

5. MILIUSA Leschenault ex A. Candolle, Mém. Soc. Phys. Genève 5: 213. 1832.

野独活属 ye du huo shu

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Saccopetalum Bennett.

Trees or erect shrubs. Inflorescences axillary or superaxillary, fasciculate or cymose, 1-flowered. Flowers mostly bisexual. Pedicel slender, usually elongate. Torus elevated, usually long pubescent. Sepals 3, small, valvate, connate at base. Petals 6, in 2 whorls, with each whorl valvate; outer petals similar to sepals; inner petals large, erect, thin, base shallowly saccate and shortly clawed, margin initially cohering but readily free, apex usually revolute. Stamens many; connectives narrow and not concealing anther locules, apex subapiculate. Carpels many, oblong; ovules 1–8 per carpel; stigmas capitate, ovoid, or globose. Fruit apocarpous; monocarps many, subsessile to long stipitate, globose to ovoid. Seeds 1 to several per monocarp.

About 38 species: tropical and subtropical Asia and Australia; seven species (three endemic) in China.

- 1a. Leaf blade broadest above middle; ovules 1 per carpel.
 - 2a. Leaf blade apex acuminate to shortly acuminate, secondary veins obscure and 7–9 on each side of midvein; pedicel 1–1.4 cm 1. *M. tenuistipitata*
 - 2b. Leaf blade apex obtuse, secondary veins raised and 12–15 on each side of midvein; pedicel 2–3 cm 2. *M. cuneata*
- 1b. Leaf blade broadest at or below middle; ovules 2–8 per carpel.
 - 3a. Shrubs; leaf blade glabrous or with larger veins only sparsely puberulent and glabrescent; sepals and petals sparsely pubescent.
 - 4a. Leaf blade secondary veins 13–20 on each side of midvein; pedicel 0.5–0.7 cm, superaxillary; inner petals ca. 0.3 cm 3. *M. glochidioides*
 - 4b. Leaf blade secondary veins 10–12 on each side of midvein; pedicel 4–6.5 cm, axillary; inner petals ca. 1.8 cm 4. *M. balansae*
 - 3b. Trees; leaf blade abaxially pubescent or tomentose; sepals and petals pubescent or tomentose.
 - 5a. Leaf blade 5–10 cm wide, base obliquely cordate; flowers 3–6 in leaf-opposed cymes or on short and few-leaved branches; carpels glabrous 5. *M. velutina*
 - 5b. Leaf blade 1.8–5 cm wide, base obtuse to rounded and slightly oblique; flowers 1–3 and axillary; carpels pubescent.
 - 6a. Pedicel 3.5–7.5 cm; outer petals as long as sepals; ovules 2 per carpel; monocarps glabrous 6. *M. sinensis*
 - 6b. Pedicel 1.5–3 cm; outer petals longer than sepals; ovules 8 per carpel; monocarps puberulent 7. *M. horsfieldii*

1. *Miliusa tenuistipitata* W. T. Wang, Acta Phytotax. Sin. 6: 200. 1957.

Miliusa bannaensis X. L. Hou.

云南野独活 yun nan ye du huo

Trees to 6 m tall. Branchlets grayish brown, reticulately striate brown tomentose or glabrous. Petiole 3–4(–8) mm; leaf blade oblanceolate to broadly oblanceolate, 4–18(–26) × 1.5–8(–10) cm, papery, more densely pubescent on veins but sometimes glabrous, secondary veins 12–15 on each side of midvein, base cuneate to rounded, apex obtuse to bluntly acuminate. Inflorescences axillary at leafless nodes, 2–6-flowered; peduncle 1–2 mm; bracts 1 or 2, broadly ovate, 1.5–2 × 1.5–2 mm. Pedicel (1–)2–3 cm, pendulous; bracteoles 1 or 2 at base of pedicel and 1 below middle, similar to bracts, persistent. Sepals triangular to broadly lanceolate, ca. 2 mm, outside pubescent. Petals pale purple; outer petals similar to sepals, ca. 3.5 × 0.7–1 mm, pubescent; inner petals broadly lanceolate to oblong, ca. 2 × 1.3 cm, outside pubescent, inside puberulent and basally concave. Stamens 14–16, in 2 series, ca. 1.5 mm; connectives apically shortly cuspidate. Carpels many, ellipsoid to ovoid, sparsely white pubescent; ovule 1 per carpel; stigmas terete, glabrous. Fruiting peduncle ca. 2 mm, thicker than long; monocarp stipes 0.7–1.4 cm; monocarps 8–14, drying blackish, subglobose to ellipsoid-ovoid, 7–9 × ca. 5 mm, glabrous; epicarp tuberculate, glabrous. Seed 1 per monocarp. Fl. Apr–Sep, fr. Jun–Feb.

Trees to 12 m tall, d.b.h. to 30 cm, most parts pubescent. Petiole 1–4 mm; leaf blade obovate-elliptic to obovate-oblong, 7.5–19 × 2.8–7 cm, membranous, secondary veins 7–9 on each side of midvein and inconspicuous on both surfaces, base rounded to broadly cuneate and sometimes slightly oblique, apex acuminate to shortly acuminate. Inflorescences axillary, 1-flowered; bracts lanceolate, ca. 3 mm. Flowers ca. 1 cm. Pedicel 1–1.4 cm. Sepals ovate-oblong, ca. 4 × 1.5 mm. Outer petals 2.5–5 × ca. 2 mm; inner petals ovate, ca. 9 × 5 mm, puberulent. Stamen connectives slightly elevated. Carpels 4–8, oblong, puberulent; ovule 1 per carpel; stigmas globose, glabrous. Fruiting pedicel 1.7–3.5 cm; monocarp stipes 0.9–2.1 cm; monocarps globose, ca. 7 mm in diam., glabrous, tuberculate. Seeds 1 per monocarp. Fl. May, fr. Jun.

• Mixed forests, scrub; 700–1500 m. SE Xizang, S Yunnan.

2. *Miliusa cuneata* Craib, Bull. Misc. Inform. Kew 1912: 145. 1912.

楔叶野独活 xie ye ye du huo

Open forests; 500–1500 m. S Yunnan [N Thailand].

3. *Milium glochidioides* Handel-Mazzetti, *Sinensia* 3: 185. 1933.

广西野独活 *guang xi ye du huo*

Shrubs to 1.5 m tall. Branchlets terete, ferruginous pilose to glabrescent. Petiole to 2 mm; leaf blade elliptic to narrowly ovate-lanceolate, 3–8 × 1–3 cm, sparsely pilose to glabrescent, secondary veins 13–20 on each side of midvein, base obliquely rounded, apex shortly acuminate. Inflorescences superaxillary, 1- or 2-flowered; bracts ovate, 0.5–1 mm, sericeous. Pedicel filiform, 0.5–0.7 cm, glabrous. Sepals broadly ovate, ca. 1 mm, outside minutely strigose, inside glabrous. Outer petals as long as sepals; inner petals ovate, ca. 3.5 × 2.5 mm, outside minutely strigose, inside glabrous. Stamens ca. 20; filaments as long as anther locules; connectives broader than anther locules, subangular. Carpels ca. 10, glabrous. Fruit not seen. Fl. Jul, fr. Aug–Oct.

- Forested slopes; below 900 m. Guangxi.

The Annonaceae Checklist (Rainer & Chatrou, eds., AnnonBase in Species 2010 & ITIS Catalogue of Life; <http://herbarium.botanik.univie.ac.at/annonaceae/listTax.php>; accessed on 1 Oct 2010) treats this species as a synonym of *Orophea polycarpa*. The short pedicels are certainly anomalous among other Chinese species of *Milium* and more typical of *Orophea*, but there are serious discrepancies in the descriptions of these two taxa within China, most notably in petal sizes and stamen numbers, such that we do not wish to follow the checklist here.

4. *Milium balansae* Finet & Gagnepain, *Bull. Soc. Bot. France* 53(Mém. 4): 149. 1906.

野独活 *ye du huo*

Milium chunii W. T. Wang; *M. filipes* Merrill & Chun (1935), not Ridley (1920).

Shrubs 2–5 m tall. Branchlets slightly pubescent. Petiole 2–3 mm; leaf blade elliptic, elliptic-oblong, or oblong, 7–15 × 2.5–4.5 cm, membranous, glabrous or sparsely puberulent on midvein and secondary veins but glabrescent, secondary veins 10–12 on each side of midvein, base cuneate to rounded and oblique, apex acuminate to shortly acuminate. Inflorescences axillary, 1-flowered. Flowers 1.3–1.6 cm in diam. Pedicel filiform, 4–6.5 cm, pendulous, glabrous. Sepals ovate, ca. 2 mm, slightly pubescent. Petals red; outer petals slightly longer than sepals; inner petals ovate, 1.2–2.5 × 0.7–1.5 cm, apex reflexed. Anthers ovoid to obovoid. Carpels oblong to lens-shaped, slightly pubescent; ovules 2 or 3 per carpel; stigmas terete, puberulent. Fruiting peduncle 4–7.5 cm, slender; monocarp stipes 1–2 cm; monocarps globose, 7–10 mm in diam. Seeds 1–3 per monocarp. Fl. Apr–Jul, fr. Jul–Dec.

Forests or scrub in valleys; 500–1800 m. Guangdong, Guangxi, Guizhou, Hainan, S Yunnan [Vietnam].

5. *Milium velutina* (Dunal) J. D. Hooker & Thomson, *Fl. Ind.* 1: 151. 1855.

大叶野独活 *da ye ye du huo*

Uvaria velutina Dunal, *Monogr. Anonac.* 91. 1817; *Guat-*

teria velutina (Dunal) A. Candolle; *U. villosa* Roxburgh.

Trees to 20 m tall. Branches tomentose when young. Petiole 2–7 mm, tomentose; leaf blade elliptic, ovate, or oblong, 8–15[–30] × 5–10[–16] cm, secondary veins ca. 16 on each side of midvein, base obliquely rounded to cordate, apex acute to shortly acuminate. Inflorescences leaf-opposed or on short few-leaved branches, cymose, 3–6-flowered. Peduncle 6–25 mm, tomentose; bracts minute, caducous. Pedicel 5–10 cm, slender; bracteoles similar to bracts. Torus glabrous. Sepals and outer petals ovate-triangular, 2–8 × 1.5–3.5 mm; inner petals dark brown, ovate-lanceolate to lanceolate-rhombic, ca. 10[–18] × 6[–10] mm, outside with very dense appressed golden hairs, inside glabrous. Carpels many, pubescent; ovules 2 per carpel, stigma clavate. Monocarp stipes 5–8 mm; monocarps globose to ovoid, ca. 20 × 16 mm, pilose. Fl. May, fr. Jul. $2n = 18$.

Forested slopes; 500–700 m. S Yunnan [Cambodia, India, Laos, Malaysia, Myanmar, Nepal, Pakistan, Thailand, Vietnam].

6. *Milium sinensis* Finet & Gagnepain, *Bull. Soc. Bot. France* 53(Mém. 4): 151. 1906.

中华野独活 *zhong hua ye du huo*

Evodia lyi H. Léveillé.

Trees to 6 m tall, most parts pubescent and densely so when young. Petiole 2–3 mm; leaf blade elliptic, oblong-elliptic, or rarely oblong, 5–13 × 2–5 cm, thinly papery to membranous, secondary veins 9–11 on each side of midvein, base obtuse to rounded and slightly oblique, apex acuminate to obtuse. Inflorescences axillary, erect to pendulous, 1-flowered; bracts 2–4, pubescent. Flowers 1–1.5 cm in diam. Pedicel 3.5–7.5 cm; bracteoles 2–4, near pedicel base. Sepals lanceolate, ca. 3 mm, apex obtuse and spreading. Outer petals as long as sepals; inner petals purplish red, ovate, 10–15 × 6–8 mm. Stamen connectives apically apiculate. Carpels ovoid, pubescent; ovules 2 per carpel; stigmas ovoid to subcapitate, glabrous. Monocarp stipes 1.3–2.1 cm, pendulous, puberulent; monocarps globose to obovoid, 7–10 × 7–8 mm, glabrous. Seeds 1 or 2 per monocarp. Fl. Apr–Sep, fr. Jul–Dec.

- Dense forests, scrub; 500–1500 m. Guangdong, Guangxi, Guizhou, S Yunnan.

7. *Milium horsfieldii* (Bennett) Pierre, *Fl. Forest. Cochinch.* t. 38. 1881.

囊瓣木 *nang ban mu*

Saccopetalum horsfieldii Bennett, *Pl. Jav. Rar.* 165. 1840; *Alphonsea prolifica* Chun & F. C. How; *Milium prolifica* (Chun & F. C. How) P. T. Li; *M. tectona* C. E. Parkinson; *S. arboreum* Elmer; *S. lineatum* Craib; *S. prolificum* (Chun & F. C. How) Tsiang; *S. unguiculatum* Fischer.

Trees to 15[–35] m tall, evergreen, d.b.h. to 50 cm. Bark ochre-colored. Branches villous. Petiole ca. 2 mm, villous; leaf blade elliptic to oblong, 4–13 × 1.8–4 cm, papery, abaxially villous, adaxially sparsely pubescent but densely so on veins, secondary veins 10–14 on each side of midvein, base rounded and slightly oblique, apex acute to acuminate. Inflorescences axillary, cymose, 1–30-flowered. Pedicel 1.5–3 cm, recurved. Se-

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pals broadly triangular, ca. $3(-10) \times 1-2$ mm. Petals dark red; outer petals lanceolate, ca. $7(-13) \times 1-2$ mm, reflexed at anthesis; inner petals ovate-lanceolate, $20-26(-40) \times 5-10(-15)$ mm, incurved, with a conspicuous midvein. Stamens ca. 1 mm. Carpels incurved crescent, densely sericeous; ovules 8 per carpel, in 2 series; stigmas ovoid, glabrous. Monocarp stipes 1–1.5 cm; monocarps 5–20, dark red at maturity, globose to subglobose, 1–2 cm in diam., puberulent. Seeds 2–8 per monocarp, reniform, ca. 11×5 mm. Fl. Mar–Jun, fr. Jul–Aug.

Dense forests, woodlands; 300–1000 m. Guangdong, Hainan [India (Andaman and Nicobar Islands), Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand; Australia].

The timber from *Milusa horsfieldii* is straight, hard, non-splitting, and fine grained and is used for vehicle construction, agricultural implements, machinery, etc. Merrill and Chun (Sunyatsenia 2: 230. 1935) misidentified material of this species as *Alphonsea mollis* Dunn.

Milusa horsfieldii is listed as Vulnerable (VU A2c) by the IUCN Red List of Threatened Species (Version 2010.3; <http://www.iucnredlist.org>; accessed on 6 Oct 2010, as *Saccopetalum prolificum*).

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