Research note

Eria gagnepainii A. D. Hawkes & A. H. Heller (Orchidaceae), a Newly Recorded Species in Taiwan

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【Summary】

Eria gagnepainii A. D. Hawkes & A. H. Heller, a newly recorded orchid from southeastern Taiwan, is described. The distribution, photos, and a line illustration are also provided. *Eria gagnepainii* can be distinguished from 2 other congeners found in Taiwan by its longer and slenderer pseudobulbs.

Key words: *Eria*, *Eria gagnepainii*, IUCN, Orchidaceae, Taiwan.

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研究簡報

台灣新紀錄蘭科植物—香港毛蘭

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摘 要

本文報導一種產於台灣東南部之新紀錄蘭科植物—香港毛蘭(*Eria gagnepainii* A. D. Hawkes & A. H. Heller)，此物種可藉其較長與纖細的假球莖而與台灣產另2種毛蘭(絨蘭)屬物種區分，本文提供其分類描述、圖片與分布資訊。

關鍵詞：香港毛蘭、毛蘭屬、蘭科、IUCN、台灣。

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Eria Lindly sensu lato (Orchidaceae) comprises around 370 species, distributed from Japan, China, the Himalayas, India, Sri Lanka, and the Philippines southward through Indonesia to New Guinea (Su 2000, Chen et al. 2009). Seidenfaden (1982) found lots of heterogeneous elements within *Eria* s. l. when studying the genus in Thailand, suggesting further classification into more genera. In fact, a more-recent molecular phylogenetic analysis uncovered that *Eria* s. l. is polyphyletic (Pridgeon et al. 2005). The clade comprising the type species, *E. javanica*, i.e., *Eria* sensu stricto, is distinct from the other clade which encompasses most sections traditionally placed in *Eria* s. l. and other widely accepted genera, such as *Epiblastus*, *Mediocalcar*, and *Trichotosia*. Broadly following Pridgeon et al.'s treatments (2005), Chen et al. (2009) split the genus *Eria* s. l. of China into several smaller genera. Herein, we adopted their classification by which the 7 Taiwanese taxa of *Eria* s. l. were separated into 4 genera, i.e., *Eria* s. s., *Conchidium*, *Aeridostachya*, and *Pinalia* (Table 1). *Eria* s. s. is a small genus, which comprises about 15 species, distributed from mainland Asia and the Malay Archipelago (including the Philippines and New Guinea) to Bougainville Island (Pridgeon et al. 2005, Chen et al. 2009). Two species, *E. corneri* Rchb. f. and *E. javanica* (Sw.) Blume, were previously recorded in Taiwan (Su 2000, Chen et al. 2009).

During a botanical expedition to southeastern Taiwan in 2004, a flowering orchid of *Eria* s. s. was collected. The cylindrical and slender pseudobulbs with 2 subterminal leaves of the species were obviously distinct from those of the other two *Eria* s. s. species previously described in Taiwan. One living plant of this species was transplanted to the greenhouse of the Endemic Species Research Institute from the field, where it has bloomed every year in early March since 2008. After a careful review of the literature and examinations of specimens and fresh material, the newly found *Eria* species was identified as *E. gagnepainii* A. D. Hawkes & A. H. Heller.

Taxonomic treatment

Eria gagnepainii A. D. Hawkes & A. H. Heller, Lloydia 20: 130. 1957; Chen & Luo, Fl. Reipubl. Popularis Sin. 19: 17-19. *pl. 3*(*5-6*). 1999; Chen et al., Fl. China 25: 345.

Table 1. A checklist of the taxa of *Eria* s. l. indigenous to Taiwan

Flora of Taiwan, 2nd ed.	Flora of China (Chen et al. 2009)	
(Su 2000)	Genera	Species and Chinese name[1)]
Eria robusta (Blume) Lindl.	*Aeridostachya* (J. D. Hooker) Brieger	*Aeridostachya robusta* (Blume) Brieger 細花絨蘭(氣穗蘭)
Eria japonica Maxim.	*Conchidium* Griffith	*Conchidium japonicum* (Maxim.) S. C. Chen & J. J. Wood 連珠絨蘭(高山蛤蘭)
Eria corneri Rchb. f.		*Eria corneri* Rchb. f. 黃絨蘭(半柱毛蘭)
Eria javanica (Sw.) Blume	*Eria* Lindl. s. s.	*Eria javanica* (Sw.) Blume 大葉絨蘭(香花毛蘭)
		Eria gagnepainii A. D. Hawkes & A. H. Heller (香港毛蘭)
Eria amica Rchb. f.		*Pinalia amica* (Rchb. f.) Kuntze 小腳筒蘭(粗莖蘋蘭)
Eria ovata Lindl.	*Pinalia* Lindl.	*Pinalia ovata* (Lindl.) W. Suarez & Cootes 大腳筒蘭(大腳筒)
Eria tomentosiflora Hayata		*Pinalia copelandii* (Leav.) W. Suarez & Cootes 樹絨蘭(台灣蘋蘭)

[1)] The Chinese names following the scientific names are those in the *Flora of Taiwan*, 2nd ed., and those in parentheses are used in the *Flora of China*.

2009.....香港毛蘭Figs. 1, 2

Epiphytic or lithophytic herb, glabrous, turning black when dried. Rhizomes distinct, 4~5 mm in diam., covered with sheaths; sheaths funnel-form, 6~12 mm long. Pseudobulbs 1.5~3 cm apart from each other, cylindrical, slender, 6~13 cm long, 4~6 mm in diam., base with 2 or 3 sheaths. Leaves 2, subterminal, sessile, narrowly elliptic-lanceolate, 10~18×3~5 cm, with 5~9 main veins, acuminate at apex. Inflorescence 1 (or 2), raceme, arising between leaves, 8~15 cm long, base with 1 or 2 sheaths, 5~12-flowered; floral bracts ovate-lanceolate or lanceolate, 5~8 mm long, acuminate; pedicel and ovary 12~16 mm long. Flowers sub-spreading, scented, white to pale-yellow, turning yellow when mature; sepals covered with random rose-purple dots outside; dorsal sepal oblong-elliptic, 13~15×3~4 mm, apex acuminate; lateral sepals falcate-elliptic, 12~15×5~7 mm, apex obtuse to acuminate, base joining with column foot forming a 5-mm-long mentum; petals oblong-lanceolate, slightly curved, 13~15×2~3 mm, apex obtuse to acuminate; lip articulated with column foot, ovate-orbicular in outline, 10~12×6~8 mm, 3-lobed; lateral lobes suboblong, erect and slightly embracing column, 7~8 mm long, apex obtuse; mid-lobe subtriangular or ovate-triangular, 3×2 mm, apex acute; disc with 2 long undulate lamellate keels and 3 slightly undulate lamellate keels, 1 of which in center, runs from base to apex and 2 others starting near middle and extending to mid-lobe. Column ca. 4 mm long, foot ca. 5 mm long; anther hook-like, 2-celled; pollinia 8, in 2 pairs of 4, connected by viscid caudicle.

Specimens examined: Taiwan: Taitung County, Chinfeng, Mt. Chienchingshan, 900 m, on a tree fern, Mar. 5, 2004, *H. M. Chang 7319* (TNU). China: Hainan, Wuzhishan, on rock, Dec. 20, 1933, *C. Wang 35709* (IBSC); Baisha County, on rock, Feb. 24, 1936, *S. K. Liu 25433* (IBSC). Guangdong, Xinyi County, on rock by a valley, Mar. 24, 1932, *C. Wang 31821* (IBSC).

Distribution: *Eria gagnepainii* is distributed in Vietnam and China (Hainan, Guangdong, Hong Kong, SE Xizang, and NW to S Yunnan). Taiwan is located on the margin of its global distribution. Intriguingly, unlike most cases of marginal distribution, the location where *E. gagnepainii* is found is Taitung

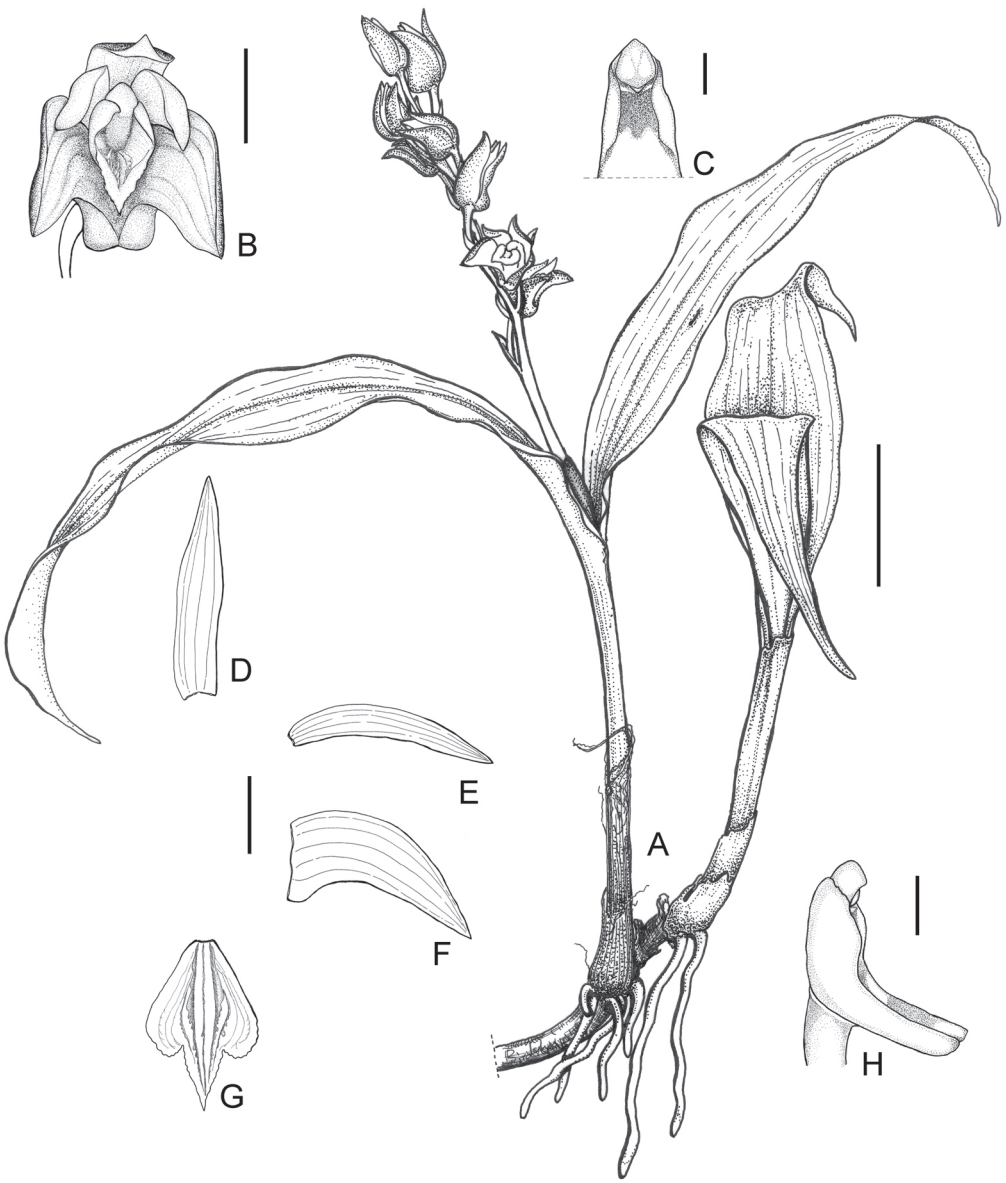

Fig. 1. *Eria gagnepainii* A. D. Hawkes & A. H. Heller. A, Habit; B, front view of flower; C, upper part of column with anther at the top; D, dorsal sepal; E, petal; F, lateral sepal; G, lip; H, lateral view of column. Scale bars: A, 5 cm; B, 5 mm; C, 1 mm; D~G, 5 mm; H, 2 mm.

County, southeastern Taiwan (Fig. 3) which displays a disjunctive distribution between southern China and southeastern Taiwan. Similar distribution patterns were also found for *Cyclobalanopsis championii* (Benth.) Oerst. ex Schott., *Merremia vitifolia* (Burm. f.) Hall. f. (Wang and Yen 1995), *Camellia kissi* Wallich (Su et al. 2008), etc. In Taiwan, these species are confined to the southeastern corner and not found elsewhere.

IUCN Red List category: In Taiwan, *E. gagnepainii* was found only as a small popu-

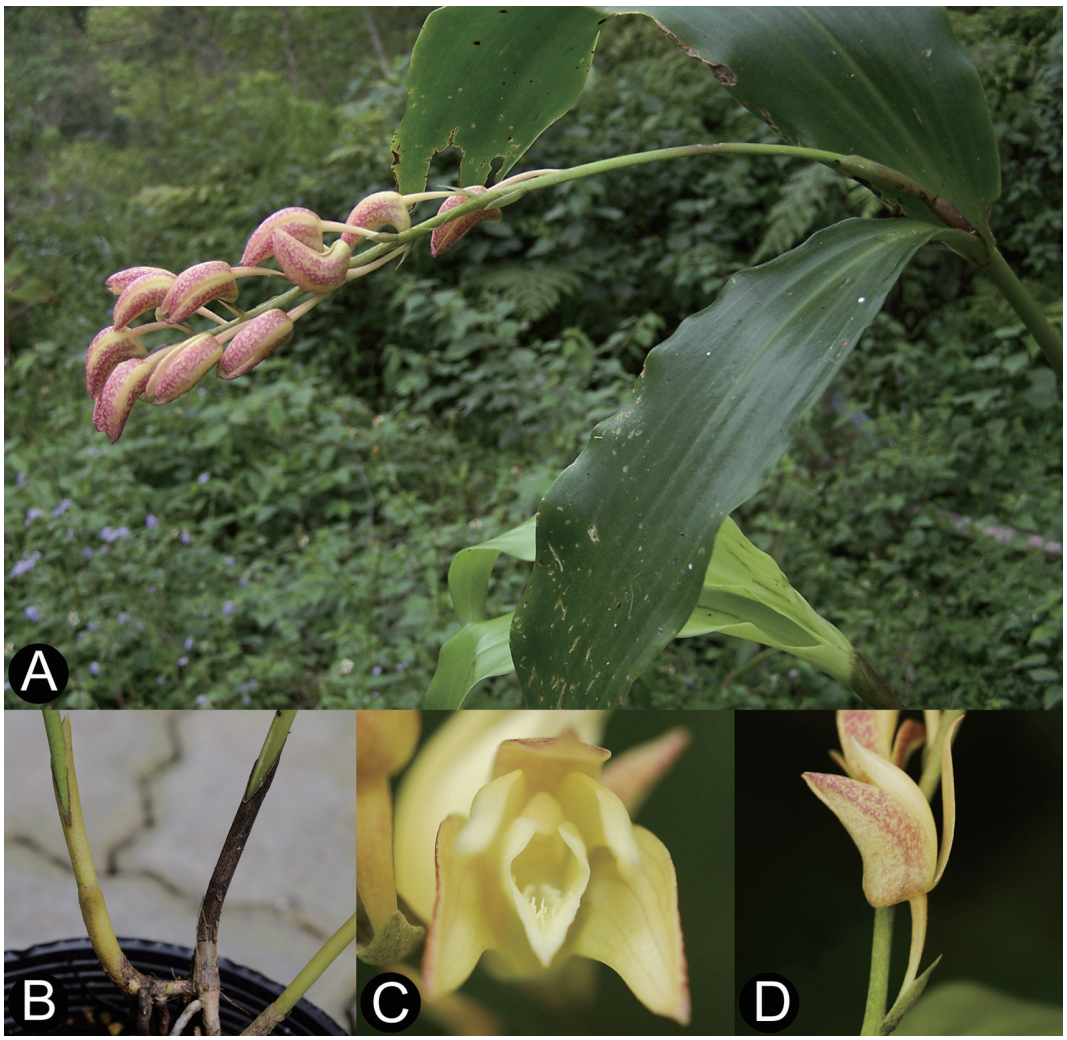

Fig. 2. *Eria gagnepainii* A. D. Hawkes & A. H. Heller. A, Habit; B, cylindrical and slender pseudobulbs; C, front view of flower; D, lateral view of flower.

lation composed of fewer than 10 clones. The area occupied was estimated to be < 4 km^2. According to the IUCN Red List Categories and Criteria (IUCN 2001), *E. gagnepainii* should be categorized as critically endangered [CR C2a (i, ii); D], although it may be downgraded to the endangered (EN) category following guidelines for application of IUCN Red List criteria at regional levels (IUCN 2003), since the species is not endemic to Taiwan. However, considering the fact that most orchids are subject to heavy collection and rapid habitat loss, *E. gagnepainii* should be placed in the CR category.

Habitat and ecology: *Eria gagnepainii* grows on the trunk of *Cyathea spinulosa* Wall. ex Hook. (Cyatheaceae), a common tree fern widely spread in the understory of subtropical rain forests in Taiwan. It flowers in early March.

Notes: *Eria gagnepainii* differs substantially from *E. corneri* and *E. javanica* in its

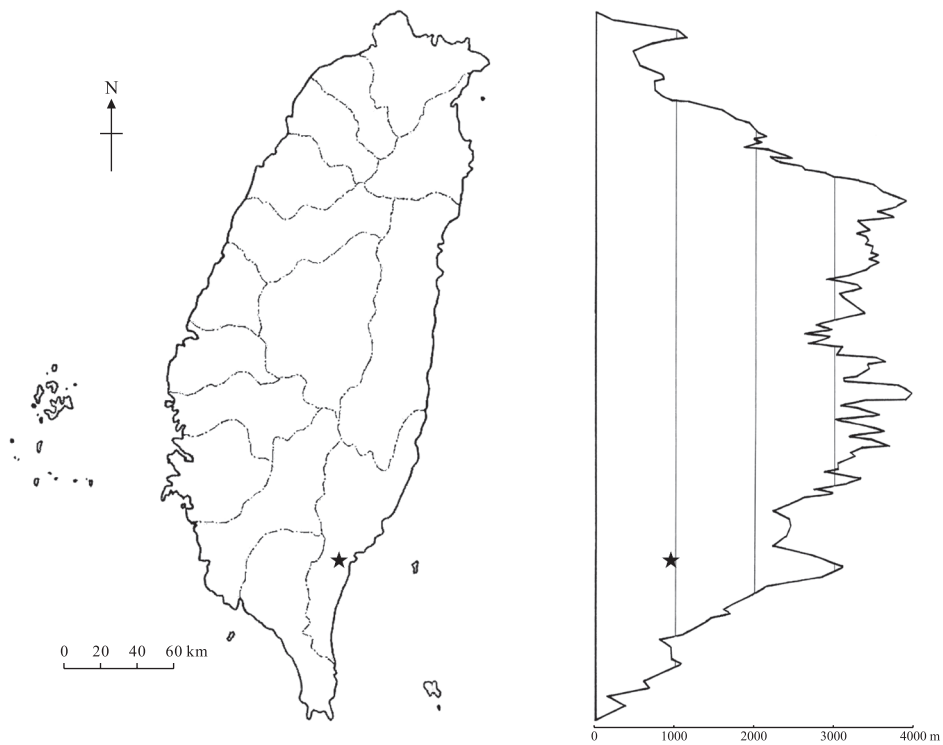

Fig. 3. Distribution of *Eria gagnepainii* A. D. Hawkes & A. H. Heller in Taiwan. The profile along longitudinal axis of Taiwan (right) represents the corresponding elevation above sea level.

much longer cylindrical and slenderer pseudobulbs (6~13 cm long, 0.4~0.6 cm in diam.), while the latter 2 have shorter angled-cylindrical or ovoid pseudobulbs (4~6 cm long, 2 cm in diam.). In addition, the flower of *E. gagnepainii* is sub-spreading and glabrous, whereas that of *E. javanica* is wide open and covered by dark-brown hairs outside; keels in the disc of *E. gagnepainii* are pale-yellow to yellow, while those of *E. corneri* are purple at the apex.

This newly recorded species is also similar to *E. coronaria* (Lindl.) Rchb. f., a species distributed in northern Indo-China, southwestern China, and the Himalayas, in vegetative morphology. However, the former differs from the latter in flower characteristics, including the flowering phenology (February to April vs. May to July), the flower morphology (sub-spreading vs. widely open), the perianth color (pale-yellow to yellow vs. bright white), and the number of flowers in a single inflorescence (5~12 vs. 1 or 2 (~6)).

During the last decade, several newly recorded or new species were found in southeastern Taiwan, e.g., *Vanoverberghia sasakiana* Funak & Ohashi (Funakoshi and Ohashi 2000), *Strobilanthes lanyuensis* Seok, Hsieh & Murata (Seok et al. 2004), *Bulbophyllum albociliatum* (Liu & Su) Nakejima var. *weiminianum* Lin & Huang (Lin and Kuo-Huang 2005), *Dendrobium okinawense* Hatusima & Ida (Chung and Lu 2007), *Camellia kissi* Wallich (Su et al. 2008), *Musa yamiensis* Yeh & Chen (Yeh et al. 2008a), *Bredia dulanica* C.L.Yeh, S.W.Chung & T.C.Hsu (Yeh et al. 2008b), *Peristylus gracilis* (Hsu et al. 2009),

and *Selaginella lutchuensis* Koidz (Chang et al. 2009). Frequent discoveries of newly recorded or new species within this area again reveal the insufficiency of botanical inventories in Taiwan especially regions, like the southeastern part, that are seldom surveyed by taxonomists. More-extensive inventories are urgently needed in order to fully document the complete biodiversity in Taiwan.

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LITERATURE CITED

Chang HM, Chen JF, Lu PF, Moore SJ, Wang JC, Chiou WL. 2009. Supplements to the lycophytes in Taiwan (I): a newly recorded species *Selaginella lutchuensis* Koidz. (Selaginellaceae). Taiwania 54(1):88-92.

Chen XQ, Luo YB, Wood JJ. 2009. *Eria*. In: Wu ZY, Raven PH, editors. Flora of China, Text Vol. 25, Orchidaceae. Beijing, China: Science Press. p 343-6.

Chung SW, Lu SY. 2007. *Dendrobium okinawense* Hatusima & Ida (Orchidaceae): a newly recorded species in Taiwan. Taiwania 52(1):106-12.

Funakoshi H, Ohashi H. 2000. *Vanoverberghia sasakiana* H. Funak. & H. Ohashi (Zingiberaceae), a new species and a new generic record for the flora of Taiwan. Taiwania 45(3):270-5.

Hsu TC, Leou CS, Yeh CL, Yeh CR, Chung SW. 2009. Supplements to the orchid flora of Taiwan (III): a newly recorded species, *Peristylus gracilis*. Taiwania 54(4):381-4.

IUCN. 2001. IUCN red list categories and criteria: Version 3.1. Gland, Switzerland and Cambridge, UK: IUCN Species Survival Commission. 30 p.

IUCN. 2003. Guidelines for application of IUCN red list criteria at regional levels: vers. 3.0. Gland, Switzerland, and Cambridge, UK: IUCN Species Survival Commission. 25 p.

Lin TP, Kuo-Huang LL. 2005. *Bulbophyllum albociliatum* (Liu & Su) Nakejima var. *weiminianum* and *Flickingeria shihfuana*, two new native orchids from Taiwan. Taiwania 50(4):290-6.

Pridgeon AM, Cribb PJ, Chase MW, Rasmussen FN. 2005. Genera Orchidacearum, Vol. 4. Epidendroideae (Part 1). Oxford, UK: Oxford Univ. Press. 696 p.

Seidenfaden G. 1982. Orchid genera in Thailand X. *Trichotosia* Bl. and *Eria* Lindl. Opera Bot 62:1-157.

Seok DI, Hsieh CF, Murata J. 2004. A new species of *Strobilanthes* (Acanthaceae) from Lanyu (Orchid Island), Taiwan, with special reference to the flower structure. J Jpn Bot 79:145-54.

Su HJ. 2000. Orchidaceae. In: Huang TC, et al., editors. Flora of Taiwan, 2nd ed., Vol. 5. Taipei, Taiwan: Editorial Committee of the Flora of Taiwan. p 864-6.

Su MH, Hsieh CF, Tsou CH, Wang JC. 2008. *Camellia kissi* Wallich (Theaceae): a newly recorded tree from Taiwan. Taiwan J For Sci 23(4):301-7.

Wang JC, Yen HF. 1995. *Merremia vitifolia* (Burm. f.) Hall. f. (Convolvulaceae), a new record for Taiwan. Taiwania 40:198-201.

Yeh CL, et al. 2008a. *Musa yamiensis* C. L. Yeh & J. H. Chen (Musaceae), a new species from Lanyu, Taiwan. Gard Bull Singapore 60:165-72.

Yeh CL, Chung SW, Hsu TC, Yeh CR. 2008b. Two new species of *Bredia* (Melastomataceae) from Taiwan. Edinburgh J Bot 65:393-405.