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Supplements to the Orchid Flora of Taiwan (V)

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ABSTRACT: New data for the orchid flora in Taiwan is presented. Two new species (*Luisia lui* and *Lecanorchis subpelorica*) and four newly recorded taxa (*Hayata merrillii*, *Lecanorchis amethystea*, *L. nigricans* var. *yakushimensis* and *L. trachycaula*) are described and illustrated.

KEY WORDS: *Hayata*, *Lecanorchis*, *Luisia*, Orchidaceae, Taiwan, taxonomy.

INTRODUCTION

In this article, we continue our previous works (Hsu and Chung, 2009; Chung and Hsu, 2009; Hsu et al., 2009) providing new insights to the taxonomy and biodiversity of Orchidaceae in Taiwan. Two new species, *Luisia lui* and *Lecanorchis subpelorica*, is described from southern Taiwan. *Hayata merrillii*, *Lecanorchis amethystea*, *L. nigricans* var. *yakushimensis* and *L. trachycaula* are reported as newly recorded species and variety in Taiwan. A new combination (*Hayata merrillii*) is also proposed for fitting recent updated studies accounting the taxonomy of Goodyerinae.

TAXONOMIC TREATMENTS

Luisia lui T. C. Hsu & S. W. Chung *sp. nov.*
呂氏金釵蘭 Figs. 1A, 1B & 2

Luisia cordata Fukuy. affinis, sed petala 3-4 mm lata; labellum 10-11 mm longum, lobus intermedius orbiculatus, retusus, ca. 7 mm longum, 7 mm latum differt.

Type: TAIWAN. Pingtung Co.: Shizi Township, Shuangliu (雙流), 200-300 m alt., 26 Mar 2010, *T.C. Hsu 2600* (holotype TAIF), here designated.

Epiphytic herbs. Stems erect or ascending, usually unbranched, 30-60 cm long, ca. 4 mm in diam., internode 2-3 cm long. Leaves terete, 10-15 cm long, ca. 4 mm in diam., fleshy, rigid, apex acute. Inflorescence 1.5-2 cm long, (2-)3-6(-8) flowered. Bracts broadly ovate, 2-3 mm long, acute. Flowers often nodding, ca. 1.5 cm in diam.; pedicel and ovary 1.3-1.6 cm long. Sepals brownish green outside, yellowish green inside; dorsal sepal ligulate, apex obtuse, 8-9 mm long, 5-5.5 mm wide; lateral sepals oblique ovate-elliptic, apex acute and slightly concave, 9-10 mm long, 5.5-6 mm wide. Petals yellowish, broad linear, apex obtuse, ca. 12 mm long, 3-4 mm wide. Lip flesh, dark purple adaxially, green abaxially, 10-11 mm long, ca. 8 mm wide when flattened, trilobed, with a distinct boundary at the base of midlobe; side lobes small, obtuse, ca. 2 mm long; midlobe ovate-orbicular, apex retuse, ca. 7 mm long and wide, disc with 5-7 indistinct longitudinal ridges. Column stout, ca. 3.5 mm long, 3 mm in diam., purplish; anther hemisphere, ca. 2 mm in diam.; pollinia 2, ellipsoid, ca. 1.5 mm long; stipe ca. 1.5 mm long; visidium ovate or nearly orbicular, ca. 1.3 mm wide.

Distribution: Endemic to Taiwan.

Note: The specific epithet is derived from Mr. Shun-Chuan Lu, an orchid amateur from Pingtung Co. who first discovered this new species in 2009. Considering the *Luisia* species in Taiwan, *L. lui* is most similar to *L. codtada* Fukuy. but differs by having a larger flower, wider petals and an ovate-orbicular, retuse midlobe of lip. The entity could also be clearly separated from the rest two *Luisia* species in Taiwan, *L. teres* (Thunb.) Blume and *L. megasepala* Hayata, by having narrower petals and different shape of lip.

Lecanorchis subpelorica T.C. Hsu & S.W. Chung, *sp. nov.*
亞輻射皿蘭 Figs. 1C, 1D & 3

Lecanorchis triloba J.J. Sm. affinis, sed labellum ecallosum, lobis lateralibus ca. 0.8 mm longum differt.

Type: TAIWAN. Pingtung Co.: Shizi Township, Shouka (壽卡), ca. 400 m alt., 4 Jul 2008, *T.C. Hsu 1438* (holotype TAIF), here designated.

Terristrial, achlorophyllous holomycotrophic herbs. Rhizome ascending or J-shaped, blackish, covered with triangular scales. Inflorescence 15-40 cm high, 1-2 mm in diam., solitary or branched, branchlets 10-20 cm long, dark redish borwn, sparsely scaled, slightly tuberculated near nodes. Scales blackish, triangulat, thick, 3-4 mm long. Rachis 1-5 cm long; flower densely arranged, successively opened. Floral bract ovate, acute, 1.5-2.5 mm long. Pedicellate ovary ascending to erect, 1.5-2 cm

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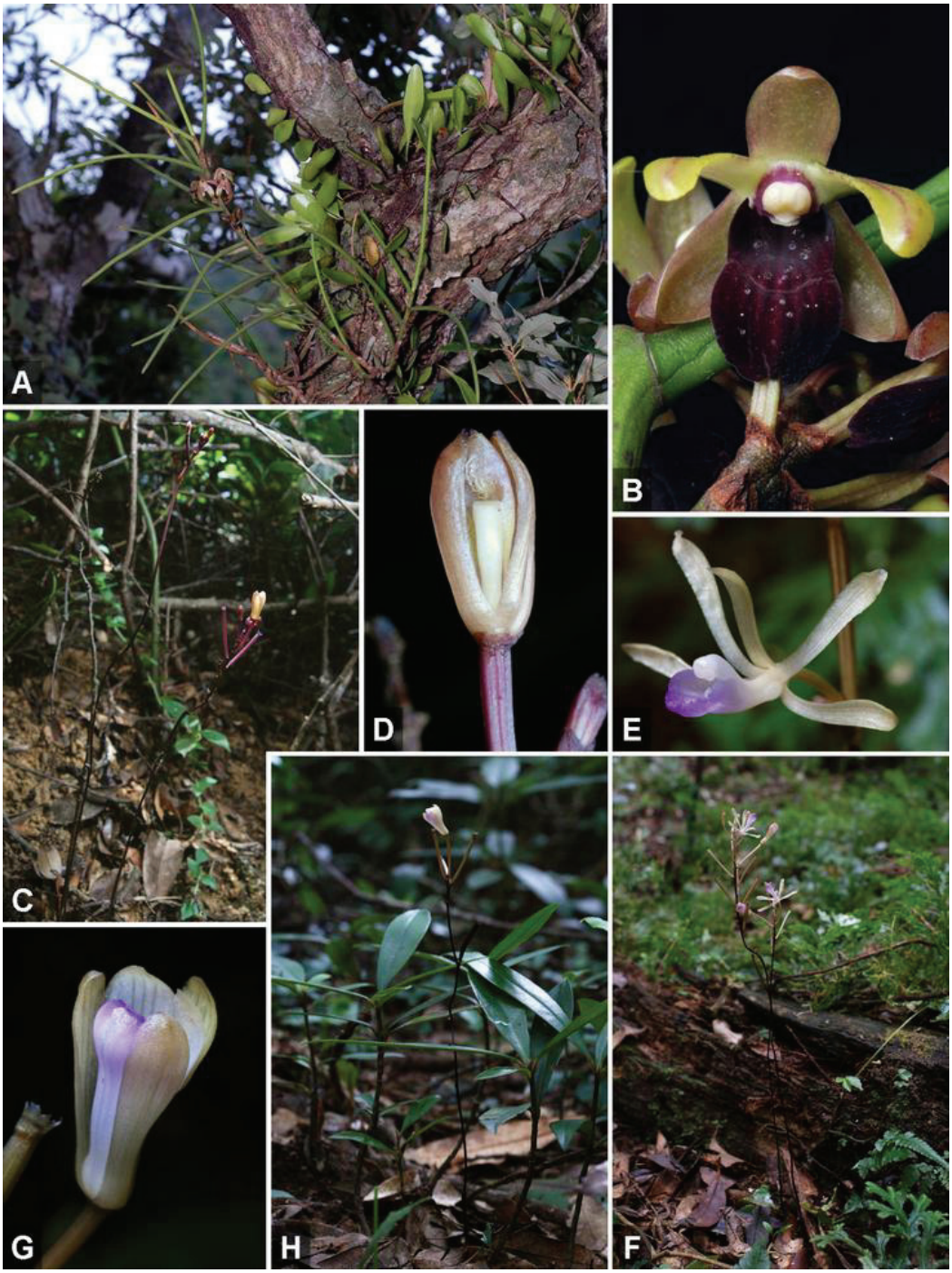


Fig. 1. Newly discovered orchids in Taiwan. A-B: *Luisia lui*. C-D: *Lecanorchis subpelorica*. E-F: *L. amethystea*. G-H: *L. nigricans* var. *yakushimensis*. (Photographed by Tian-Chuan Hsu)

long. Flower hardly opened, pale yellow tinged with light brownish purple. Sepals similar, oblanceolate-oblong, strongly concave, 10-11 mm long, ca. 2 mm wide when flattened, acute at apex. Petals spathulate, somewhat concave, 10-11 mm long, ca. 2.5 mm wide when flattened, obtuse at apex. Lip free from column, spathulate, trilobed, 10-11 mm long, ca. 3 mm wide in natural situation, 4 mm wide when flattened; side lobes erect, semiorbicular, ca. 0.8 mm long; midlobe rectangular, ca. 3 mm long, 3.5 mm wide when flattened, irregularly dentate at margin, truncate at apex, with sparse multicellular hairs on surface. Column white,

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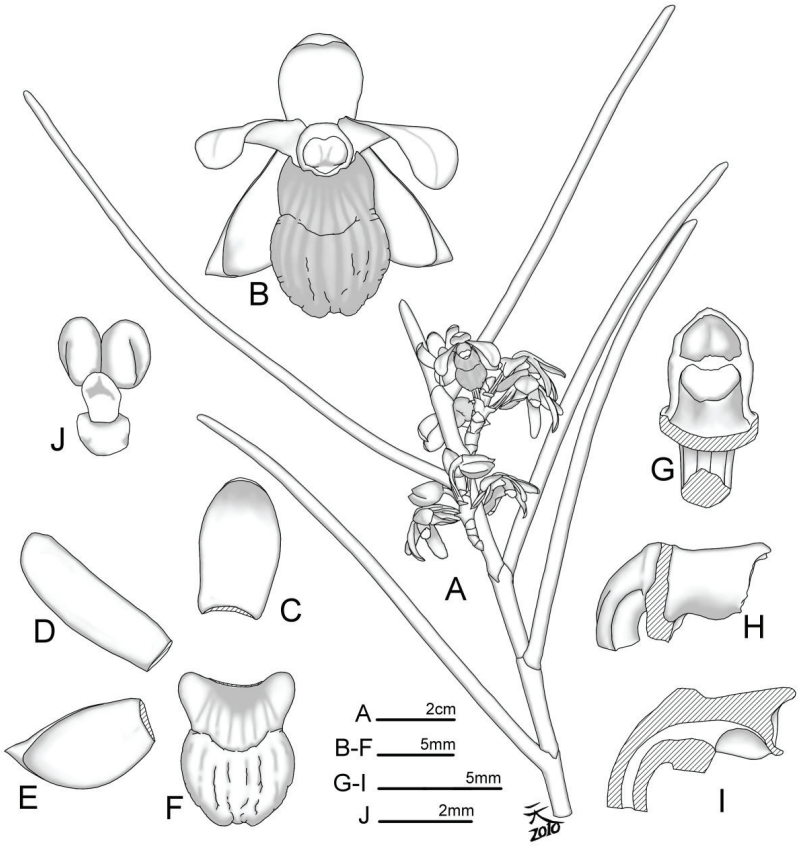


Fig. 2. *Luisia lui* T.C. Hsu & S.W. Chung. A: Habit. B: Flower. C: Dorsal sepal. D: Petal. E: Lateral sepal. F: Lip. G: Column, lower view. H: Column, side view. I: Column, longitudinal section. J: Pollinia.

clavate, 6.5-7 mm long, 1.5 mm wide, papillose on ventral side and column wings. Anther ca. 1.2 mm wide, minutely papillose. Capsule ascending to erect, 18-22 mm long.

Distribution: Endemic to Taiwan.

Note: This new species is characterized by its partial petalized lip which is completely free from column and similar texture and colorization to petals. It is possibly a semi-peloric form of *Lecanorchis triloba* J.J. Sm. since they have nearly undistinguishable habits and approximate flower size.

Hayata merrillii (Ames & Quisumb.) T.C. Hsu & S.W. Chung, *comb. nov.* 全唇早田蘭 Fig. 4

Adenostylis merrillii Ames & Quisumb., Philipp. J. Sci. 44: 370. 1931.
Cheirostylis merrillii (Ames & Quisumb.) Ormerod, Austral. Orch. Rev. 63(4): 10. 1998.

Type: PHILIPPINE. 12 Mar 1930, *E. Quisumbing 6040* (holotype PNH, destroyed; isotype AMES).

Epiphytic herbs to 10 cm tall. Rhizome creeping, terete, branched. Roots emerging from nodes, fleshy, densely pubescent. Stems ascending, 3-6 cm long, 3-6 leaved. Leaves elliptic-oblong, 3-6 cm long, 1.5-2.5 cm wide, base cuneate, apex acute, surface shiny. Inflorescence 4-6 cm long, pubescent, with 2 sterile bracts; rachis 2-4 cm long, loosely 2-3 flowered. Floral bracts narrowly lanceolate, 1-1.5 cm long, sparsely pubescent abaxially. Flowers slightly nodding; pedicel and ovary greenish, 7-9 mm long, pubescent. Sepals free, not spreading, sparsely pubescent abaxially, 3-veined; dorsal sepal greenish white tinged with light pink, ovate-elliptic, 8-10 mm long, ca. 5 mm wide; lateral sepals light green, oblong, slightly keeled abaxially, 8-10 mm long, ca. 3 mm wide. Petals appressed to dorsal sepal and forming a hood, white tinged with light green at base and light pink on midrib, falcate, 2-veined, 9-11 mm long, 3-3.5 mm wide. Lip simple, entire, white tinged with light green and light pink, oblanceolate-oblong, 12-13 mm long, 5-6 mm wide when flattened, 3-veined, apex obtuse, lateral margin incurved. Column 5-6 mm long, rostellum arms elongated to 3 mm long, ventral appendages (stelidia) very short; anther triangular-ovate, 2.5-3 mm long, pollinia rapidly fragmented, tegula stipe and viscidium ca. 3 mm long; stigma 2, laterally positioned.

Distribution: The Philippines and Taiwan.

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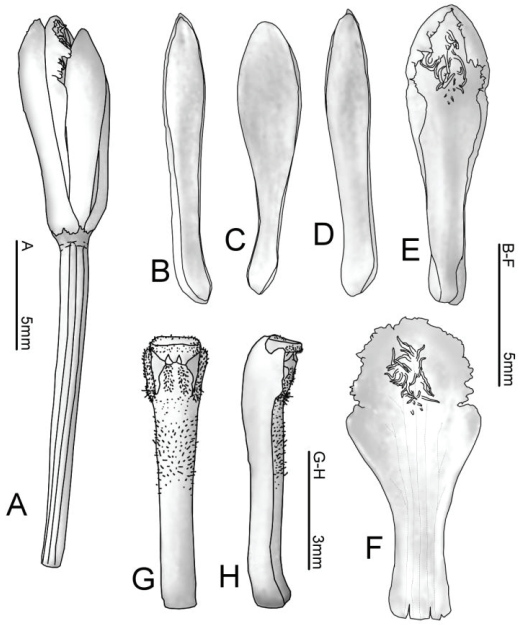


Fig. 3. *Lecanorchis subpelorica* T.C. Hsu & S.W. Chung. A: Flower and ovary. B: Dorsal sepal. C: Petal. D: Lateral sepal. E: Lip, natural situation. F: Lip, flattened. G: Column, lower view. H: Column, side view.

Additional specimens examined: TAIWAN. Nantou Co.: Sinyi Township, Shuanglong (雙龍), ca. 1000 m alt., *T.C. Hsu 2588* (TAIF).

Note: The wild population of *Hayata merrillii* in Taiwan was first discovered by Mr. Shin-Che Hong in 2009. Ormerod (2002) mentioned that this species is a peloric form related to *Cheirostylis tabiyahanensis* (Hayata) N. Pearce & P.J. Cribb from Taiwan and *C. sherriffii* N. Pearce & P.J. Cribb from Bhutan. This group of species were placed in *Cheirostylis* by some authors (Ormerod, 1998; Pearce and Cribb, 1999; Chen et al., 2009) on account of the shape of column. However, they are distinct from typical *Cheirostylis* species by the presence of fleshy roots, relatively large flowers, and completely free sepals. Here we tentatively follow the latest treatment by Averyanov (2009) who places the species with such characters within a new genus *Hayata* Aver., although Dr. Chong-Sheng Leou (pers. comm.) argued that they should belong to *Heterozeuxine* T. Hashim. A detailed phylogenetic study, especielly based on molecular evidence, is needed for further demonstrating the systematic position of *Hayata merrillii* and related species within Goodyerinae.

Lecanorchis amethystea Y. Sawa, Fukunaga & S. Sawa, Acta Phytotax. Geobot. 57(2): 123. 2006.
紫晶皿蘭 Figs. 1E & 1F

Type: JAPAN. Shikoku, Kochi Pref.: Muroto cape, 26 Jul 1987, *Sawa SC-1702* (holotype TI, isotype MBK).

Rhizone often J-shaped, covered with scale-like sheaths at nodes. Inflorescence 15-45 cm tall, solitary or sometimes 1-2 branched, yellowish white at flowering, brownish black at fruiting, glabrous, 0.8-1.5 mm in diam. Rachis 6-15 cm, 4-20 flowered, flowers 5-15 mm apart. Floral bracts deltoid, 1.5-2 mm long, 1-1.3 mm wide. Pedicellate ovary ascending, 15-20 mm long. Flower widely opened, ca. 2.5 cm in diam. Sepals yellowish white tinged with light pink, linear, slightly narrower on lower half, 13-16 mm long, 2-3 mm wide, apex obtuse, 3-veined. Petals white tinged with light purple, linear-oblanceolate, slightly oblique, 13-16 mm long, 2.5-3.2 mm wide, apex obtuse. Lip white tinged with purple toward apex, spathulate, 14-15 mm long, 6-7 mm wide when flattened, slightly 3-lobed, side lobes erect, disc with purplish multicellular hairs at apex and whitish papillose at base. Column 12-13 mm long, slightly curved, fused with lip about 3/5 its length, ventrally puberulent; anther whitish, ca. 1.2 mm wide. Capsule suberect, 20-30 mm long, light yellowish brown.

Distribution: Japan (Shikoku) and Taiwan.

Additional specimens examined: TAIWAN. Taipei Co.: Padaoerhshan (拔刀爾山), *T.C. Hsu 2259* (TAIF); West Peak of Ayushan (阿玉山西峰), *T.C. Hsu 2550* (TAIF); Fushan Botanic Garden (福山植物園), *T.C. Hsu 2252* (TAIF).

Notes: As mentioned by Sawa et al. (2006), *Lecanorchis amethystea* is similar to *L. nigricans* Honda but distinguishable by a combination of several characters including longer and lighter colored rachis, more loosely arranged flowers, narrower sepals and petals, column fused more than half with lip, and yellowish brown, suberect capsules.

Lecanorchis nigricans Honda var. ***yakushimensis*** T. Hashim., Ann. Tsukuba Bor. Gard. 9: 31. f. 23, 24. 1990. 屋久全唇皿蘭 Figs. 1G & 1H

Type: JAPAN. Kyusyu, Kagoshima Pref.: Yakushima, 21-27 Jul 1986, *Y. Hanei s.n.* (TNS).

Habits of *Lecanorchis nigricans* Honda var. *nigricans*. Sepals and petals linear-spathulate, 13-15 mm long, 3-4 mm wide, apex obtuse. Lip spathulate, strongly concave, 12-14 mm long, ca. 4.5 mm wide in natural situation, ca. 8 mm wide when flattened, disc with rather scarce multicellular hairs near apex. Column ca. 10 mm long, ventrally puberulent.

Distribution: Japan (Yakushima) and Taiwan.

Additional specimens examined: TAIWAN. Taoyuan Co.: Fuhsing Township, Peichatianshan (北插天山), *T.C. Hsu 2267* (TAIF). Taitung Co.: Taimali Township, Kueinashan (規那山), *S.W. Chung et al. 8077* (TAIF).

Notes: *Lecanorchis nigricans* var. *yakushimensis* is a newly recorded variety in Taiwan. It differs from the typical variety mainly by having a ventrally puberulent column and a slightly different flower shape as described above.

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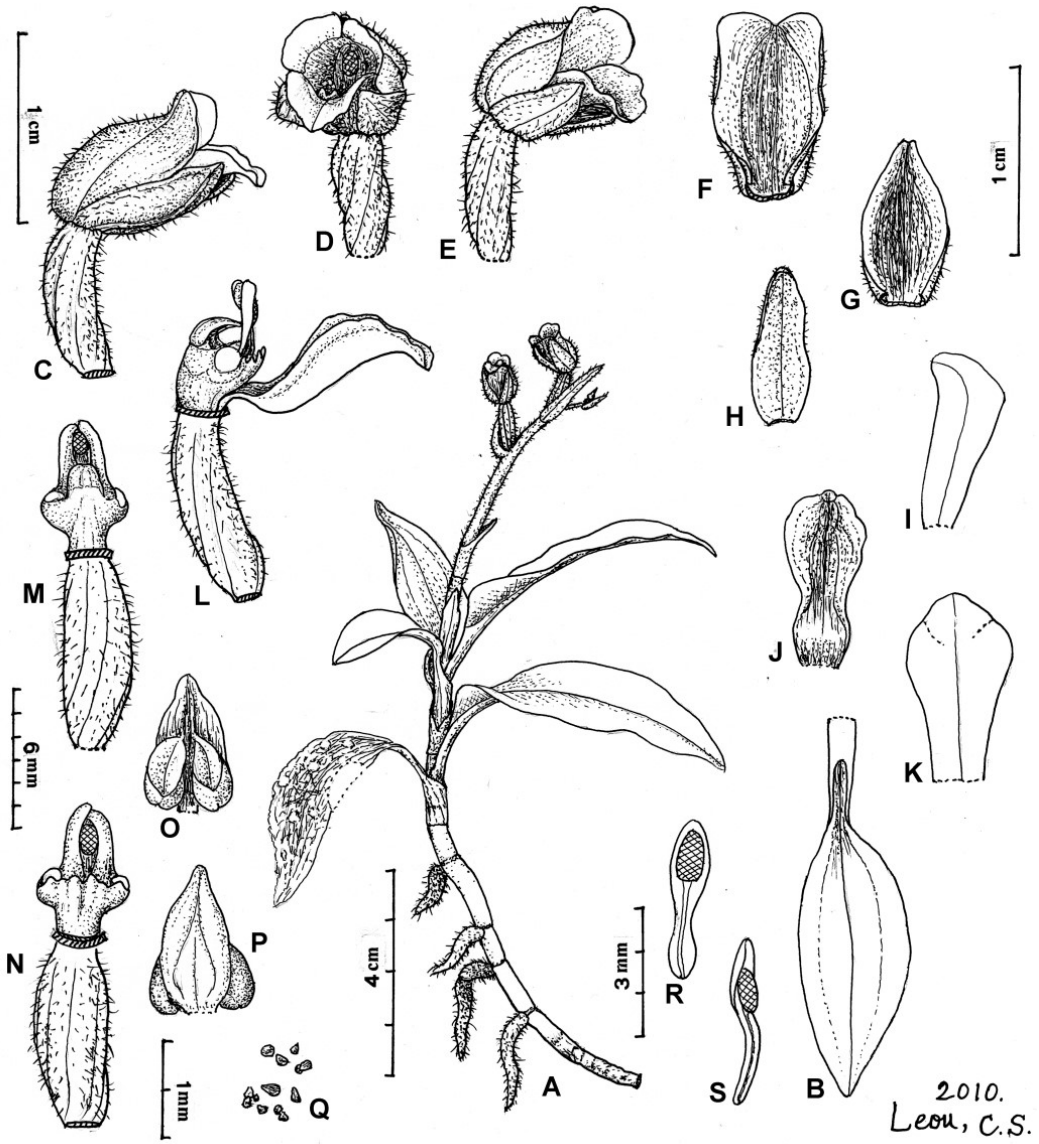


Fig 4. *Hayata merrillii* (Ames & Quisumb) T.C. Hsu & S.W. Chung. A: Habit. B: Leaf. C-E: Flower. F: Hood formed by doral sepal and petals, lower view. G: Dorsal sepal. H: Lateral sepal. I: Petal. J: Lip, natural situation. K: Lip, flattened. L: Column and lip, side view. M: Column, upper view. N: Column, lower view. O: Anther, lower view. P: Anther, upper view. Q: Pollinia massulae. R-S: Tegula and viscidium.

Lecanorchis trachycaula Ohwi, Fl. Jap., rev. ed. 1438. 1965; Hashimoto, Ann. Tsukuba Bot. Gard. 9: 19. f. 14-16. 1990; Hashimoto In: Hashimoto et al., Jap. Indig. Orch. in Col., Revised and Enlarged. 116. pl. 1991. 糙莖皿蘭 Fig. 5

Type: JAPAN. Shikoku, Tokushima Pref.: Shishikuicho, 18 Jun 1964, *C. Abe 15387* (TNS).

Rhizone ascending, with scale-like sheaths at nodes. Inflorescence 20-60 cm tall, usually branched, branchlets 5-30 cm long, brownish black, sparsely to densely tuberculate, 1-2 mm in diam.; rachis 2-4 cm long; flowers densely arranged, successively opened. Pedicel and ovary ascending, more or less tuberculated, 16-20 mm long. Flower not widely opened. Sepals subsimilar, brownish yellow, oblanceolate, 16-19 mm long, ca. 3 mm wide, adaxially sparsely verruculose, apex obtuse. Petals light yellowish brown, similar to sepals in size and shape. Lip white or sometimes tinged with light purple,fused with column at base, 15-16 mm long, ca. 4 mm wide in natural situation, ca. 8 mm wide when flattened, 3-lobed; side lobes erect, semiorbicular, obtuse and irregularly dentate at apex, ca. 2 mm high; midlobe semiorbicular, irregularly undulate and lacinate at margin, ca. 2 mm long, 4 mm wide, densely covered with occasionally branched white multicellular hairs of

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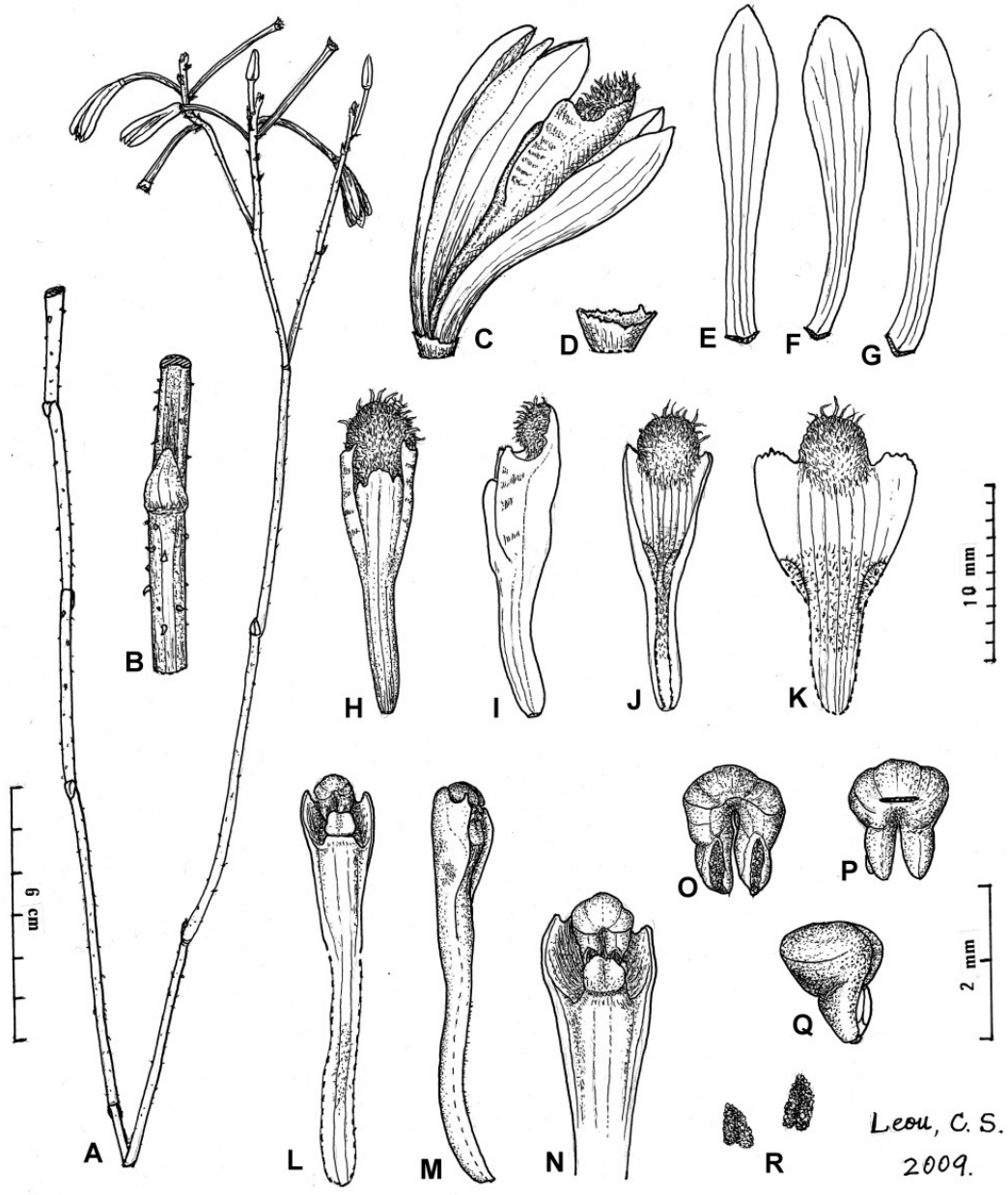


Fig. 5. *Lecanorchis trachycaula* Ohwi. A-B: Inflorescence. C: Flower. D: Calyculus. E: Dorsal sepal. F: Petal. G. Lateral sepal. H-I: Lip and column, upper and side views. J: Lip, natural situation. K: Lip, flattened. L: Column, lower view. M: Column, side view. O-Q: Anther, various views. R: Pollinia.

0.3-0.8 mm long; disc densely papillose at the fused portion except for the very base. Column 12-13 mm long, spathulate, straight, fused with lip for ca. 8 mm long, glabrous; anther whitish, ca. 1.2 mm wide. Capsule ascending, 18-22 mm long, blackish brown, more or less tuberculate.

Distribution: Japan and Taiwan.

Additional specimens examined: TAIWAN. Taipei Co.: Wulai Township, Polushan (波露山), *T.C. Hsu 2236* (TAIF); Sanshia Township, Jiajouling (加九嶺), *T.C. Hsu 2266* (TAIF). Taoyuan Co.: Fuhsing Township, Sileng (四稜), *T.C. Hsu 2191, 2791* (TAIF).

Note: *Lecanorchis trachycaula* could be easily recognized by tuberculate inflorescences, condensed rachis, pale yellowish brown flowers, and lip with a relatively small midlobe. The wild population in Taiwan was first discovered by Mr. Bao-Hong Chou in 2008.

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Hayata merrillii and *Lecanorchis trachycaula*. We are also grateful to Mr. Sheng-Kun Yu, Mr. Ming-Yu Kuo, Mr. Shun-Chuan Lu, Mr. Shin-Che Hong and Mr. Bao-Hong Chou for their assistance in field works.

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臺灣蘭科植物補註 (五)

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摘要：本文提供臺灣蘭科植物誌之增補，報導新種呂氏金釵蘭 (*Luisia lui*)、亞輻射皿蘭 (*Lecanorchis subpelorica*)，新紀錄種全唇早田蘭 (*Hayata merrillii*)、紫晶皿蘭 (*Lecanorchis amethystea*)、糙莖皿蘭 (*L. trachycaula*) 及新紀錄變種屋久全唇皿蘭 (*L. nigricans* var. *yakushimensis*)；並提供其形態描述及圖片。

關鍵詞：早田蘭屬、皿蘭屬、金釵蘭屬、蘭科、臺灣、分類學。

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