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Note on the genus *Duperrea* (Rubiaceae) in Thailand

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Abstract. Current studies by the author on some genera of the family Rubiaceae in Thailand, have brought to light the need to lectotypify a synonym (*Ixora debilis*) and a new synonym (*Duperrea scabrida*) of *Duperrea pavettifolia*. Ecological and distribution data, description, specimens examined and also a photograph are presented.

Keywords: *Duperrea*, lectotypification, Rubiaceae, synonymy, Thailand

Introduction

Duperrea Pierre ex Pit., a monospecific genus is most diverse in the dry dipterocarp, dry evergreen and evergreen forests of Myanmar, South and South-western China, Indo-China and Thailand (Puff *et al*., 2005; Mabberley, 2008). This genus of the family, Rubiaceae, belongs to tribe Pavetteae, subfamily Ixoroideae. As the taxonomic account of the Rubiaceae is now about to be published for Flora of Thailand in the year 2016–2019, it is necessary to formalize a lectotypification and notes of the genus.

This work was consulted material based on dried specimens and photographs from AAU, ABD, BCU, BK, BKF, BM, E, K, KKU, P and QBG (Theirs, 2016) and data collected of fieldwork. Citation of authors of plant names follow Brummitt & Powell (1992).

Taxonomic treatment

Duperrea pavettifolia [*pavettaefolia*] (Kurz) Pit. in Lecomte, Fl. Indo-Chine 3: 334, f. 25 (11–15) & f. 26 (1–2). 1924.— *Mussaenda pavettifolia* [as *pavettaefolia*] Kurz, Forest Fl. Burma 2: 57. 1877.— *Ixora pavettifolia* (Kurz) Craib, Bull. Misc. Inform. Kew 1911: 394. 1911. Type: Myanmar, Tonkyeghat, Nakawa Chg, *S. Kurz* 1409 (holotype K 000763457).— *Ixora debilis* Drake, Journ. Bot. (Morot) 9: 234. 1895. Type: Vietnam, Tonkin, Valley of Langkok, Mt. Bavi, 24 June 1887, *B. Balansa* 2662 (lectotype P 04010893, selected here, isolectotype K 000763455).— *Duperrea pavettifolia* Pit. var. *scabra* Pit. in Lecomte, Fl. Indo-Chine 3: 335. 1924 (based on *Ixora debilis*).— *D. insignis* Pierre, *nom. nud*., Pit. in Lecomte, Fl. Indo-Chine 3: 334. 1924.— *D. scabrida* Craib, Bull. Misc. Inform. Kew

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1932: 430. 1932. Type: Thailand, Trat (Krat), Takum, alt. 100 m, 18 May 1930, *Put* 2889 (lectotype K 000763453, selected here, isolectotypes ABD, BK 257340, BM & K 000763452), *syn. nov.*— *D. pavettifolia* Pit. var. *kontumensis* N.N.Tran in Tien Ban, Dinh Dai & Ke Loc, Fl. Taynguy. Enum.: 150. 1984, *nom. nud.*— *D. pavettifolia* (Kurz) Pit. f. *mollissima* H. Chu, Acta Sci. Nat. Univ. Sunyatsenia 28(2): 66. 1989. Type: China, Yunnan, Xishuanbanna, Monglun, limestone hills, *Chu Hua* 964 (Univ. Sunyatsen). Fig. 1.

Shrubs or small trees, 3–6 m high; stem typically with decussate lateral branches; branches slightly compressed, strigose, glabrescent. *Petiole* 3–5(–10) mm long, strigulose. *Leaves* opposite or sometimes anisophyllous and apparently in group of 3, due to reduced internode grouping 2 leaves at one node and an apparently single leaf produced on a single very short axillary branch, chartaceous to subcoriaceous, oblanceolate, obovate, elliptic or elliptic-oblong, 7–25 x 3–8.5(–10) cm, upper surface scabrous and puberulous along veins, lower surface puberulous or strigulose along veins, apex acuminate or shortly acuminate to mucronate, base cuneate to obtuse or rounded; lateral veins 7–13 pairs; stipules interpetiolar, ovate or triangular, acuminate to cuspidate, 6–10 mm long, or sometimes basally fused into a sheath, persistent, strigulose to strigose. *Inflorescence* terminal or principal branches or on reduced axillary, corymbose cyme, many flowered, densely strigillose, hirsute or strigose, up to 7 cm long; peduncle 1–2.5 cm long; lateral branches 5 cm long; bracts linear, 1.5–5 mm long. *Flowers* white, bisexual, monomorphic, 5-merous; pedicels 3–5 mm long, hairy. *Calyx*: tube 3–4 mm long; lobes 5–7 x 0.2–0.3 mm, linear, densely hirsute to strigillose. *Corolla*: tube infundibular, narrowly cylindrical, 1–2 cm long, glabrous inside, densely strigulose outside; lobes 3–5 mm long, ovate, oblong-elliptic, elliptic or suborbicular, apex obtuse to rounded, convolute, spreading in open flowers. *Stamens* 5, inserted at corolla throat; filaments reduced or adnate to corolla tube; anther 2.5–3.2 x 0.5–0.8 mm, ellipsoid, dorsifixed, exserted, bifid at base, with connective prolonged apically into a short conical appendage. *Carpel*: style 2–3 cm long, stigma subglobose to ellipsoidal, 4–5 mm long, exserted; ovary 2-locular, with 1 ovule in each locule, crowned by large annular disc. *Fruit* black, drupaceous, or sometimes baccate, 7–10 x 10–12 mm, pyrenes 2-celled with 1 seed; seed 5–6 x 5–6 mm, oblate or concave on ventral face, smooth to shallowly ridged, compressed subglobose.

Thailand.— NORTHERN: Mae Hong Son [18 Jun. 1973, *R. Geesink*, *D. Phanichapol & T. Santisuk* 5966 (AAU, BKF, E); Mueang, Thamwua, Mae Suya waterfalls, Huai Phra subdistrict, *M. Norsaengsri* 11259 (QBG); ibid., Na Pla Chad, Tham Pla-Namtok Pha Suea NP, 20 Aug. 2013, *M. Norsaengsri* 10521 (QBG); ibid., Huai Sai Khao, Huai Pha, 12 Jun. 2014, *M. Norsaengsri* 11314 (QBG)], Chiang Mai [Doi Luang NP, Chom Thong waterfall, 9 Dec. 2002, *V. Chamchumroon, C. Puff & I. Schanzer* V.C.1781 (BKF-2 sheets); Doi Suthep NP, 23 Jun. 2002, *V. Chamchumroon*, *N. Suphuntee*, *N. Koonkhunthod*, *C. Ngernsaengsaruay &*

N. Tetsana V.C.1636 (BKF-2 sheets); *H.B.G. Garrett* 1384 (P-2 sheets); 5 May 1973, *R. Geesink*, *D. Phanichapol & T. Santisuk* 5693 (AAU, E, P); Chiang Dao, 5 Jun. 1973, *R. Geesink*, *D. Phanichapol & T. Santisuk* 5707 (BKF); ibid., 17 Jun. 2010, *P. Karaket*, *S. Sirimongkol*, *U. Kawatkul & R. Meeboonya* 162 (BKF); ibid., Muang Kawng, 30 May 1921, *A.F.G. Kerr* 5527 (AAU, ABD, BK, BM); ibid., 3 Jun. 1951, *Khanthachai* 97 (BKF); ibid., *Khanthachai* s.n. (BKF); ibid., 7 May 1989, *J.F. Maxwell* 89-566 (BKF); ibid., 13 Aug. 1995, *R. Pooma* 1060 (BKF); Mae Sa valley, 26 Jun. 1974, *J.K. Jackson* 6114 (BKF); Mueang, Doi Suthep, 10 Oct. 1987, *J.F. Maxwell* 87-1162 (BKF); Mae Chaem, Huai Hom, Ban Chand subdistrict, 11 Dec. 2011, *N. Tanaka*, *H. Nagamasu*, *A. Naiki*, *S. Nishida*, *P. Srisanga & S. Watthana* HN8190 (QBG); Mae Rim, 2 Oct 1990, *J.F. Maxwell* 90-1092 (AAU); ibid., 25 Oct. 1993, *W. Nanakorn et al*. 0078 (QBG); Huai Puu, 1 Jun. 1994, *W. Nanakorn et al.* 732 (QBG); ibid., Huai Puu, 4 Jun. 1997, *W. Nanakorn et al.* 9131 (QBG); ibid., Huai Puu, 2 Jul. 1997, *W. Nanakorn et al.* 9323 (QBG); Mae Mae, Mae Rim–Samoeng Rd., Mae Rim, 20 Nov. 1995, *W. Nanakorn et al.* 5269 (QBG); Mae Mae, Mae Haad, 7 Aug. 1996, *W. Nanakorn et al.* 7017 (QBG); ibid., Mae Rim–Samoeng Rd., 24 Jun. 1998, *P.T.* 22 (QBG); Prao, Doi Mae Sai, Long Khod, 8 Jun. 1997, *W. Nanakorn et al.* 9151 (QBG); ibid., Pa Dang village, 15 Oct. 2006, *J.F. Maxwell* 06-715 (QBG); Fang, 25 May 1991, *J.F. Maxwell* 91-488 (AAU, E, P-2 sheets); Mae Tang, Doi Saing Liang, 28 Aug. 1997, *J.F. Maxwell* 97-901 (BKF); Doi Sutep, 14 Jul. 1912, *A.F.G. Kerr* 642A (BM, E); Doi Suthep-Pui NP, 3 Jul. 1992, *J.F. Maxwell* 98-364 (P); ibid., 3 Jul. 1992, *J.F. Maxwell* 92-364 (E); ibid., Daht Mawk falls, 5 Dec. 1989, *J.F. Maxwell* 89-1506 (E); Wiang Pa Pao, Khun Chae NP, 19 Aug. 2001, *J.F. Maxwell* 01-349 (BKF); Mueang Awn, 16 Jun. 2005, *J.F. Maxwell* 05-393 (BKF); Mae Suai, Ban San Sa At, 29 Jul. 1963, *Prayad* 949 (BK)], Chiang Rai [Pan, Doi Luang NP, 18 Jun. 2012, *V. Chamchumroon*, *N. Suphuntee*, *N. Koonkhunthod*, *C. Ngernsaengsaruay & N. Tetsana* V.C.1492 (BKF-2 sheets); Mae Fah Luang, Doi Luang, Doi Tung, 1 Jun. 2007, *J.F. Maxwell* 07-363 (QBG); Huai Hin Falls, 1 Jun. 2009, *J.F. Maxwell* 09-148 (QBG); Mae Sai, Tham Luang-Khun Nam Nang Non Forest Park, 3 Nov. 2010, *M. Norsaengsri & N. Tathana* 7296 (BKF, QBG); ibid., Khun Nam Nang Non Forest Park, 25 May 2011, *M. Norsaengsri & N. Tathana* 7872 (BKF, QBG); ibid., 6 Jul. 2011, *M. Norsaengsri & N. Tathana* 7957 (BKF, QBG); ibid., Ban Sanpasak, Tham Luang-Khun Nam Nang Non, Forest Park, 11 Jul. 2012, *M. Norsaengsri & N. Tathana* 9798 (QBG); Khun Korn waterfall, 21 May 1997, *PK* 3 (BCU)], Phayao [Mueang, Doi Luang NP, 23 May 1997, *O. Petraitr* 8 (BKF)], Nan [Pha Chang, Ban Yod, Song Kwae, 12 May 2011, *W. La-ongsri*, *P. Tatiya & S. Satatha* 1667 (QBG); 12 Sept. 1995, *K. Larsen*, *S.S. Larsen*, *C. Tange & D. Sookchaloem* 46386 (AAU); Doi Phu Kha NP, 27 May 2000, *P. Srisanga* 1453 (QBG); ibid., Huai Pong, 23 Aug. 2001, *P. Srisanga & C. Maknoi* 2059 (QBG); Nam Hueng, 11 Jul. 1926, *Winit* 1737 (ABD, BK, BKF, K)], Lamphun [Mae Tha, Doi Khun Tan NP, 4 Jun. 1994, *J.F. Maxwell* 94-686 (BKF)],

Lampang [Hang Chat, Doi Khun Tan NP, 31 Aug. 1994, *J.F. Maxwell* 94-960 (BKF); Pan, Chae Son NP, 23 Oct. 1995, *J.F. Maxwell* 95-971 (BKF); Mueang Pan, 25 Jun. 1996, *J.F. Maxwell* 96-896 (BKF); Wang Nuea, Doi Luang NP, 4 Sept. 1957, *J.F. Maxwell* 97-930 (BKF); Mae Ping, 21 Jun. 1926, *Winit* 1717 (ABD, BK, BKF, K)], Tak [Tha Song Yang, 29 May 2008, *R. Pooma*, *P. Karaket*, *N. Phattharahirantricin & S. Saengrit* 7067 (BKF-2 sheets)], Sukhothai, [Phaka, Si Satchanalai, 12 Jun. 2012, *S. Klongngern* 20 (QBG)], Phitsanulok [Noen Maprang, Tham Pha Tha Phon Non-hunting Area, 2 Jul. 2012, *C. Maknoi* 4898 (QBG); Chat Takan, Phu Miang-Phuthong WS, 1 May 2011, *Romklao Botanical Garden* 0246/2554 (QBG); Phu Soi Dao NP, 8 Jun. 1999, *P. Suksathan* 1736 (QBG)]; NORTH-EASTERN: Phetchabun [Lom Kao, 15 Jun. 1956, *Dee* 880 (BKF)], Loei [Na Haeo, Phu Suan Sai NP, 15 May 2008, *C. Maknoi & P. Srisanga* 2273 (BKF, QBG); Na Haew, Phu San Sai, 17 May 2006, *C. Maknoi* 874 (QBG); Phu Ho, Phu Luang WS, *M. Norsaengsri & W. La-ongsri* 5594 (QBG)], Udon Thani [Nong Saeng, 18 Mar. 2004, *W. Sidajium* 6 (BKF)], Bueng Kan [Bung Khla, 21 Jun. 1997, *C. Niyomdham* 5053A (BKF-2 sheets); Phu Wua, Phu Wua WS, 28 Dec. 2011, *M. Norsaengsri & N. Tathana* 8684 (BKF, QBG); ibid., 30 Jul. 2008, *R. Pooma*, *P. Karaket*, *N. Phattharahirantricin & U. Kawatkul* 7316 (BKF-2 sheets); ibid., 3 May 2002, *R. Pooma*, *V. Chamchumroon*, *N. Koonkhunthod & P. Chantaboon* 3431 (BKF); ibid., 15 Jun. 2004, *Th. Wongprasert et al.* 046-112 (BKF-2 sheets), Bung Khla, Phu Wua WS, 30 Jul. 2008, *R. Pooma*, *P. Karaket*, *N. Phattharahirantricin & U. Kawatkul* 7319 (BKF-2 sheets)], Sakon Nakhon [Kusuman, 25 Aug. 2001, *R. Pooma*, *W.J.J.O. de Wilde*, *B.E.E. Duyfjes*, *V. Chamchumroon & K. Phattarahirankanok* 2581 (BKF-2 sheets)]; EASTERN: Chiayaphum [3 May 1974, *R. Geesink*, *T. Hattink & C. Phengklai* 7105 (AAU, BKF, P)], Nakhon Ratchasima [30 Oct. 1969, *C.F. van Beusekom & C. Charoenpol* 1913 (AAU, ABD, BKF, P), Sakaerat, 23 Oct. 1971, *C.F. van Beusekom*, *R. Geesink & Chanwid* 3309 (BKF)]; SOUTH-WESTERN: Uthai Thani [Ban Rai, 3 May 1963, *Kasem* 385 (BK)], Kanchanaburi [near Wang Ka, 21 May 1946, *S. Bloembergon* 606 (BK, K); Sangkhla Buri, 16 Jun. 1993, *J.F. Maxwell* 93-628 (BKF)]; CENTRAL: Saraburi [Kaeng Khoi, 7 Oct. 1979, *T. Shimizu*, *H. Toyokuni*, *H. Koyama, T. Yahara & T. Santisuk* T-19426 (P)]; SOUTH-EASTERN: Chanthaburi [Pong Nam Ron, Soi Dao, 25 Jun. 1967, *Bunnak* 1482 (BKF); Khao Soi Dao WS, 29 Jun. 2001, *V. Chamchumroon & C. Puff* V.C.1101 (BKF-2 sheets); ibid., 16 Dec. 1987, *C. Puff & W. Ueachirakan* 871216-2/4 (BKF); Makham, 1 Jul. 2001, *V. Chamchumroon & C. Puff* V.C.1127 (BKF); ibid., Khao Klua, 20 Apr. 1956, *T. Smitinand* 3324 (BKF); Khlung, 13 Dec. 1945, *Chit* 194 (BKF); Soi Dao, 8 Jun. 1963, *K. Larsen* 9882 (BKF); 25 Aug. 1972, *K. Larsen*, *S.S. Larsen*, *I. Nielsen & T. Santisuk* 31954 (AAU, BKF, E, P); Pong Nam Ron, 5 Jul. 1974, *J.F. Maxwell* 74-671 (AAU, BK); ibid., 4 May 1975, *J.F. Maxwell* 75-474 (AAU, BK); ibid., 8 Jul. 1956, *T. Smitinand* 3406 (BKF); ibid., Khao Soi Dao WS, 28 Nov.

1979, *T. Shimizu*, *H. Toyokuni*, *H. Koyama*, *T. Yahara & D. Phanichaphol* T-23923 (P); Khao Soi Dao, 10 Jun. 1959, *B. Sangkhachand* 4 (BKF, E, K); Khao Soi Dao Tai, 12 Jun. 1988, *T. Santisuk* 6672 (BKF); 9 Nov. 1969, *C.F. van Beusekom & T. Smitinand* 2052 (AAU, BKF, E, P)], Trat [Khlong Son, Ko Chang NP, 3 Jul. 2001, *V. Chamchumroon & C. Puff* V.C.1145 (BKF-2 sheets); Kao Kuap, 20 May 1930, *Put* 2867 (ABD, BK, BM, K); Khao Mai See, *T. Smitinand* 1409 (BKF)].

Distribution.— Myanmar, China (Hainan, Yunnan), Cambodia, Laos, Vietnam.

Ecology.— In upper mixed deciduous, dry dipterocarp, dry evergreen, disturbed or shaded evergreen and hill evergreen forests, alt. 200–1,000 m.

Vernacular.— Khem dong (เข็มดง) (Chiang Mai), Khem doi (เข็มดอย), Khao San (ข้าวสาร) (Northern).

Notes.— The distinguishing features of *Duperrea pavettifolia* are the opposite



Figure 1. *Duperrea pavettifolia* inflorescence.

leaf arrangement and often apparently ternate-trifoliolate at the branchlet ends, according to reduced internodes between the last two pairs at the branchlet ends, which the end pair with only a solitary well-developed leaf and the long exserted style with ellipsoidal or subglobose stigma. The slightly scabrate lower leaf surface as noted by Craib (1932) does occur on some specimens, but does not appear to be sufficiently diagnostic for recognition of *D. scabrida* Craib as a separate species. I have examined both the specimens of *Duperrea pavettifolia* and *D. scabrida* and concluded that they are the same species with little variation between them.

Three syntypes, *Balansa* 2262 (K 000763455 & P 04010893), *Balansa* 2263 (K 000763454, P 04010877 & P 04010892) and *Balansa* 2264, fruiting specimens (P 00729177 & P 00729180) are mentioned in the original description of *Ixora debilis*. *Balansa* 2262 at P is selected as the lectotype because it is in good condition and best condition of all the potential lectotypes.

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