

Additional notes on Melastomataceae of China

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Abstract *Oxyspora curtisii* King, a newly recorded species of *Oxyspora* (Melastomataceae) in China, is reported and illustrated. *Allomorpha eupteroton* Guillaumin var. *teretipetiolata* C. Y. Wu & C. Chen is raised to species rank and relegated to the genus *Oxyspora*, viz. *O. teretipetiolata* (C. Y. Wu & C. Chen) W. H. Chen & Y. M. Shui, which is described further based on flowering specimens. Scanning electron microscopy images of pollen grains and seeds support the distinctness of the new species.

Key words Melastomataceae, *Oxyspora curtisii* King, new record, *Oxyspora teretipetiolata* (C. Y. Wu & C. Chen) W. H. Chen & Y. M. Shui, new combination, China.

Many generic delimitations in the family Melastomataceae are unclear, especially among the genera with paniculate inflorescences. An example are the genera *Allomorpha* Bl. and *Oxyspora* DC., which overlap in most characters except the characteristics of their stamens. In *Oxyspora*, the stamens are equal or slightly equal in size and shape, while in *Allomorpha*, the stamens are unequal in size and shape. However, these stamen characters can be difficult to apply consistently (Maxwell, 1982; Renner et al., 2001), and species then are difficult to allocate to either *Oxyspora* or *Allomorpha*. Furthermore, neither Maxwell nor Renner et al. studied sufficient species to make such a claim that stamen variation is continuous among all species. The present study concerns a few interesting entities from China, but cannot draw conclusions about generic delimitation because the majority of species of *Oxyspora* are in Borneo. So, at the present time we are inclined to accept the generic treatment of Maxwell and Renner.

In recent years, specimens of *Allomorpha* (Melastomataceae) with distinct wings on the petioles were collected during field work in southeastern Yunnan, China. At first sight, they belonged to *Allomorpha eupteroton* Guillaumin var. *teretipetiolata* C. Y. Wu & C. Chen. However, after consultation of the relevant literature (Guillaumin, 1921; Chen, 1979; Maxwell, 1982; Ho, 1992), it became clear that the specimens represented two independent species. One of them is *Oxyspora curtisii* King, a new record of China, while the other was formerly ranked as a variety of *A. eupteroton*, but is here considered to belong in *Oxyspora*, as *Oxyspora teretipetiolata* (C. Y. Wu & C. Chen) W. H. Chen & Y. M. Shui.

Pollen grains and seeds of one or two specimens from each species were studied using light microscopy (LM) and scanning electron microscopy (SEM). Mature dry pollen grains and seeds were washed in water using ultrasound, and for SEM they were then air-dried and fixed to aluminum specimen holders and sputter-coated with gold. Morphological observations and micrographs were then carried out with a Hitachi-S-3000N ESEM. There were consistent differences between the two species as specified below. All voucher specimens are deposited in Herbarium of Kunming Institute of Botany, the Chinese Academy of Sciences (KUN).

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1. *Oxyspora curtisii* King in Journ. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 69: 9. 1900; S. S. Renner et al. in T. Santisuk & K. Larsen, Fl. Thailand 7 (3): 458. 2001. — *Allomorpha curtisii* (King) Ridley, J. Straits Branch Roy. Asiat. Soc. 57: 40. 1911. Type: Malay Peninsula. Perak, *Curt?* 1300 (K).

Allomorpha eupteroton Guillaumin in Notul. Syst. (Paris) 2: 323. 1913; Guillaumin in Lecomte, Fl. Gen. Indo-Chine 2: 903, fig. 98. 1921; Craib, Fl. Siam. Enum. 1: 685. 1931; M. Ho in P. H. Ho, An Illustrated Flora Vietnam 2: 91, fig. 3865. 1992. Type: Vietnam. Tonkin, *Balansa* 3504 (P).

柑叶尖子木 Fig. 1.

Shrub, 1.7–2.5 m tall. Branchlets puberulous 4-winged, wings 1–4 mm wide. Blades ovate or elliptic, 10–25 cm long, 5–16 cm wide, nearly glabrous above and minutely furfuraceous beneath on veins, base attenuate or rounded with 2 pairs of lateral primary veins, apex shortly acuminate, margin obtuse serrulate, the veins depressed above and prominent beneath. Petioles 1.5–4 (–7) cm long and winged, wings 3–9 mm wide. Inflorescences conic, 10–25 cm long, 4–5 cm wide on base, peduncles 4-winged, flowers verticillate, clustered in small umbels near the ends of the branchlets of inflorescences, bracts and bracteoles minute and deciduous. Flowers 4-merous, pedicels to 1.5 mm long. Hypanthium cylindrical, 8-ribbed, 5–7 mm long, puberulous, calyx rim with 4 cusps 0.5 mm long. Petals ovate, ca. 3 mm long and wide, pinkish or white. Stamens 8, subisomorphic, 5–7 mm long, anthers white or sometimes pinkish, long-hastate, 4–5 mm long, with short spur on the base. Infructescence mostly extremely enlarged, 15–30 cm long, 10–30 cm wide. Capsule suburceolate or cylindrical, ca. 3 mm long, crowned by the persistent 8-angled calyx rim on the top. Fl. Jul.–Aug., fr. Aug.–Dec.

China. Yunnan (云南): Lüchun (绿春), S. K. Wu et al. (武素功等) 1069 (KUN), Y. M. Shui & W. H. Chen (税玉民, 陈文红) 13536 (KUN, PE), *Lüchun Exped. of Yunnan Forestry School* (云南林校绿春队) 95, 1768 (KUN, YFS), L. M. Zhou (周鲁们) 305 (IBSC, KUN, PE).

Ecology and Distribution: In the seasonal rain forests along the valley, alt. 200–1200 m. Vietnam, Laos, Thailand, Malay Peninsula. New to China.

Pollen morphology: Pollen grains nearly elliptic or oblong, $15.6\text{--}17.3 \times 9.3\text{--}9.9\text{ }\mu\text{m}$ in size, polar view obtusely triangular, colpi 3, shallow, zones 3, ring-like, protuberant from exine, elliptic, termination truncate, and inside ca. $9 \times 2.7\text{ }\mu\text{m}$ in size (Fig. 2: A–D). The voucher specimen is L. M. Zhou 305 (KUN).

Seed morphology: Seeds obtusely triangular, 450–600 μm long, embryo basal, dark in LM, other parts saccate, slightly dark in LM, outside with dense fine strumae, termination truncate and with sparse thick strumae (Fig. 2: E, F). The voucher specimen is *Lüchun Expedition of Yunnan Forestry School* 95 (KUN).

The species is mainly characterized by the broad wings along petioles, flowers clustered in small umbels near the ends of the inflorescence branchlets, and long-hastate anthers with short spurs at the base. The wings along branchlets and peduncles reveal that it is very similar to the following new species, viz. *Oxyspora teretipetiolata*.

2. *Oxyspora teretipetiolata* (C. Y. Wu & C. Chen) W. H. Chen & Y. M. Shui, comb. et stat. nov. — *Allomorpha eupteroton* Guillaumin var. *teretipetiolata* C. Y. Wu & C. Chen in Fl. Yunnan. 2: 93, pl. 25, fig. 1. 1979; et in Fl. Reip. Pop. Sin. 53 (1): 164, pl. 37, fig. 1. 1984. Type: China. Yunnan (云南): Jinping (金平), *Sino-Russ. Unit. Yunnan Exped.* (中苏联合考察云南队) 701 (KUN!).

翅茎尖子木 Fig. 3



Fig. 1. *Oxyspora curtisii* King. A, plant; B, flower; C, face view of stamen; D, ventral view of stamen; E, fruit. Drawn by Y. T. Liu from S. K. Wu et al. 1069 (KUN) (A, E) and L. M. Zhou 305 (KUN) (B, C, D).

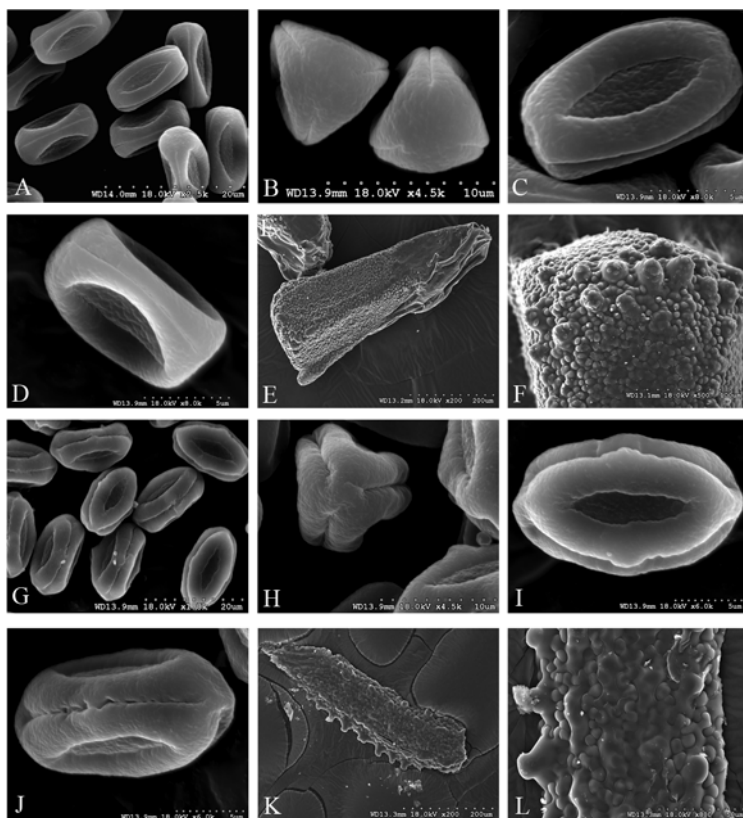


Fig. 2. The SEM observation of pollen grains and seeds of *Oxyspora curtisii* King and *Oxyspora teretipetiolata* (C. Y. Wu & C. Chen) W. H. Chen & Y. M. Shui in Melastomataceae. **A–F**, *Oxyspora curtisii*. **A**, Pollen grains. **B**, Face view of pollen. **C**, Lateral view of a pollen grain. **D**, Polar view of a pollen grain. **E**, Seed. **F**, Strumae of testa at the termination of seed. **G–L**, *Oxyspora teretipetiolata*. **G**, Pollen. **H**, Face view of a pollen grain. **I**, Lateral view of a pollen grain. **J**, Polar view of pollen. **K**, Seed. **L**, Strumae of testa at the middle of a seed. A–D, from L. M. Zhou 305 (KUN); E, F, from Lüchun Expedition of Yunnan Forestry School 95 (KUN); G–L, from Y. M. Shui et al. 43548 (KUN).

China. Yunnan (云南): Hekou (河口), Y. M. Shui et al. (税玉民等) 43548 (IBSC, KUN, PE); Jinping (金平), Sino-Russ. Unit. Yunnan Exped. (中苏联合考察云南队) 701, 1769 (KUN), Z. K. Zhou et al. (周浙昆等) 608 (KUN).

Additional description: Inflorescences 18–26 cm long, peduncle 4-winged, scorpioid dichotomous branching. Hypanthium ovoid, 8-ribbed, ca. 4 mm long, puberulous, calyx rim with 4 widely ovate cusps to 0.5 mm long. Petals ca. 5 mm long, ovate, pink. Stamens 8, 7–8 mm long, anthers pinkish, long-oblong, ca. 3.5 mm long without short spur on the base.

Ecology and Distribution: In bush on the open slope or on riverside in the dense bamboo forest of the deep valley, alt. 400–800 m. Endemic to China (Yunnan: Hekou and Jinping). Type collected from Yunnan (Jinping).

Pollen morphology: Pollen grains nearly ovate, $11\text{--}12 \times 6.7\text{--}7\text{ }\mu\text{m}$ in size, polar view 6-lobate-circular, colpi 3, deep, zones 3, ring-like, protuberant from exine, termination acute, and inside ca. $7.5 \times 2.2\text{ }\mu\text{m}$ (Fig. 2: G–J). The voucher specimen is Y. M. Shui et al. 43548 (KUN).

Seed morphology: Seeds narrowly oblong or sea-cucumber-like, ca. 500 μm long, embryo basal, dark under LM, other part saccate, slightly dark under LM, outside densely covered with both fine and thick strumae, termination obtuse (Fig. 2: K, L). The voucher

specimen is *Y. M. Shui et al.* 43548 (KUN).

Allomorpha eupteroton Guillaumin var. *teretipetiolata* was established on fruiting specimens (Chen, 1979). Flowering collections now available revealed that the variety is distinct from *A. eupteroton* (which is a synonym of *Oxyspora curtisii* King; above). It differs from *A. eupteroton* in the inflorescences and flowers (Figs. 1, 3). Specifically, *O. teretipetiolata* has an ovoid hypanthium, scorpioid dichotomous branching inflorescences, and long-hastate anthers without short spurs at the base, while *A. eupteroton* (= *O. curtisii*) has wide wings on the petioles, a cylindrical hypanthium, verticillate inflorescences and infructescences, and long-oblong anthers with short spurs at the base.

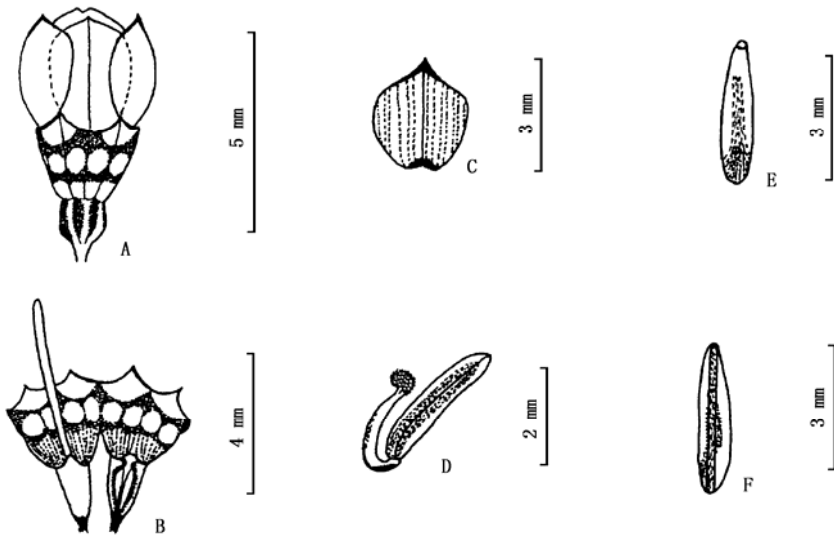


Fig. 3. *Oxyspora teretipetiolata* (C. Y. Wu & C. Chen) W. H. Chen & Y. M. Shui. A, lateral view of flower; B, longitudinal section of flower; C, petal; D, lateral view of stamen; E, dorsal view of anther; F, ventral view of anther. Drawn by Y. M. Shui, and redrawn by R. M. Zhang. From Z. K. Zhou et al. 608.

The SEM observations of the pollen grains and seeds provide further evidence to diagnose the species in the family Melastomataceae. The polar view of pollen of *O. curtisii* is more obtusely triangular, with shallow colpi and truncate termination, while the polar view of pollen of *O. teretipetiolata* is nearly 6-lobate-circular, with deeper colpi and acute termination. Seeds of *O. curtisii* are obtusely triangular, truncate at the apex and with small and dense strumae on the whole surface and big and sparse ones only on the termination, while seeds of *O. teretipetiolata* is like sea cucumber, obtuse at the apex and with both small and big strumae on the whole surface (Fig. 2). So, the obvious difference shows that *Allomorpha eupteroton* Guillaumin var. *teretipetiolata* C. Y. Wu & C. Chen is not conspecific to *Allomorpha eupteroton* Guillaumin (the synonym of *O. curtisii*). Although the variety was described in China (Chen, 1979, 1984), *O. curtisii* is a species newly reported in China.

Pollen grains and seeds of more species need to be examined to evaluate the relationships between *Allomorpha* and *Oxyspora* in the future. Under LM, one other species of *Allomorpha* that has been studied (*A. balansae* Cogn.) has pollen grains that are long globose, with an obtusely triangular polar view, $12(11-13) \times 10(9-10) \mu\text{m}$ in size, with

threadlike 3-colpi, while one species of *Oxyspora* that has been studied (*O. paniculata* (D. Don.) DC.) has pollen grains that are long globose, with a 6-lobate-circular global polar view, $17(16-19) \times 13(12-15) \mu\text{m}$ in size (Institute of Botany and South China Institute of Botany, Chinese Academy of Sciences, 1982). On the one hand, the comparison with SEM observation shows that SEM observation provides more subtle structure than LM does. On the other hand, the four species mentioned have not only obvious difference but also some unanimousness. So, further SEM observation of pollen grains and seeds of more species may be significant for delimitation of genera in Melastomataceae.

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中国野牡丹科植物补充订正

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摘要 报道了中国野牡丹科 Melastomataceae 尖子木属 *Oxyspora* 一新记录种——柑叶尖子木 *O. curtisii* King, 并绘制了特征线条图。另基于花序和花特征的不同, 将翅茎异形木 *Allomorpha eupteroton* Guillaumin var. *teretipetiolata* C. Y. Wu & C. Chen 由变种提升为种, 归入尖子木属, 即翅茎尖子木 *Oxyspora teretipetiolata* (C. Y. Wu & C. Chen) W. H. Chen & Y. M. Shui, 并补充描述了其花部特征。通过扫描电镜观察了它们的花粉和种子形态, 为分类处理提供了佐证。

关键词 野牡丹科; 柑叶尖子木; 新记录; 翅茎尖子木; 新组合; 中国