Taxonomic notes on the genus *Alphonsea* (Annonaceae) in Thailand

CHARAN LEERATIWONG1*, PIYA CHALERMGLIN2 & DAVID M. JOHNSON3

ABSTRACT
The following four species in the genus *Alphonsea* (Annonaceae) are new records for Thailand: *Alphonsea glandulosa*, *A. kingii*, *A. lucida* and *A. malayana*. *Alphonsea lutea* var. *longipes* is reduced to a taxonomic synonym of *A. glandulosa*. The reinstatement of *A. pallida* is proposed and explained. Complete descriptions are provided here for both *A. pallida* and *A. siamensis* following the recent discovery of the fruits of the former and the flowers of the latter. Descriptions of all taxa with notes on their distribution, ecology, vernacular names and photographs are also provided.

KEYWORDS: Miliuseae, new record, reinstatement, taxonomy.
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INTRODUCTION

The genus *Alphonsea* Hook. f. & Thomson (Annonaceae) comprises 23 to 34 species distributed in India, Sri Lanka, Bangladesh, Myanmar, China, Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia, Papua New Guinea and the Philippines. (Kessler, 1995; Chatrou et al., 2012; Turner, 2018). The genus is, in contrast to many other genera of the family, easily recognizable by its flower structure, having petals with a saccate base and a reflexed apex at anthesis, miliusoid stamens and multi-seeded monocarp (Kessler, 1995; Mols et al., 2004).

In Thailand, six to 12 species of this genus have been reported (Craib, 1925; Kessler, 1995; Pooma & Suddee, 2014; Turner, 2018). However, in preparing the *Alphonsea* account for the Flora of Thailand, we discovered four species new to the flora and a new synonym of *A. glandulosa*. *Alphonsea lutea* var. *longipes* is reduced to a taxonomic synonym of *A. glandulosa*. The reinstatement of *A. pallida* is proposed and explained. Complete descriptions are provided here for both *A. pallida* and *A. siamensis* following the recent discovery of the fruits of the former and the flowers of the latter. Descriptions of all taxa with notes on their distribution, ecology, vernacular names and photographs are also provided.

MATERIALS AND METHODS

We made fresh field collections in Thailand and also examined specimens from the following herbaria: AAU, ABD, BCU, BK, BKF, BM, C, CAL, CAS, CMU, CMUB, E, K, KKU, L, OWU, P, PSU, QBG, US and WAG (herbarium acronyms follow Thiers, 2019). Most type specimens cited have been seen, indicated in the text by !; types not seen are indicated by n.v. (non vide).

TAXONOMIC TREATMENT


Tree 9–40 m tall; deciduous, bark brown, greyish-brown or grey. Twigs lenticellate, densely brown appressed hairs when young, later glabrous, often with ridges extending along the twig from petiole base. Leaves subcoriaceous to chartaceous, lanceolate, elliptic, oblanceolate, broadly ovate

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or ovate, 4–18 by 1.5–8 cm, base cuneate or slightly rounded, apex acuminate or acute, the acumen 2–15 mm long, margins entire, revolute, adaxial surface slightly shiny, glabrous, midrib sunken, sometime with brown pubescent hairs; abaxial surface glabrous or sparsely brown appressed pubescent, with densely brown or orangish-brown glands, secondary veins 7–12 per side, petiole 2–5 mm long, moderately brown pubescent, transversely densely striate. Inflorescences extra-axillary or leaf-opposed, 3–13-flowered, peduncle 2–5 mm long, with 3–7 bracts, individual pedicels 6–20 mm long, each bearing a single bracteole near the middle, bracts ovate, 0.8–1.5 mm long, bracteole ovate, 0.8–1.5 mm long, buds conical. Sepals brownish-green to brown, connate at base, ovate, 1–2 mm by 1.5–2.5 mm, obtuse, reflexed, hairy outside, glabrous except hairy at apex, with glandular tissue near the base, apparent as a transverse ridge inside. Stamens 25–35, oblong, 0.8–1 mm long. Carpels 4–7, ovary ellipsoid-oblong, 2–3 mm long, hairy, stigma U-shaped, 0.5–0.8 mm long. Torus conical. Fruit of 4–6 monocarps borne on a pedicel 1–3 cm long. Monocarps green when young, turning dark yellow, ovoid, ellipsoid-ovoid or subglobose, smooth, densely brown pubescent, 2–3.5 by 1.7–3 cm, apex rounded, with a longitudinal groove at abaxial side, sometimes constricted between seed, base contracted into a stipe 2–10 mm long. Seeds 6–13 per monocarp, ellipsoid-reniform, 1–1.5 by 0.5–0.8 cm, smooth.

Thailand.—NORTHERN: Chiang Rai [Mae Sai, Than Luang-Khun Nam Nang Non Forest Park, alt. 505 m, 27 Mar. 2012, Norsaengsri & Thathana 9247 (BKF, QBG)]; ibid., alt. 602 m, 10 July 2012, Norsaengsri & Thathana 9708 (BKG); Doi Luang NP, 31 Mar. 2015, Norsaengsri 19996 (QBG); ibid., 5 May 2015, Norsaengsri 12244 (QBG)]; Mae Hong Son [alt. 500 m, Geesink et al. 3937 (L, P)]; Phrae [Mae Song, alt. 300 m, 18 Mar. 1920, Vanpruk 444 (K); ibid., Vanpruk 997 (BKF); ibid., alt. 451 m, 30 Apr. 2013, La-onsrgsi et al. 2833 (QBG)]; Phayao [Phu Sang NP, 25 Mar. 1998, SC 122 (BKF); Muang, Doi Luang NP, alt. 600 m, 8 May 1997, Maxwell 97-492 (BKF, CAS, CMUB, L); ibid., alt. 600 m, 28 May 1997, Gardner & Sidusinhorn 2157 (CAS, CMUB, L); ibid., alt. 400 m, 6 May 2002, Chalermglin 450506 (L)]; Nan [Tham Sakoen NP, alt. 722 m, 15 July 2012, La-onsrgsi et al. 2405 (QBG)]; Lampun [Doi Khun Tan NP, alt. 1025 m, 4 April 1994, Maxwell 94-454 (CAS, CMUB, L)]; Lampang [Wang Nuea, Doi Luang NP, alt. 600 m, 25 Mar. 1977, Maxwell 97-219 (BKF, CMUB, L); ibid. 10 July 1997, Maxwell 97-716 (BKF, CMUB, L); ibid., alt. 400 m, 10 April 1999, Chalermglin 420410 (L); Chae Sorn NP, alt. 650 m, 28 April 1996, Maxwell 96-640 (BKF, CMUB); ibid., 2 June 1996, Maxwell 96-784 (BKF, CAS, CMUB)]; Sukhothai [Srisatchanalai NP, 1 Apr. 2015, Maknoi 7668 (QBG)]; NORTHEASTERN: Phetchabun [Nam Nao NP, alt. 900 m, 17 Apr. 2002, Chalermglin 450417 (L); ibid., 28 May 2013, Maknoi 5553 (QBG)]; ibid., Phu Pha Chit, 11 Apr. 2014, Maknoi 6847 (QBG); ibid., 18 June 2014, Maknoi 7006 (QBG)]; Loei [Phu Luang NP, June 1968, Bunchua 1678 (BKF)]; ibid., alt. 885 m, 27 May 2009, Norsaengsri & La-onsrgsi 5603 (QBG); Phukradueng, Phanok Khao, 1 Mar. 2011, Norsaengsri et al. 7754 (QBG)]; ibid., alt. 348 m, 21 Feb. 2019, Leeratiwong & Chalermglin 19-1416 (PSU)]; EASTERN: Chaiyaphume [Khon San, Chulaphorn dam, alt. ca 800 m, 20 July 2007, Wongprasert 077-4 (BKF)]; ibid. alt. 850 m, 20 June 2003, Wongprasert 036-25 (BKF)]; Nam Phrom dam, alt. 650 m, 25 Mar. 1980, Smitinand & Santisuk s.n. (BKF)]; Nakhon Ratchosima [Khao Yai NP, alt. 800 m, 30 Nov. 1994, Smitinand s.n. (BKF)]; SOUTH-WESTERN: Uthai Thani [Huay Kha Khaeng WS, 5 May 2002, Khoonchampa & Thongpudkee s.n. (L)]; Kanchanaburi [Khwae Noi Basin, alt. 200 m, 30 May 1946, Kostermans 773 (BK, L, P, SING)]; Srisawat, Than Lat Noi cave, alt. 565 m, 29 June 2017, La-onsrgsi et al. 5224 (QBG)]; CENTRAL: Nakhon Nayok [Muang, Khaob Yai NP, alt. 790 m, 30 June 2002, Boonkongchart 137 (BK, CMUB, L)]; ibid., alt. 825 m, 13 Mar. 2002, Maxwell 02-91 (BK, CMU, CMUB, L)); ibid., alt. 600 m, 16 Dec. 2006, Maxwell 06-981 (QBG)]; ibid., alt. 760 m, 24 Mar. 1994, Brockelman 65 (CMUB)]; ibid., Panpeng s.n. (CMUB)]; ibid., alt. 760 m, 16 May 1998, Charoenchai 631 (BK, CAS, CMUB, L)].

Distribution.—China.

Ecology.—Scattered on shaded or streamside
areas in tropical rain, dry evergreen, hill evergreen or mixed deciduous forest; limestone hill in dry dipterocarp forest; alt. 400–1,025 m; Flowering: December–May; fruiting: April–July

Vernacular.— Cha fang (เต้ารักเกียรติ).

Note.— Examination of the type specimens of *Alphonsea glandulosa* and *A. lutea* var. *longipes* shows that these taxa are conspecific, both having inner petals with a transversely glandular ridge on the inner base. Therefore, *A. lutea* var. *longipes* is treated to be a synonym under *A. glandulosa*. In addition, this species is found in China and is to be a synonym under *A. longipes*.


Tree, small tree or shrub 1.5–15 m tall; bark brownish-black to brown. Twigs lenticellate, moderately covering with brown appressed hairs when young, later glabrous to sparsely hairy, often with ridges extending along the twig from the petiole base. Leaves subcoriaceous to chartaceous, elliptic, lanceolate, lanceolate-elliptic, oblong-lanceolate, ovate-elliptic or rarely ovate, 3–13 by 2–6 cm, base rounded, slightly cordate or cuneate, apex acute, acuminate or obtuse, the acumen 0–20 mm long, margins entire, adaxial surface shiny, glabrous or sometimes with very sparsely brown hairs at midrib, midrib flattened to slightly sunken, abaxial surface glabrous except with sparse hairs on midrib or margins, secondary veins 6–13 per side, petiole 2.5–4 mm long, moderately to sparsely brown hairy, with shallow grooves. Inflorescences extra-axillary or leaf-opposed, 1–10-flowered, peduncle 1.5–4 mm long, with 1–4 bracts, individual pedicels 5–13 mm long, each bearing a single bracteole near to the middle, bracts ovate, 0.5–2 mm long, bracteole ovate, 0.5–1.5 mm long, buds conical. Sepals brown to brownish-green, connate at base, broadly ovate, 1–2 mm by 1.5–2 mm, obtuse, reflexed, hairy outside, glabrous inside. Outer petals greenish-yellow or whitish-yellow, triangular-ovate, 5.5–14 by 3.5–8 mm, apex obtuse to slightly acute, hairy outside, hairy to glabrous at base inside; inner petals greenish-yellow to pale whitish-yellow, triangular-ovate, 6–13 by 3–7 mm, apex obtuse or slightly acute, hairy outside, glabrous or particularly hairy at apex inside. Stamens 15–35, oblong-elliptic to elliptic, 0.8–1.5 mm long. Carpels (2–)3–5, ovary oblong, 1.8–2.5 mm long, hairy, stigma U-shaped, 0.3–0.8 mm long. Torus conical. Fruit of 1–4 monocarps borne on a pedicle 1–3 cm long. Monocarps green when young, turning yellow, cylindrical, ellipsoid or ovoid-ellipsoid, with slightly verrucose to verrucose surface, glabrous or with sparse brown hairs, 2–5 by 1.2–2.5 cm, apex rounded, sometimes with a longitudinal ridge at abaxial side, base contracted into a stipe 0.2–1.5 cm long. Seeds 2–8 per monocarp, ellipsoid-ovoid or reniform-ovoid, 0.8–2 by 0.7–1.5 cm, smooth.

Thailand.— SOUTH-WESTERN: Prachuap Khiri Khan [Sam Roi Yot, alt. 300 m, 5 May 1974, Larsen & Larsen 33616 (AAU, L)]; PENINSULAR: Phangnga [Muang, alt. 50m, 22 Apr. 2006, Gardner & Säisunthorn ST2609 (L, QBG)]; Nakhon Si Thammarat [2 Mar. 1957, Thaworn 959 (BKF)]; Phatthalung [Ko Si-Ko Ha Island, alt. ca 50 m, 12 Apr. 1928, Kerr 15150 (AAU, BK, BM, L)]; Chai Ya Buri park, Pa Phrayom, alt. 245 m, 23 Oct. 2018, Leeratiwong 18-1408 (PSU); ibid., 1 Mar. 2019, Leeratiwong 19-1406 (PSU), ibid., 27 May 2019, Leeratiwong 19-1423 (PSU); Khao Chiak, Muang, alt. 179 m, 8 Mar. 2019, Leeratiwong 19-1407 (PSU); Songkhla [Rattaphum, Khao Rak Kiat, alt. 56 m, 2 May 2018, Leeratiwong 18-1410 (PSU)]; ibid., 23 Oct. 2018, Leeratiwong 18-1426 (PSU); ibid., 3 July 2018, Leeratiwong 18-1427 (PSU)]; Peninsular [2 Mar. 1957, Thaworn 959 (BKF)]; Phatthalung [Ko Si-Ko Ha Island, alt. ca 50 m, 12 Apr. 1928, Kerr 15150 (AAU, BK, BM, L)]; Songkhla [Rattaphum, Khao Rak Kiat, alt. 56 m, 2 May 2018, Leeratiwong 18-1410 (PSU)]; ibid., 3 July 2018, Leeratiwong 18-1426 (PSU); ibid., 8 Feb. 2018, Leeratiwong 19-1412 (PSU); ibid., 29 Mar. 2019, Leeratiwong 19-1411, 19-1413 (PSU); ibid., 9 May 2019, Leeratiwong 19-1427 (PSU)].

Distribution.— Malaysia (type)

Ecology.— Scattered on limestone hill in dry evergreen forest; shaded areas in tropical rain forest; alt. 40–380 m; flowering: February to August; fruiting April to October.

Vernacular.— Tam yao khao rak kiat (ตำาหยาว เขารักเกียรติ)(General).

Note.— *Alphonsea kingii* is distinguished by its verrucose to slightly verrucose monocarp covering with or without hairs. It was formerly known only from Malaysia (Sinclair, 1955; Turner, 2016; Turner
Figure 1. Alphonsea glandulosa Y.H. Tan & B. Xue: A. flowering branch, B. flowers, C. inner petal with glandular ridge (arrow) near the base on inside surface, D. monocarps; A. kingii J. Sinclair: E. flowering branch, F. flowers, G. monocarps. Photos by C. Leeratiwong (A–C, E–G) and P. Chalermglin (D).

Tree 8–15 m tall; bark blackish-brown. Twigs lenticellate, sparsely covered with brown appressed hairs when young, later glabrous to sparsely hairy, often with ridges extending along the twig from the petiole base. Leaves chartaceous to subcoriaceous, elliptic, broadly elliptic, lanceolate or lanceolate-elliptic, 6–17 by 2–6.5 cm, base cuneate, apex acuminate or acute, the acumen 3–12 mm long, margins entire; adaxial surface glabrous, shiny, midrib slightly sunken to flattened; abaxial surface glabrous except with sparsely brown pubescent at midrib, secondary veins 8–14 per side, petiole 5–8 mm long, sparsely hairy, with rugose surface. Inflorescences extra-axillary, 1–3-flowered, peduncle 1.5–3 mm long, with 1–4 bracts, individual pedicels 6–8 mm long, each bearing a single bracteole near to the tip, bracts ovate, 0.5–1 mm long, bracteole ovate, 0.8–1 mm long, buds broadly conical. Sepals brownish-green, connate at base, ovate, 2–3 mm by 2.5–3.5 mm, obtuse, reflexed, hairy outside, glabrous inside. Outer petals greenish-yellow or yellow, triangular-ovate or ovate, 11–13 by 4.5–6 mm, apex obtuse, hairy both sides; inner petals greenish-yellow to pale whitish-yellow, ovate-triangular or triangular-elliptic, 12–14 by 4.5–5 mm, apex obtuse to slightly acute, hairy outside, glabrous to sparsely hairy at apex inside. Stamens 30–40, ovary to elliptic, 0.8–1.5 mm long. Carpels 2–3, ovary elliptic-oblong or oblong, 2.5–3 mm long, hairy, stigma U-shaped, 0.5–0.8 mm long. Torus conical. Fruit of 1–3 monocarps borne on a pedicel 0.5–1.5 cm long. Monocarps green when young, colour at maturity unknown, subglobose to ellipsoid-globose, very verrucose, densely brown hairy, 1.5–4.5 by 2.2–3.5 cm, apex rounded, base contracted into a stipe 5–10 mm long. Seeds 6–8 per monocarp, ellipsoid, ca 2 cm long, smooth.

Thailand.— PENINSULAR: Pattani [Khao San Kala Khiri, alt. ca 500 m, 3 Apr. 1928, Kerr 15015 (BM, K, L)]; Narathiwat [Ba Cho, alt. ca 400 m, 3 July 1923, Kerr 7170 (BK, BM, K, L)].

Distribution.— Malaysia (Perak, type).

Ecology.— Scattered on tropical rain forest; alt. 400–500 m; flowering: January to March; fruiting: April to July.

Vernacular.— Tam yao pak tai (ตำาหยาวปักษ์ใต้) (General).

Note.— Alphonsea lucida is similar to A. johorensis J.Sinclair from Malaysia, but differs in having 1–2 monocarp in fruit (vs 3–6 monocarps in A. johorensis) and monocarps 2.2–3.5 cm wide (vs ca 1.5 cm in width in A. johorensis). The Thai specimens have narrower petals, 4.5–6 mm (vs ca 8 mm) and fewer carpels, 2–3 (vs 6 carpels) than the specimens of A. lucida from Malaysia. This species is a new record for Thailand and is only known from two collections from Pattani and Narathiwat Provinces.

Alphonsea malayana Kessler, Bot. Jahrb. Syst. 118: 97. 1995. Type: Malaysia, Selangor, 8th mile, Genting Highlands road, 17 Mar. 1976, Kochummen FR 23183 (holotype L [L0180172!]; isotypes K [K000574894!], KEPl!). Fig. 2C–D.

Small tree or tree 8–12 m tall; bark greyish-brown. Twigs lenticellate, glabrous to sparsely brown appressed hairs when young, later glabrous, often with ridges extending along the twig from the petiole base. Leaves subcoriaceous, lanceolate, lanceolate-elliptic or elliptic, 2.5–10 by 1–3.5 cm, base cuneate, apex acuminate or acute, the acumen 2–10 mm long, margins entire, not reflexed, adaxial surface not shiny, glabrous, midrib slightly sunken; abaxial surface glabrous or sometimes with very sparsely appressed hairy at midrib, secondary veins 5–10 per side, petiole 2–5 mm long, sparsely hairy. Flowers not seen. Fruit of 1 monocarp borne on a pedicel 1 cm long. Monocarps green or greyish green when young, colour at maturity unknown, ovoid to subglobose, slightly verrucose, with very sparsely brown hairs or glabrous, 1.8–4 by 1.3–3 cm, apex rounded or mucronate, base contracted into a stipe 3–6 mm long. Seeds not seen.
Thailand.—Peninsular: Satun [La-ngu, Tarutao NP, alt. 50–950 m, 31 Mar. 2006, Gardner ST2533 (BKF, L, QBG)]; Yala [Betong, Hala-Bala WS, alt. 950 m, 22 May 2005, Middleton et al. 3574 (BKF)].

Distribution.—Malaysia (Selangor, type).

Ecology.—Scattered on tropical rain forest or the edge areas between mangrove and lowland forests; alt. 50–950 m; unknown in flower; fruiting: March to May.

Vernacular.—Tam yao malay (ตำาหยาวมาเลย์) (General).

Note.—Alphonsea malayana closely resembles A. pallida. Nevertheless, it is different from the latter in having ovoid to subglobose monocarps with a slightly verrucose surface and not constricted between seeds (vs cylindrical or ellipsoid monocarps with a smooth surface and constrictions between the seeds). A newly recorded species for Thailand, it is only found in the Peninsular region in Satun and Yala Provinces.

Alphonsea pallida Craib, J. Nat. Hist. Soc. Siam 6: 45. 1923 & Fl. Siam. 1(1): 63. 1925. Type: Thailand, Nakhon Si Thammarat, Khao Rum, alt. 360 m,
Small tree or tree 6–20 m tall; bark dark brown. Twigs lenticellate, with brown or greyish-brown appressed hairs when young, later glabrous often with longitudinally striate ridges. Leaves coriaceous, lanceolate, elliptic, elliptic-lanceolate, broadly elliptic or ovate-lanceolate, 4–14 by 1.3–5.5 cm, base cuneate, apex acute or acuminate, the acumen 2–10 mm long, margins entire, sometimes slightly revolute; adaxial surface shiny, glabrous, midrib flattened or slightly sunken; abaxial surface glabrous, sometimes sparsely hairy on midrib, secondary veins 7–14 per side, petiole 2–5 mm long, moderately to sparsely brown hairy, wrinkled. Inflorescences extra-axillary, 1–4-flowered, peduncle 3–5 mm long, with 1–3 bracts, ovate, 0.5–1 mm long, individual pedicels 5–13 mm long, slender, each bearing a single bracteole near the base, bracteole ovate, 0.5–1 mm long, buds conical. Sepals greenish-yellow or green, connate at middle, ovate, 0.8–1 by 0.8–1.2 mm, obtuse, sparsely hairy outside, glabrous inside. Outer petals pale whitish-yellow or yellow, triangular-ovate, 8–15 by 4–6.5 mm, apex acute to obtuse, moderately hairy outside, glabrous to sparsely hairy at apex inside; inner petals yellow or pale whitish-yellow, lanceolate-triangular, 8.5–15 by 3.5–6 mm, apex acute or obtuse, densely grey hairy at margins and upper part and glabrous at lower part outside, glabrous or sparsely hairy at apex inside. Stamens 18–25, oblong, 0.8–1.5 mm long. Carpels 1–2, ovary oblong, 2–3 mm long, densely grey-hairy, stigma U-shaped, 0.2–0.5 mm long. Torus conical. Fruit of 1–(2) monocarps borne on a pedicel 1–1.5 cm long, slender. Monocarps green when young, turning yellow, cylindrical or ellipsoid, constricted between seeds, smooth, sparsely to moderately appressed short pubescent, 2–4 by 1–1.5 cm, apex rounded to mucronate, base contracted into a stipe 3–7 mm long. Seeds ca 5, reniform-ellipsoid, 6–8 by 4–5 mm, brown.

Thailand.—PENINSULAR: Nakhon Si Thammarat [Khao Run, alt. 360 m, Feb. 1922, Smith 622 (ABD, BK, K); Khoao Luang, alt. ca 600 m, 21 Oct. 1951, Smitinand 973 (BKF, K)]; ibid., alt. ca 400 m, 28 Apr. 1928, Kerr 15427 (BK, BM, K); ibid., alt. 660 m, 24 Mar. 1955, Snan 55 (BKF); Kiwi Wong, Khoao Luang, alt. 1700 m, 26 Mar. 1955, Snan 31 (BKF); Na Bon, Kha Maen, alt. 600 m, 8 Feb. 2005, Williams et al. 1276 (BKF); Phi Poon, Khoao Luang NP, alt. 470 m, 2 Mar. 2006, Gardner ST2416 (BKF, L); ibid., alt. 500 m, 21 June 2019, Leeratiwong & Chalermglin 19-1428 (PSU)]; Trang [Khao Chong, 14 Jan. 1968, Sangkhachand 1544 (BKF, L, K, P)]; ibid., 4 Apr. 1967, Sangkhachand 1837 (BKF); ibid., 11 Apr. 1969, Phusomsaeng 112 (BKF, L, K, P); ibid., 8 Mar. 1970, Chernsirivathana & Kasem 1671 (BK)].

Distribution.—Endemic to Thailand.

Ecology.—Scattered on tropical rain forest; alt. 360–1,700 m; flowering: February to July; fruiting: March to January.

Vernacular.—Dok mai nang (ดอกไม้หนัง) (General).

Note.—Alphonsea pallida was placed as a taxonomic synonym of Alphonsea boniana Finet & Gagnep. by Kessler (1995). From specimen comparison of A. pallida and A. boniana, however, we have found characters to distinguish the two species (Table 1). Therefore, we reinstate A. pallida as a distinct species here. Craib (1925) described this species based on a flowering collection (Smith 622 from Nakhon Si Thammarat Province), but he had no information about the fruit. Recently, we collected a fruiting specimen from Phi Poon district, Nakhon Si Thammarat Province and also examined specimens with fruits from the BKF herbarium and are now able to present a full description of fruits and seeds for this species. In addition, photographs and a brief description of both flowering and fruiting plants of this species were published in Gardiner et al. (2015), where it was identified as Alphonsea sp. A.

Alphonsea siamensis Kessler, Bot. Jahrb. Syst. 118(1): 100. 1995. Type: Thailand, Chumphon, Bang Son, 8 Mar. 1928, Put 1463 (holotype K [K000574889!]). Fig. 3D–F.

Shrub to tree 3–15 m tall; bark brown, blackish-brown or greyish-brown. Twigs lenticellate, sparsely to moderately covered with brown appressed hairs when young, later sparsely pubescent to glabrous, often with ridges extending along the twig from the petiole base. Leaves chartaceous to subcoriaceous, elliptic, ovate-elliptic, oblong-elliptic or ovate, 3–12 by 1.5–4.5 cm, base rounded to cuneate, apex acute, acuminate or obtuse, the acumen 0–10 mm long, margins entire; adaxial surface glabrous, except with very sparse brown hairs, shiny, midrib flattened to slightly sunken; abaxial surface glabrous, sometimes with sparse, long, brown pubescence at midrib or margins, secondary veins 7–13 per side, petiole 2–6
mm long, sparsely hairy, with shallow grooves. Inflorescences extra-axillary or leaf-opposed, 1–5-flowered, peduncle 1.5–3.5 mm long, with 1–3 bracts, individual pedicels 5–15 mm long, each bearing a single bracteole near to the middle or near to base, bracts ovate, 0.5–0.8 mm long, bracteole ovate, 0.8–1 mm long, buds broadly conical. Sepals brownish-green, connate at base to middle, broadly elliptic, 1.2–2 mm by 1.5–2.5 mm, obtuse, reflexed, hairy outside, glabrous to sparsely hairy. Outer petals greenish-yellow to yellow, triangular-ovate or ovate, 11–15 by 6–7 mm, apex obtuse, hairy both sides except glabrous at base inside; inner petals greenish-yellow to pale whitish-yellow, ovate-triangular or triangular-elliptic, 11–14 by 4.5–6.5 mm, apex obtuse to slightly acute, hairy outside, glabrous to sparsely hairy at apex inside. Stamens 15–22, ovate, elliptic or oblong-elliptic, 0.8–1.6 mm long. Carpels (2–)3–5, ovary oblone or elliptic-oblong, 2–3.5 mm long, hairy, stigma U-shaped, 0.3–0.6 mm long. Torus conical. Fruit of 3–4 monocarps borne on a pedicel 0.7–2 cm long. Monocarps green or greyish green when young, colour at maturity unknown, cylindrical, ellipsoid or ovoid, smooth or slightly verrucose, densely brown hairy (velutinous), 1.5–4 by 1–2 cm, apex rounded, sometimes with a longitudinal groove at lower side, irregularly constricted between seed on dry monocarps, sessile or base contracted into a stipe 2–5 mm long. Seeds not seen.


Distribution.—Endemic to Thailand.

Ecology.—Scattered on limestone or sandstone hills in dry evergreen or mixed deciduous forest; alt. 50–450 m; flowering: December–April; fruiting: February–June.

Vernacular.—Chan khao (จันขาว)(General).

Note.—Alphonsea siamensis was described by Kessler (1995), but the description of the species was not complete, because flowering material was unknown. During fieldwork at Chom Phon cave in Ratchaburi Province in February 2016, the complete flowers of this species were found. Therefore, a full description is presented here that agrees with the brief description and photos of the flower in this species shown by Gardner et al. (2015). The species is endemic to Eastern, South-Western, Central, Southern-Eastern and Southern floristic regions of Thailand. This species is characterised by having velutinous monocarps with irregular constrictions between the seeds in the dry condition.

<table>
<thead>
<tr>
<th>Characters</th>
<th>A. pallida</th>
<th>A. boniana</th>
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<tbody>
<tr>
<td>Abaxial surface of inner petals</td>
<td>having a glabrous patch toward the base</td>
<td>uniformly hairy</td>
</tr>
<tr>
<td>Monocarp surface</td>
<td>smooth and having sparse to moderate hairs (Fig. 3B.)</td>
<td>verrucose and having dense hairs (Fig. 3C.)</td>
</tr>
<tr>
<td>Monocarp apex</td>
<td>rounded to mucronate</td>
<td>mucronate</td>
</tr>
<tr>
<td>Number of seeds per monocarp</td>
<td>ca 5</td>
<td>8–16</td>
</tr>
</tbody>
</table>

Table 1. Morphological comparison of Alphonsea pallida and A. boniana.
Figure 3. *Alphonsea pallida* Craib: A. flower, B. monocarps; *A. boniana* Finet & Gagnep.: C. monocarp; *A. siamensis* Kessler: D. flowering branch, E. flowers, F. monocarps. Photos by C. Leeratiwong (A–E) and Kithisak Aongyong (F).
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