A New Species of *Tropidia* (Orchidaceae) from Southern Taiwan

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ABSTRACT: A new species of *Tropidia* Lindl. (Orchidaceae), *T. angustifolia* C. L. Yeh *et* C. S. Leou, from Mt. Lilung, southern Taiwan is described and illustrated. The main difference between this species and another similar species, *T. nipponica*, is that *T. angustifolia* is characterized by its linear-lanceolate leaves with acuminate apex and acute base, and bigger sub-saccate lips. We also provide a new key to the species of *Tropidia* in Taiwan.

KEY WORDS: Orchidaceae, *Tropidia angustifolia*, taxonomy, Taiwan.

INTRODUCTION

The genus *Tropidia* was established by Lindley in 1849 for *T. curculigoides* Lindl. This singular genus has the habit of some large kind of grass, the form and texture of its leaves being quite of such a nature (Lindley, 1840). There are roughly up to 40 species (Holttum, 1964; Misra, 2004; Pridgeon et al., 2003; Seidenfaden, and Wood, 1992), ranging from Japan, Taiwan to SE Asia. *T. polystachya* Ames is found in Central America, the only species known to be outside of Asia.

During ecological and botanical inventories undertaken in recent years, one unknown *Tropidia* species was discovered in Mt. Lilung, Pingtung County, southern Taiwan. In the summer in 2008, we collected living flowers and plants in Mt. Lilung. After examination of these living materials, we found that this plant has a unique leave shape and several flora structures. Therefore, we describe it as a new species.

Lin et al. (2006) also described a new species *T. nanhuae* W. M. Lin, L. L. Kuo Huang & T. P. Lin in WS Taiwan. Up to now, there are five species of *Tropidia* in Taiwan. The following is the key to *Tropidia* in Taiwan.

Key to the species of *Tropidia* in Taiwan

1. Leaves many (more than 3) per branchlet 2
1. Leaves 1-3 per branchlet 3
2. Inflorescence quite short, almost sessile, axillary … *T. curculigoides*
2. Inflorescence long, terminal ..... *T. nanhuae*
3. Lip tip not recurved ..... *T. somai*
3. Lip tip recurved 4
4. Leaves linear lanceolate; lip bigger and sub-saccate at base ..... *T. angustifolia*
4. Leaves elliptic to ovate-oblong; lip smaller and deeply concave at base ..... *T. nipponica*

Tropidia angustifolia C.-L. Yeh et C.-S. Leou *sp. nov.*
狹葉摺唇蘭 Figs. 1-3

Herbae terrestris, erectae, 10-20 *cm alta,* 2 *mm diametro. Folium lineare-lanceolatum,* 8-10.5 *cm longum,* 1.7-2.1 *cm latum. Inflorescentia terminalis; pedunculis* 4.5-5 *cm longis; spica densus floribusi novem-duodecim. Sepalum* 6.5-8 *mm longum; sepalum dorsalis discretus oblique oblongus; sepalum lateralis oblongus connatus; labium ca.* 5 *mm longum,* 3 *mm latum, subsacciforma longior basi; columma hemisphaerica trilobatus,* 3 *mm longa; anthera ovatus,* 1.8 *mm longa;* 2-*pollinia claviformis,* 1.7 *mm longa; stigma transverse ellipticus; rostellum late deltatus bifidus ad apicem. Ovarium cylindricus,* 5-7 *mm longum.* –Type: Taiwan, Pingtung, Mt Lilung, on the ridge of a mountain, 600-700 m, 19, July, 2008 (fl), *C. R. Yeh s. n.* (holo PPI).

Terrestrial herbs. Stems erect, 10-20 cm tall, 2 mm in diameter. Roots rigid, 2-3 mm in diameter. Tubers lateral, short cylindric. Branchlet (i.e. annual growth) mostly bearing one leaf and three sheaths. Sheaths thin and often caducous. Leaf solitary, apical, thin, linear-lanceolate, 8-10.5 cm long, 1.7-2.1 cm wide, apex acuminate, base acute, with 5 longitudinal main veins, veinlets 4-6, wavy at margins. Inflorescence terminal; peduncle 4.5-5 cm long; spike densely 9-12-flowered, less than 1.5 cm long; bracts lanceolate, glabrous; ovary cylindric, 5-7 mm long, 6-ridged. Flower not resupinate, whitish except the apex of lip; sepals 6.5-8 mm long, dorsal sepal free, obliquely oblong, concave, lateral sepals connate, nearly completely uniting of their adjacent margins together, oblong, slightly concave at both ends, reflexed; petals free, obliquely oblong, 6.5-7 mm long, slightly concave, keeled at back; lip ca. 5 mm long, 3 mm wide, sub-saccate base bigger and white below, very slightly bisaccate at the very base, ligulate apex smaller, smooth, recurved and orange or orange-red, bearing 2 longitudinal ridges near the margins, the ridges lamellate below and diminishing their height toward apex; column half globose, 3-lobed, 3 mm long; anther ovate, 1.8 mm long; pollinarium 2.2 mm long,

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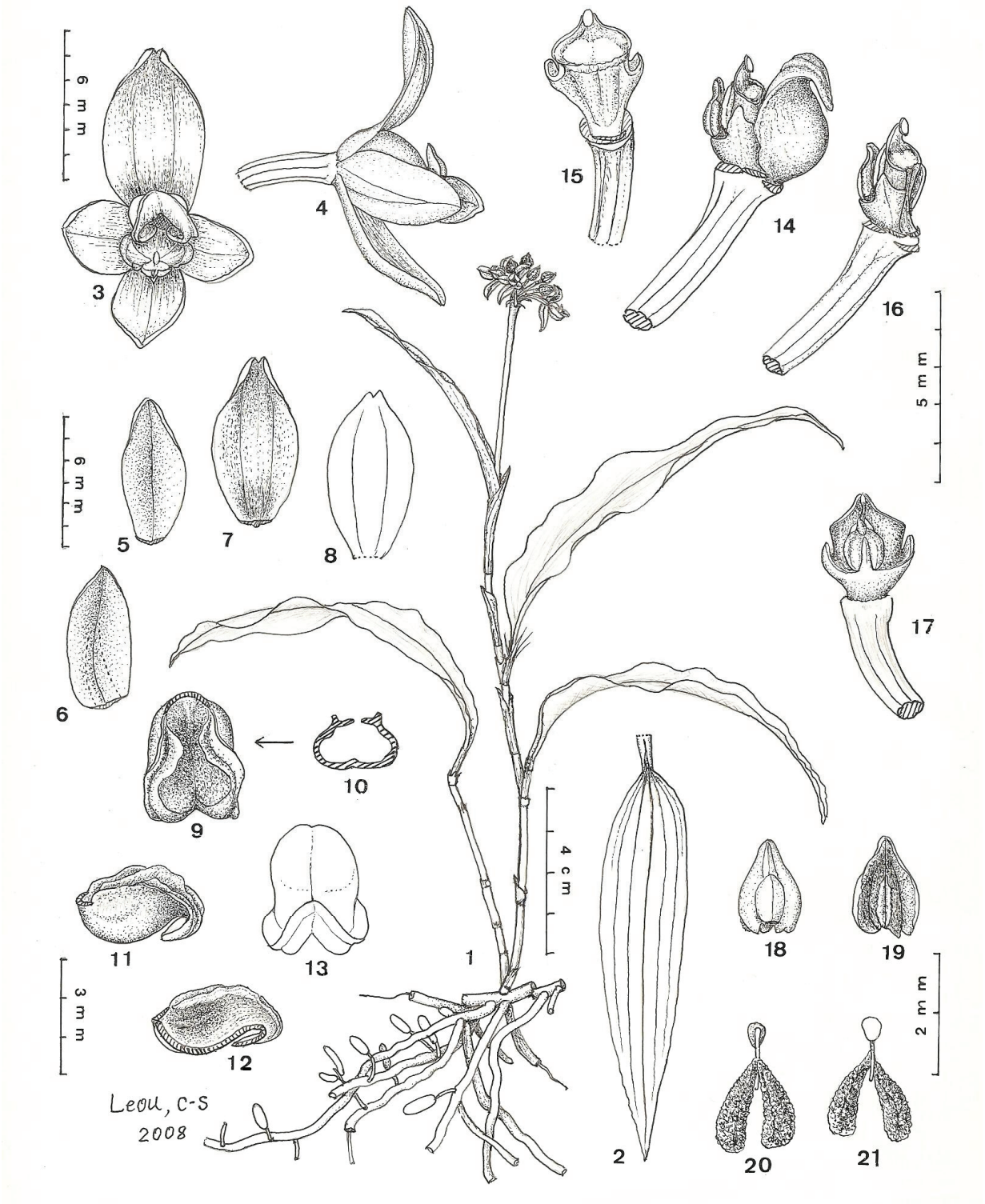


Fig. 1: *Tropidia angustifolia* C.-L. Yeh et C.-S. Leou. 1: Habit. 2: Leaf. 3: Flower, front view. 4: Flower, side view. 5: Dorsal sepal, inside. 6: Petal, inside. 7: Connate lateral sepals, inside. 8: Connate lateral sepals, flattened. 9: Lip, viewed from above. 10: Cross-section of lip at the arrow mark. 11: Lip, side view. 12: Longitudinal section of lip along the midrib. 13: Lip, viewed from lower side. 14: Column, ovary and lip, side view. 15-17: Column and ovary, viewed from varied sides. 18: Anther, upper side. 19: Anther, lower side. 20: Pollinarium, dorsal side. 21: Pollinarium, ventral side. (Drawn from fresh material).

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Fig. 2. *Tropidia angustifolia*. A: Habit. B: Flowers. C: Habitat.

viscidium obovate, 0.4 by 0.3 mm , hamulus stipe slender, 1 mm long; pollinia 2, clavate, white, 1.7 mm long; stigma transversly elliptic; rostellum broadly triangular, bifid at apex.

This species is similar to *T. nipponica* Masam., but it is distinguished from the latter by the characters shown in the following Table 1.

Flowering season: from July to August.

Distribution: Taiwan. It is only found on Mt Lilung (Lilungshan), Pingtung County, south-western Taiwan. (Fig. 3). We predict this species would be also distributed in southern Asia.

Habitat: Distributed in semi-shade slop in cloud forest, 600-800 m altitude. This forest type belongs to *Dysoxylum hongkongense-Drypetes karapinensis* type, This type has three canopy strata. The upper layer is about 13 m in height, and dominant species include *Machilus japonica* Sieb. & Zucc. var. *kusanoi* (Hayata) Liao, *Schefflera octophylla* (Lour.) Harms, *Dysoxylum hongkongense* (Tutch.) Merr., *Michelia compressa* (Maxim.) Sargent and *Syzygium formosanum* (Hayata) Mori, The middle layer is about 7 m in height, and dominant species include *Drypetes karapinensis* (Hayata) Pax, *Turpinia ternata* Nakai, *Euonymus tashiroi* Maxim.. The lower layer is about 3 m in height, and dominant species inclued *Psychotria rubra* (Lour.) Poir., *Callicarpa remotiserrulata* Hayata, *Aucuba chinensis* Benth. and *Hydrangea chinensis* Maxim.. The understory are dominatede by *Diplazium dilatatum* Blume, *Elatostema lineolatum* Wight var. *majus* Wedd. and *Codonacanthus pauciflorus* (Nees) Nees.

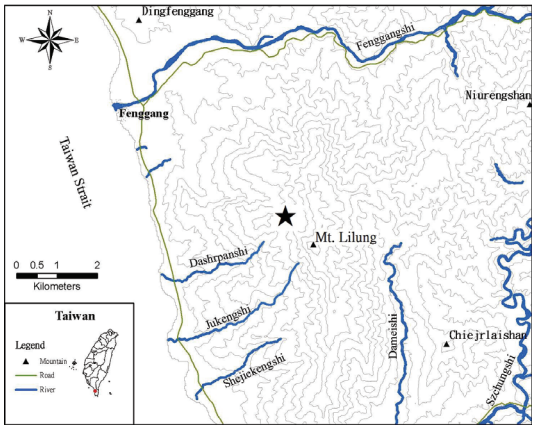


Fig. 3. Distribution of *Tropidia angustifolia* in Taiwan, marked with a ★.

Phenology: Flowering season is July.

Etymology: The specific epithet refers to its narrow leave shapes compared to the analogous species, *T. nipponica*.

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Table 1. The differences between *T. angustifolia* and *T. nipponica*.

characters	*Tropidia angustifolia*	*Tropidia nipponica*
Stem height	10-20 cm tall	up to 60 cm tall
Stem diameter	2 mm	3-4 mm
Leaf shape	linear lanceolate	elliptic to ovate-oblong
Leaf size	8-10.5 by 1.7-2.1 cm	10-15 by 4-8 cm
Lip structure	bigger and sub-saccate at base	smaller and deeply concave at base
Flowering season	July to August	May to June
References	Living materials	Hatusima, 1971: 821; Kanta, 1976: 189; Leou, 1991: 66-73; Maekawa, 1971: 284; Masamune, 1929: 249-250; Satake et al., 1982: 210; Su, 2000: 1055-1059; Yamashita, 2006: 136

DISCUSSION

Tropidia angustifolia is closely related to *T. nipponica*. Our new species is readily distinguished by the flora and leaf morphology (Table 1). *T. angustifolia* is unique in having linear-lanceolate, apex acuminate, base acute leaves. Although *T. nipponica* and *T. angustifolia* have different leaf shapes and habits, these two species shared the analogous flower in appearance. We also noticed the same characters in *T. curculigoides* and *T. nanhuae*, and *T. somai* Hayata and *T.calcarata* Ames. Further efforts are needed to more effectively distinguish different species in the genus *Tropidia.*

As to the distribution area of *T. nipponica* and *T. angustifolia* in Taiwan, *T. nipponica* is distributed from northern to southern Taiwan but *T. angustifolia* is only distributed in one place: Mt. Lilung, Taiwan. We also see the analogous type of this species in Mt. Dulan, Taitung County, SE Taiwan, as well as in the herbarium (Mt. Dulan, Taitung, Aug., 10, 2004, Hsu, T. C. & Chung, S. W. *144* (TAIF)). Yet, so far, as the living flowers are not available, we can't say for sure whether this new species also exists in Mt. Dulan.

In Mt. Lilung, *T. angustifolia* and *T. nipponica* grow in different niches. Their niches never overlap and these two species share different flowering season. Because of the mentioned reasons, we described *T. angustifolia* as a new species.

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LITERATURE CITED

Hatusima, S. 1971. Flora of the Ryukyus. Okinawa Seibutsu-kyoiku Kenkyukai. Naha, Japan. pp. 820-821.

Holttum, R. E. 1964. A Revised Flora of Malaya. Authority Government Printing Office. Singapore City, Singapore. pp. 142-143.

Kanta, A. 1976. The Native Orchids of Japan. Seibundo-Shinkosha. Tokyo, Japan. p. 189.

Leou, C.-S. 1991. Systematic studies on the Spiranthoideae (Orchidaceae) in Taiwan. Ph. D. Dissertation, Graduate Institute of Forestry, National Taiwan Univ, Taipei. Taiwan. pp. 66-73.

Lin, W.-M., L.-L. Kuo Huang and T.-P. Lin. 2006. Newly Discovered Native Orchids of Taiwan. Taiwania **51**: 165-168.

Lindley, J. 1840. The Genera and Species of Orchidaceous Plants. Ridgways, Piccadilly, London, UK. p. 497.

Maekawa, F. 1971. The Wild Orchids of Japan in Colour. Seibundo-shinkousha, Tokyo, Japan. pp. 621-623.

Masamune, G. 1929. On New or Noteworthy Plants from the Island of Yakusima. The Botanical Magazine, XLIII, no. **509**: 249-252.

Misra, S. 2004. Orchids of Orissa. Bishen Singh Mahendra Pal Singh, Dehra Dun, India. pp. 272-281.

Pridgeon, A. M., P. J. Cribb, M. W. Chase and F. N. Rasmussen. 2003. Genera Orchidacearum, **3**: Orchidoideae (Part Two): Vanilloideae. Oxford University Press, Oxford, UK. pp. 621-623.

Satake, Y., J. Ohwi, S. Kitamura, S. Watari and T. Tominari. (eds.). 1982. Wild Flowers of Japan. Heibonsha, Tokyo, Japan. p. 210.

Su, H.-J. 2000. Orchidaceae. In: Huang, T.-C. (eds.), Flora of Taiwan, 2nd ed. **5**: 1055-1059. Editorial Committee, Dept. Bot., NTU, Taipei, Taiwan.

Yamashita, H. 2006. Endangered Plants of Island Amami. South New Publisher, Kagoshima, Japan. pp. 136-137.

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南臺灣新種摺唇蘭屬 (蘭科) 植物

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摘要：本文記述產自臺灣南部屏東里龍山之新種蘭科植物「狹葉摺唇蘭 (*T. angustifolia*)」之學名、形態特徵、產地、花期及標本等資料。本種與相似種日本摺唇蘭 (*T. nipponica*) 之主要差別，為本種之葉片為線狀-披針型、尖端具有尾尖、基部漸狹，另外則為本種具有較日本摺唇蘭大、基部呈半囊狀的唇瓣。本研究並提供臺灣 *Troppidia* 屬之新檢索表。

關鍵詞：蘭科、狹葉摺唇蘭、分類學、臺灣。

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