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97. XANTHOPHYTUM Reinwardt ex Blume, Bijdr. 989. 1826–1827.

岩黄树属 yan huang shu shu

Chen Tao (陈涛); Charlotte M. Taylor

Paedicalyx Pierre ex Pitard; *Xanthophytopsis* Pitard.

Small trees, shrubs, or subshrubs, sometimes unbranched (i.e., monocaulous), unarmed, often fleshy; young growth usually densely sericeous to lanate, hirsute, or tomentose with trichomes drying golden yellow to ferruginous. Raphides present. Leaves opposite, isophyllous [or sometimes markedly anisophyllous], without domatia; stipules persistent or deciduous, interpetiolar, generally triangular or somewhat leaflike, sometimes markedly parallel-veined or -fibrous, entire or 2-lobed. Inflorescences axillary, cymose to paniculate or subcapitate, several to many flowered, sessile to pedunculate, bracteate or bracts reduced. Flowers sessile to pedicellate, bisexual, distylous or monomorphic, at least sometimes fragrant. Calyx limb shallowly to deeply 5-lobed; lobes sometimes unequal on an individual flower. Corolla white, yellow, or purple, tubular to funnelform, inside with pubescent ring in upper part of tube; lobes 5, valvate in bud. Stamens 5, exserted or included, inserted near middle to base of corolla tube; filaments reduced to developed; anthers apparently dorsifixed. Ovary 2-celled, ovules numerous in each cell on peltate placentas attached at middle of septum; stigmas clavate to 2-lobed, included or exserted. Infructescences often with peduncle, axes, and pedicels elongating notably. Fruit indehiscent, schizocarpous, or capsular, ovoid to subglobose, dry, with calyx limb persistent or deciduous, sometimes splitting septicidally into 2 indehiscent mericarps or loculicidally dehiscent valves, these each 1-celled, ellipsoid to plano-convex, each with numerous seeds; seeds small, angled, smooth, often brown.

About 30 species: China, Indonesia (including Borneo, with most of the species), Laos, Malaysia, New Guinea, Pacific islands (Fiji), Philippines, Vietnam; four species in China.

Xanthophytum was reviewed for China by Chun and F. C. How (Sunyatsenia 4: 10–15. 1939, as *Paedicalyx*) and then by H. S. Lo (Bull. Bot. Res., Harbin 6(4): 21–33. 1986), who formally synonymized *Xanthophytopsis* and *Paedicalyx* in this region based on previous comments by Bakhuizen but making the necessary combinations. Axelius (Blumea 34: 425–497. 1990) provided the only comprehensive review of *Xanthophytum*. She recognized four types of trichomes characteristic of the genus (loc. cit.: 427, f. 1); also notable in *Xanthophytum* are the fruit with numerous tiny seeds apparently enclosed in drupaceous locules or mericarps, and the stamen filaments that are often fused to the corolla only at the base and appear free or nearly free. Several authors have described the fruit as drupaceous and splitting, but the fruit morphology apparently corresponds better to schizocarpous in the terminology used in this treatment. Axelius observed also that distyly in *Xanthophytum* was apparently not noted by Chinese authors, resulting in somewhat confused descriptions of floral morphology.

1a. Inflorescences subcapitate to congested-cymose, subsessile to shortly pedunculate, with peduncles to 0.5 cm in flower, sometimes to 1 cm at fruiting; leaves with secondary veins 9–16 pairs ..... 3. *X. kwangtungense*
1b. Inflorescences subcapitate to laxly cymose or paniculate, pedunculate with peduncles 0.5–11 cm; leaves with secondary veins 9–30 pairs.
2a. Fruit septicidally dehiscent; inflorescences laxly cymose to paniculate; peduncles 4–11 cm; leaves with secondary veins 9–15 pairs ..... 2. *X. balansae*
2b. Fruit indehiscent; inflorescences subcapitate to laxly cymose or paniculate; peduncles 0.5–6 cm; leaves with secondary veins 14–30 pairs.
3a. Inflorescences subcapitate; corolla tube 2–2.2 mm ..... 1. *X. attopevense*
3b. Inflorescences laxly cymose to paniculate; corolla tube 1.5–2 mm ..... 4. *X. polyanthum*

1. Xanthophytum attopevense (Pierre ex Pitard) H. S. Lo, Bull. Bot. Res., Harbin 6(4): 32. 1986.

琼岛岩黄树 qiong dao yan huang shu

Paedicalyx attopevensis Pierre ex Pitard in Lecomte, Fl. Indo-Chine 3: 88. 1922.

Shrubs or herbs, to 1 m tall; branches flattened to subterete, densely sericeous to pilose. Petiole 0.2–2 cm, densely sericeous; leaf blade drying membranous or thinly papery, narrowly elliptic or oblanceolate-oblong, 10–20 × 3.5–6 cm, adaxially moderately to sparsely villous to hirsute, abaxially rather densely hirtellous to hirsute on veins and densely sericeous on lamina, base acute and often decurrent, apex acuminate or shortly acuminate; secondary veins 17–30 pairs; stipules persistent, ovate or lanceolate, 12–17 × 4–8 mm, sericeous or pilose to glabrescent, longitudinally veined, caudate or acuminate. Inflorescences subcapitate, densely sericeous; peduncles 0.5–1.5 cm; heads subglobose, 0.5–1 cm in diam.; bracts triangular, 1.5–3 mm; bracteoles reduced; pedicels 0–1 mm. Calyx densely villous or strigose; ovary portion obconic, ca. 1.5 mm; lobes obovate, 1–2.5 mm, sometimes unequal, glabrescent. Corolla white, outside pilosulous at least on lobes; tube 2–2.2 mm; lobes oblong-lanceolate, ca. 1 mm. Fruit indehiscent, subglobose to didymous, ca. 2 × 2.5 mm, hirsute to sericeous. Fl. Jan–Mar, fr. May–Aug.

Dense forests. Hainan [Laos, Vietnam].

This species is circumscribed here following Axelius; many of the specimens that were included in this species by Chinese authors are here separated in *Xanthophytum polyanthum*.

2. Xanthophytum balansae (Pitard) H. S. Lo, Bull. Bot. Res., Harbin 6(4): 31. 1986.

长梗岩黄树 chang geng yan huang shu

Xanthophytopsis balansae Pitard in Lecomte, Fl. Indo-Chine 3: 90. 1922.

Shrubs, ca. 1 m tall; stems subterete, densely sericeous. Petiole 5–15 mm, puberulent to sericeous; leaf blade drying membranous or thinly papery, green above, pale brown below, elliptic or elliptic-oblong to lanceolate, 9–17.5 × 2.5–5 cm, adaxially glabrous or sparsely strigose, abaxially densely sericeous, base cuneate to acute and often decurrent, apex acute; secondary veins 9–15 pairs; stipules persistent, narrowly ovate, ca. 10 × 3 mm, acuminate. Inflorescence laxly cymose to paniculate, pilose to strigillose; peduncles flexuous, 4–11 cm; branched portion broadly pyramidal, 2–7 × 2–10 cm; bracts elliptic, up to 2.5 × 9 cm, acute; bracteoles reduced; pedicels 1–2 mm. Flowers unknown. Fruit septicidally dehiscent, subglobose to ovoid, ca. 2 mm in diam., densely strigillose to strigose, with persistent calyx lobes obovate or oblanceolate, 1–3 × ca. 1 mm, ciliate; seeds yellow. Fl. and fr. Jun–Oct.

Streamsides in dense forests. Guangxi (Shiwan Dashan) [N Vietnam].

3. Xanthophytum kwangtungense (Chun & F. C. How) H. S. Lo, Bull. Bot. Res., Harbin 6(4): 32. 1986.

岩黄树 yan huang shu

Xanthophytopsis kwangtungensis Chun & F. C. How, Sunyatsenia 4: 14. 1939.

Shrubs, 0.5–1 m tall; branches flattened to subterete, densely sericeous to tomentose-pilose. Petiole 0.5–3 cm, densely sericeous to pilose; leaf blade drying papery, elliptic, elliptic-oblong, or ovate, 5–20 × 2.5–7 cm, adaxially glabrous or sparsely pilose at least along veins, abaxially densely sericeous or sericeous-villous, base cuneate to acute and usually long decurrent, apex acuminate; secondary veins 9–16 pairs; stipules drying membranous, persistent, ovate to triangular, 9–15 × 5–7 mm, sericeous or pilose to glabrescent, parallel-veined, acute to acuminate or bilobed for up to 1/2, margins often ciliolate. Inflorescences subcapitate to congested-cymose, many flowered, densely strigose to strigillose; peduncles 0.1–0.5 cm; flowering portion subglobose, ca. 1 cm in diam.; bracteoles linear-lanceolate, ca. 2 mm; pedicels 0–3 mm. Calyx densely strigillose to sericeous; ovary portion ellipsoid, 1.1–1.2 mm; limb lobed essentially to base, glabrous internally; lobes subspatulate to ovate or oblanceolate, 1.2–2.5 mm, obtuse to rounded, often ciliate. Corolla pale yellow, campanulate-funnelform, outside pilosulous at least on lobes; tube 2.2–2.3 mm; lobes ovate-triangular to spatulate, 1.2–1.3 mm, obtuse to acute. Infructescences often borne at lower leaf nodes or below leaves, with peduncles up to 1 cm, pedicels up to 2 mm. Fruit capsular, subglobose to ovoid, ca. 2 mm in diam., strigillose to sericeous. Fl. May, fr. Jul–Oct.

Wet places in forests. SE Guangxi, S Yunnan (Hekou) [Vietnam].

The calyx lobe measurements given here are based on Chinese specimens studied and on H. S. Lo (in FRPS 71(1): 24. 1999); Axelius (Blumea 34: 467–469. 1990) reported that these range up to 4.1 mm throughout the range of the species (i.e., in Vietnam). Several specimens of this species, in particular *W. T. Tsang 23975* and *24532*, were distributed as "*Xanthophytum chinense* Merrill," but that name has not been published.

4. Xanthophytum polyanthum Pitard in Lecomte, Fl. Indo-Chine 3: 91. 1922.

多花岩黄树 duo hua yan huang shu

Low shrubs, ca. 0.5 m, little branched; branches weakly angled or subterete, sometimes rather stout, densely sericeous. Petiole 0.8–5 cm, densely sericeous; leaf blade drying papery, lanceolate to elliptic, elliptic-oblong, or oblanceolate, 9–30 × 3.5–8 cm, adaxially sparsely or moderately hirtellous to villous to subglabrous, abaxially densely pilose to sericeous, base cuneate to acute and usually decurrent, apex acute to acuminate; secondary veins 14–25 pairs; stipules persistent, lanceolate to ovate, 1.8–2.3 × 0.6–0.9 cm, sericeous to glabrescent, acuminate or lobed for up to 1/3. Inflorescences laxly paniculate or cymose, densely villous to hirtellous; peduncles 2–6 cm; branched portion pyramidal, 1.5–5 × 2–5 cm; bracts triangular, 2–5 mm; bracteoles narrowly triangular, 1–2 mm; pedicels 0–3 mm. Calyx densely villosulous; ovary portion subglobose to ellipsoid, ca. 0.5 mm; limb lobed nearly to base, glabrous inside; lobes spatulate to ovate or obovate, 0.6–2.1 mm, obtuse to rounded. Corolla tubular to funnelform, glabrous or with a few stout hairs outside; tube 1.5–2 mm; lobes 0.5–1.5 mm, acute. Fruit indehiscent or perhaps tardily splitting septicidally, ellipsoid to subglobose or didymous, 1.5–3 mm, villosulous to hirtellous. Fl. Feb, fr. Apr.

Wet forests; ca. 1400 m. Hainan (Jianfeng Ling) [N Vietnam].

The specimens described here were included by Chinese authors in *Xanthophytum attopevense* but are here separated following Axelius (Blumea 34: 470–472. 1990).

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