

Notes on the taxonomy and distribution of *Telaranea semperiana* (Steph.) Del Ros. and *Telaranea octoloba* Del Ros. (Lepidoziaceae, Marchantiophyta)

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(Received 11 June 2007, accepted 6 August 2007)

Abstract – *Telaranea octoloba*, a rare species previously known only from the Philippines, is newly discovered in Johore, Malaysia. *Telaranea semperiana*, newly found in Hainan Island of China, its northernmost locality, is new to the liverwort flora of China. The Chinese *Kurzia hainanensis* D.K.Li & Z.K.Bai, previously known only from the type locality, is reduced to synonym of *Telaranea semperiana*. The sporophytes of *T. octoloba* are described and illustrated for the first time.

China / Hainan / liverworts / new records / *Telaranea* / Taxonomy

INTRODUCTION

Telaranea, a genus of Lepidoziaceae, was established by Schiffner (1893), based on the New Caledonian *Telaranea chaetophylla* (Spruce) Schiffn. The main features of *Telaranea* include 1) filamentous plants pellucid or subpellucid, 2) 1-3-pinnate or irregularly branching, normally *Frullania*-type, 3) stems with a distinct hyaloderm, 4) leaves with 2-12 (-13) lobes whose tips are at least 1-seriate for 4-5 cells or more, 5) leaf cells larger, thin walled and usually elongated, 6) leaf disk cells often rectangular, in narrow lobes, and frequently tending to linear, and 7) usually fusiform perianths typically with 2 (-3) layers at middle. *Telaranea* is related to *Lepidozia* (Dumort.) Dumort., but the former is easily distinguished by the leaf disk composed of clearly rectangular cells.

Telaranea is also similar to *Kurzia* G.Martens. The latter, however, differs in its occurrence of *Frullania*-type branches on one side of the stem and *Microlepidozia*-type branches on the other, and usual absence of oil bodies in leaf cells.

Telaranea is almost exclusively in austral regions with 35 species world-wide (Schuster, 2000; Gradstein *et al.*, 2001). Recently Engel and Merrill (2004) provided a monograph of *Telaranea* in which a total of 98 species are recognized, including 62 species extra-Australasian. In East Asia, it was represented only by two species: *T. iriomotensis* T.Yamag. & Mizut. endemic to Japan (Yamaguchi, 1983) and *T. neesii* (Lindenb.) Fulf. known from Taiwan (Wu & Yamada, 1996).

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Recently *T. iriomotensis* was placed in the synonymy of *T. neesii* by Engel & Merrill (2004). In the course of our study of some Malaysian and Chinese liverworts, we encountered some specimens of the genus *Telaranea* which proved to be *Telaranea semperiana* (Steph.) Del Ros. and *Telaranea octoloba* Del Ros. *Telaranea octoloba*, a rare species previously known only from Mindanao, the Philippines, is newly discovered in Malaysia. *Telaranea semperiana* is newly found in Hainan Island. It is new to the hepatic flora of China. In this paper we report the range extension of *Telaranea semperiana* and *Telaranea octoloba*, and reduce the Chinese *Kurzia hainanensis* D.K.Li & Z.K.Bai to a new synonym of *T. semperiana*.

DESCRIPTION

Telaranea octoloba Del Ros., *Philipp. J. Sci.* 100: 239. 1973 "1971". **Figs 1-10, 17-21**

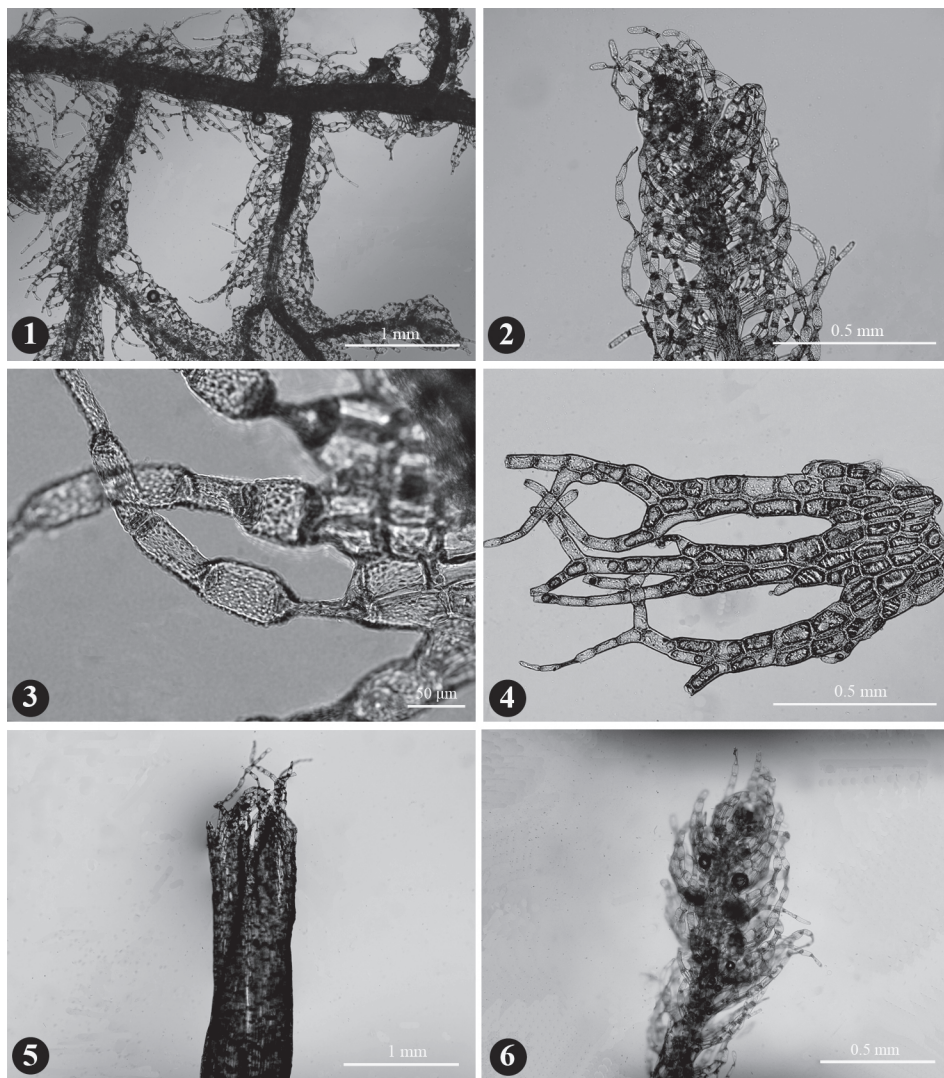
Type: The Philippines. Mindanao, Davao, Mt. McKinley, *Edano 605* (holotype: PNH, lost (fide Engel & Merrill, 2004)).

Dioicous. Plants filamentous, yellowish green in herbarium material. Stems 1.0-2.5 cm long, 0.20-0.35 mm in diameter, cross section with a distinct hyaloderm consisting of about 22 enlarged and thin-walled cells, branches irregularly pinnate to bi- or tripinnate, 2-5 mm long, densely leafy. Stem leaves distant to approximate, 0.5-0.7 mm long, 0.5-0.7 mm wide, deeply 8-lobed, lobes usually 6-10 uniseriate cells long, cells in the middle of lobes 70-80 × 25-35 μm, apical cells 70-75 × 10-15 μm; discus 100-160 μm high, 480-560 μm wide, usually 2-3 cells high, 16 cells wide; cells rectangular, thin-walled; cuticle verrucose. Stem underleaves similar to leaves but slightly shorter, 0.4-0.5 mm long, 0.3-0.5 mm wide, usually 6- (7-) lobed, lobes usually 4-6 cells long tipped with a minute globular musilaginous cell; discus 2-3 cells high, 12 (-14) cells wide, rhizoids hyaline, at base of discus. Branch leaves densely imbricate, incurved, 0.3-0.5 mm long, 0.2-0.5 mm wide, 3-6-lobed, lobes 6-8 cells long; discus 2 cells high, 6-12 cells wide. Branch underleaves 0.2-0.4 mm long, 0.15-0.40 mm wide, 2-4-lobed, lobes 4-6 cells long; discus 1-2 cells high, 2-8 cells wide. Androecium on lateral branch; bracts asymmetrically 2-3-lobed, lobes 3-8 cells long, 2-4 cells wide at base, discus 3-5 cells high, 8-12 cells wide; bracteoles 3-lobed. Gynoecium on short ventral branch; bracts and bracteoles similar, deeply 4-lobed. Perianth cylindrical, 5-6 mm long, 0.65-0.84 mm wide, mouth with cilia 4-8 cells long; perianth walls 2-3 layered at middle, 3-4 layered basally. Capsule 1.3-1.5 mm long, 0.55-0.65 mm wide, cylindrical, wall 3 layered. Elaters 100-360 μm long, 10-20 μm wide, bispiral. Spores spherical, areolate, 15-20 μm in diameter, papillae and rosettes absent.

Specimen examined: Malaysia. Johore, Gunung Belumat, 1999, *L.J. Harrison* s.n. (HSNU).

Distribution: Malaysia and Philippines.

Telaranea octoloba, previously known only from Mindanao, is newly found in Malaysia. The main features are the densely leafy stem (Fig. 1), 8-lobed stem leaves (Fig. 17), epidermal cells of stem in 22 rows (Fig. 21), and simple cilia of the perianth mouth (Fig. 5). This species is similar to *Telaranea neesii* (Lindenb.) Fulf. in the transverse section cells of the stem thin-walled, stem underleaves similar to stem leaves, only slightly shorter, and leaf cells cuticle verrucose (Fig. 3).



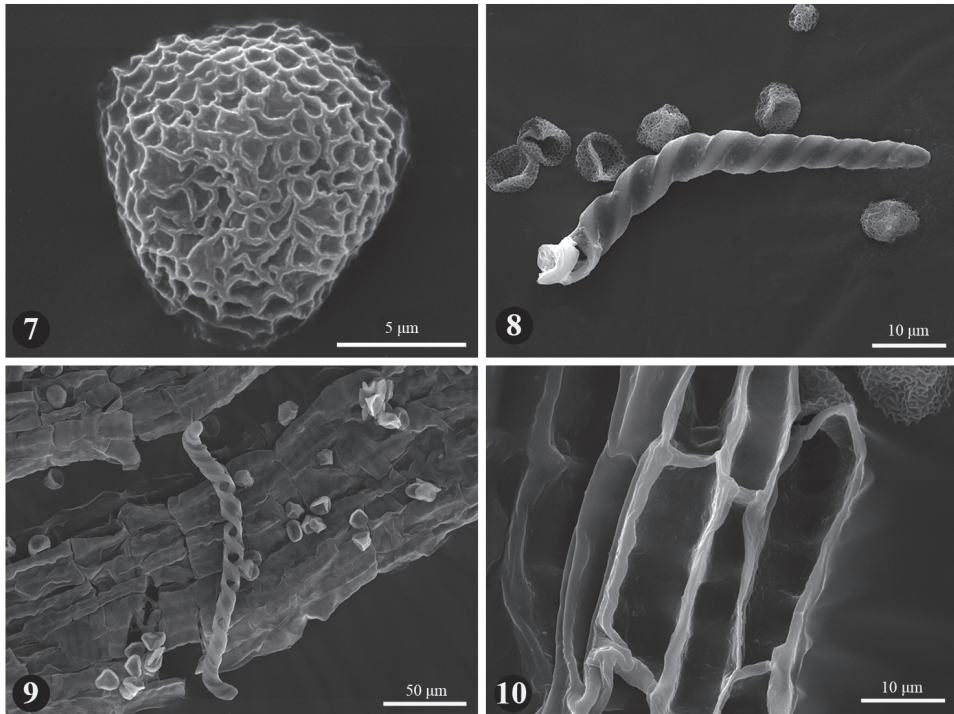
Figs 1-6. *Telaranea octoloba* Del Ros. **1, 2.** Portion of shoot, ventral view. **3.** Median cells of leaf lobes, showing verrucose cuticle. **4.** Bract. **5.** Perianth. **6.** Androecium, ventral view. All from *L.J. Harrison s.n.* (HSNU).

However, *T. nesii* is distinguished from *T. octoloba* mainly by the usually 6-lobed stem leaves, and spiny and branched cilia of the perianth mouth.

Telaranea semperiana (Steph.) Del Ros., *Philipp. J. Sci.* 100: 238. 1973 "1971".

Figs 11-16, 22-25

≡ *Lepidozia semperiana* Steph., *Sp. Hepat.* 3: 612. 1909. ≡ *Telaranea semperiana* (Steph.) Mizt., *J. Hattori Bot. Lab.* 38: 385. 1974, nom. superfl. **Type:** The Philippines, without definite locality, *Semper s.n.* (holotype: G-12707).

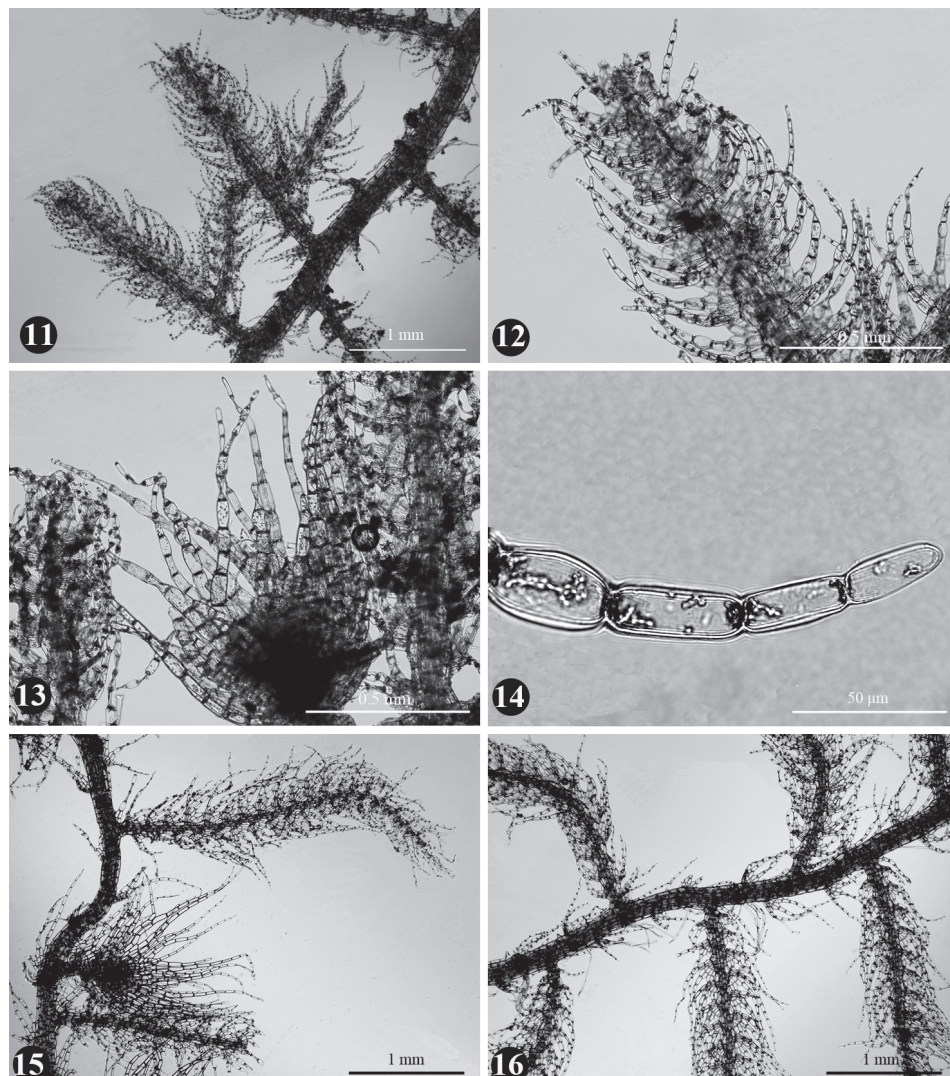


Figs 7-10. SEM micrographs of *Telaranea octoloba* Del Ros. **7.** Spore. **8.** Elater and spores. **9.** Capsule. **10.** Capsule wall cells. All from *L.J. Harrison s.n.* (HSNU).

≡ *Kurzia hainanensis* D.K.Li & Z.K.Bai, *Bull. Bot. Res.* 19(4): 368. 1999, **syn. nov.**
Type: China. Hainan, “Xing’anjiang”, on rotten log, 1020 m alt., 24 Nov. 1977,
D.K. Li et al. 4975 (holotype: SHM).

Plants filamentous, pale green in herbarium material. Stem 1.5-2.0 cm long, 0.15-0.20 mm in diameter, branches irregularly 1- (2-) pinnate, branches of the *Frullania*-type, 2-3 mm long, straight and spreading; stem in cross-section with a distinct hyaloderm consisting of 12 enlarged and thin-walled cells. Stem leaves somewhat plane, distant, almost symmetrical, 0.4-0.6 mm long, 0.16-0.20 mm wide, (3-) 4-lobed, lobes (6) 7-10 uniseriate cells long, cells in the middle of lobes $50-52 \times 25-30 \mu\text{m}$, apical cells $40-50 \times 9-13 \mu\text{m}$; discus 70-110 μm high, 160-170 μm wide, usually 2-3 cells high, 6-8 cells wide, the cells in disc $40-60 \times 17-25 \mu\text{m}$; cuticle smooth. Stem underleaves dense, 0.12-0.14 mm long, 0.10-0.12 mm wide, (3-) 4-lobed, lobes 3 cells long tipped with a minute globular musilaginous cell; discus 2-3 cells high, (6-) 8 cells wide, rhizoids hyaline, at base of disc. Branch leaves densely imbricate, incurved, 0.3-0.5 mm long, 0.12-0.16 mm wide, 3-4-lobed, lobes 7-9 uniseriate cells long; discus usually 2-3 cells high, 6-8 cells wide. Branch underleaves 0.80-0.12 mm long, 0.035-0.065 mm wide, 2-3 lobes, lobes 2 to 3 cells long; discus 1 cell high, 2-6 cells wide. Androecium not seen. Gynoecium on short ventral branch; bracts deeply lobed, simple. Perianth not seen.

Specimen examined: China. Hainan, Diaoluoshan Nature Reserve, Diaoluoshan, on rotten log, 950 m, 2 Sept. 2005, *Rui-Liang Zhu 20050902-29a* (HSNU).

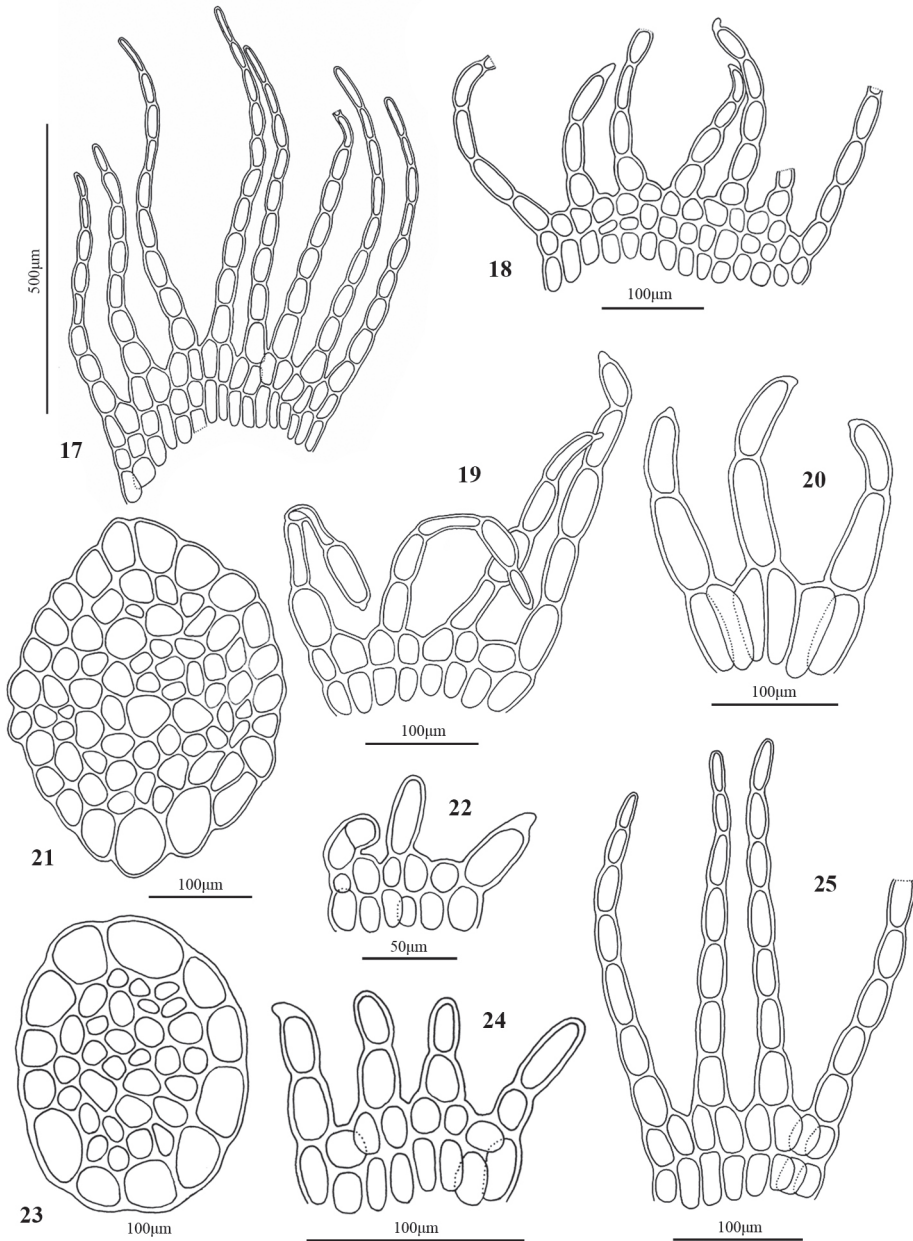


Figs 11-16. *Telaranea semperiana* (Steph.) Del Ros. **11, 12, 16.** Portion of shoot, ventral view. **13, 15.** Gynoecium, ventral view. **14.** Apex of leaf lobe, showing smooth cuticle. Figs. 11-14 from Rui-Liang Zhu 20050902-29a (HSNU); Figs. 15-16 from D.K. Li et al. 4975 (SHM).

Distribution: China (Hainan), Malaysia (Sabah) (Mizutani, 1974), Philippines (Tan & Engel, 1986), and Sri Lanka (Stephani, 1909).

Li and Bai (1999) described *Kurzia hainanensis*, a rare species known only from Hainan Island, China. Our examination of the type specimen revealed that *Kurzia hainanensis* lacks *Microlepidozia*-type branches. Further studies showed that *Kurzia hainanensis* is identical with *Telaranea semperiana*. So we here reduce *Kurzia hainanensis* to a new synonym of *T. semperiana*.

Telaranea semperiana, usually growing on rotten logs, was reported previously from Malaysia (Kinabalu) (Mizutani, 1974), the Philippines and Sri



Figs 17-25. *Telaranea octoloba* Del Ros. **17.** Leaf. **18.** Underleaf. **19, 20.** Branch underleaves. **21.** Transverse section of stem. *Telaranea semperiana* (Steph.) Del Ros. **22, 24.** Underleaves. **23.** Transverse section of stem. **25.** Leaf. Figs. 17-21 from *L.J. Harrison s.n.* (HSNU); Figs. 22-25 from *Rui-Liang Zhu 20050902-29a* (HSNU).

Lanka (Stephani, 1909). It is newly found in China (Hainan) which is its northernmost locality.

Telaranea semperiana is similar to *T. lawesii* (Steph.) Grolle, but differs in its imbricate branch-leaves, apical cells of leaf lobes as long as subapical cells, and smooth cuticle (Figs. 11-16, 22-25). *Telaranea octoloba*, *T. semperiana* and related species are separated in the following key.

Key to some species of *Telaranea*

1. Stem leaves 4-lobed 2
 2. Apical cells of leaf lobes as long as subapical cells; cuticle usually smooth; distributed in China, Malaysia (Mizutani, 1974), Philippines, and Sri Lanka (Stephani, 1909). *T. semperiana*
 2. Apical cells of leaf lobes shorter than the subapical cells; cuticle usually verrucose 3
 3. Lobes of stem leaves 6-8 cells long; cuticle almost smooth or faintly papillose; transverse section of stem with 16-18 rows of cortical cells; distributed in New Caledonia and Papua New Guinea (Grolle, 1966; Piippo, 1984). *T. kogiana*
 3. Lobes of stem leaves 9-11 cells long; cuticle verrucose; transverse section of stem with 12 rows of cortical cells; distributed in Indonesia, Papua New Guinea and Solomon Islands (Piippo, 1984) *T. lawesii*
1. Stem leaves 6-8-lobed 4
 4. Stem leaves 6 (-7)-lobed; perianth mouth with spiny and branched ciliae; distributed in Indonesia (Grolle, 1966), Japan (Yamaguchi, 1983 as *T. iriomotensis*), Malaysia, Papua New Guinea (Grolle, 1966), Philippines (Del Rosario, 1973), and Taiwan (Wu & Yamada, 1996) *T. neesii*
 4. Stem leaves 8-lobed; perianth mouth with simple ciliae; distributed in Malaysia and Philippines *T. octoloba*

Acknowledgements. We are grateful to Benito C. Tan of National University of Singapore for checking the English of the manuscript and sending L.J. Harrison's collections to us for identification, and to G and SHM for loaning the type specimens. This research was sponsored by the National Natural Science Foundation of China (nos. 30470142, 30670155). The first author also thanks the Graduate School of East China Normal University for financial support.

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