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Notes on the Flora of Taiwan (29)—*Scutellaria austrotaiwanensis* Hsieh & Huang *sp. nov.* (Lamiaceae) from Taiwan

Tsung-Hsin Hsieh [1] and Tseng-Chieng Huang [2, 3]

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ABSTRACT: A new species, *Scutellaria austrotaiwanensis* Hsieh & Huang from south Taiwan is described. This new species is similar to *S. playfairi* Kudo, but can be distinguished by its smaller leaves with 4 to 5 shallow crenations on the margins and the nutlet coat with short grappling-hook tuberculae. This new species differs from *S. luzonica* Rolfe by its rugulate-reticulate to reticulate and microperforate versus rugulate exinal ornamentation. This species is found on steep slopes between 400 and 500 m in *Machilus* dominated forest in south Taiwan. SEM micrographs of pollen grains and nutlets, and a chromosome number $2n=26$ are provided.

KEY WORDS: ***Scutellaria austrotaiwanensis*, Pollen, Nutlet, Taxonomy, Taiwan.**

INTRODUCTION

Five species of *Scutellaria* were previously reported in Taiwan (Hsieh and Huang, 1995) Recently, scions of a plant identified as *S. playfairi* Kudo (Hsieh and Huang, 1995) from Lilongshan, Pingtung County, was transplanted to the greenhouse of the Botany Department National Taiwan University and flowered in May, 1996 (Fig. 1). Our close study of this plant in the field, greenhouse, and laboratory on pollen, nutlet morphology and chromosomes number revealed it to be a new species, *S. austrotaiwanensis* Hsieh & Huang. The holotype. (*T.-C. Huang, T.-H. Hsieh, S.-F. Huang, & P.-C. Lee 16266*) has been deposited in TAI-herbarium.

MATERIALS AND METHODS

Dried herbarium specimens and the flowers and roots collected from the cultivated plant in the greenhouse were studied. Transplants in greenhouse were from previous collection (*T.-C. Huang, T.-H. Hsieh, S.-F. Huang, & P.-C. Lee 16266*) from Lilongshan, Pingtung County. The methods for preparation and examination of pollen grains, nutlets and chromosome numbers followed those of Hsieh and Huang (1995) and Huang *et al.* (1995) .

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Fig. 1. Habit of *Scutellaria austrotaiwanensis* Hsieh & Huang.

RESULTS

External morphology

Scutellaria austrotaiwanensis is similar to *S. playfairi*, but the former has smaller leaves with 4-5 shallow crenations along the margins (Fig. 2a) and a high petiole length versus leaf length ratio (Fig. 3). *S. playfairi* has larger leaves with 5-9 serrations along the margins (Fig. 2b) and a low petiole length versus leaf blade length ratio (Fig. 3).

Pollen morphology

The pollen grains are isopolar, 3-colpate, prolate from the equatorial shape, 15-20 μm long, 10-15 μm wide, and rugulate-reticulate to reticulate and microperforate in exinal ornamentation (Figs. 4-5).

Nutlet morphology

The nutlet of *S. austrotaiwanensis* is orbicular and 1.3 mm long by 0.9 mm wide. The nutlet coat has short grappling-hook tuberculae, which are similar to those of *S. tashiroi* Hayata (Hsieh and Huang, 1995) and different from other species. The hilum is lateral (Figs. 6-8, Fig. 12: 6-7).

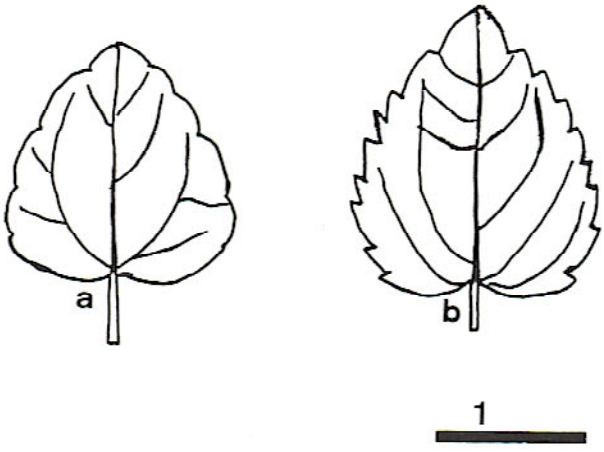


Fig. 2. Leaves of *Scutellaria austrotaiwanensis* Hsieh & Huang(a) and *S. playfairi* Kudo(b).

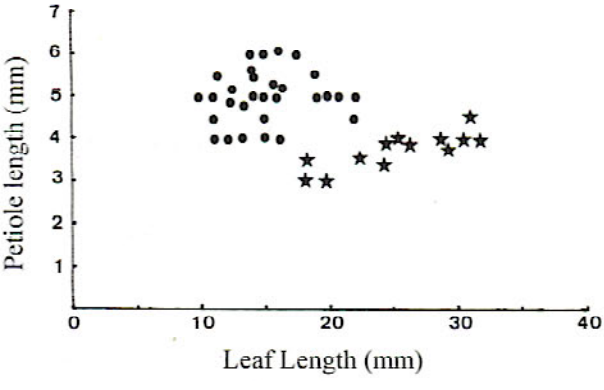


Fig. 3. Distribution of petiole and blade ratio of *Scutellaria austrotaiwanensis* Hsieh & Huang (●) and *S. playfairi* Kudo (★).

Chromosome number

The chromosome number was reported previously as 2n=26 for other species in Taiwan (Hsieh and Huang, 1995). This new species has the same chromosome number as 2n=26 (Fig. 9) .

Taxonomic treatment.

Scutellaria austrotaiwanensis T.-H. Hsieh & T.-C. Huang, *sp. nov.*

Pingtung Co.: Lilongshan, *T.-C. Huang, C.-H. Hsieh, S.-F.Huang et P.-C. Lee 16266* (*Holotypus*, TAI, *isotypus*, TAI, TNM, HAST).

Affinis Scutellariae playfairi, sed folia margine crenato et nucula uncato tuberculato differt.

Herba perennis 30 cm alta caules ascendentibus vel decumbentibus pubescentibus. Folia chartacea petiolatis; petioli 4-6 mm longi; lamina late ovata basi truncata apice obtusa vel rounda margine 4-5 crenato vadoso. Inflorescentia racemosa in terminales, 4-15 cm longa, pedicello convoluto; flos bilabiatus corollae purpureo-azureo tubo 1.0-1.2 cm longo geniculato. Nucula orbicula, 1.3 mm longa 0.9 mm lata tunica brevi-uncato tuberculato, hilo laterali. Chromosomatum numerus 2n=26.

Habitatio: In sylvis Machilo ad 400-500 m supra mare vel ad clivo praerupto. Pingtung, Lilongshan. *Leg. T.-C. Huang, T.-H. Hsieh, S.-F. Huang et P.-C. Lee 16266* (*Holotypus*, TAI, *isotypus,* TAI, TNM, HAST).

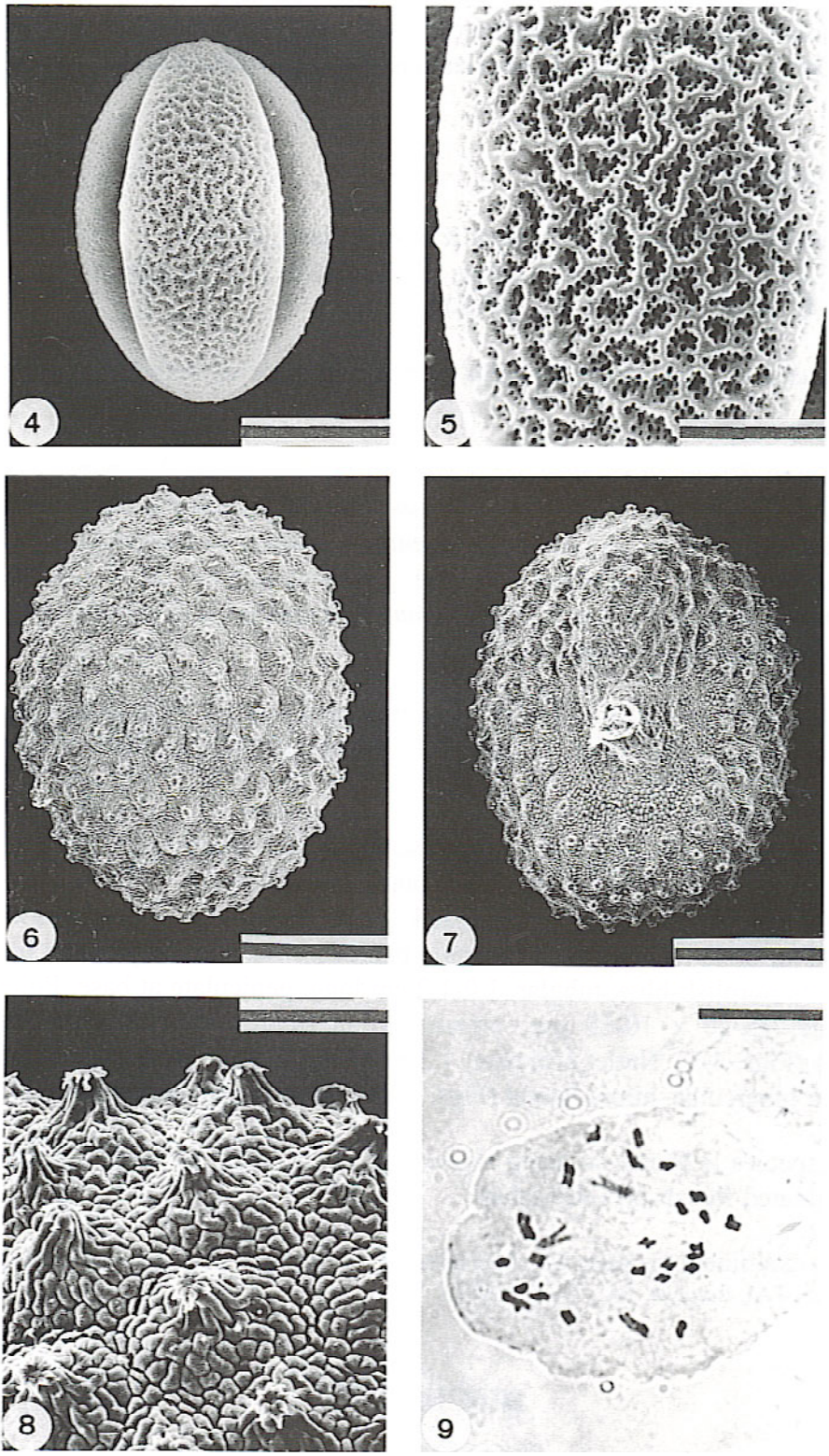
Perennial herbs, to 30 cm tall; stems ascending or decumbent, pubescent. Leaves chartaceous, petiolate; petioles 4-6 mm long; blade broadly ovate, 1-2.2 cm long, 1-2.2 cm wide, base truncate, apex obtuse to rounded, margins with 4 or 5 shallow crenations Inflorescence a terminal raceme, 4-15 cm long; pedicels twisted, nearly in one plane. Flower bilabiate; corolla purplish-blue, tubular, 1.0-1.2 cm long, geniculate at base. Pollen grains 3-colpate, prolate, 15-20 x 10-15 μm, ornamentation rugulate-reticulate to reticulate and microperforate (Figs. 4-5). Nutlet orbicular, 1.3 mm long, 0.9 mm wide, seed coat with short grappling-hook tuberculae, hilum lateral (Figs. 6-8). Chromosome number 2n=26.

Habitat: This species is found on steep slopes and forest edges between 400 and 500 m in *Machilus* dominated forests on Lilongshan.

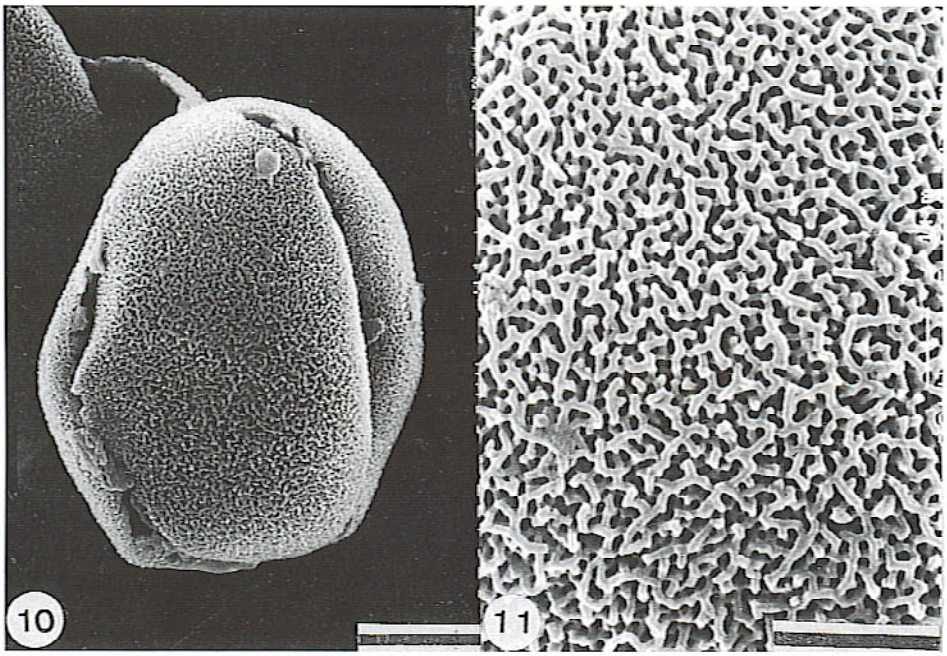
Specimens examined: **Pingtung Co.**: Lilongshan, *T.-C. Huang, C.-H. Hsieh, S.-F. Huang & P.-C. Lee 16266* (*Holotypus*, TAI, *isotypus*, TAI, TNM, HAST).

DISCUSSION

Scutellaria austrotaiwanensis grows with *S. taiwanensis* Hsieh & Huang in the same Lilongshan with different habitats. The former is found in the *Machilus* dominated forests between 400 and 500 m while the later is found in the Fagaceae dominated forests above



Figs. 4-8: *Scutellaria austrotaiwanensis* Hsieh & Huang. SEM micrographs of pollen grains (4 & 5) and nutlet coat (6-8). Fig. 9: somatic chromosomes 2n=26. Scale bar: Fig. 4 = 7.5 μm; Fig. 5 = 3 μm; Fig. 6 = 430 μm; Fig. 7 = 430 μm; Fig. 8 = 100 μm; and Fig. 9 = 10 μm.



Figs. 10-11. SEM micrographs of pollen grains of *Scutellaria luzonica* Rolfe. Scale bar: Fig. 10=5 μm, and Fig. 11=2 μm.

1000 m. *Scutellaria austrotaiwanensis* can be distinguished from *S. taiwanensis* readily by its crenate leaf margin and geniculate corolla.

It resembles most closely *S. playfairi*. The new species differs from *S. playfairi* by its smaller leaves with 4-5 shallow crenations on the margin (Fig. 2a), the high petiole length versus leaf blade length ratio (Fig. 3), the nutlet coat with short-hooked tuberculae (Figs. 6-8) and by its habit growing on steep slopes and forest edges. *Scutellaria playfairi* has 5-9 serrations margin on the leaves (Fig. 2b), a low petiole length versus leaf blade length ratio (Fig. 3), the nutlet coat with rounded tuberculae (Hsieh and Huang, 1995) and by its habit growing on exposed rocks.

Scutellaria playfairi and this new species are closely related to *S. luzonica* Rolfe in external morphology and have been considered different varieties of the same species (Keng, 1969). But the ornamentation of the pollen grains of the former two species is a loosely reticulate to rugulate with microperforations (Hsieh and Huang, 1995, Figs. 4 & 5). *Scutellaria luzonica* (*Mearns s. n.* July, 1901, L) has rugulate ornamentation without microperforations (Figs. 10 & 11).

The pollen morphology of *S. luzonica* therefore differs from other Taiwanese species. Additionally, consultation of the literature from neighbouring regions (Kudo, 1929; Keng, 1969; Yamazaki, 1969, 1992; Li, 1977; Ying, 1991), support our recognition of *Scutellaria austrotaiwanensis* as a new species.

ACKNOWLEDGMENT

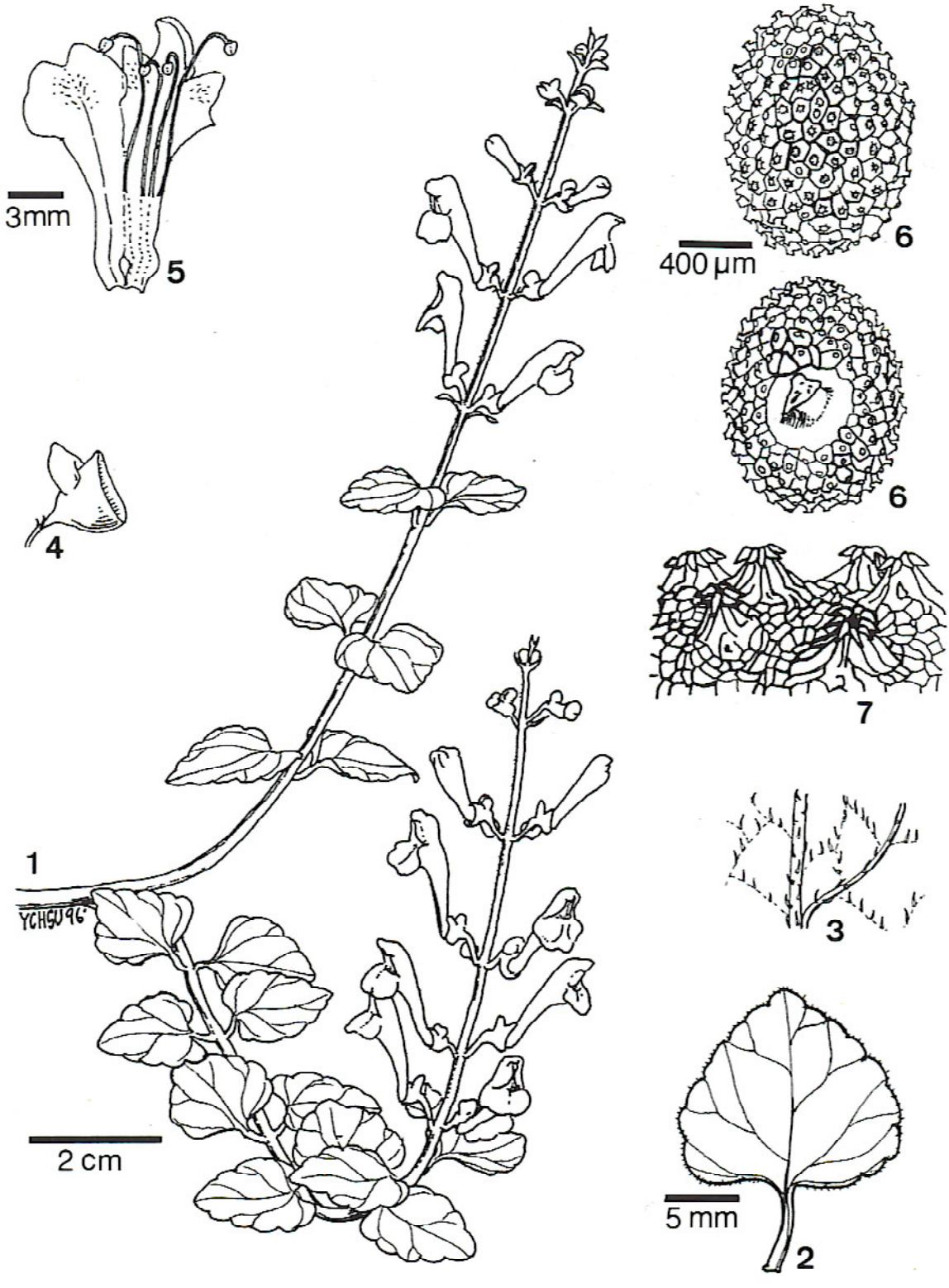


Fig. 12. *Scutellaria austrotaiwanensis* Hsieh & Huang. 1. habit, 2. leaf, 3. Portion of lower leaf surface showing few hairs, 4. Calyx, 5. Corolla, 6. Nutlet, 7. Portion of nutlet surface with short, grappling-hook tuberculae.

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台灣植物誌之觀查(29)--南台灣黃芩(唇形科)

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摘　　要

本文描述黃芩屬一新種，南台灣黃芩(*Scutellaria austrotaiwanensis* Hsieh & Huang)。本種近似布烈氏黃芩(*S. playfairi* Kudo)，但其具有較小的葉子，葉緣具4-5個淺圓齒，小堅果具短鉤狀突起，後者葉子較大，葉緣具5-9個鋸齒，小堅果具平滑瘤狀突起，足以區別。呂宋黃芩(*S. luzonica* Rolfe)長期以來被認為和省產的前二者植物有密切的關係，本文經由花粉的比對認為其與本省的此二者植物為不同的種。本種見於台灣南部位於海拔400至500公尺之楠木林陡坡上。本種之花粉形態、小堅果表皮微細構造及染色體數目2n=26均為首次報導。

關鍵詞：南台灣黃芩，花粉，小堅果，分類，台灣。

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