



RESEARCH ARTICLE

Newly Discovered Native Orchids of Taiwan (VII)

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ABSTRACT: In this report three new orchids to Taiwan, i.e., *Cephalantheropsis longipes*, *Habenaria tsaiana* and *Nervilia linearilabia* are presented. *Cephalantheropsis dolichopoda* (Fukuy.) Lin is a new combination from *Calanthe dolichopoda* Fukuy. *Liparis* sp. is an unknown species also included for reference.

KEY WORDS: *Cephalantheropsis*, *Habenaria*, *Liparis*, native orchids, *Nervilia*, Taiwan.

INTRODUCTION

Continuing efforts to hunt native orchids by several orchid hobbyists have generated substantial progress of species number. In this report in addition to new species from genera *Habenaria* and *Nervilia*, the relationship between *Cephalantheropsis longipes* and *C. dolichopoda* is revealed. *Liparis* sp. is an unknown species also included for reference.

TAXONOMIC TREATMENT

Cephalantheropsis longipes (Hook. f.) Ormd., Orchid Digest 62: 156. 1998

三伯肖頭蕊蘭 Figs. 1 A, 2A & 3

Syn.: *Calanthe longipes* Hook. f., Fl. Brit. India 6: 195. 1890; *Alismorkis longipes* (Hook. f.) Kuntze, Revis Gen. Pl. 2: 650. 1891; *Phaius longipes* (Hook. f.) Holttum, Gard. Bull. Singapore 11: 286. 1947; *Phaius mindorensis* Ames, Philipp. J. Sci., 2: 324. 1907. *Phaius calanthoides* Ames, Orchidaceae 2: 153. 1908.

Plant including inflorescence almost same as the *Cephalantheropsis dolichopoda* (Fukuy.) Lin (see Lin 1975 and below) in every aspects except the flower morphology. Plants tufted, 30-55 cm tall, stem has a diameter between 5.5-8 mm. Leaves 6, narrowly oblong, usually smaller than 16 cm long and 3.6 cm wide. Flowering stem 15-45 cm long. Ovary hairy. Flowers white and age to orange, widely open, 1.1-1.3 cm across, whitish hairy on surface of tepals. Sepals reflexed-spreading, elliptic, 9.5-11 mm long, 4.0-4.3 mm wide; petals elliptic, 8 mm long, 4.3 mm wide, usually bearing whitish long hairs at upper half; lip 6.5-7.5 mm long and 7.7 mm wide when spread out, adnate to the base of column, light yellow to light

orange, 3-lobed, the lateral lobes triangular, sub-open, denticulate at apices (6-7 small teeth), 4.5 mm long; the midlobe has a length about 40-45% of labellum, 3.2 mm long, 3 mm wide in nature condition, the apex dilated into 2-blades, ascending, undulate; lip disc deeply concave, bearing 2 keels; the keels become very thick and warty in the front, bright orange. Column 2.5 mm long, laxly hirsute on dorsal surface at apex, has a clear rostellum; anther cap laxly hirsute, pollinia 8.

Flowering time: November.

Distribution: *C. longipes* is widely distributed in Southeast Asia countries.

Ecology: *C. longipes* grows in the understory or along the track at an elevation about 1300 m in Tahanshan area and was firstly collected by Mr. Shyh-Shiarn Lin in 2010 and 2012 (Shyh-Shiarn Lin s.n. TAI282147, Dec. 5, 2012). The flower is white in the beginning except the front portion of keels or basal area of the midlobe showing orange or yellow. The flower ages to light orange/yellow but the front portion of the midlobe always much darker orange. This orchid also occurs to Lanyu of Taitung Co.

Note: *Cephalantheropsis longipes* of Tahanshan agrees well with those plants found in Southeast Asia. This plant growing in Lanyu has been known for a long time but was misidentified as the *C. dolichopoda* (Fukuy.) Lin (see below) thus it represents a new record species of Taiwan. The Chinese name refers to Mr. S.-S. Lin who discovered this orchid.

Another plant described by Fukuyama (1935, *Calanthe dolichopoda*) and by me (Lin, 1975, *Phaius longipes* var. *calanthoides*) is very similar to *C. longipes* in every aspects except some flower details. The *C. longipes* is different from *C. dolichopoda* by the



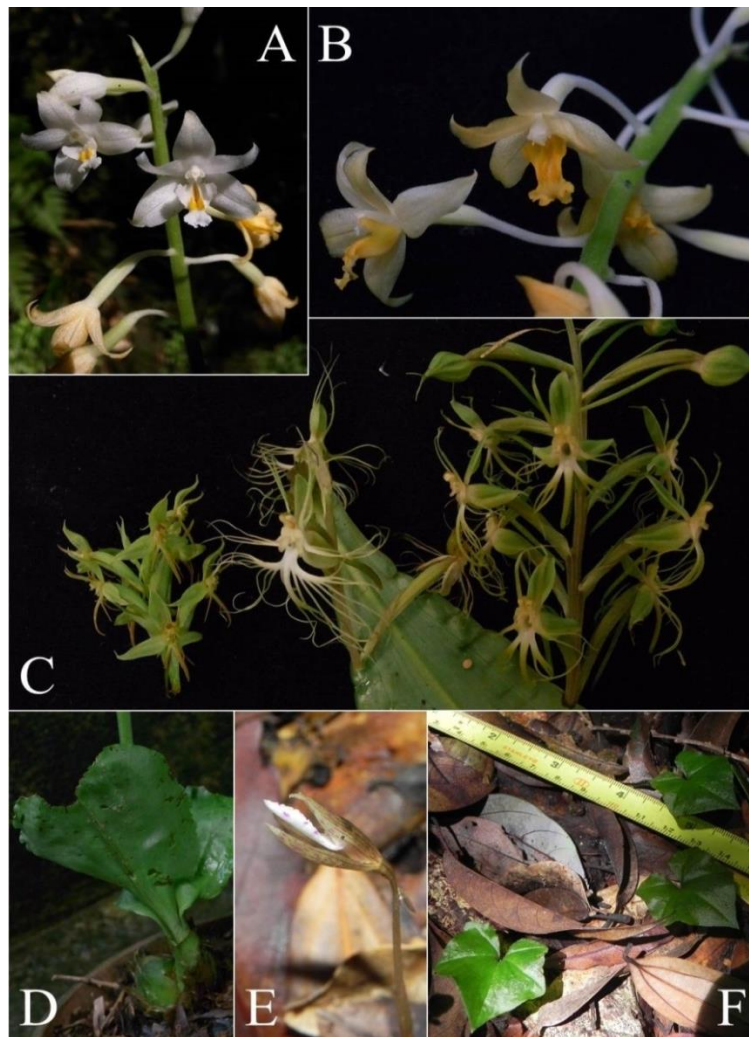


Fig. 1. Images of the new orchids. A: *Cephalantheropsis longipes* (Hook. f.) Ormd. B: *Cephalantheropsis dolichopoda* (Fukuy.) Lin, collected from Wulai. C: *Habenaria tsaiana* T.-P. Lin sp. nov. (right panel), *H. delessertiana* (left panel) and *H. polytricha* (central). D: *Liparis* sp. E & F: *Nervilia linearilabia* T.-P. Lin sp. nov.

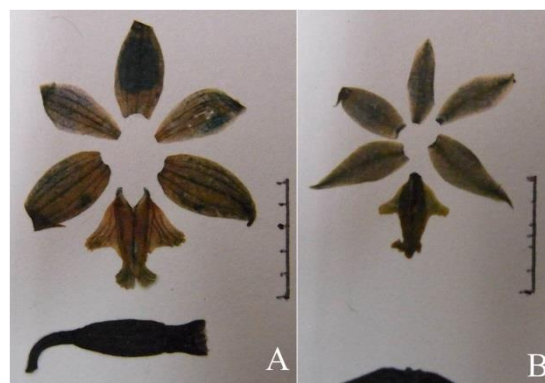


Fig. 2. Comparison of dissected flowers of *Cephalantheropsis longipes* (Hook. f.) Ormd. (A) and *Cephalantheropsis dolichopoda* (Fukuy.) Lin (B). *C. dolichopoda* (Fukuy.) Lin was collected from Wulai. Scales indicate 1 cm long.



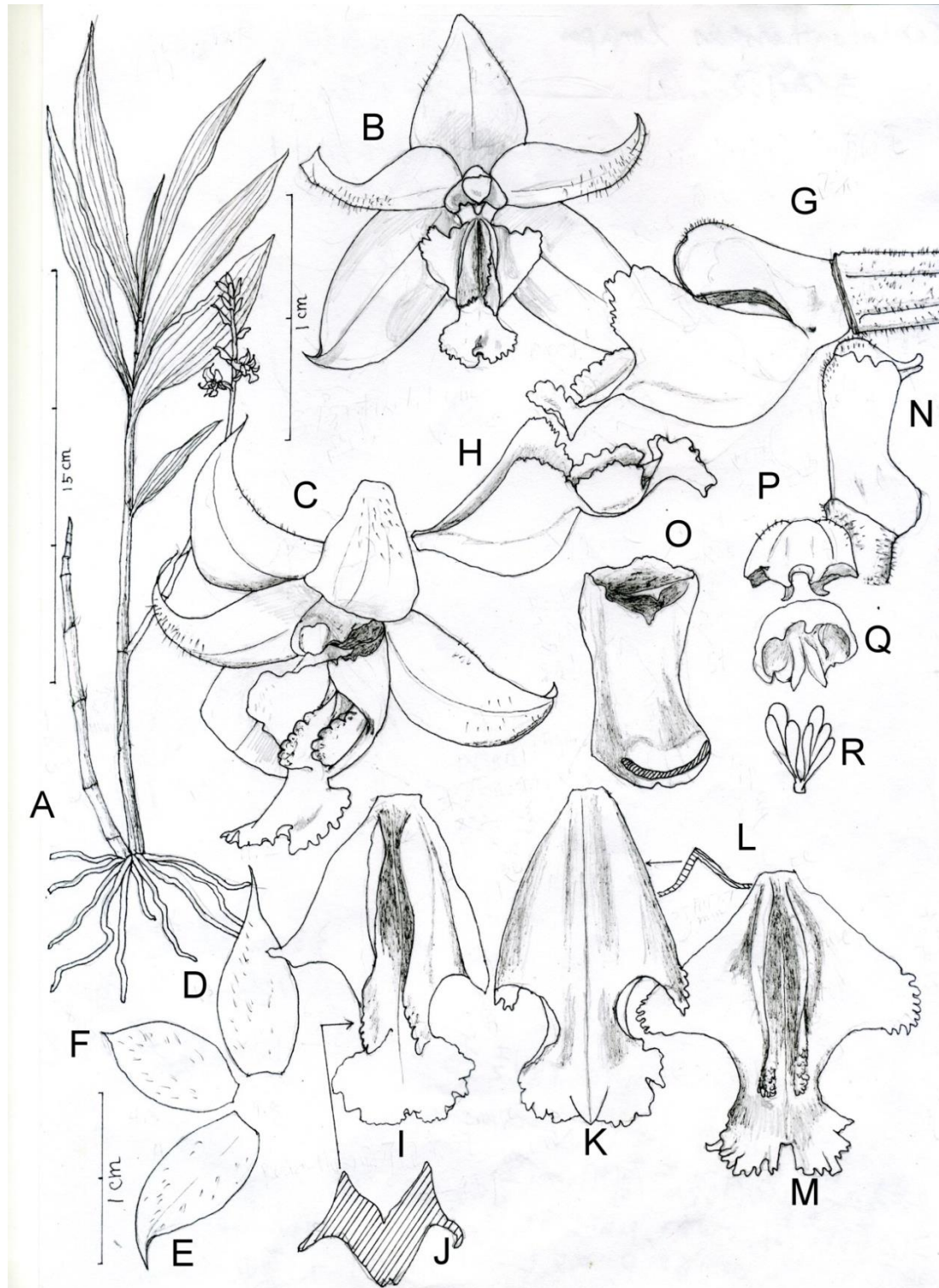


Fig. 3. *Cephalantheropsis longipes* (Hook. f.) Ormd A: Plant body and inflorescence; B: Front view of flower; C: Lateral view of flower; D: Upper sepal. E: Lateral sepal. F: Petal; G: Lateral view of column and lip; H: Lateral view of lip; I: Top view of lip; J: Cross section as indicated; K: Bottom view of lip; L: Cross section as indicated. M: Lip when spread out; N: Lateral view of column showing the anther cap; O: Ventral view of column showing the rostellum and stigma; P: Front view of anther cap; Q: Ventral view of anther cap; R: Pollinia.





high keel on disc, hairy perianths, elliptic sepals, and the midlobe of lip having very short claw that is about 40-45% of lip length. The length of midlobe including the long claw of *C. dolichopoda* is about 55% of lip which marked the significant difference between these two species (Fig. 2). Our *C. longipes* agrees well with the description by Ormerod (1998) who considered *C. longipes* has mainly white flowers which age to orange, the sepals are broadly ovate, and the sidelobe of the labellum are truncate or form squarish erose lobules. The comparatively shorter epichile (midlobe) than the hypochile of *C. longipes* of Taiwan is shared by the plants growing in Thailand (Ormerod et al. 2012), Vietnam (Averyanow 2001), Bhutan (Pearce and Cribb, 2002), and the Luzon of the Philippines (*Phaius calanthoides* Ames the TYPE specimen, Williams 1947, in the New York Botanical Garden; *Phaius mindorensis* Ames the TYPE specimen, Robinson 17115). Interestingly, the flower details shown in *C. dolichopoda* have not been observed in the literature of Southeast Asia but widely distributed in Taiwan even though rare in north and central part but highly populated in southeastern part. *Phaius calanthoides* Ames was reduced into a synonym of *Cephalantheropsis halconensis* (Ames) S.S. Ying in Coloured Illustrations of Plants of Taiwan 3: 622. 1988. This was not supported by Ormerod (1998) who considered *Cephalantheropsis longipes* and *C. halconensis* are two different species.

Using the average *FST* value, a parameter of population genetics of each population in comparison with the remaining populations, the most divergent populations can be grouped into two locations (Kuo et al. 2012). One location is in the south, especially the southeastern Taiwan. This location at least represents one of the most genetically divergent regions in Taiwan. I hypothesize that *Cephalantheropsis longipes* was introduced to Taiwan from the Philippine but the population didn't survive well and only a small population left in Tahanshan area. During the past time the *C. longipes* probably had evolved a new variety which expanded to southern Taiwan and adapted well and gradually migrated to northern and central Taiwan. To substantiate the hypothesis further study is needed.

***Cephalantheropsis dolichopoda* (Fukuy.) Lin, comb. nov.**

白花肖頭蕊蘭 Figs. 1B & 2B

Calanthe dolichopoda Fukuy. Bot. Mag. (Tokyo) 49: 296. 1935.
Cephalantheropsis longipes auct. non (Hook. F.) Ormd.: Ormerod, Orchid Digest 62: 156. 1998

As I have mentioned this is widely distributed in Taiwan but most common in southeastern mountains. The TYPE was collected from Daitun, Shintien in Nov. 11, 1933 (Fukuyama 4536). In the past this variety was

treated as a synonym of *C. longipes* because of high similarity in every aspect.

***Habenaria tsaiana* sp. nov.**

蔡氏玉鳳蘭 Figs. 1C right panel and 4

Typus: Xi-Chi Tsai s.n. (holo TAI283132, Jianshi Township, Hsinchu County)

Plant morphology similar to *Habenaria delessertiana*. Leaves tufted, oblanceolate, 6-7, 11-16 cm long, 3-4 cm wide, smooth on back with the midvein keel-like. Scapes terminal, peduncle ridged. Flowers greenish, open widely, about 3 cm long, 1 cm wide, perianths hairless; upper sepal concave, elliptic, 1.3 cm long, greenish; lateral sepals reflexed, obliquely ovate, long-caudate; concave; petals pale green, divided into 2 cluster of filament, the upper one linear, 1.2 cm long, close and parallel to the upper sepal, the lower cluster 1.2 cm long, divided near base into 2 filaments, nearly parallel with the side-lobes of lip; lip pale-green, 3-lobed, the base about 3 mm wide, the side-lobes about 1.2 cm long, further divided into 3 filaments, the mid-lobe linear, 1.3 cm long; spur slender, 2.3 cm long. Column similar to *H. delessertiana*, with long stigmaphore, auriculae warty, growing on both sides of column; anther cells separated; pollinia 2, each with long caudicle.

Flowering time: September.

Ecology: This plant was originally found in bamboo stand of Jianshi Township (尖石鄉), Hsinchu Co. at an elevation of 500 m by Mr. Xi-Chi Tsai in Sept. 2013. *H. tsaiana* T.-P. Lin exists as a small population and possibly a hybrid origin between *H. delessertiana* and *H. polytricha* because both of which occur in the same location.

Note: The epithet “*tsaiana*” refers to the collector who discovered this orchid by accident. The flower of *H. tsaiana* T.-P. Lin clearly shows a combination of characteristics of both *H. delessertiana* and *H. polytricha* (Lin 1977). For example, *H. tsaiana* T.-P. Lin has a flower (or lip) of 1 cm across which is different from *H. polytricha* (2.8 cm across) but similar to *H. delessertiana*; *H. tsaiana* T.-P. Lin has the anther cells separated same as *H. delessertiana* but *H. polytricha* has the anther cell close at their apices; *H. tsaiana* T.-P. Lin has more fimbriate lip than that of the *H. delessertiana* but is less complicated than the *H. polytricha*.

***Nervilia linearilabia* sp. nov.**

小麥脈葉蘭 Figs. 1E, 1F & 5

Typus: Shyh-Shiarn Lin s. n. (holo TAI 284097, Tahanshan, Pingtung Co.).



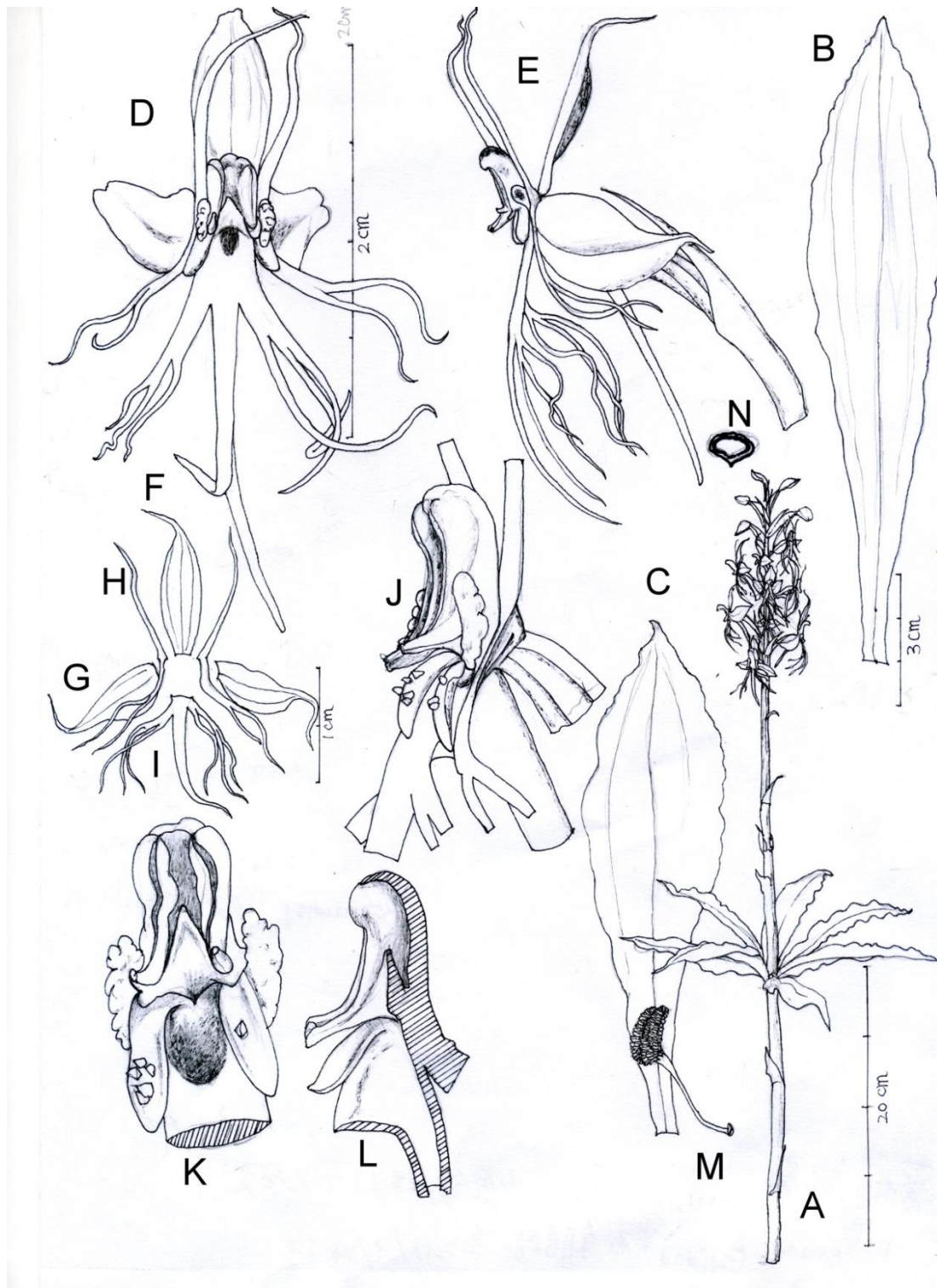
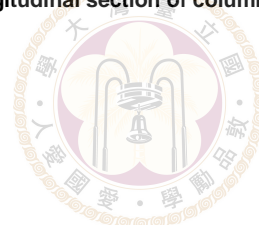


Fig. 4. *Habenaria tsaiana* T.-P. Lin sp. nov. A: Plant body and inflorescence. B & C: Leaf. D: Front view of flower. E: Lateral view of flower. F: Upper sepal. G: Lateral sepal. H: Petal. I: Lip. J: Lateral view of column and tepals. K: Front view of column showing the anther, stigmapore, and warty auriculae. L: Longitudinal section of column. M: Pollinia.



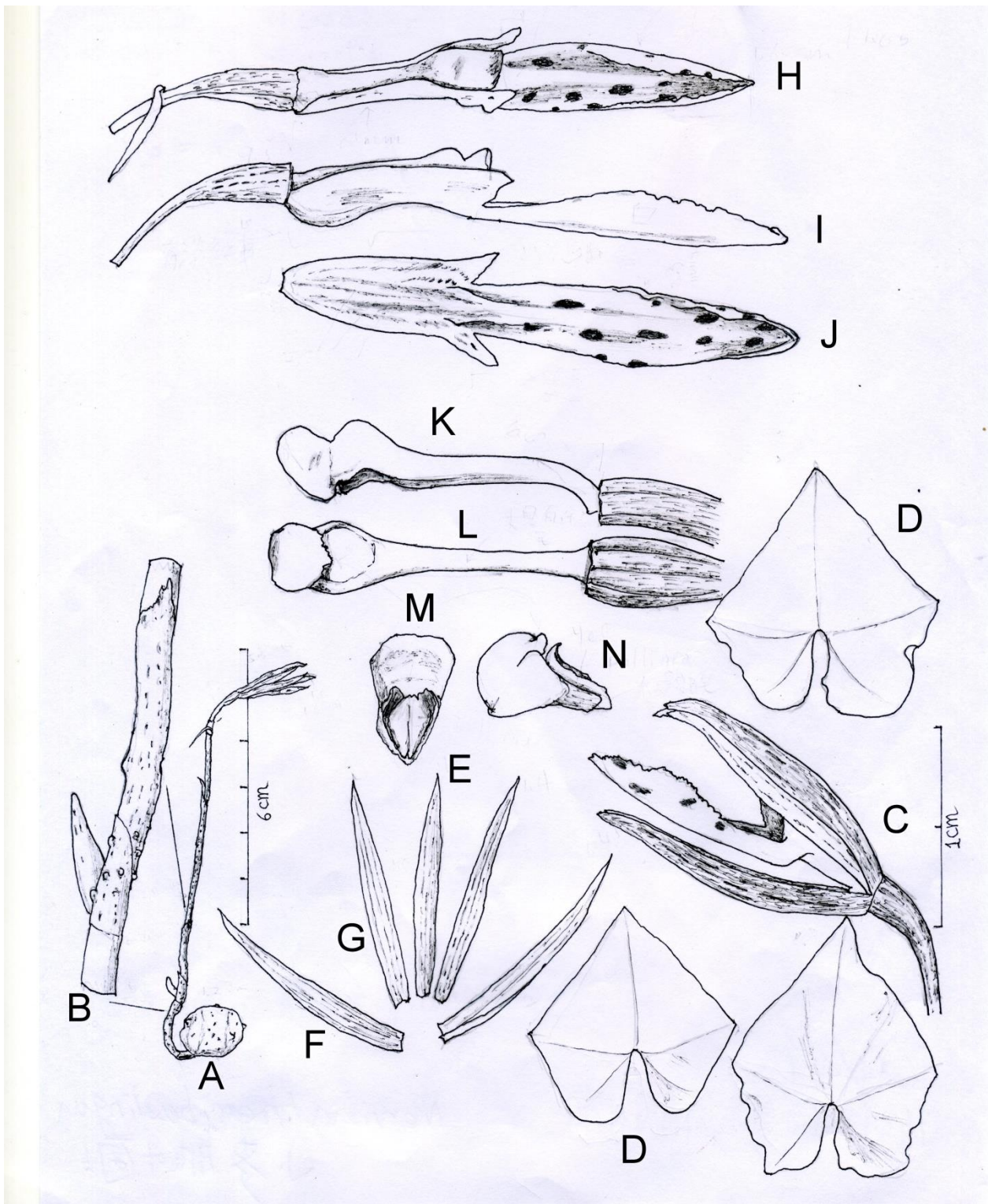


Fig. 5. *Nervilia linearilabia* T.-P. Lin sp. nov. A: Corm and inflorescence. B: Enlargement of A showing the warty stem. C: Lateral view of flower. D: Leaves. E: Upper sepal. F: Lateral sepals. G: Petals. H: Top view of column, lip and ovary. I: Lateral view of column, ovary and lip. J: Lip after spreading out. K: Lateral view of column and ovary. L: Ventral view of lip and ovary. M: Dorsal view of anther cap. N: Lateral view of the anther cap.





Plant including inflorescence 5-6 cm aboveground. Corms ovoid or nearly so, < 1 cm across, marked purple spots. Stem short, warty. Leaves petiolate, pentagon-like, the cleft between adjoining basal lobes of leaf open or closed, usually smaller than 3 cm long and 3 cm wide, acute, cordate at base, 5-veined, light green on upper surface, pale-green on lower surface, leaf emerges only after anthesis; petiole reddish-brown, usually smaller than 3 cm long. Peduncle slender, with reddish-brown markings, with several tubular sheaths. Pedicel and ovary 4 mm long. Flowers solitary, resupinate; perianth not spreading, 1.5-1.6 cm long, having reddish-brown short markings; sepals linear, 1.2-1.4 cm long, 1.5-2 mm wide, acuminate; petals linear, 14 mm long, 2.3 mm wide; lip 16 mm long, 2.7 mm wide in nature state but 3.3 mm wide when spread out, 3-lobed, side lobes small, embracing column, epichile and hypochile more or less same length, hypochile tinged reddish at base, epichile straight do not curving downwards, white marked purple spots, margins in front slightly undulate and curved inward, acute, disc with 1 longitudinal low keel. Column slender, white, 6.5-7.0 mm long, swollen in the front, no obvious hairs on ventral side, the rostellum dentate after removing anther cap; anther cucullate; pollinia yellow, 4, without viscidium; stigma semiorbicular.

Flowering Season: April.

Ecology: *Nervilia linearilabia* sp. nov. is restricted to Tahanshan, southern Taiwan at an elevation of about 900 m. So far only a small population has been located. The type specimen was originally collected by Mr. Shyh-Shiarn Lin in summer 2013 and he noticed that the leaf morphology of *N. linearilabia* sp. nov. was very different from *N. tahanshanensis* which was now known common in this area. Even though the leaf shape more like pentagon, however, sometime it look like triangular in the wild. The cultivated plants came to flower in April 13, 2014.

Note: Epithet of species name indicates linear lip blade. Flowers of *N. linearilabia* sp. nov. are similar to the *N. tahanshanensis*, *N. ratis* and *N. taiwaniana* but differ from them in having much narrowed lip blade. The ratio of length and width of lip is about 3.5 of the *N. tahanshanensis*, whereas the ratio is 5 in *N. linearilabia* sp. nov. This new species should be considered as a member of the *N. taiwaniana* aggregate which also includes *N. tahanshanensis*, *N. ratis* and *N. taiwaniana*.

Liparis sp.

環山羊耳蘭 Figs. 1D and 6

Terrestrial. Plants tufted, usually less than 10 cm tall aboveground. Pseudobulbs ovoid, slightly compressed, 2.2 cm in diameter. Leaves two at apex of pseudobulbs, round, obtuse, cuneate at base, fleshy, 5-6

cm long, 5-6 mm wide, the surface flat, shiny, the adaxial side of leaf lighter in color, central vein slightly keeled. Leaf sheath forming a very short stem, the stem laterally compressed. Inflorescence terminal, around 20 cm long, the peduncle very long about 12 cm long, 4 mm thick, triangular in cross section. Capsule ellipsoid.

Flowering time: April?

Ecology: The specimen was originated from Huanshan area, the Central Cross-Island Highway, at an elevation about 1600 m. Only 3 plants have been found in the native habitat.

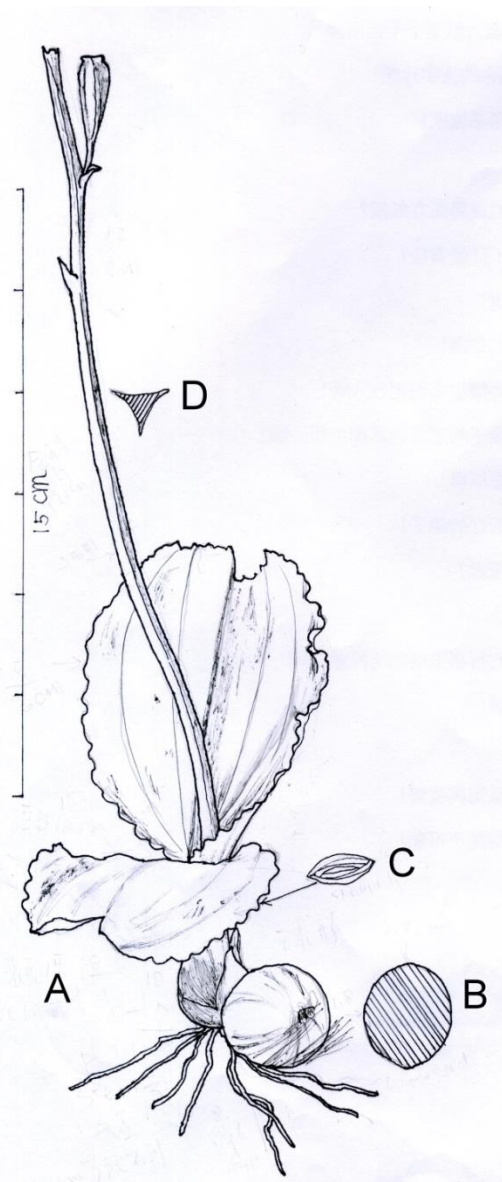


Fig. 6. *Liparis* sp. A: Plant body and Inflorescence B: Cross section of pseudobulb. C: Cross section of the very short stem. D: Cross section of inflorescence scape.





Note: No flower information is available. We publish this information because the next chance to observe this species is unknown.

ACKNOWLEDGEMENTS

Thanks go to Paul Ormerod for the papers and drawings of *Cephalantheropsis longipes*. I also thank Dr. Ho-Yi Liu for assisting with the Latin names for the new species and comments.

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臺灣新發現的野生蘭 (VII)

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摘要：本文介紹 3 種臺灣新發現的野生蘭（三伯肖頭蕊蘭、蔡公玉鳳蘭、小麥脈葉蘭）。*Cephalantheropsis dolichopoda* (Fukuy.) Lin 則是源自 *Calanthe dolichopoda* Fukuy. 的一個新組合名稱。環山羊耳蘭是未明種亦列入供未來之參考。

關鍵詞：野生蘭、肖頭蕊蘭、玉鳳蘭、羊耳蘭、脈葉蘭屬。

