Taiwania 65(4): 463–472, **2020**
DOI: 10.6165/tai.2020.65.463

New additions of *Oreorchis*, *Cheirostylis*, and *Cymbidium* (Orchidaceae) from Taiwan

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(Manuscript received 1 June 2020; Accepted 22 September 2020; Online published 1 October 2020)

ABSTRACT: This report presents 3 new orchids from Taiwan, i.e., *Oreorchis wumanae* T.P. Lin, *Cymbidium* × *oblancifolium* Z.J. Liu & S.C. Chen, and *Cheirostylis tortilacinia* var. *wutaiensis* T.P. Lin. A color variant of the flower of *Oberonia formosana* is also presented.

KEY WORDS: *Cheirostylis tortilacinia* var. *wutaiensis*, *Cymbidium* ×*oblancifolium*, *Oberonia formosana*, *Oreorchis wumanae*.

INTRODUCTION

The present paper is a continuation of efforts to update the orchid flora of Taiwan. A complete description of native orchids of Taiwan was recently published (Lin, 2019). In that book about 465 species and varieties belonging to 108 genera were reported. However, the emergence of newly discovered orchids from different locations has continued due to ongoing orchid surveys. The rate of adding new orchids to the country's flora is slowing. Explorers are now transferring their attention to morphological variations of known species. Thus, increasing reports of new natural hybrids and varieties are expected. A recent field trip resulted in the discovery of several new orchids in the genera of *Cheirostylis*, *Cymbidium,* and *Oreorchis* of Taiwan, which are presented below.

TAXONOMIC TREATMENT

In the following, 1 new species (*Oreorchis wumanae*) is introduced first, followed by 1 new natural hybrid (*Cymbidium* × *oblancifolium*) and 1 new variety (*Cheirostylis tortilacinia* var. *wutaiensis*). Finally, a new forma of *Oberonia formosana* is presented.

Oreorchis wumanae T.P. Lin, ***sp. nov***.

吳厝山蘭 Figs. 1, 2

Type: Taiwan: Hualien Co. Xiulin Township, Dowmung, Mar. 16, 2020, *Ching-Hwang Liu s.n.*, 1900–2000 m (TAI289760!).

Plant morphology similar to that of *Oreorchis fargesii* Finet (Lin, 2019) (Figs. 1A, B, 2). Terrestrial. Rhizome cylindrical, very short. **Pseudobulbs** ovoid, glabrous, 1–1.5 cm long, 1–1.5 cm in diam., with 3 nodes and 2 major internodes, green at terminal part, light-green at base, 1-leafed. **Leaves** linear, 20–25 × 0.8–1.3 cm, acuminate, attenuate toward base, articulated with a petiole; leaf base forming a tubular sheath and a false stem ca. 6 cm long. **Flowering stems** arising from middle of pseudobulb, shorter than leaves, ca. 18 cm long; peduncle slender, purple but greenish at terminal part, ridged, enclosed by 3 or 4 sheath-bracts; sheath-bracts light-brownish, obovate, tubular, membranous, the uppermost one ca. 3.5 cm long; rachis green, ca. 2 cm long, bearing 11–15 flowers; inflorescence ca. 2.5 cm across, subcapitate. Floral bracts ovate-lanceolate, 3.3 × 0.6 mm, acute. Pedicel and ovary 8–10 mm long, light-greenish, slender, glabrous. **Flowers** white, not widely opening, 1–2 cm across; sepals subequal, whitish (Fig. 1B, C); upper one elliptic, 10.5 × 3.5 mm, acute; lateral ones obliquely ovate-lanceolate, 10 × 4.3 mm, acute; petals obliquely elliptic, marked with purple dots and speckles which intertwine especially on basal portion (Fig. 1C), 10.5 × 4.3 mm, acute. **Lip** cuneate-rectangular, 7.5 × 3 mm in natural state (Fig. 1E), elliptic when spread out, whitish but marked with purplish blotches along veins, yellow on basal part, short-clawed at base, 3-lobed above claw, villose on upper surface; claw strongly bent upwards and subtending column base, grooved; lateral lobes linear-oblanceolate, 2.5 × 0.4 mm, obtuse, curving forwards, with 1 purple stripe along midvein; midlobe porrect, elliptic, 5 × 3.2 mm in natural state, truncate and crispate-ruffled along front margin; disc with dense villi, marked with purple stripes and spots, with a callus near base; callus white, elongate triangular, 2 mm long, longitudinally grooved. **Column** yellow, 3–3.5 mm long, base dilated (Fig. 1G), dark-punctate near apex and grooved on ventral surface, becoming deeply concave on basal part (Fig. 1G). **Rostellum** triangular (Fig. 1G). Stigma surface broad and concave. Anther-cap more or less round, light-yellowish; pollinia 4, in 2 pairs, yellow, round, attached to a short stipe (Fig. 1H), viscidium broadly round.

Flowering time: March–April.

Distribution: Endemic. **Taiwan**: Only known from Hualien Co. at elevations of 1500–2000 m.

Etymology: The scientific and Chinese name were

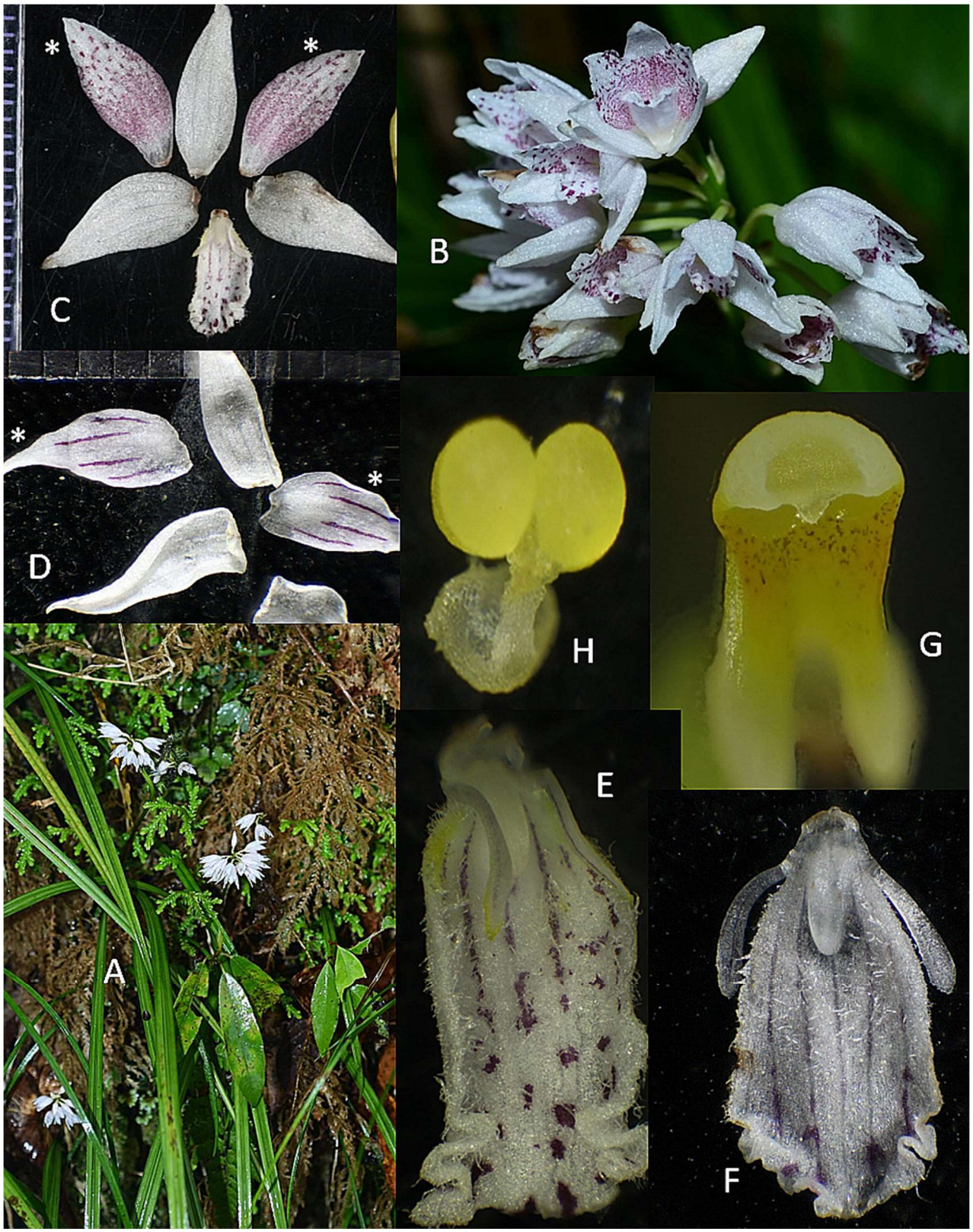

Fig. 1. Photos of ***Oreorchis wumanae*** T.P. Lin (**A**-**C**, **E** & **G**-**H**) and ***Oreorchis fargesii*** Finet (**D** & **F**). **A**: Habitat. **B**: Inflorescence. **C** & **D**: Dissected flower **E** & **F**: Lip. **G**: Frontal view of column. **H**: Pollinarium. A & B taken by Ching-Hwang Liu; TAI289760; D and F, *Oreorchis fargesii* collected from southern Taiwan at 2000 m. Petals are marked by "*".

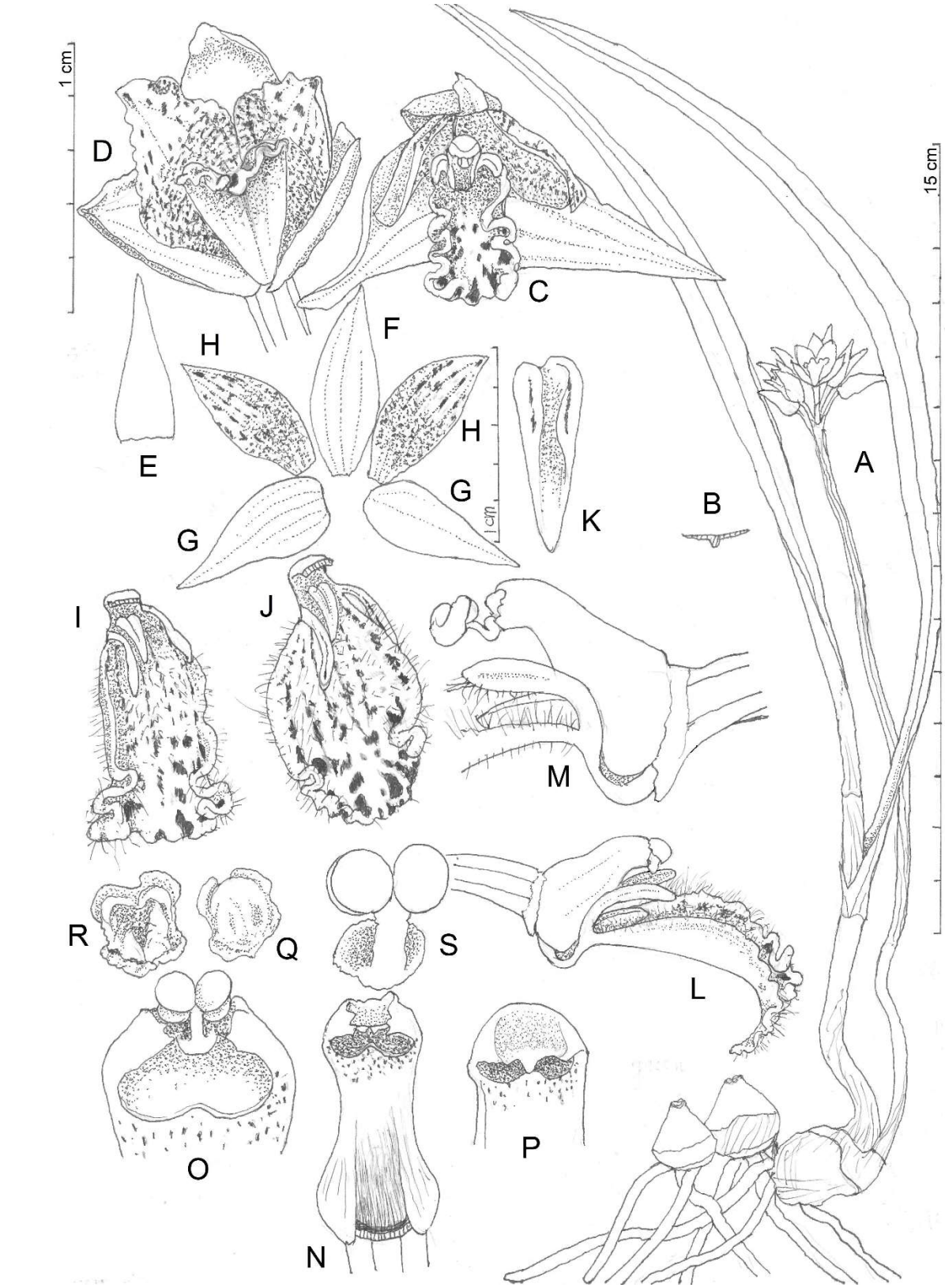

Fig. 2. ***Oreorchis wumanae*** T.P. Lin. **A**: Flowering plant. **B**: Leaf cross-section. **C**: Flower, frontal view. **D**: Flower, view from below. **E**: Floral bract. **F**: Upper sepal. **G**: Lateral sepal. **H**: Petal. **I**: Lip. **J**: Lip, spread out. **K**: Callus at basal part of lip. **L**: Lip and column, side view. **M**: Column and basal lip, side view. **N**: Column with anther removed, view from below. **O**: Column apex with pollinarium attached, view from below. **P**: Column apex showing the rostellum. **Q**: Anther-cap, view from above. **R**: Anther-cap, view from below. **S**: Pollinarium.

created in memory of Dr. Ching-Hwang Liu's mother.

Note: *Oreorchis wumanae* was discovered by Dr. Ching-Hwang Liu on Apr. 5, 2019 in a mountainous area of Dowmung, Hualien Co. at an elevation of about 2000 m. This orchid was also found by Sheng-Kun Yu on Mt. Lán, Hualien Co. on Apr. 16, 2020 at an elevation of 1600 m. In Taiwan, we have 5 species of *Oreorchis* (Lin, 2019). Among them, *O. fargesii* has a similar morphology to *O. wumanae* because both have a very short rachis thus making the inflorescence look like it is subcapitate. However, the ornamental intertwined markings on the petals of *O. wumanae* (Fig. 1C) clearly differ from those of *O. fargesii* (Fig. 1D). In the basal part of lip of *O. wumanae*, it is yellow, and the disc is marked with purple blotches along veins (Fig. 1E), whereas in *O. fargesii* the lip is white, and the disc is marked with parallel purple delicate stripes (Fig. 1F). A detailed comparison between *O. fargesii* and *O. wumanae* is given in Table 1. A new key to Taiwanese species of *Oreorchis* including *O. wumanae* is provided as follows.

Additional speciesmen examed: Taiwan: Hualien Co. Mt. Lán. 1600 m, Apr. 16, 2020, *Sheng-Kun Yu s.n.* (TAIF!)

Table 1. Comparison between *Oreorchis wumanae* and *O. fargesii*.

Features	*Oreorchis wumanae*	*Oreorchis fargesii*
Petal marks	marked with purple dots and speckles which intertwined especially at the lower part	marked with 4 purple stripes along veins
Petal shape	elliptic	ovate-lanceolate
Lip shape	elliptic when spread out	oblong when spread out
Lip marks	White but yellow at basal part, disc marked with purple blotches along veins	White, disc marked with parallel purple delicate stripes
Column	yellow	white
Pollinia	yellow	white

Key to *Oreorchis* species in Taiwan

1a. Flowering plants ca. 50 cm tall; flowers yellowish-brown to dark-brown ……. ***O. bilamellata***
1b. Flowering plants <30 cm tall; flowers whitish to reddish-brown …….. 2
2a. Flowers dark-reddish-brown with purplish-brown striations …….. …… ***O. foliosa*** var. ***indica***
2b. Flowers whitish or brownish-yellow, with white lip ……. 3
3a. Flowers brownish-yellow, with white lip …… ***O. patens***
3b. Flowers whitish ……. 4
4a. Inflorescence racemose, not subcapitate …….. ***O. micrantha***
4b. Inflorescence subcapitate 5
5a. Petals ovate-lanceolate, with 4 purple stripes along veins …… ……..... ***O. fargesii***
5b. Petals elliptic, with purple dots and speckles which intertwine especially on the lower part ……. ***O. wumanae***

Cymbidium* ×*oblancifolium Z.J. Liu & S.C. Chen, For. Stud. China 2001(**1**): 23–25. ***Type***: China: Guangdong, Shenzhen, Nov. 24, 1999, cultivated, *Zhongjian Liu 100* (Herbarium, Shenzhen City Wutongshan Nurseries, Guangdong, China).

四季竹柏蘭 Figs. 3A-C, 4

Terrestrial. Flowering plant 30–40 cm tall. **Pseudobulbs** cylindrical, ca. 4–5 cm long, 1.5 cm in diam., with 3–4 leaves. **Leaves** linear-oblanceolate, to 52 cm long, 2.3 cm wide at terminal part, thinly coriaceous. **Flowering stems** basal to pseudobulb, ca. 35 cm long, bearing 6 well-spaced flowers. Floral bracts ovate-lanceolate, shorter than pedicel and ovary, 19 × 4.5 mm. Pedicel and ovary ca. 2.8 cm long. **Flowers** fragrant, 4 cm across, spreading; sepals similar, oblong-oblanceolate, greenish-white, often with light-reddish stripes; upper sepal 35 × 8.5 mm, acute; lateral sepals oblique, 33 × 8 mm, acute, forming an angle of ca. 90°; petals elliptic, 28 × 11 mm, with red spots and 1 striation (Figs. 3C, 4G), spreading or bending forward over column. **Lip** white with purplish-red blotches, 28 × 12.5 mm, obscurely 3-lobed; side-lobes erect, not embracing column; midlobe ovate-triangular, revolute from middle, obtuse at tip; disc with a pair of fleshy inclined approximate keels extending from base of lip to middle. **Column** arcuate, whitish, 1.4 cm long, 8 mm near terminal part, with reddish blotches on ventral side. **Rostellum** hood-like, arch-shaped or deeply cleft after removing viscidium. Anther-cap orbicular, 3 mm long, yellowish; pollinia yellow, compressed, 2, each with 2 unequal superimposed partitions, seated directly on broad viscidium.

Flowering time: July.

Distribution: China. **Taiwan**: Found in forests of Taitung at an elevation of ca. 800 m.

Note: Natural hybrids between species of *Cymbidium* are listed in the WCSP (2019). Hybridization among small-flowered and terrestrial *Cymbidium*, i.e., *Cymbidium goeringii*, *C. lancifolium*, *C. ensifolium*, *C. sinense,* and *C. kanran,* is possible (Table 2).

Table 2. List of some known hybrids of *Cymbidium*.

Cymbidium Hybrid	Reference
C.* ×*nishiuchianum Makino ex J.M.H. Shaw = *C. goeringii* × *C. kanran*	Orchid Rev. 110(1243): new orchid hybrids 13. 2002
C.* ×*nomachianum T. Yukawa & Nob. Tanaka = *C. kanran* × *C. lancifolium*	Bull. Natl. Mus. Nat. Sci., Tokyo, B. 34: 86. 2008
C.* ×*oblancifolium Z.J.Liu & S.C. Chen = *C. ensifolium* × *C. lancifolium*	For. Stud. China 2001(1): 23-25.
C.* ×*jy-shiang = *C. lancifolium* × *C. sinense*	https://speciosa.blogspot.com/2011/01/cymbidium-jy-shiang.html

Cymbidium ×*oblancifolium,* a natural hybrid between *C. lancifolium* and *C. ensifolium,* was originally found in southern Sichuan, China (Liu and Chen, 2001). In Taiwan, this hybrid was discovered by an unknown collector in Taitung Co., and was later obtained by Mr. Liang-Zu Chang in 2017. At first glance of *Cymbidium* ×*oblancifolium,* I found the linear-oblanceolate leaf with widened terminal part to be unique (Figs. 3A, 4Q). The inflorescence and flower look like those of *C. ensifolium* but are not identical (Fig. 3A). After careful study, I suppose that this is a hybrid between *C. lancifolium* and *C.*

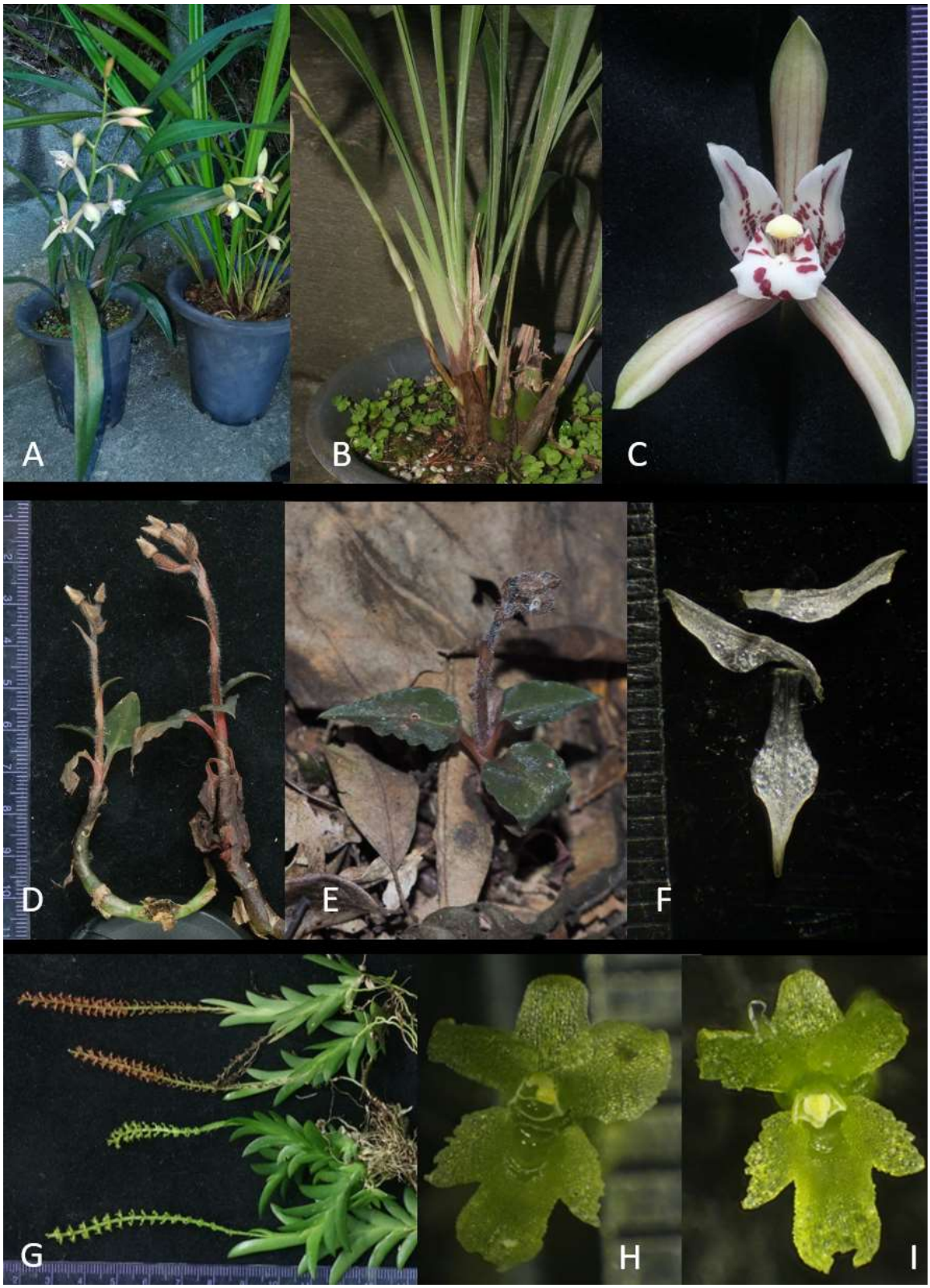

Fig. 3. Photos of ***Cymbidium* ×*oblancifolium*** Z.J. Liu & S.C. Chen (**A-C**), ***Cheirostylis tortilacinia*** var. ***wutaiensis*** T.P. Lin (**D-F**) and ***Oberonia formosana*** Hayata f. ***viridiflora*** T.P. Lin (**G-I**). **A**: ***Cymbidium* ×*oblancifolium*** (left, TAI289010) and ***C. ensifolium*** (right). **B**: Flower of ***C.* ×*oblancifolium***. **C**: Naked mature pseudobulbs of ***C.* ×*oblancifolium***. **D**: ***C. tortilacinia*** var. ***wutaiensis*** (TAI289755). **E**: ***C. tortilacinia*** var. ***wutaiensis*** in native habitat (taken by Shih-Ho Tseng, 2020). **F**: Petals and lip. **G**: ***O. formosana*** f. ***viridiflora*** (lower side), ***O. formosana*** f. ***formosana*** (upper side). **H-I**: Flowers of ***O. formosana*** f. ***viridiflora***.

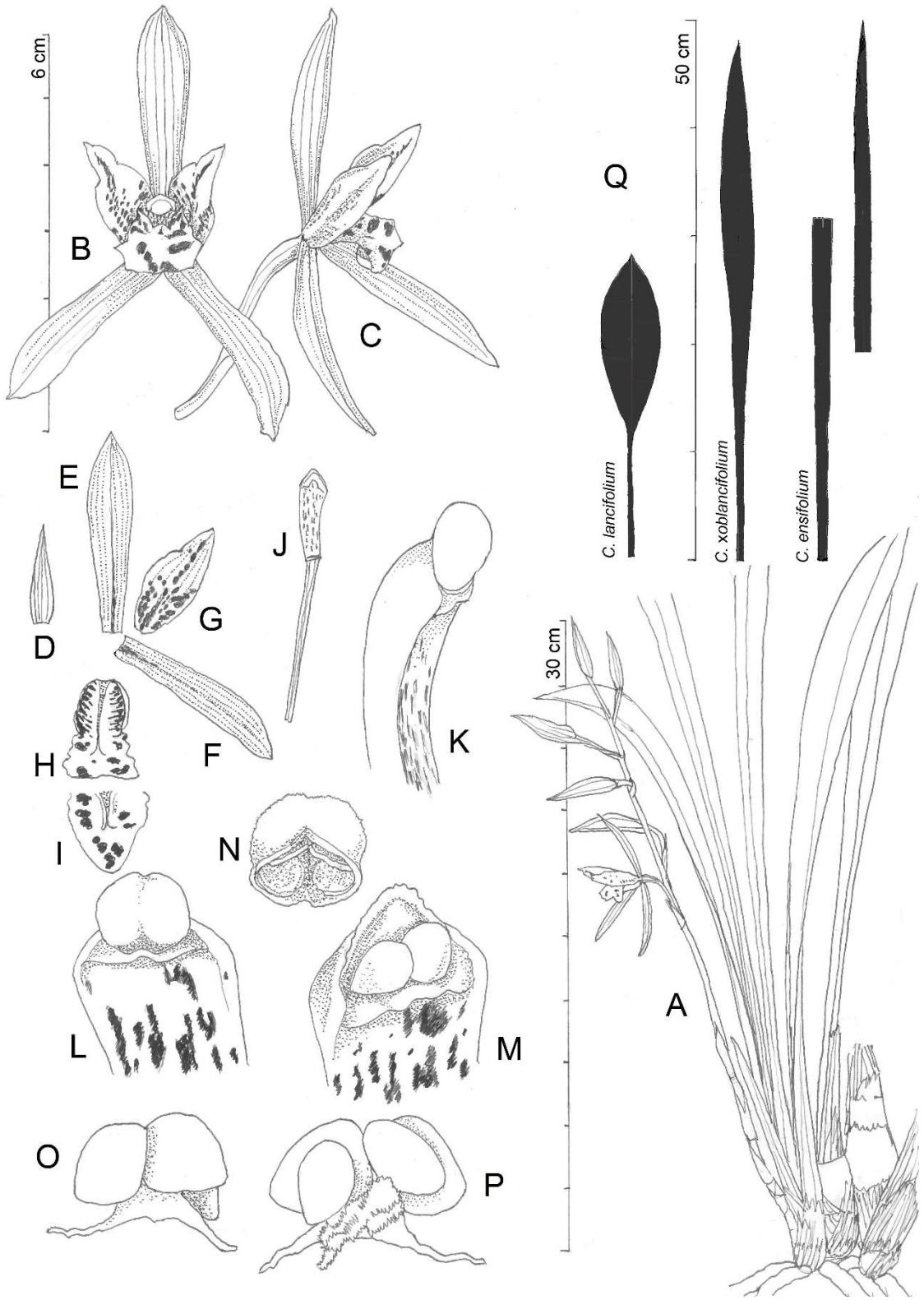

Fig. 4. ***Cymbidium* × *oblancifolium*** Z.J. Liu & S.C. Chen. **A**: Flowering plant. **B**: Flower, frontal view. **C**: Flower, side view. **D**: Floral bract. **E**: Upper sepal. **F**: Lateral sepal. **G**: Petal. **H**: Lip, in natural state. **I**: Lip apex. **J**: Column and ovary. **K**: Column with anther attached, side view. **L**: Column with anther attached, view from below. **M**: Column with pollinarium attached, view from below. **N**: Anther cap, view from below. **O**: Pollinarium, frontal view. **P**: Pollinarium, view from rear. **Q**: Image of leaves of ***C. lancifolium*** (left), ***C.* ×*oblancifolium*** (center), and ***C. ensifolium*** (right).

Table 3. Comparisons of ***Cymbidium ×oblancifolium***, ***C. lancifolium*** and ***C. ensifolium***. The first 4 characteristics of ***C. ×oblancifolium*** show intermediate between 2 parental species.

Species	***C. lancifolium***	***C. ×oblancifolium***	***C. ensifolium***
Leaf	elliptic-oblanceolate	linear-oblanceolate	linear
Length of leaf	10–20 cm	40–52 cm	45–80 cm
Petals	usu. 1 striation	1 striation and blotches	striation(s) and blotches
Coloration of sepals	white/greenish usu. without red striation	white/light-greenish with light red striations	greenish/yellowish with clear or intensified red striations
Shape of sepals	oblong/linear-oblong	linear-oblong	oblong
Mature pseudobulb	naked	naked	enclosed within leaf sheaths
Inflorescence	8-20 cm long	35 cm long	25-35 cm long
Fragrance of flower	no smell	fragrant	fragrant

ensifolium because the hybrid shows some intermediate characteristics. The intermediate properties include the leaf shape, leaf length, and coloration of the petal and sepal (see the first 4 items of Table 3). The mature naked cylindrical pseudobulb found in the hybrid (Figs. 3B, 4) is identical to that of *C. lancifolium* but not of *C. ensifolium,* in which the mature pseudobulb is not well-developed and is entirely enclosed in the bilaterally imbricate leaf sheaths. The shape of sepals in the hybrid is similar to that of *C. lancifolium* but not *C. ensifolium*. The flower has a sweet fragrance in the hybrid and is similar to that of *C. ensifolium*, while *C. lancifolium* has no smell. Based on these observation, I suggest that TAI289010 is potentially a natural hybrid between *C. ensifolium* and *C. lancifolium*.

Speciesmen examed: **Taiwan**: Taitung Co., 800 m. July 5, 2018, *Liang-Zu Chang s.n.*, cultivated (TAI289010!).

Cheirostylis tortilacinia var. ***wutaiensis*** T.P. Lin, ***var. nov***.
擬紅衣指柱蘭 Figs. 3D-F, 5, 6

Type: Taiwan: Pingtung Co. Wutai Township, 1050 m, Jan. 5, 2020, *Shih-Ho Tseng s.n.* (TAI289755!).

A complete peloria (peloric flower) of *Cheirostylis tortilacinia*. Flowering plant about 7.5 cm tall (Fig. 3D, E). Vegetative part is exactly identical to that of *C. tortilacinia* and *C. rubrofolia* (Lin and Lin, 2009). **Rhizomes** 3–5 cm long, decumbent. Stem 2.5–5 cm long, cylindrical, 4–6 mm in diam., gray-greenish or dark-reddish-brown, succulent. Roots fine. Flowering plants 7–11 cm tall. **Leaves** 4–6, narrowly ovate-triangular. Leaves tend to be dark-reddish-purple in vegetative stage but dark-greenish in flowering stage, pale-green underneath, ca. 2 × 0.8 cm, slightly wavy along margins; petioles 0.5 cm long. **Flowering stem** 4–5 cm long; peduncle 3–5 cm long, reddish-brown, hairy, with 3–4 sheath-bracts; raceme short, < 2 cm long, 3–5-flowered. Floral bracts lanceolate, hairy outside. Pedicellate ovary 5–7 mm long, reddish-brown, glandular-pubescent. **Flowers** resupinate, grayish-brown, tube-like; sepals 5 mm long, connate into a tube for more than 1/2 their length, glandular-pubescent; petals white, falcate, ca. 4.5 mm long, glabrous, appressed to upper sepal, with narrowed base. **Lip** white, spindle-like or spatulate, 4.8 × 1.5 mm when expanded, clawed at base, independent from column, simple and entire, no appendage (Fig. 3F). **Column** 3 mm long; column appendage lacking (Fig. 5). **Rostellum** bifid, narrow. Stigma 2, on lateral sides of column. Anther ovate, reddish-brown; pollinia 2, clavate, granular, each with 2 equal partitions, yellow; viscidium linear, translucent.

Flowering time: January.

Distribution: Endemic. **Taiwan**: The collector discovered a small population of this species in Wutai Township, Pingtung Co. at an elevation of 1050 m on Jan. 5, 2020. This small plant grows in the understory and is often covered by dry leaves.

Etymology: The varietal epithet "*wutaiensis*" refers to the township where this new variety was discovered.

Note: *Cheirostylis tortilacinia*, *C. rubrofolia,* and *C. tortilacinia* var. *wutaiensis* share the same vegetative morphology, and only differ in the lip shape. It seems likely that peloria is involved in the origin of *C. tortilacinia* and its varieties, a condition whereby a bilaterally symmetrical flower mutates into a regular flower. I thus consider that *C. tortilacinia* is the progenitor with a fimbriate lip, whereas *C. rubrofolia* has an incomplete peloria with a less-complicated lip (Lin and Lin, 2009), and eventually *C. tortilacinia* var. *wutaiensis* has an entirely simplified lip. The glandular hairs in the sac of the lip are still well-developed in *C. rubrofolia*; however the epichile of the lip is simplified. This concept is illustrated in Fig. 6. *Cheirostylis tortilacinia* var. *wutaiensis* and *C. rubrofolia* are 2 independent populations both found in Pingtung Co. With the cognition mentioned above, I would adjust the name as follows.

Cheirostylis tortilacinia var. ***rubrifolia*** (T.P. Lin & W.M. Lin) T.P. Lin***, comb. nov***. - *Cheirostylis rubrifolia* T.P. Lin & W.M. Lin, Taiwania **54**(4): 327, f.2E, 3. 2009.
Type: Taiwan: Pingtung: Shantimen Township, Feb. 16, 2009, *Wei-Min Lin s.n.* (holo. TAI268960!).
紅衣指柱蘭

Peloria refers to a state of certain flowers, which, being naturally irregular or asymmetrical, have become regular or symmetrical through a genetic mechanism. In the wild, lip petalization refers to the labellum being replaced by an undifferentiated petal (named type-B peloria by Rudall and Bateman 2003). Type-B peloric orchid flowers have been reported in many genera in

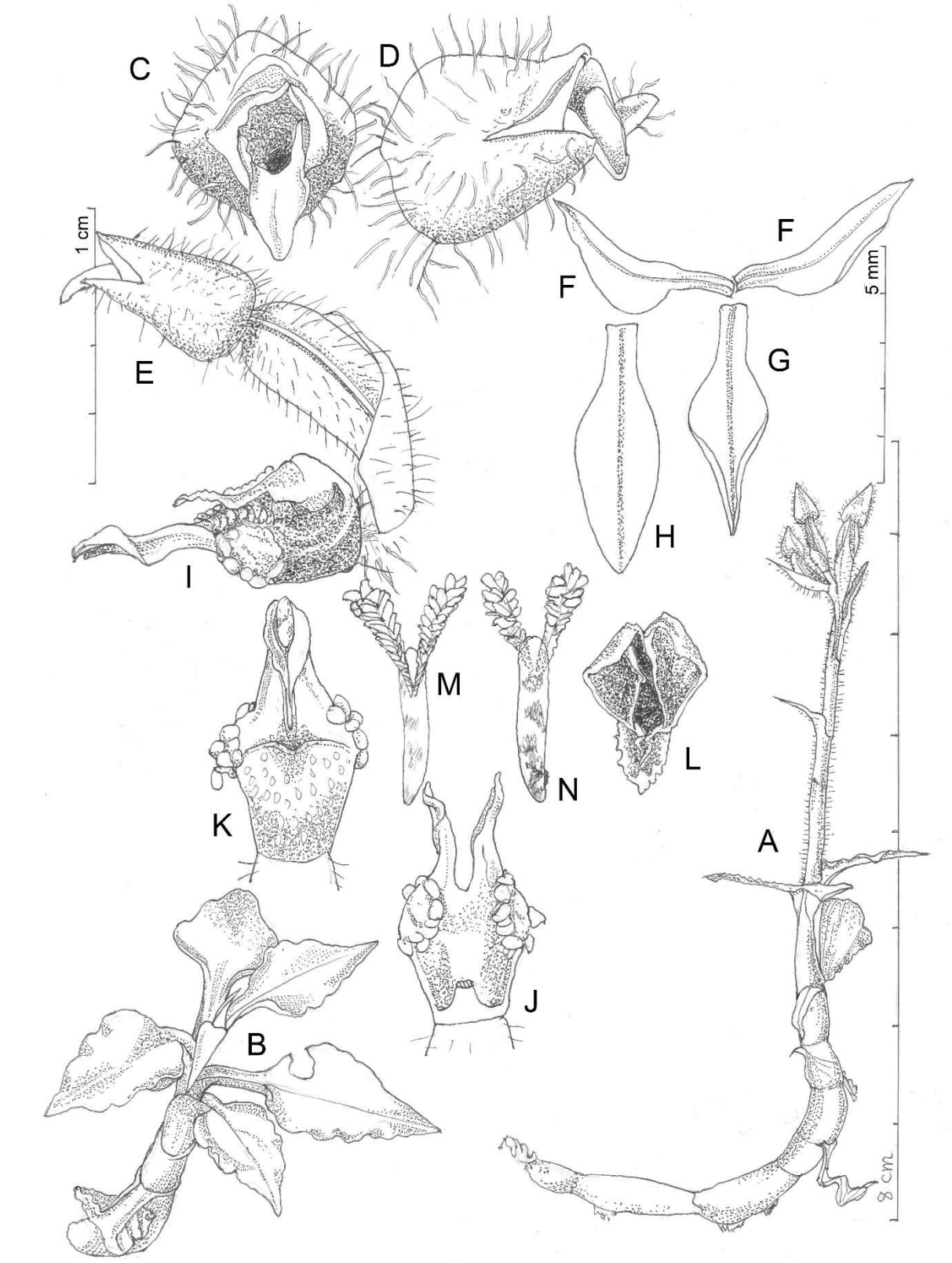

Figure 5. ***Cheirostylis tortilacinia*** var. ***wutaiensis*** T.P. Lin **A**: Flowering plant. **B**: Vegetative stage. **C**: Flower, frontal view. **D**: Flower, side view. **E**: Flower, side view. **F**: Petal. **G**: Lip. **H**: Lip, spread out. **I**: Column, side view. **J**: Column, view from above. **K**: Column, view from below. **L**: Anther-cap, view from below. **M**: Pollinarium, view from above. **N**: Pollinarium, view from below.

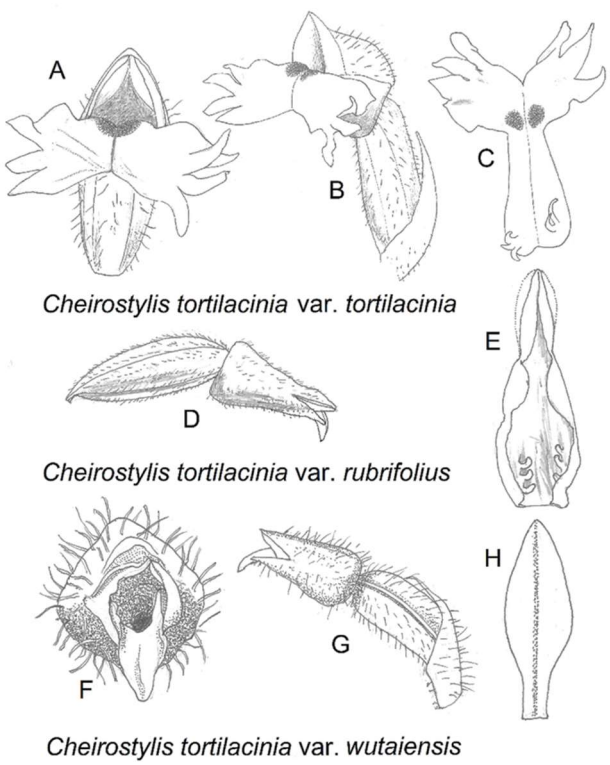

Fig. 6. Comparison of flower and lip of ***Cheirostylis tortilacinia*** (**A**-**C**) and it's varieties, var. ***rubrifolius*** (**D**-**E**) and var. ***wutaiensis*** (**F**-**H**). **A**, Flower, frontal view. **B**, Flower, oblique view. **C**, Lip, spread out. **D**, Flower, side view. **E**, Lip. **F**, Flower, frontal view. **G**, Flower, side view. **H**, Lip, spread out. The line drawings of ***Cheirostylis tortilacinia*** and ***Cheirostylis tortilacinia*** var. ***rubrifolius*** are derived from my previous work (Lin, 2019). The dash line refers to expanded epichile.

Table 4. Lip petalization of *Cheirostylis* in Taiwan

Progenitor	Pseudopeloric	Progeny with simple lip
C. chinensis		?
C. liukiuensis	*C. liukiuensis* var. *nantouensis*	*C. liukiuensis* var. *derchiensis*
C. cochinchinensis		*C. cochinchinensis* var. *clibborndyeri*
C. octodactyla	*C. octodactyla* f. *cymbiformes*	
C. pusilla●		*C. pusilla* var. *simplex*
C. tortilacinia	*C. tortilacinia* var. *rubrifolia*	*C. tortilacinia* var. *wutaiensis*
?		*C. takeoi*

●, Not reported in Taiwan.

Taiwan, for example *Aphyllorchis*, *Cheirostylis*, *Eulophia*, *Gastrodia*, *Hayata*, *Lecanorchis*, *Styloglossum*, *Zeuxine*, etc. (Lin, 2019). However, type-A peloria or petal lipization, in which the 2 lateral petals are replaced by a relatively strongly differentiated labellum, seems only to occur in tissue culture-derived orchid flowers (Tsai *et al*., 2004, Huang *et al*., 2017). We have 12 species and varieties of *Cheirostylis* (Lin, 2019: 93), and type-B peloria occurs in almost every species of *Cheirostylis*; however, some entities exhibit a slightly simplified but not simple lip. The latter flowers that display 'diminished' zygomorphy relative to the normal state are termed pseudopeloric (Rudall and Bateman, 2003) (Table 4). Hayata (1914) even considered species with an entire lip to comprise a distinct genus, *Arisanorchis* (= *Cheirostylis takeoi* Hayata), even though other features conform to *Cheirostylis*. It is interesting to note that *C. liukiuensis* Masam. (Masamune 1930), *C. nantouensis* T.P. Lin (Lin, 2017), and *C. liukiuensis* var. *derchiensis* (S.S. Ying) T.P. Lin (Lin, 2016) have similar or parallel relationships as *C. tortilacinia* and its 2 varieties. This was illustrated in my previous work (Lin, 2019). Here, I make the same adjustment as follows.

Cheirostylis liukiuensis var. ***nantouensis*** (T.P. Lin) T.P. Lin, ***comb. nov***. - *Cheirostylis nantouensis* T.P. Lin, Taiwania **62**(2): 205–208, f.1C, D, 3. 2017. ***Type***: Taiwan: Nantou Co., Feb. 3, 2017, 1300 m, *P.N. Shen s.n.* (holo. TAI286823!).

南投指柱蘭

It is still rare for peloric *Cheirostylis* to be reported in other Asian areas except Hong Kong (Barretto, 2011). This is probably because such tiny flowers may be overlooked especially when they have an identical plant morphology as the normal flower.

Oberonia formosana Hayata f. ***viridiflora***, T.P. Lin, ***f. nov***.
綠花台灣莪白蘭 Fig. 3G-I

Type: Taiwan: Hsinchu Co., Jianshi Township, Mt. Lidong, 1500~1600 m, Apr. 20, 2020, *Da-Ming Huang s.n.* (TAI289764!).

Plant morphology of *Oberonia formosana* f. *viridiflora* is identical to that of f. *formosana* except for green flowers (Fig. 3G, 2 plants at lower side). This is the first time a green flower is reported for *O. formosana* since its publication by Hayata (1911). **Stem** 3–6 cm long, enclosed by leaf sheaths, tufted, bearing 5–10 imbricating leaves. Leaves falcate-linear to ensiform, 15–30 × 4–5 mm, acute, green, laterally compressed, without articulation at base. Flowering stems slender, pendulous, 5–8 cm long, bearing moderately dense flowers. Floral bracts ovate-lanceolate, 1–1.7 mm long. Pedicel and ovary 1–1.7 mm long. **Flowers** minute, spreading, green, ca. 2.1–2.5 mm long, 1.5 mm across (Fig. 3H, I); sepals elliptic or oblong, 0.9 × 0.6 mm, obtuse; petals elliptic, 0.8 × 0.7 mm. Lip green, 1.1 × 1.3 mm, with a semicircular depression at base, 3-lobed; lateral lobes triangular or rectangular, 0.5 mm long, margin erose; midlobe 0.7 × 0.7 mm, square or cuneate at base, bilobed at apex, sinus broad, sometimes with a tooth; lobules small. Column 0.2 mm long, with broad truncate wings apically. Rostellum ligule-like. Anther-cap whitish to yellowish-green, broadly ovate, 0.2 mm long; pollinia 2, each with 2 subequal partitions, ovoid-ellipsoid, light-yellow, viscidium round.

Flowering time: April.

Distribution: Endemic.

Note: Forma *viridiflora* was originally discovered by Da-Ming Huang in April 2020. It was observed growing on the trunk of a broadleaf tree about 5 m above the ground. The known population is small. Two clusters of *O. formosana* with normal orange flowers were growing in trees at a distance of about 30~100 m apart (Fig. 3G, 2 plants at upper side, TAI289763!). The midlobe of lip of *O. formosana* is characterized by being relatively short and shallowly bilobed.

ACKNOWLEDGMENTS

I thank Mr. Kuo-Hsiung Wang for assisting in the search for old literature.

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