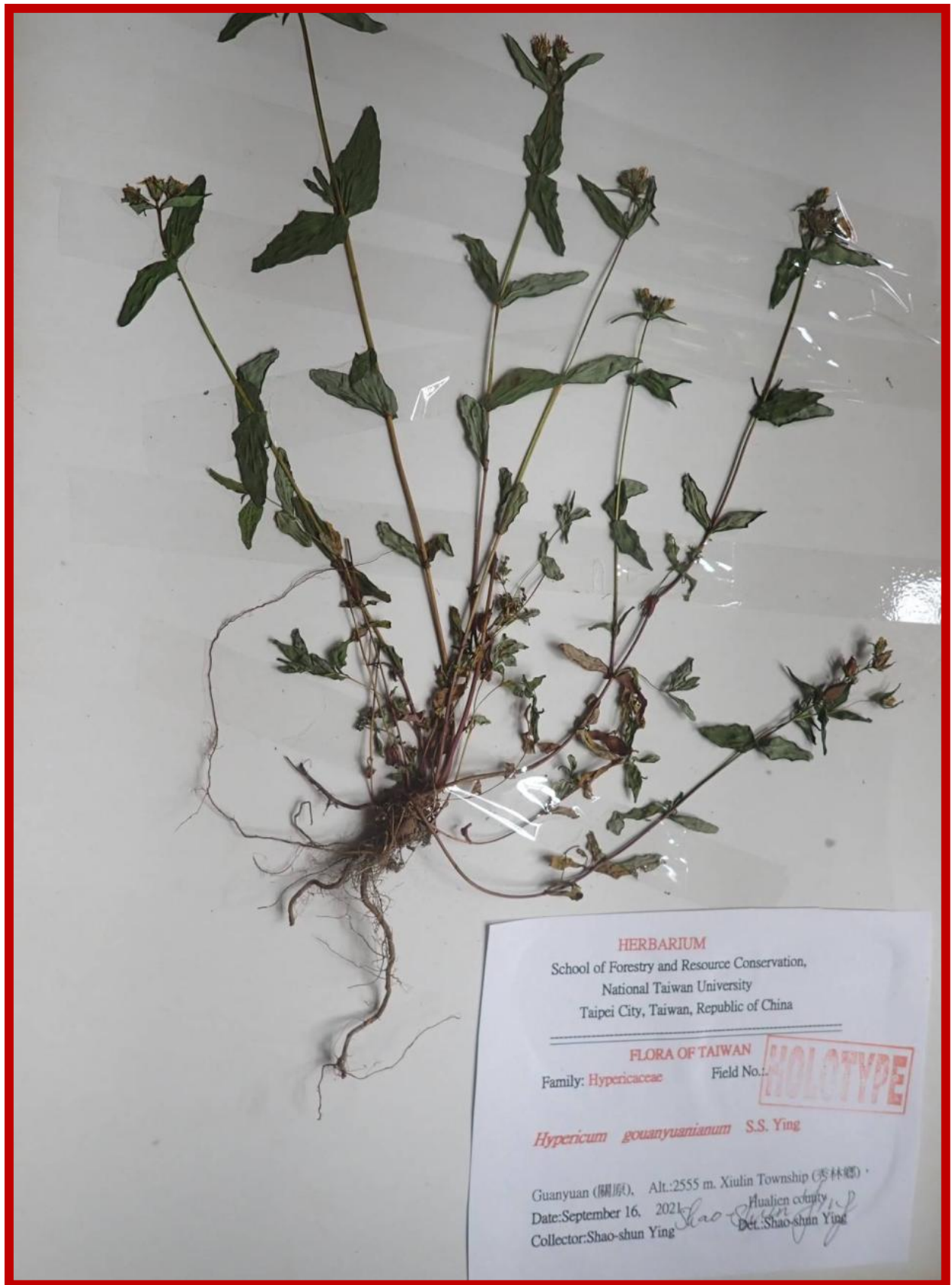


Fig.357. *Hypericum gouanyuanianum* S.S. Ying, the holotype NTUF-110-053.

### Distribution and phenology.

The species is endemic in Taiwan, It is known from on mountain slopes on the edage of a coniferous and broadleaved mixed forest (*Picea morrisonicola* Hayata, *Pinus taiwanensis* Hayata and *Quercus semecarpifolia* Sm.) at the elevation between 2600 and 2450m and between Tayulin (大禹嶺) and Guanyuan (關原) Hualien county , eastern Taiwan . Its flowering time is September to October.



Fig.358. *Hypericum gouanyuanianum* S.S. Ying, the habitat



## 27.A New Species of Genus *Brassica* (Brassicaceae) from Taiwan

*Brassica taiwanensis* S.S. Ying

*Brassica taiwanensis* S.S. Ying, *sp. nov.* 台灣野菜

TYPE:TAIWAN. Taichung City,Hoping District (和平區), Hsuehshan (雪山) 1850 m alt. *S. S. Ying*, *s.n.* September 02, 2021. (holotype, NTUF).



Fig.359. *Brassica taiwanensis* S.S. Ying, the plants

**Morphology** : Annual herbs about 120 cm tall; taproots somewhat fleshy, 2-3.5 cm long, 5-6 mm across; fibrous root many. slender; stem erect to ascending, simple to branched, terete, hollow, green, glabrous; branches slender, erect to ascending, green, glabrous. Leaves radical and cauline; the radical ones simple, alternate, oblong to oblong-elliptic, 22-32 cm long, 6.5-8.5 cm wide, obtuse at apex, attenuate to the petioles at base, chartaceous, deeply cleft to double serrate at margins, glabrous on both surfaces, midrib and lateral veins (5-7 per side) slightly impressed





Fig.360. *Brassica taiwanensis* S.S. Ying, the radical leaves



-285- Fig.361. *Brassica taiwanensis* S.S. Ying, A radical leaf



surface and elevated beneath; the petioles 6-9 cm long, grooved, glabrous; cauline leaves oblong, oblong-lanceolate to lanceolate, 10-18 cm long, 2.5-4 cm wide, obtuse at apex, attenuate to the petioles at base, double serrate at margins, midrib and lateral veins (3-5 per side) slightly impressed surface and elevated beneath; the petioles 2.5-5 cm long, grooved, glabrous.



Fig.362. *Brassica taiwanensis* S.S. Ying, the inflorescences

Flowers numerous, yellow, 6-8 mm in diameter and somewhat capitate-like when opened, in a terminal 30-60 cm long panicle; the panicles often with 4-7 racemes; the racemes ascending, 15-30 cm long, glabrous, with 10-35 flowers; bracts absent; pedicels 5-8 mm long, green, glabrous; sepals 4, lanceolate, 4.5-6 mm long, 2-3 mm wide, obtuse at apex, involute, pale green to pale yellow, glabrous; petals 4, oblong to ovate-oblong, 5-6.5 mm long, 3.5-4 mm wide, obtuse at apex, slightly clawed at base, yellow, glabrous; stamens 6, tetradynamous, filaments slender, 2.5-3.5 mm long, yellow; anthers oblong, 2mm long, obtuse at apex; nectar glands confluent; median glands present; ovary cylindric, 2.5-3 mm long, glabrous, green; style short, 0.6-0.8 mm long; stigma capitate.





Fig.363. *Brassica taiwanensis* S.S. Ying, close-up of flowers



Fig.364. *Brassica taiwanensis* S.S. Ying, flowers and fruits





-288- Fig.365. *Brassica taiwanensis* S.S. Ying., the holotype NTUF-110-054.





Fruits dehiscent siliques, slender, terete, 3.5-5.5 cm long, 2-2.5 mm across, stipitate, smooth or slightly torulose, dehiscent 2-valved when mature; valves with 1 midvein, lateral veins inconspicuous, glabrous; seeds 6-15 in per fruit, 1-seriated, rounded, 1.5-2.0 mm in diameter, glabrous, light brownish. the pedicels slender 1.5-2 cm long, glabrous.



Fig.367. *Brassica taiwanensis* S.S. Ying, in its natural habitat on Hsuehshan

#### **Diagnosis.**

*Brassica taiwanensis* is characterized by its oblong to oblong-elliptic, 22-32 cm long, 6.5-8.5 cm wide radical leaves which deeply clefted to double serrate at margins; and numerous, yellow flowers, which 6-8 mm in diameter and somewhat capitate-like when opened, arranged in a terminal 30-60 cm long panicle.

#### **Distribution and phenology.**

The species is endemic in Taiwan, It is known from on mountain slopes in the wild at the elevation between 1800 and 2250m at Hsuehshan (雪山) area, Heping District (和平區), Taichung City, central Taiwan. Its flowering time is August to September, and fruiting time from September to October.



Fig.368. *Brassica taiwanensis* S.S. Ying, the inflorescence



-291- Fig.369. *Brassica taiwanensis* S.S. Ying, the habitat



## 28.A New Species of Genus *Berberis* (Berberidaceae) from Taiwan

*Berberis yangtoushanensis* S.S. Ying

*Berberis yangtoushanensis* S.S. Ying, *sp. nov.* 羊頭山小檗

TYPE:TAIWAN. Taichung City,Hoping District (和平區), yangtoushan (羊頭山) 2840 m alt. *S. S. Ying*, *s.n.* October 20, 2021. (holotype, NTUF).



Fig.370. *Berberis yangtoushanensis* S.S. Ying, the fruiting plant

**Morphology** : A evergreen small shrub, about 120-150 cm tall; much branches from the base; branches 79-110 cm long, terete, lightly brownish, glabrous; branchlets 35-70 cm long, terete, glabrous[ spines, 2-4-, mostly 3-fid, lightly brownish, 8-13 mm long. Leaves 3-5 fascicled, lanceolate to linear-lanceolate, 2-3 cm long, 5-7 mm wide, acuminate at apex, attenuate at base, coriaceous, 3-5-spinulose-serrulate on each side at margins, lustrous and somewhat dark green surface, glaucous and pale green beneath; glabrous on both surfaces; midrib impressed surface and elevated beneath, lateral veins inconspicuous. Petioles 2-4 mm long, glabrous.



Fig.371. *Berberis yangtoushanensis* S.S. Ying, close-up of branchlets and leaves



Fig.372. *Berberis yangtoushanensis* S.S. Ying, the plant





Fig.373. *Berberis yangtoushanensis* S.S. Ying., the holotype NTUF-110-056.

Flowers 4-6 fascicles on the leaf-axils, pedicels 0; bracts minute, lanceolate, 2-3 mm long; sepals, petals and stamens unknown and will be described next year of this book, ovary ovoid, 4-ovuled, glabrous; style short, column-like; stigma capitate.



Fig.374. *Berberis yangtoushanensis* S.S. Ying, close-up of fruits

Fruits 4-6 fascicled at leaf-axils, ovoid, 8-10 mm long, 4-6 mm wide, pruinose, dark purple when mature, obtuse torounded at apex; siyle persistent, like a disc, 4 seeds in each fruit. Seeds fusiform, 1.5-2 mm long, about 1.5 mm wide, dark brown, lustrous, glabrous, aril absent, usually only 2 seeds germinated; pedicels absent.

#### **Diagnosis.**

*Berberis yangtoushanensis* is characterized by its small tree, lanceolate to linear-lanceolate, glaucous beneath leaves, 4-6 axillary flowers, dark purple, pruinose fruits.





Fig.375. *Berberis yangtoushanensis* S.S. Ying, the plant





Fig.376. *Berberis yangtoushanensis* S.S. Ying, close-up of seeds, just one fruit contained

**Distribution and phenology.**

*Berberis yangtoushanensis* is endemic in Taiwan, It is known from Yangtoushan (羊頭山) , Hoping District (和平區), Taichung City , northern Taiwan°. It was collected at rich loam of forest edges about 2850 m. elevation. Its flowering time from May to June.and fruiting time from October to November. °



-297- Fig.377. *Berberis yangtoushanensis* S.S. Ying,, another plant



29. A New Species of Genus *Gentiana* and A new combination of genus *Swertia*  
(Gentianaceae) from Taiwan

A. A New Species of Genus *Gentiana* from Taiwan

*Gentiana taiwanialboflora* S.S. Ying

*Gentiana taiwanialboflora* S.S. Ying, *sp. nov.* 台灣白花龍膽

TYPE: TAIWAN. I-Lan County, Tatung Township (大同鄉), Siyuanyakou (思源埡口) 1920 m alt.  
*S. S. Ying*, *s.n.* April 08, 2021. (holotype, NTUF).



Fig.378. *Gentiana taiwanialboflora* S.S. Ying., close-up of plants

**Morphology** : An annual herb, about 1.5-2.5 cm tall; stem simple to branched at base, somewhat  
-298-

fleshy, pale purplish to pale green, glabrous; branches slender, 2-4 cm long, ascending, pale purplish, glabrous. Leaves simple, opposite, lanceolate to ovate-lanceolate, 2.5-6 mm long, 1-2.5 mm wide, acuminate at apex, amplexicual at base, slightly fleshy, entire at margins, glabrous on both surface, lustrous green surface and pale green tinged with purple beneath; 3-nerved impressed surface and elevated beneath, lateral veins inconspicuous. Petioles absent.



Fig.379. *Gentiana taiwanialboflora* S.S. Ying., the leaves (lanceolate ones)

Flower solitary, terminal on the branches, white with pale yellow throat and scattered pale yellow spots at lobe-base, 1-1.2 cm in diameter when opened, scentless; pedicels 8-15 mm long, erect to ascending, purplish red, glabrous; calyx tubular, 2.5-4 mm long, about 2.5 mm wide, 5-lobed at apex, green tinged with purplish red; lobes lanceolate, 2-3 mm long, about 1.2 mm wide, acuminate at apex, green tinged with purplish red, membranous; corolla widely campanulate, 1-1.2 cm in diameter, 5-lobed at apex; lobes ovate, 2.5 mm long, 2-2.5 mm wide, obtuse and with apiculate at apex, entire at margins; plicae broadly lanceolate to oblong, same length to slightly longer than lobes, acuminate at apex, entire at margins; stamens 4-5, inserted just below middle





Fig.380. *Gentiana taiwanialboflora* S.S. Ying., close-up of flower

tube, filaments 1-1.5 mm long, whitish; anthers seniform, 0.3 mm across, pink to white; style 1.5-2.5 mm long, white; stigma lobes linear, 0.05 mm long, pink; ovary somewhat ovoid, 0.4 mm across, pale yellow; glands 5, minute, at ovary base; gynophore slender, white, glabrous.

Fruit a capsule, ovoid, 2.5-3.5 mm long, about 2 mm wide, green, glabrous, 2-valved dehiscent when mature; the valves usually with apiculate at apex, pink to purple, with obscure serrulate wings along sutures; gynophore elongate, 3.5-4 mm long, pale white, glabrous; calyx persistent, subtended the fruit. Seeds numerous, minute, ellipsoid, 0.4-0.6 mm, somewhat lustrous; seed coat minutely reticulate, rugose.

### **Diagnosis.**

*Gentiana taiwanialboflora* is characterized by its small leaves and flowers, the corolla white with pale yellow throat and scattered pale yellow spots at lobe-base, and plicate broadly lanceolate



Fig.381. *Gentiana taiwanialboflora* S.S. Ying,, the habitat



Fig.382. *Gentiana taiwanialboflora* S.S. Ying,, the plant



to oblong, same length to slightly longer than lobes, acuminate at apex, entire at margins.



Fig.383. *Gentiana taiwanialboflora* S.S. Ying., fruiting plant

**Distribution and phenology.**

*Gentiana taiwanialboflora* 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 collected at limestone area about 12850 m. elevation. Its flowering time from April to May and fruiting time from May to late July.

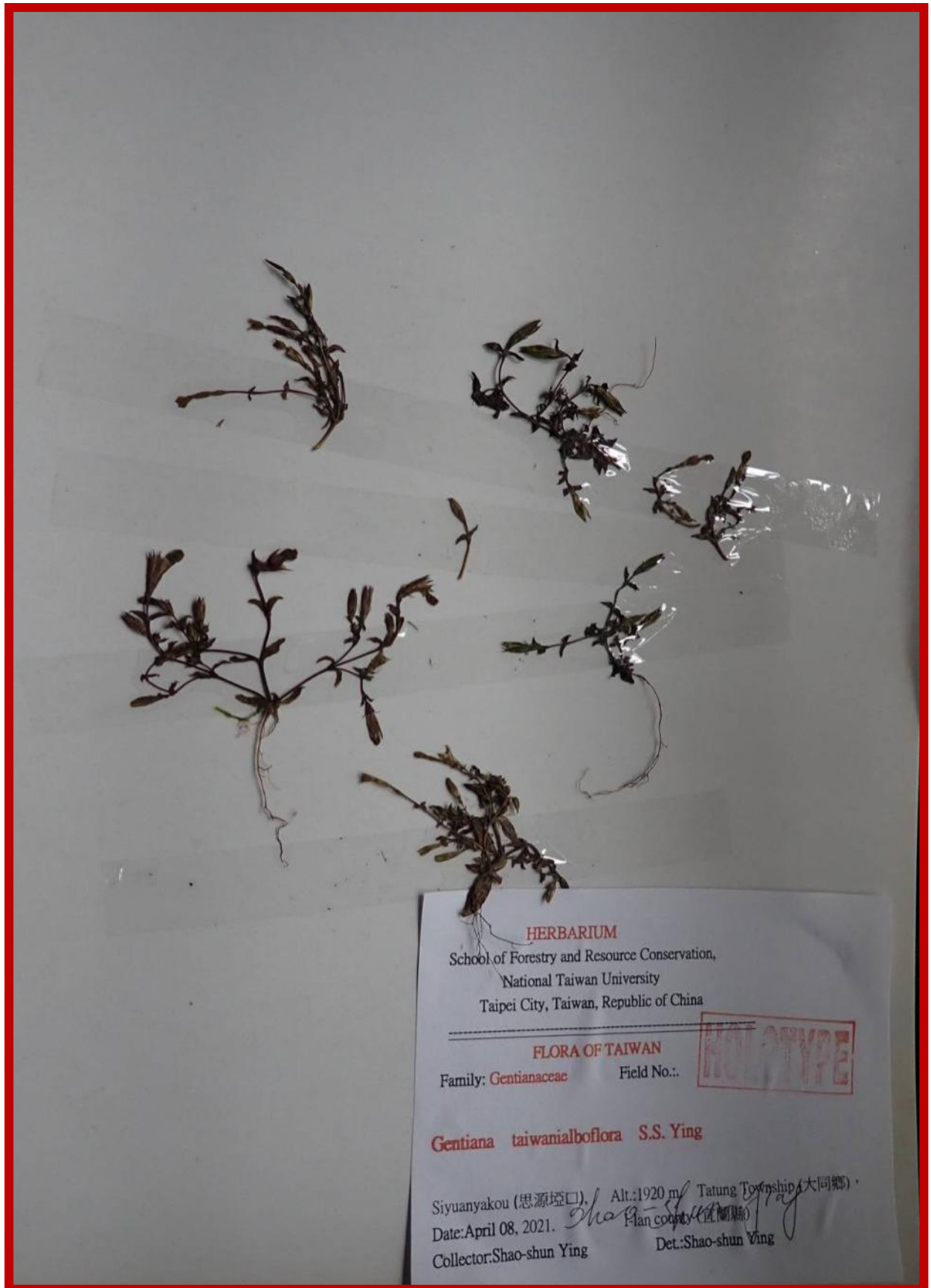


Fig.384. *Gentiana taiwanialboflora* S.S. Ying,, fruiting plants



-303- Fig.385. *Gentiana taiwanialboflora* S.S. Ying,, close-up of flower





-304- Fig.386. *Gentiana taiwanialboflora* S.S. Ying., the holotype NTUF-110-057.

B.A new combination of genus *Swertia* (Gentianaceae) from Taiwan

*Swertia bimaculata* subsp. *tozanensis* (Hayata) S.S. Ying, *comb. nov.* 塔山當藥

*Swertia tozanensis* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 204 1911.

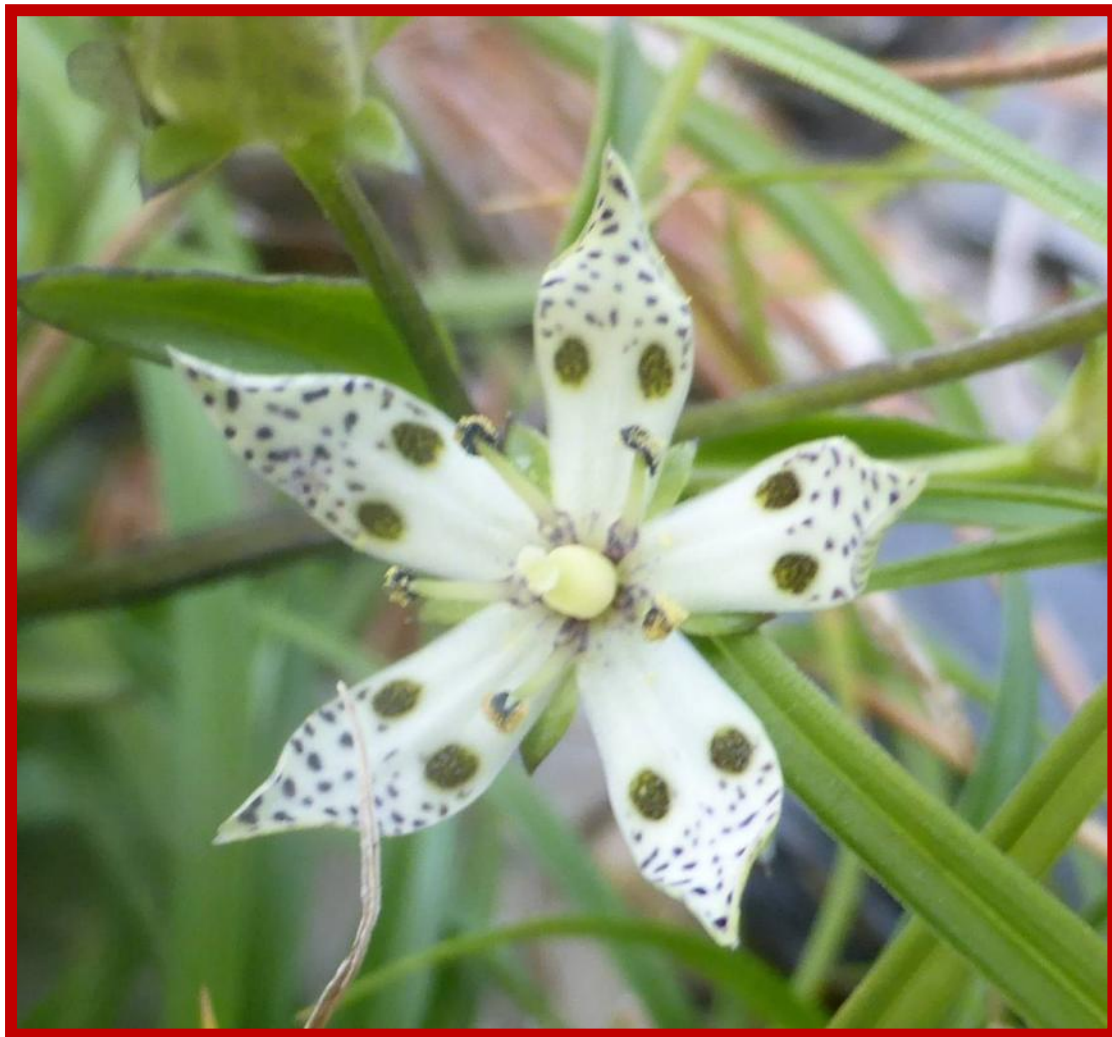


Fig.387. *Swertia bimaculata* subsp. *tozanensis* (Hayata) S.S. Ying., the flower

*Swertia tozanensis* was described by Hayata in 1911, it is an endemic species of Taiwan, compared flowers characters of a widespread species, *S. bimaculata* (Siebold & Zuccarini) J. D. Hooker & Thomson ex C. B. Clarke, which grows in Mainland China (Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang), Bhutan, India, Japan, Malaysia, Myanmar, Nepal, Sikkim and Vietnam. there are much similar, except the petals of our species somewhat narrower,





Fig.388. *Swertia bimaculata* (Siebold & Zuccarini) J. D. Hooker & Thomson ex C. B. Clarke, the flower

Double-spotted Swertia: *Swertia bimaculata* [Synonym: *Ophelia bimaculata*] - Family: Gentianaceae | Unusual flowers, Beautiful flowers, Flower seeds (pinterest.com)

black spots on apex of petals more densely. Meanwhile, our species smaller than *S. bimaculata*, 15-25 cm tall and oblong-lanceolate to lanceolate, 1.5-3 cm long, 5-7 mm wide leaf blade relative to 30-140(-200) cm tall and broadly elliptic to ovate-lanceolate, 3.5-9 cm long, 1-4(-5) cm wide leaf blade. I am inclined to treat our species as a subspecies of *S. bimaculata*.



Fig.389. *Swertia bimaculata* subsp. *tozanensis* (Hayata) S.S. Ying,, the plants



-307- Fig.390. *Swertia bimaculata* subsp. *tozanensis* (Hayata) S.S. Ying,, close-up of flower





Fig.391. *Swertia bimaculata* subsp. *tozanensis* (Hayata) S.S. Ying,, the habitat



Fig.392. *Swertia bimaculata* subsp. *tozanensis* (Hayata) S.S. Ying,, the habitat

### 30.A New Combination of genus *Senna* (Fabaceae) from Taiwan

*Senna sophera* (Linn.) Roxb. var. *penghuana* (Y.C. Liu et F. Y. Lu) S.S. Ying, *comb. nov.*

澎湖決明

*Cassia sophera* Linn. var. *penghuana* Liu et Lu, Quart. J. Chin. For. 12(4):76-77(1979).

The variety endemic to Taiwan.

### 31.Taxonomic Notes on the Family Orchidaceae inTaiwan (1)

#### A.One New Species of Orchidaceae in Taiwan

#### 1. *Vexillabium* (*Odontochilus*) *gouanyuanensis* S.S. Ying

*Vexillabium* (*Odontochilus*) *gouanyuanensis* S.S. Ying, sp.nov. 關原全唇蘭

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉) , Guanyuan (關原) 2455 m alt. *S. S. Ying* , s.n.August 19 , 2021 ° (holotype, NTUF) °

**Morphology** : Terrestriis, hizome creeping, hortizontal, 6-8 cm long, somewhat fleshy, pale purplish, glabrous; roots few produced from nodes, short and fleshy, white, 4-10 mm long. Flowering plant 12-16 cm tall. Stem simple, prostrate at base, 4-5.5 cm long, pale purplish, fleshy, glabrous.

Leaves 3-5, simple, alternate, ovate to ovate-oblong, 5-15 mm long, 5-12 mm wide, acuminate at base, cordate at base, slightly fleshy, entire and very short ciliate at margins, scattered short hairy surface and glabrous or nearly so beneath, dark green surface and pale purplish beneath, 3-nerved at base, impressed surface and elevated beneath; petioles 7-10 mm long, pale purplish,glabrous, amplexucal at base.

Flowers 4-5, 4-6 mm in diameter when opened, in a terminal spike; the peduncle 6-8 mm long, erect to ascending, pale purplish, glabrous; 2-3 sheath-bracts at base and middle of peduncle; ,





Fig.393. *Vexillabium (Odontochilus) gouanyuanensis* S. S. Ying, the habitat



Fig.394. *Vexillabium (Odontochilus) gouanyuanensis* S. S. Ying, stem and leaves



sheath-bracts tubular-like, 8-12 mm long, 2-3 mm wide, acuminate at apex, amplexual at base, membranous, glabrous; inflorescence 2-3 cm long, glabrous to scattered few hairs; bracts lanceolate, 8-11 cm long, 3-4 mm wide, acuminate at apex, amplexual at base, pale red, glabrous; pedicel with ovary 4-6 mm long, glabrous; dorsal sepal ovate-oblong,concave, 4-5 mm long, 2.5-3 mm wide, acute at apex, green tinged with putplish brown, glabrous; lateral sepals lanceolate, 4.5-5.5 mm long, obtuse at apex, light purplish brown, glabrous; petals falcate-oblong, 3.5-4.5 mm long, 2-3 mm wide, acute at apex, lip squarw-like, 3.5-4 mm long, 4-5 mm wide, shallowly 2-lobed or emarginate at apex, white, glabrous; the lobes unequal, 1.5-2 mm long, obtuse at apex;



Fig.395. *Vexillabium (Odontochilus) gouanyuanensis* S. S. Ying, the inflorescence





Fig.396. *Vexillabium (Odontochilus) gouanyuanensis* S. S. Ying, the plants



Fig.397. *Vexillabium (Odontochilus) gouanyuanensis* S. S. Ying, sepals and lip



mesochile smooth; spur 1.5-2.5 mm long, 1.5mm across, light brown, glabrous; column about 2 mm long, oblong in outline; rostellum bifid with unequal arms; pollinia 2,

### Diagnosis.

*Vexillabium (Odontochilus) gouanyuanensis* is characterized by:

1.Lin, T.P (2019) followed Yukawa, T. (2016) treated genus *Vexillabium* as congeneric with genus *Odontochilus*. However, as in morphological perspective, differentness between two grnera are so clear, I would like to treat them as a distinct genus each other here.

2.The species was found 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, It is highest elevation for Taiwan *Vexillabium* species growing.

3.Near to *V. yakushimaensis* (Yamamoto) Naek. but our species is rather small, the leaves dark green in colour, 3-nerved at base; flowers rather smaller too, and glabrous on its sepals and petals; the lip also smaller, shallowly 2-lobed or emarginate at apex, the lobes unequal and obtuse at apex.



Fig.398. *Vexillabium (Odontochilus) gouanyuanensis* S. S. Ying, the habitat  
( the leaves of *Quercus semecarpifolia* Sm. are on ground)



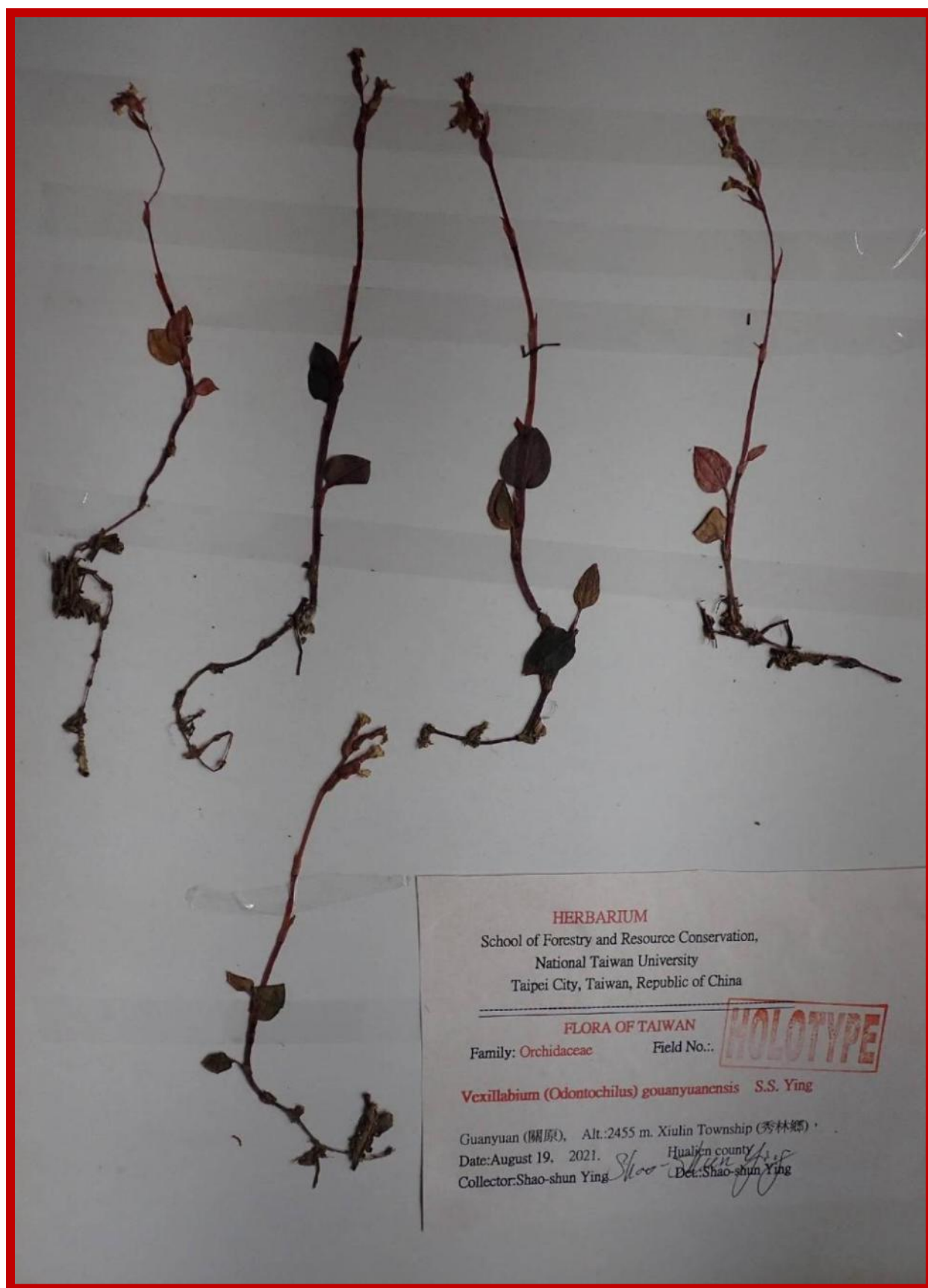


Fig.399. *Vexillabium (Odontochilus) gouanyuanensis* S. S. Ying, the holotype NTUF-110-058.



Fig.400. *Vexillabium (Odontochilus) gouanyuanensis* 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.

#### **B.The correct name of *Tulotis taiwaniana* S.S. Ying**

*Plantanthera taiwaniana* (S.S. Ying) S. S. Ying, Col Illust. Orchid. Taiwan 1:294& 494 (1977) & 2:649 (1990).

*Tulotis taiwaniana* S. S. Ying, Quart.Journ. Chin. Forest. 8(4)144 (1975) & Col.Alp. Pl. Taiwan 1:73. col. photo100 (1975).

*Platanthera taiwanensis* (S.S.Ying) S. C. Chen, S. W. Gale & P. J. Cribb, Fl. China. 25: 114. (2009).



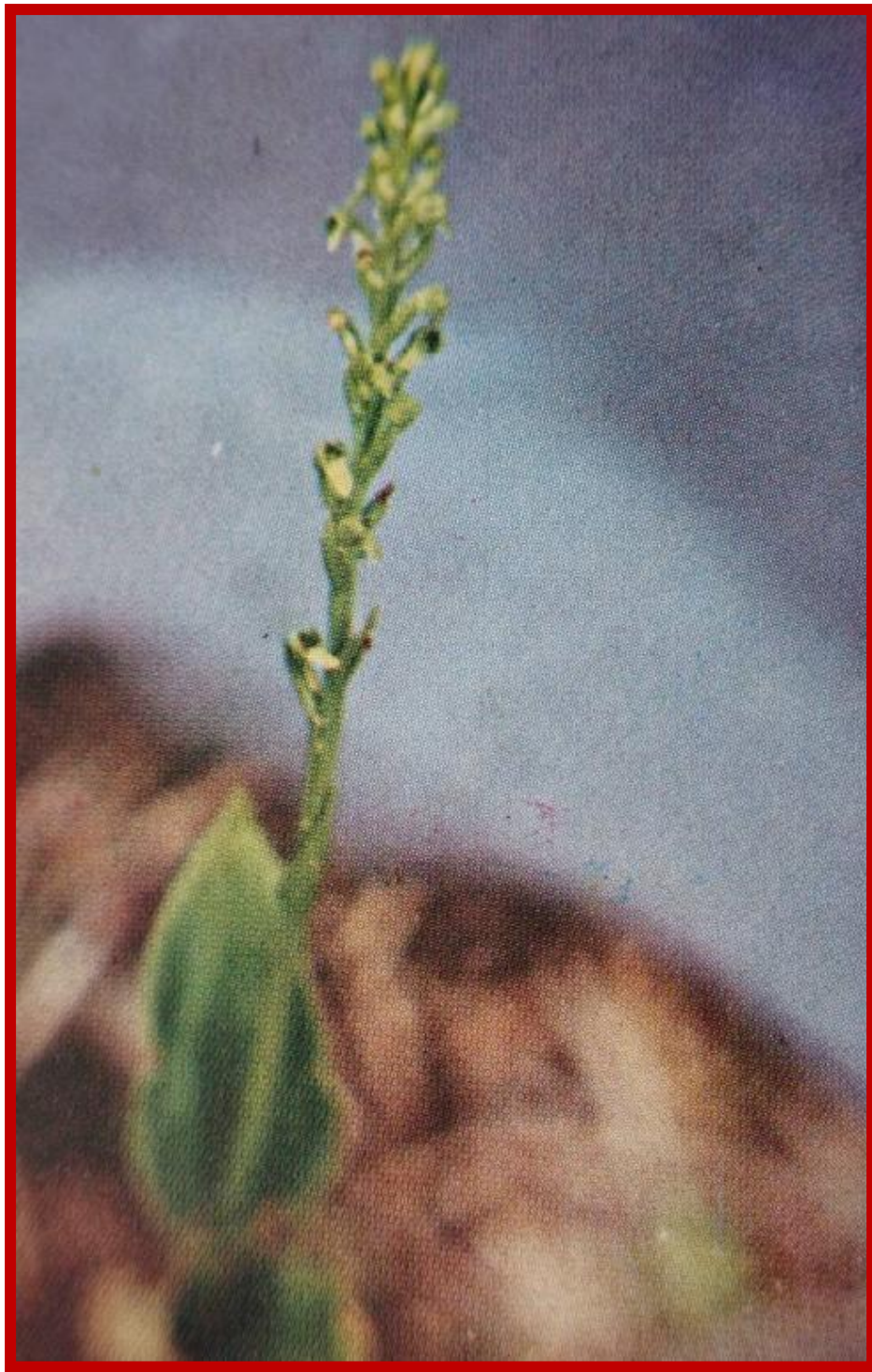


Fig.401. *Plantanthera taiwaniana* (S.S. Ying) S. S. Ying, the type plant

*Tulotis taiwaniana* S. S. Ying, the species was transferred to genus *Plantanthera* in 1977, as *Plantanthera taiwaniana* (S.S. Ying) S. S. Ying.

C.A new combination of genus *Holcoglossum* from Vietnam orchid

*Holcoglossum phongii* (Aver.) S.S. Ying, *comb. nov.* 越南槽舌蘭

*Aerides phongii* Aver., Turczaninowia 17(1):6 (2014)

8

Averyanov L.V., Loc P.K., Canh C.X.  
*Aerides phongii* (Orchidaceae), a new species from Southern Vietnam

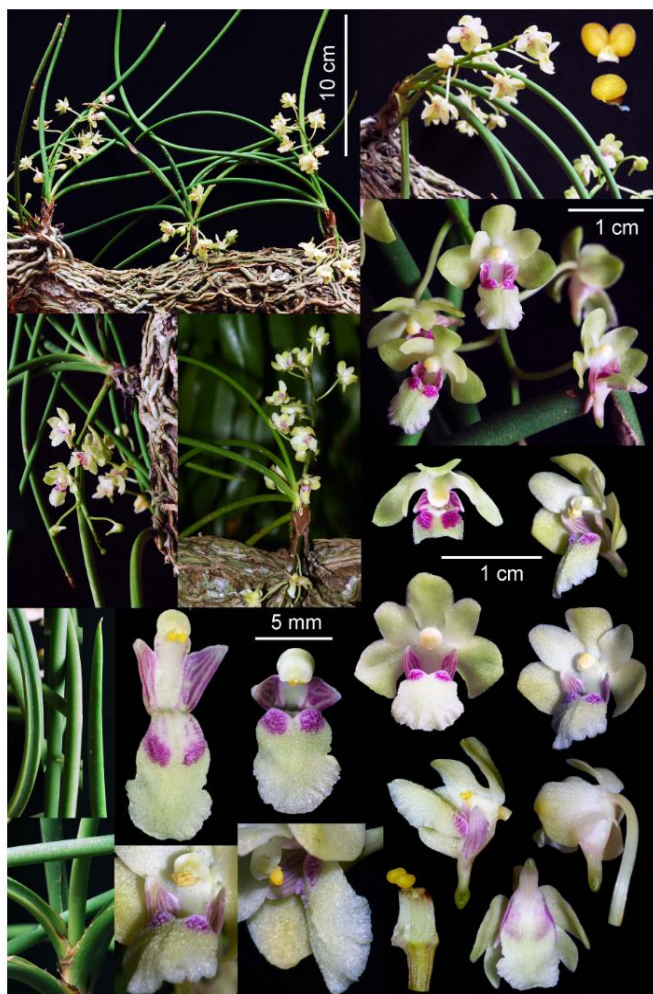


Fig. 1. *Aerides phongii* Aver. Flowering plants, flowers and floral details (all photos from the type specimens by Phan Ke Loc and Chu Xuan Canh, image correction and design by Leonid V. Averyanov).

Reprinted from Turczaninowia 17(1):8 (2014)

The species fits the characters of genus *Holcoglossum* very well , I transferred it to genus *Holcoglossum*.



## 32.Taxonomic Notes on the Family Asteraceae inTaiwan (2)

### A.Seven New Species of Asteraceae in Taiwan

#### 1. *Paraprenanthes nanhutashanensis* S.S. Ying

*Paraprenanthes nanhutashanensis* S.S. Ying, sp.nov. 南湖大山假福王菊

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Nanhutashan (南湖大山) 2050 m alt.  
*S. S. Ying* , *s.n.* October 07, 2021 ° (holotype , NTUF) °



Fig.402. *Paraprenanthes nanhutashanensis* S. S. Ying, the inflorescences

**Morphology** : An annual herb, root rhizome-like, slightly fleshy, 2-3.5 cm long, creeping; fibrous  
-318-





Fig.403. *Paraprenanthes nanhutashanensis* S. S. Ying, the habitat, grows along a small creek  
-319-





-320- Fig.404. *Paraprenanthes nanhutashanensis* S. S. Ying, radical and cauline leaves



roots numerous, slender. Stem simple, not branched, 120-195cm long, erect to ascending, glabrous, hollow, lactate, green. Leaves radical and cauline; the radical ones basal and lower part of the stem, pinnate, 23-35 cm long, 12-17 cm wide, 5-7 leaflets, petioles terete, 15-19 cm long, green, glabrous; the terminal one ovate-triangular, 15-18 cm long, 7-9 cm wide, acuminate at apex, cuneate at base, somewhat oblique, chartaceous, remotely dentate with a mucro at apex and ciliate at margins, scattered short and soft hairs on both surfaces, midrib and lateral veins (2-4 per side) impressed surface and elevated beneath; petioles 1.4-1.8 cm long, hairy; lateral leaflets 2-3 pairs, alternate to nearly opposite, oblong to broadly lanceolate, 4-8 cm long, 3-3.5 cm wide, acute at apex, obtuse at base, other parts like the terminal one; cauline leaves ternate to simple; the ternate ones at lower-middle of stem, the terminal leaf like the terminal leaf of pinnate but



Fig.405. *Paraprenanthes nanhutashanensis* S. S. Ying, radical leaves

but somewhat smaller, 12-15 cm long, 8-10 cm wide, petioles 1.4-2 cm long, green, glabrous; the lateral leaflets opposite or nearly so, oblong, 7-9 cm long, 3.5-4.5 cm wide, sessile' simple leaves on the upward of stem, lanceolate to broadly lanceolate, 12-20 cm long, 3.5-4.5 cm wide, acuminate apex, cuneate at base, chartaceous, crenate and with a mucro at apex at margins, petioles 3-3.5 cm long, green, glabrous.





Fig.406.*Paraprenanthes nanhutashanensis* S. S. Ying, in its natural habitat on Nanhutashan  
-322-





Fig.407. *Paraprenanthes nanhutashanensis* S. S. Ying, the synflorescence



Fig.408. *Paraprenanthes nanhutashanensis* S. S. Ying, capitula in panicle



Synflorescence 85-130 cm long, green, glabrous or nearly so, erect to ascending, widely compound paniculiform, often with 10-15 panicles 9-15 cm long; each panicle with 6-12 racemes, each raceme 4-10 cm long, green, glabrous, with 3-8 single or pair pendent capitula; pedicels slender, 1-1.5 cm long, green, glabrous; bracts linear, 2-3 mm long, about 1 mm wide, acute at



Fig.409. *Paraprenanthes nanhutashanensis* S. S. Ying, capitula in ramces

apex, green, glabrous; involucre cylindric, 8-10 mm long, 2.5-3.5 mm wide, glabrous; phyllaries 3 series, imbricate; the outer ones smaller, lanceolate, 1.2-1.5 mm long, 2.5-3 mm wide, green, acute at apex; middle ones lanceolate, 2-3.5 mm long, 1-1.5 mm wide, green tinged with purple, acute at apex; the outer lanceolate, 4.5-6.5 mm long, 1.3-1.6 mm wide, acute at apex, purplish red; florets 5, corolla open one side, 8-10 mm long, 1.5-2.5 mm wide, white and dark purple at apex, truncate and 5-toothed at apex, glabrous; anther tubes 5, 4-5 mm long, black, exserted the corolla-tube, 5-toothed at apex, anther cylindrical, 2.5-3 mm long, opened on terminal; ovary clindrical, 1-1.6 mm long, glabrous, pale yellow; style elongate, purplish red, 12-15 mm long, 2-lobed at apex; stigma capitate, white; papus numerous, white, 4-5 mm long, silk-like. .



Fig.410. *Paraprenanthes nanhutashanensis* S. S. Ying, close-up of the capitula



Fig.411. *Paraprenanthes nanhutashanensis* S. S. Ying, close-up of the capitula





-326- Fig.412. *Paraprenanthes nanhutashanensis* S. S. Ying, the holotype NTUF-110-059.



Fig.413. *Paraprenanthes nanhutashanensis* S. S. Ying, the isotype NTUF-110-060.





Fig.414. *Paraprenanthes nanhutashanensis* S. S. Ying, close-up of the a fruit

Achenes cylindrical, 5-6 mm long, about 1.3 mm wide, laterally compressed, light brownish, smooth, with 5-6 longitudinal ribs; apical rim forming a smooth-margined upright crown; pappus 10-15 mm long, without plumose bristles, usually forming basal ring.

#### **Diagnosis.**

*Paraprenanthes nanhutashanensis* is an unique species of the genus *Paraprenanthes*, it has three kinds of leaves, pinnate, ternate and simple; capitula numerous, forming a compound panicle 85-130 cm long synflorescence; each capitulum with 5 florets; corolla open one side, 8-10 mm long, 1.5-2.5 mm wide, white and dark purple at apex.

#### **Distribution and phenology.**

*Paraprenanthes nanhutashanensis* is endemic in Taiwan, It is known from Nanhutashan (南湖大山), Hoping District (和平區), Taichung City, northern Taiwan. It was collected along a small creek about 2050 m. elevation. Its flowering time from September to October and fruiting time from October to November. °

## 2. *Paraprenanthes yangtoushanensis* S.S. Ying

*Paraprenanthes yangtoushanensis* S.S. Ying, sp.nov. 羊頭山假福王菊

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , yangtoushan (羊頭山) 2750 m alt. *S. Ying* , s.n. October 20, 2021 . (holotype , NTUF) .



Fig.415. *Paraprenanthes yangtoushanensis* S. S. Ying, the plant

**Morphology :** An annual herb, root corm-like, ovoid, 8-10 mmlong in diameter, fleshy; roots 6-10 produced from corm, slender, 6-12 cm long, 1 mm wide, glabrous. Stemless. Leaves radical, basal simple, ovate to ovate-rounded, 4-8 cm long, 4.5-8 cm wide, acuminate to obtuse at apex, deeply cordate at base, chartaceous, remotely obscurely dentate with a mucro at apex at margins, glabrous on both surfaces, palmately veins impressed surface and elevated beneath, lateral veins 2-3; lustrous green surface and slightly glaucous beneath; petioles 4.5-8 cm long, terete, slightly groove, glabrous.

Scape produced from leaf-fascicle, erect to ascending, 40-85 cm long, green, glabrous, leafless or sometime (the larger one) with 1 leaf at base of the scape; if so, the leaf triangular, 5-6.5 cm long, aboutt 5-6 cm wide at base, acuminate at apex, truncate at base; synflorescence 20-45 cm long, green, glabrous, erect to ascending, widely compound paniculiform, oftenwith 5-10 panicles





Fig.416. *Paraprenanthes yangtoushanensis* S. S. Ying, the leaves



Fig.417. *Paraprenanthes yangtoushanensis* S. S. Ying, compound paniculiform synflorescence





Fig.418. *Paraprenanthes yangtoushanensis* S. S. Ying, part of compound paniculiform synflorescence



Fig.419. *Paraprenanthes yangtoushanensis* S. S. Ying, three panicles





Fig.420.*Paraprenanthes yangtoushanensis* S. S. Ying, in its natural habitat on Yangtoushan  
-332-



5-9 cm long; each panicle with 3-6 racemes, each raceme 3-5.5 cm long, green, glabrous, with 3-5 single pendent capitula; pedicels slender, 7-12 mm long, green, glabrous; bracts triangular, 2-3 mm long, about 1.5 mm wide, acute at apex, green tinged with purplish glabrous; involucre cylindric, 8-12 mm long, 2.5-3.0 mm wide, glabrous; phyllaries 3 series, imbricate; the outer ones smaller, lanceolate, 1.5-2.5 mm long, 1.5-2 mm wide, pale purplish, acute at apex; middle ones lanceolate, 3.5-4.5 mm long, 2-2.5 mm wide, green tinged with purple, acute at apex; the outer lanceolate, 5.5-7.5 mm long, 1.5-2.6 mm wide, acute at apex, pale purplish red; florets 3, corolla open one side, 8-12 mm long, 1.5-2.5 mm wide, dark purple, truncate and 5-toothed at apex, glabrous; anther tubes 3, 4-5 mm long, 5-toothed at apex, anther cylindrical, 1.5-2 mm long, opened on terminal; ovary clindrical, 1.2-1.5 mm long, glabrous, pale brown; style elongate, purplish red, 8-10 mm long, 2-lobed at apex; stigma capitate, white; papus numerous, white, 4-6 mm long, silk-like. .



Fig.421. *Paraprenanthes yangtoushanensis* S. S. Ying, the unopened capitula





Fig.422. *Paraprenanthes yangtoushanensis* S. S. Ying, the fruits



-334- Fig.423. *Paraprenanthes yangtoushanensis* S. S. Ying, the anthers



-335- Fig.423. *Paraprenanthes yangtoushanensis* S. S. Ying, the holotype NTUF-110-061.





Fig.425. *Paraprenanthes yangtoushanensis* S. S. Ying, the isotype NTUF-110-062.

Achenes cylindrical, 4-5 mm long, about 1.2 mm wide, laterally compressed, dark brownish, smooth, with 2-4 longitudinal ribs; apical rim forming a smooth-margined upright crown; pappus 6-8 mm long, without plumose bristles, usually forming basal ring.

### Diagnosis.

*Paraprenanthes yangtoushanensis* is an unique species of the genus *Paraprenanthes*, it has simple, ovate leaves; capitula numerous, forming a compound panicle 40-85 cm long synflorescence; each capitulum with 3 florets; corolla open one side, 8-12 mm long, 1.5-2.5 mm wide, purple in color.



Fig.426. *Paraprenanthes yangtoushanensis* S. S. Ying, an opened capitum

### Distribution and phenology.

*Paraprenanthes yangtoushanensis* is endemic in Taiwan, It is known from Yangtoushan (羊頭山), Hoping District (和平區), Taichung City, northern Taiwan. It was collected at rich loam of forest edges about 2750 m. elevation. Its flowering time from October to November. and fruiting time from October to November. °



### 3. *Cirsium nanhutashanense* S.S. Ying

*Cirsium nanhutashanense* S.S. Ying, *sp.nov.* 南湖大山薊

TYPE:TAIWAN. Taichung City,Hoping District (和平區) , Nanhutashan (南湖大山) 2350 m alt.  
*S. S. Ying* , *s.n. June 17, 2021* ° (holotype , NTUF) °



Fig.427. *Cirsium nanhutashanense* S. S. Ying, the habitat

**Morphology** : Annual herbs, stems erect or ascending, simple, 30-45 cm long, unwinged, with densely white appressed hairs, hollow, smooth, without prickles. Leaves simple, alternate, oblong in outline, 9-15 cm long, 3-5 cm wide, pinnatisect at margins, lustrous green surface and glaucous beneath, midrib impressed surface and elevated beneath, scattered hirsute surface, glabrous but hirsute along midrib beneath; pinna 5-8 pairs, broadly lanceolate-triangular, 2.5-4 cm





Fig.428. *Cirsium nanhutashanense* S. S. Ying, the stem and leaves



Fig.429. *Cirsium nanhutashanense* S. S. Ying, the leaves



long, 1-2 cm wide, spinulate-serrated at margins; spines 3.5-5.5 mm long; upper cauline leaves gradually smaller.



Fig.430. *Cirsium nanhutashanense* S. S. Ying, the inflorescence

Capitulum 3-4, solitary on the upward leaf-axil, 2.5-3cm in diameter; bract 2 leaf-like, at base of capitulum and middle of pedicels, lanceolate, 2.5-4 cm long, 3-4 mm wide, acuminate at apex; pedicels 2-4 cm long, erect to ascending, glabrous to white-tomentose; involucre campanulate, 2.5-3 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; corolla light brown, 5-9 mm long, 1.5mm wide, 5-toothed at apex; the teeth minute, 0.3-0.4 mm long, acute at apex; ovary spindle-like, 1-1.5 mm long, glabrous; 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 2.5-3mm long, 5-toothed at apex, included the corolla tube, anther cylindrical, about 3 mm long, opened on terminal.





Fig.431. *Cirsium nanhutashanense* S. S. Ying, the capitulum



-341- Fig.432. *Cirsium nanhutashanense* S. S. Ying, the phyllaries





Fig.433. *Cirsium nanhutashanense* S. S. Ying, the corolla and style



Fig.434. *Cirsium nanhutashanense* S. S. Ying, the fruits



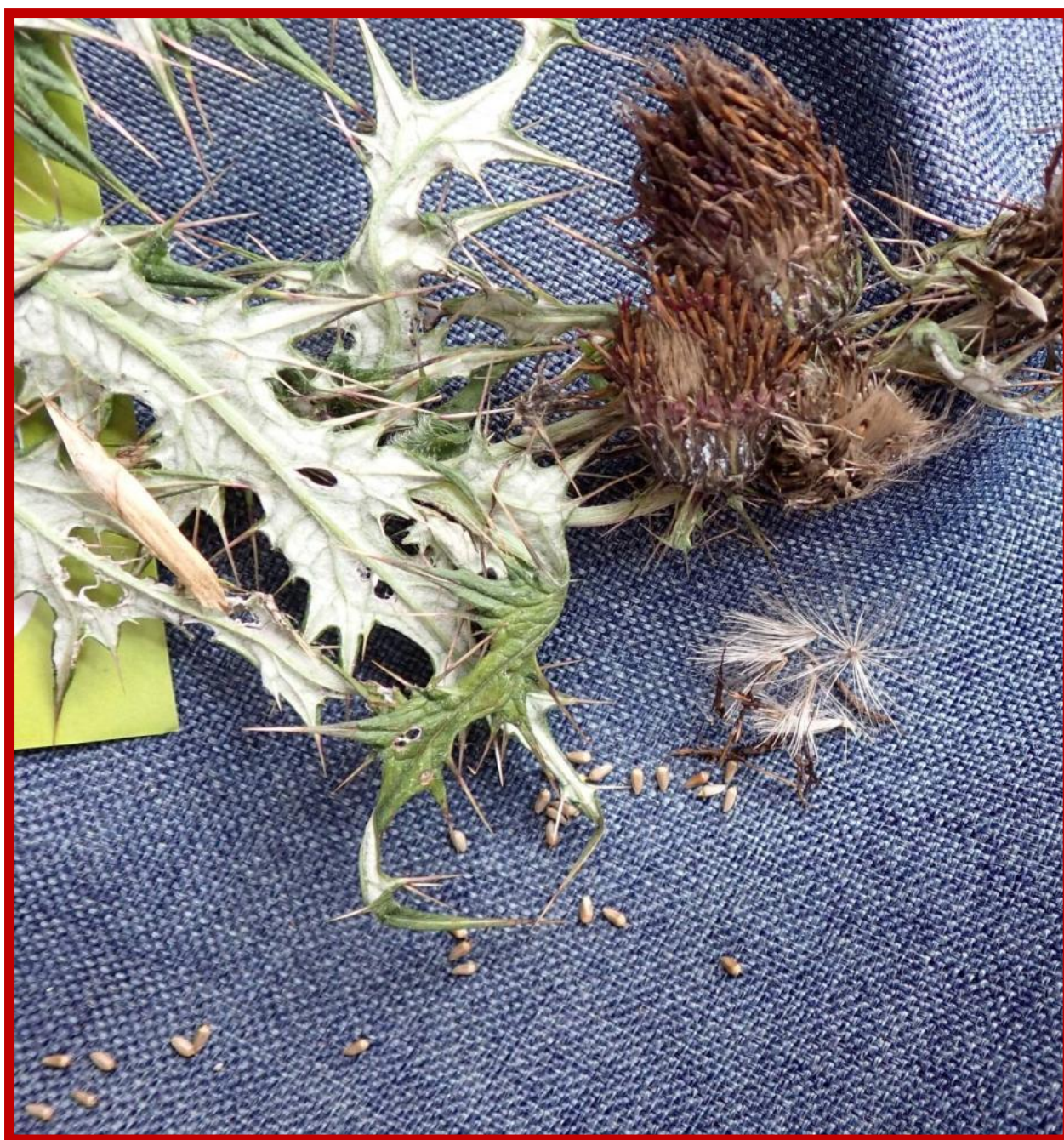


Fig.435. *Cirsium nanhutashanense* S. S. Ying, the fruits, achenes and pappus

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.

**Diagnosis.**

*Cirsium nanhutashanense* is characterized by:

- 1.Plant erect, 30-45 cm long, stem simple.





Fig.436. *Cirsium nanhutashanense* S. S. Ying, the achenes



-344- Fig.437. *Cirsium nanhutashanense* S. S. Ying, the achenes, pappi and weatheded corolla





Fig.438. *Cirsium nanhutashanense* S. S. Ying, the capitulum





-346- Fig.439. *Cirsium nanhutashanense* S. S. Ying, the holotype NTUF-110-063.

2. Capitula dioecious; involucre campanulate, contracted at apex; phyllaries 4-5 series, imbricate, uniform, the inner ones smaller, purple to red, acute and needle-like at apex, obtuse at base, glabrous, the basal ones often with elongate white hairs along margins.

3. Corolla light brown, 5-toothed at apex; the teeth minute, 0.3-0.4 mm long, acute at apex; ovary spindle-like, 1-1.5 mm; style elongate, red, 8-12 mm long, glabrous; stigma 2, minute, 0.2 mm long.

4. Achenes obovoid, 2-3 mm long, about 1.5 mm wide, smooth, sometime with 1 longitudinal ribs; pappus 8-12 mm long, with plumose bristles, usually forming basal ring, often shed.

### **Distribution and phenology.**

The species is endemic in Taiwan, It is known from Nanhutashan(南湖大山), Hoping District (和平區), Taichung City, northern Taiwan. It was discovered at under forest floor, at elevation between 2350 and 2700 meters, Its flowering time is from April to June, and fruiting from June to July.





#### 4.. *Blumea hsinbaiyangensis* S.S. Ying

*Blumea hsinbaiyangensis* S.S. Ying, *sp.nov.* 新白楊艾納香

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉), Hsinbaiyang (新白楊) 1750 m alt.  
*S. S. Ying* , *s.n.* February 25, 2021 ° (holotype, NTUF) °



Fig.441. *Blumea hsinbaiyangensis* S. S. Ying, the terminal capitals

**Morphology** : Perennial herbs about 30-40 cm high, stem erect to ascending, branched at base, branches elongate, 15-25 cm long, ascending, light brownish tomentose. Leaves simple, alternate, radical and cauline; the basal ones lanceolate, to broadly lanceolate, 5-7.5 cm long, 1-1.5 cm wide, acuminate at apex, amplexicual at base, slightly fleshy, dentate at margins, pubescent on both surface, midrib and lateral veins impressed surface and elevated beneath, green surface and pale green beneath; petioles absent. The cauline leaves lanceolate, 2.5-5 cm long, 4-10 mm wide, acuminate to obtuse at apex, amplexual at base, fleshy, dentate at margins, brownish tomentose,





Fig.442. *Blumea hsinbaiyangensis* S. S. Ying, the radical leaves



-349- Fig.443. *Blumea hsinbaiyangensis* S. S. Ying, the cauline leaves



midrib and lateral veins impressed surface and elevated beneath, dark green surface and pale green beneath; petioles absent.



Fig.444. *Blumea hsinbaiyangensis* S. S. Ying, the capital

Capitulum many, globose, 6-8 mm in diameter, 6-7 mm long, in terminal cymes; peduncles erect to ascending, 5-9 cm long, densely tomentose;; pedicels 0.5-3.5 cm long, slender, tomentose; phyllaries 3-4 series, imbricate, not reflexed; the outer ones shorter, triangular, 3-4 mm long, acute at apex, truncate at base, usually distinctly purple tipped; inner ones lanceolate, 4-6 mm long, 1-2



Fig.445. *Blumea hsinbaiyangensis* S. S. Ying, close-up of capitula

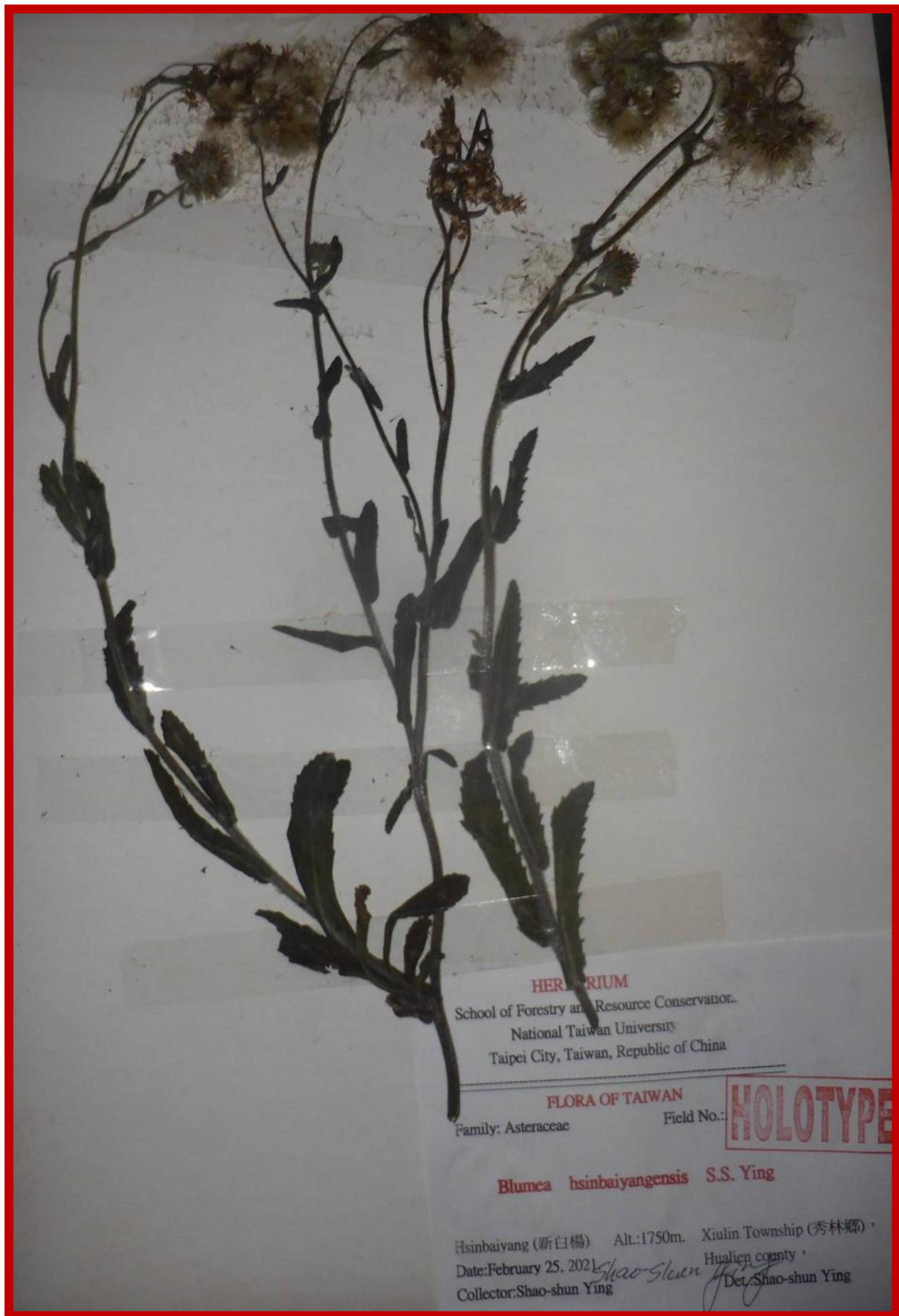
mm wide, acute at apex, truncate at base, white villose outside and glabrous inside, entire at margins, distinctly purple tipped; receptacle flat, 6-8 mm in diam., with white villose; disk florets bisexual; corolla yellow to greenish yellow, tubular; the tube 4.5-5.5 mm long, with 5 triangular lobes at apex, nearly glabrous; style slightly longer than stamens tube. Cypselas gray, oblong, 1.5-2 mm long, ribs inconspicuous; pappus numerous, white, 4.5-5.5 mm long.

**Diagnosis.**

*Blumea hsinbaiyangensis* is characterized by:

1. Plant grows on sunny dry places.
2. Plant 30-40 cm tall, branched at base, stem, branches and branchlets all tomentose.
3. Leaves radical and cauline, lanceolate to broadly lanceolate, .





-352- Fig.446. *Blumea hsinbaiyangensis* S. S. Ying, the holotype NTUF-110-064.



Fig.447. *Blumea hsinbaiyangensis* S. S. Ying, the plant

4.Capitulum 6-8 mm in diameter, many, in terminal cymes.

5.Phyllaries 3-4 series, the outer one triangular, the inner lanceolate, distinctly purple tipped;.

6.Corolla yellow to greenish yellow, 5-lobed at apex.

7.Cypselas gray, oblong; ribes inconspicuous.

#### **Distribution and phenology.**

*Blumea hsinbaiyangensis* S.S. Ying is endemic to Taiwan . It is known from Hsinbaiyang (新白楊) area, about 1750 m elevation, Xiulin Township (秀林鄉) , Hualien county , along roadsides , Eastern Taiwan. and flowering and fruiting time from January to April .



## 5.. *Blumea luoshaoensis* S.S. Ying

*Blumea luoshaoensis* S.S. Ying, sp.nov. 洛韶艾納香

TYPE:TAIWAN. Hualien county , Xiulin Township (秀林鄉) , luoshao (洛韶) 1050 m alt. *S. S. Ying* , *s.n.* May 20, 2021 ° (holotype, NTUF) °



Fig.448.*Blumea luoshaoensis* S. S. Ying, the inflorescence

**Morphology** : Perennial herbs about 130-200 cm high, usually forms a massive plant colony, stem short, erect to ascending, branched at base, branches elongate, 25-100 cm long, erect to ascending, green to light brownish, glabrous to slightly white pubescent. Leaves simple, alternate, oblong to ovate-oblong, 4-6 cm long, 2-3 cm wide, acuminate at apex, obtuse and slightly rounded at base, chartaceous, dentate and wavy at margins, scattered short hairs on both surface, especially on the midrib and veins beneath; midrib and lateral veins (6-7 per side) impressed surface and elevated beneath, green surface and pale green beneath; petioles slender, 8-12 mm long, scatteres short white hairs.



Fig.449. *Blumea luoshaoensis* S. S. Ying, the branches and leaves



-355- Fig.450. *Blumea luoshaoensis* S. S. Ying, the plant colony





Fig.451. *Blumea luoshaoensis* S. S. Ying, the branches and leaves



-356- Fig.452. *Blumea luoshaoensis* S. S. Ying, the inflorescence



Fig.453. *Blumea luoshaoensis* S. S. Ying, the cymes

Capitula numerous, cylindrical, 3.5-4.5 mm in diameter, 6-8 mm long, in terminal compound cymes; compound cymes usually consisted of 4-5 main cymes; each main cyme consists of 3-5 cymes; each cyme consists of 7-12 capitula; rachis of inflorescence 4-7 cm long, pale green, glabrous to scattered pubescent; peduncles of cymes erect to ascending, 3-4.5 cm long, pale green, glabrous; pedicels 0.5-1.5 cm long, slender, glabrous to scattered pubescent; phyllaries 4-5 series, imbricate; the outer ones shorter, lanceolate, 3-4 mm long, acute at apex, truncate at base, green, not reflexed; medium and inner ones linear, 5-7 mm long, 1 mm wide, obtuse at apex, truncate at base, white, membranous, glabrous, some reflexed and some not reflexed, entire at margins; receptacle flat, 5-6 mm in diam., with white villose; each capitulum with 5-7 disk florets, disk florets bisexual; corolla pale yellow, tubular; the tube 3.5-5.5 mm long, with 5 lobes at apex, lobes oblong, 2-3 mm long, about 1 mm wide, obtuse at apex, glabrous; style slightly longer than stamens tube, exerted on the corolla tube, obtuse at apex. Cypselas black, oblong, 1-1.5 mm long, ribs inconspicuous; pappus numerous, white, 4-5 mm long.

#### **Diagnosis.**

*Blumea luoshaoensis* is characterized by:

1. Plant grows on sunny edge of forests.





-358- Fig.454. *Blumea luoshaoensis* S. S. Ying, the holotype NTUF-110-065.



-359- Fig.455. *Blumea luoshaoensis* S. S. Ying, the isotype NTUF-110-066.





Fig.456. *Blumea luoshaoensis* S. S. Ying, the capitulum, corolla and style



-360- Fig.457. *Blumea luoshaoensis* S. S. Ying, the plant colony



Fig.458. *Blumea luoshaoensis* S. S. Ying, the fruits

2. Plant 130-200 cm tall, usually forms a massive plant colony; branched at base, branches elongate, 25-100 cm long, erect to ascending

3. Leaves simple, alternate, oblong to ovate-oblong, 4-6 cm long, 2-3 cm wide, acuminate at apex, obtuse and slightly rounded at base.

4. Capitula numerous, cylindrical, 3.5-4.5 mm in diameter, 6-8 mm long, in terminal compound cymes; compound cymes usually consisted of 4-5 main cymes; each main cyme consist of 3-5 cymes; each cyme consist of 7-12 capitula.

5. Each capitula with 5-7 disk florets.

6. Phyllaries 4-5 series, imbricate; the outer ones shorter, lanceolate, green, not reflexed; medium and inner ones linear, obtuse at apex, truncate at base, white, membranous, glabrous, somewhat reflexed, entire at margins.

7. Corolla pale yellow, tubular; the tube 3.5-5.5 mm long, with 5 lobes at apex, lobes oblong, 2-3 mm long, about 1 mm wide, obtuse at apex, glabrous

8. Cypselas black, oblong, 1-1.5 mm long, ribs inconspicuous; pappus numerous, white °





Fig.459. *Blumea luoshaoensis* S. S. Ying, close-up of achenes and pappi



-362- Fig.460. *Blumea luoshaoensis* S. S. Ying, close-up of achenes and pappi



### Distribution and phenology.

*Blumea luoshaoensis* S.S. Ying is endemic to Taiwan. It is known from Luoshao (洛韶) area, about 1050 m elevation, Xiulin Township (秀林鄉), Hualien county, along edges of forests, Eastern Taiwan. and flowering and fruiting time from May to August.

## 6. *Taraxacum hohuanshanense* S.S. Ying

*Taraxacum hohuanshanense* S.S. Ying, sp.nov. 合歡山蒲公英

TYPE: TAIWAN. Hualien county, Xiulin Township (秀林鄉), Hohuanshan (合歡山) 3000 m alt. S. S. Ying, s.n. February 25, 2021. (holotype, NTUF).



Fig.461. *Taraxacum hohuanshanense* S. S. Ying, the habitat

**Morphology :** Rather small perennial herbs about 2-3 cm high, taproot short, somewhat ligneous, lightly brownish, fleshy, glabrous; fibrous roots few, pendulous, white or nearly so. Leaves radical, -363-



4-7 in a rosulate, rather smaller, spatulate to spatulat-lanceolate, 2-3 cm long, 5-6 mm wide, pinnatisect, chartaceous, lustrous green surface and slight glaucous beneath, glabrous or nearly so surface, scatter pubescent beneath; ciliate at margins ; lateral lobes 2 or 3 pairs; the lobes cuneate to cuneate-triangular, 3-5 mm long, 1-2 mm wide, acute to obtuse at apex; terminal lobe semi-orbicular, 4-6 mm long, 2-3 mm wide, obtuse at apex, entire at margins. petioles 1-1.7 cm long, winged to narrowly winged, glabrous to pubescent.



Fig.462. *Taraxacum hohuanshanense* S. S. Ying, the plant





Fig.463. *Taraxacum hohuanshanense* S. S. Ying, the leaves



Fig.464. *Taraxacum hohuanshanense* S. S. Ying, young capitula



Capitulum solitary, terminal on the scape, 3.5-4.5 cm in diameter when open; scape robust, 1.5-3 cm long, erect to ascending, sparsely arachnoid; involucre 8-10 mm wide; outer phyllaries 18-22, lanceolate, 1-1.5 cm long, 2-3 mm wide, acute at apex, green tinged with purplish at apex, pubescent outside and nearly glabrous inside, spreading, sparsely ciliate at margins; inner phyllaries lanceolate to narrowly lanceolate, 1.2-1.8 cm long, about 2 mm wide, acuminate at apex, green tinged with purplish at apex, glabrous on both surfaces, entire at margins; ligulate florets numerous, the corolla of outer florets longest, 1-1.5 cm long, 2-3 mm wide, obtuse and 2-4 toothed at apex, glabrous; corolla of inner florets shorter, obtuse and 1-2 toothed at apex; corolla tube glabrous or nearly so; style slender, slightly exserted the corolla, stigma 2, pale yellow.

Achenes spindle-like 3-4 mm long, about 2 mm wide, pale brownish, 8-12 ribbed; the ribs with spinulose; cones cylindrical, 1.5-3 mm long, brownish; beaks slender, 7-9 mm long, white; pappus numerous, white, 5-8 mm long.



Fig.465. *Taraxacum hohuanshanense* S. S. Ying, the capitula





Fig.466. *Taraxacum hohuanshanense* S. S. Ying, close-up of fruit.



Fig.467. *Taraxacum hohuanshanense* S. S. Ying, habitat





-368- Fig.468. *Taraxacum hohuanshanense* S. S. Ying, the holotype NTUF-110-067.

### Diagnosis.

*Taraxacum hohuanshanense* is characterized by:

1. plant dwarf, 2-3 cm high; taproot robust.
2. Leaves small, spatulate to spatulate-lanceolate, 2-3 cm long, 5-6 mm wide, pinnatisect, lateral lobes 2 or 3 pairs.
3. Scape short, 1.5-3 cm long, erect to ascending, sparsely arachnoid.
4. the corolla of outer florets longest, 1-1.5 cm long, 2-3 mm wide, obtuse and 2-4 toothed at apex, glabrous; corolla of inner florets shorter, obtuse and 1-2 toothed at apex.
5. Achenes spindle-like 3-4 mm long, about 2 mm wide, pale brownish, 8-12 ribbed; the ribs with spinulose.

### Distribution and phenology.

*Taraxacum hohuanshanense* S.S. Ying is endemic to Taiwan. It is known from Hohuanshan (合歡山) area, about 3150 m elevation, Xiulin Township (秀林鄉), Hualien county, along sunny roadsides, Eastern Taiwan. and flowering and fruiting time from January to May.

## 7.. *Eupatorium guanyuanense* S.S. Ying

*Eupatorium guanyuanense* S.S. Ying, *sp.nov.* 關原澤蘭

TYPE:TAIWAN. Hualien county, Xiulin Township (秀林鄉), Guanyuan (關原) 2350 m alt. *S. S. Ying*, *s.n.* August 19, 2021. (holotype, NTUF).



-369- Fig.469. *Eupatorium guanyuanense* S. S. Ying, each capitulum with 2-4 florets



**Morphology :** Perennial herbs about 50-110 cm high, stem erect to ascending, simple or branched upward, pale purplish, glabrous. Leaves simple, opposite, lanceolate to broadly lanceolate, 6-10 cm long, 1.5-2.5 cm wide, acuminate at apex, obtuse to slightly cordate at base, chartaceous to thin coriaceous, serrulate at margins, glabrous on both surfaces, lustrous green surface and pale green beneath, midrib and lateral veins (4-6 per side) impressed surface and elevated beneath. Petioles 4-6 mm long, green, glabrous.



Fig.470. *Eupatorium guanyuanense* S. S. Ying, the plants, on the *Pinus taiwanensis* Hayata forest floor

Capitula numerous, white, 4-6 mm in diameter when opened, in a terminal panicle; the panicle usually consist of 4-6 racemes; each raceme usually consist of 6-12 capitula; peduncle of panicle 4-8 cm long, erect to ascending, green to pale purplish, scattered white short hairs' peduncle of raceme 3-5 cm long, slender, pale purplish, hairy; bracts linear, 1-1.5 cm long, 1-2 mm wide, acute at apex, glabrous or nearly so; pedicels 4-7 mm long, pale purplish, hairy; bractlets smaller, cauduous; involucre cylindrical 4-5 mm long, green to pale purplish, glabrous; phyllaries 3-series, the outer smaller, ovate, 2-3 mm long, 1.5-2 mm wide, acute at apex, hairy outside; medial phyllaries oblong, 3-5 mm long, 2-2.6 mm wide, acuminate at apex, hairy; inner phyllaries



Fig.471. *Eupatorium guanyuanense* S. S. Ying, the inflorescence



-371- Fig.472. *Eupatorium guanyuanense* S. S. Ying, 3 series phyllares, corolla, style branches



laneolate, 4-6 mm long, 1-2 mm wide, obtuse at apex, glabrous or nearly so; 2-4 florets in each capitula; corolla tubular-like, 4-6 mm long, 2-2.5 mm wide, grayish white, 5-toothed at apex; style branches elongate, lath-shaped, 8-10 mm long, 1.5 mm wide, lustrous white, glabrous, with short stigmatic lines.

Achenes cylindrical, grayish brown, 4.5-5.5 mm long, 4-5-nerved; pappus 20-40, whitish barbellate bristles, persistent.



Fig.473. *Eupatorium guanyuanense* S. S. Ying, close-up of capitula

#### Diagnosis.

*Eupatorium guanyuanense* is characterized by:

1. The species is near to *E. chinense* var. *tozanense* (Hayata) Kitam. in general appearance, however, our species is different from it by 3-series phyllaries, 2-4 florets in a capitulum and



-373- Fig.474. *Eupatorium guanyuanense* S. S. Ying, the holotype NTUF-110-068.





-374- Fig.475. *Eupatorium guanyuanense* S. S. Ying, the isotype NTUF-110-069.

elongate, lath-shaped, 8-10 mm long, 1.5 mm wide style branches.

2. The species was found 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,

### **Distribution and phenology.**

*Eupatorium guanyuanense* S.S. Ying is endemic to Taiwan. It is known from Guanyuan (關原) area, about 2350 m elevation, Xiulin Township (秀林鄉), Hualien county, Eastern Taiwan. and flowering and fruiting time from August to September.



*Urtica taiwaniana* S.S. Ying, flowering plant



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# 新植物及新名稱 (第四卷)

(NEW TAXA AND NEW NAMES)

(VOLUME THREE )

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