AN UPDATED SYNOPSIS OF **LUDWIGIA** (ONAGRACEAE) IN MALESIA

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I. M. TURNER
Singapore Botanical Liaison Officer, Royal Botanic Gardens Kew, UK. Singapore Botanic Gardens, National Parks Board, 1 Cluny Road, Singapore 259569, Republic of Singapore.
E-mail: I.Turner@kew.org

**ABSTRACT**

TURNER, I. M. 2021. An updated synopsis of **Ludwigia** (Onagraceae) in Malesia. *Reinwardtia* 20(1): 9–16. — A synopsis of the seven native or naturalised species of **Ludwigia** (Onagraceae) occurring in Malesia is presented. The newly established **Ludwigia leptocarpa** is included. The paper incorporates a key to the species, synonymy and typification. Lectotypes are designated for 25 names, including five at the second step.

**Key words**: **Ludwigia leptocarpa**, South-East Asia, typification, weeds.

**INTRODUCTION**

**Ludwigia** is a genus of 82 species distributed through the tropical, subtropical and warm temperate regions of the world; most diverse in the New World (Wagner et al., 2007). **Ludwigia** is sister to the rest of the Onagraceae and placed in its own subfamily: Jussiaeoideae. The genus has been divided into 23 sections (Wagner et al., 2007), but recent molecular analyses found limited support for this system of infrageneric division (Liu et al., 2017).

The revision of **Ludwigia** (Onagraceae) in the Old World by Raven (1964) has stood the test of time very well; and his account for *Flora Malesiana* (Raven, 1977) equally so. Raven (1977) recognised six species for Malesia. While this is a very small number compared with the size of the complete flora of the region, the species are quite important as weeds, particularly in rice-growing areas (Kostermans et al., 1987). A newly established invasive species and some further clarification of typification make it worthwhile in publishing an updated synopsis of the genus for Malesia.

**MATERIALS AND METHODS**

The paper is largely based on study of material in the herbarium of the Royal Botanic Gardens Kew (K). In addition, on-line information was searched for information on type holdings. Recent literature was scanned and relevant references are cited under the description and distribution heading for each species.

**RESULTS AND DISCUSSION**

**LUDWIGIA** L.

**Ludwigia** L., Sp. Pl. 1 (1753) 118, as **Ludvigia**. — Type: **Ludwigia alternifolia** L., lectotype designated by Britton & Brown, Ill. Fl. N. U.S. ed. 2. 2 (1913) 586.

**Isnardia** L., Sp. Pl. 1 (1753) 120. — *Dantiia* Boehm. in Ludwig, Def. Gen. Pl. 6 (1877) 463. — Type: **Isnardia palustris** L., lectotype designated by Hitchcock & Greene, Prop. Brit. Bot. (1929) 153.

**Jussiaea** L., Sp. Pl. 1 (1753) 388. — **Ludwigia** sect. **Jussiaea** (L.) Baill., Hist. Pl. 6 (1877) 463. — Type: **Jussiaea repens** L., lectotype designated by Hitchcock & Greene, Prop. Brit. Bot. (1929) 153.

**Cubospermum** Lour., Fl. Cochinch. (1790) 258, 275. — Type: **Cubospermum palustre** Lour.

**Prieuria** DC, Prodr. 3 (1828) 58. — Type: **Prieuria senegalensis** DC.

**Adenola** Raf., Aut. Bot. (1840) 36. — Type: **Adenola grandiflora** (Michx.) Raf.

**Diplandra** Raf., Aut. Bot. (1840) 35, nom. illegit., non **Diplandra** Bertero (1830), nec **Diplandra** Hook. & Arn. (1838). — Type: **Diplandra decurrens** (Walt.) Raf., lectotype designated by Pennell, Bull. Torrey Bot. Club 48 (1921) 92.

**Corynostigma** C.Presl., Epim. Bot. (1851 [‘1849’]) 218. — Type: **Corynostigma jussiaeoides** C.Presl.
Reinwardtia

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REINWARDTIA

Key to Ludwigia species in Malesia

1a. Sepals generally 5, sometimes more .......... 2
1b. Sepals generally 4 .................................. 3

2a. Plant with creeping or floating stems; petals white with a yellow base; pedicel of capsule 2.5–5.5 cm long; each seed firmly embedded in a block of endocarp………… 1. Ludwigia adscendens
2b. Plant erect; petals entirely yellow; pedicel of capsule to 2 cm long; each seed surrounded by an easily detached horseshoe-shaped section of endocarp………… 3. Ludwigia leptocarpa

3a. Sepals less than 5 mm long .......................... 4
3b. Sepals more than 5 mm long ........................ 6

4a. Capsules with 4 longitudinal rows of seeds clearly discernible when dry ... 7. Ludwigia prostrata
4b. Capsules more or less terete when dry, longitudinal rows of seeds not discernible ........... 5

5a. Capsules with two sorts of seed, free in apical portion, embedded in corky endocarp below ........................................................................................................................................................................ 2. Ludwigia hyssopifolia
5b. Capsules with seeds all free ........ 5. Ludwigia perennis

6a. Bracteoles ca. 8 mm long, capsules obconical ........................................ 6. Ludwigia peruviana
6b. Bracteoles minute, ca. 0.5 mm long, capsule cylindrical with 8 longitudinal ridges or ribs ................................................................................................................................. 4. Ludwigia octovalvis

1. Ludwigia adscendens (L.) H. Harra

Ludwigia adscendens (L.) H. Harra, J. Jap. Bot. 28 (1953) 291. – Jussiaea adscendens L., Mant. Pl. (1767) 69. – Type: India. Mysore, Hassan District, Belur-Gendehally Road, 17 September 1904, Hochreutiner 2208 (Holotype BM [BM000528814]).

Jussiaea repens var. glaberrima Kuntze, Revis. Gen. Pl. 1 (1891) 251. – Type: Cambodia, March 1875, Kuntze s.n. (holotype NY [NY00232245], designated here).

Jussiaea repens forma albilora Hochr., Candollea 2 (1925) 479. – Type: Java, Preanger, étangs tièdes de Tjipanas près Garroet, 26 October 1904, Hochreutiner 2208 (lectotype G [G00013806], designated by Raven, Reinwardtia 6 (1964 ['1963']) 388).

Description and distribution. Raven (1964: 387), Vu & Vidal (1973: 26), Khan & Shamsunnahar (1977: 3), Raven (1977: 104), Kostermans et al. (1987: 368), Thompson (1990: 227), Wagner (1995: 341), Barua (2010: 60), Boufford & Raven (2014: 602), Ummul-Nazrah (2017: 55).

2. Ludwigia hyssopifolia (G.Don) Exell

Ludwigia hyssopifolia (G.Don) Exell, Garcia de Orta 5 (1557) 471. – Jussiaea hyssopifolia G.Don, Gen. Hist. 2 (1832) 693. – Type: St. Thomas [São Tomé], G. Don 42 (holotype BM [BM000528814]).

Jussiaea linifolia Vahl, Eclog. Amer. 2 (1798) 32. – Fissendocarpa linifolia (Vahl) Bennet, J. Bombay Nat. Hist. Soc. 67 (1970) 126. – Ludwigia linifolia (Vahl) R.S.Rao, Fl. Goa, Diu, Dadra & Nagarhaveli 1 (1985) 179, nom. illegit., non Poir. (1814). – Type: America meridionali, von Rohr 188 (lectotype C [C10016131], designated by Raven, Reinwardtia 6 (1964 ['1963']) 385).

Jussiaea micrantha Kunze, Index Seminum (LZ, Lipsiensis) 1847 (1848) 2; Linnaea 24 (1851) 177. – Ludwigia micrantha (Kunze) H. Harra, J. Jap. Bot. 28 (1953) 293. – Lectotype (designated by Jonckheer, Fl. Suriname 3(2) (1942) 19): Surinam, Linnaeus 24 (1851) 177.

Jussiaea micrantha Kunze, Index Seminum (LZ, Lipsiensis) 1847 (1848) 2; Linnaea 24 (1851) 177. – Ludwigia micrantha (Kunze) H. Harra, J. Jap. Bot. 28 (1953) 293. – Lectotype (designated by Jonckheer, Fl. Suriname 3(2) (1942) 19): Surinam, Linnaeus 24 (1851) 177.
3. LUDWIGIA LEPTOCARPA (Nutt.) H.Hara

Ludwigia leptocarpa (Nutt.) H.Hara, J. Jap. Bot. 28 (1953) 292. – Jussiaea leptocarpa Nutt., Gen. N. Am. Pl. 1 (1818) 279. — Type: Nuttall s.n. (Lectotype PH [PH00016622], designated by Brenan in Turrill & Milne (1953) 292).

Jussiaea pilosa Kunth, Nov. Gen. Sp. 6 (1823) 101, t. 532. – Jussiaea variabilis var. pilosa (Kunth) Kunze, Revis. Gen. Pl. 1 (1818) 279. — Type: Colombia, Rio Apuro, Bonpland 375 (Lectotype P-Bonpl. [P00679565], designated by Brenan in Turrill & Milne-Redhead, Fl. Trop. E. Africa, Onagraceae (1953) 16).

Jussiaea surinamensis Miq., Linnaea 18 (1844) 370. — Type: Surinam, Oranjewoud, langs de zandweg, October 1842, Focke 721 (Holotype U [U0005340]).

Jussiaea schottii Micheli, Flora 57 (1874) 302. — Type: Brazil, Rio de Janeiro, Schott 4192 (Lectotype W, designated by Raven, Reinwardtia 6 (1964 ['1963']) 375).

Jussiaea pilosa var. robustior Donn.Sm., Bot. Gaz. 16 (1891) 6. — Type: Guatemala, Zacatepequez, April 1890, Donnell Smith 2123 (Lectotype US [US00123986], designated here; Isolectotypes GH, K [K00053292], NY).

Jussiaea pilosa var. pterocarpa Hassler, Fedde Rep. Sp. Nov. 12 (1913) 274. — Type: Paraguay, Gran Chaco, Santa Eliza, December 1903, Hassler 2708 (Lectotype B [B 10 0367937], designated here; Isolectotypes BM, K, MPU, NY, POM).

Jussiaea seminuda H.Perr., Not. Syst. 13 (1947) 146. — Type: Madagascar, Marais de Mahabo, June 1926, H. Perrier de la Bâthie 17641 (Lectotype P [P00412973], designated at the first step by Raven, Reinwardtia 6 (1964 ['1963']) 376 and at the second step here; Isolectotypes K [K000310868], P [P00412974, P00412975]).

Description and distribution. Raven (1964: 375).

Notes. The first report of this species being found in Malesia came from Papua New Guinea. Tucker (2017: 96) found that the species is invading riparian areas, wetlands and swamps in Papua New Guinea. I have also seen a specimen (FRI 84523) collected from Gunong Ledang, Johore, Peninsular Malaysia. This species should certainly looked out for in other parts of the Malesian region.

4. LUDWIGIA OCTOVALVIS (Jacq.) P.H.Raven

Ludwigia octovalvis (Jacq.) P.H.Raven, Kew Bull. 15 (1962 ['1961']) 476. – Oenothera octovalvis Jacq., Enum. Syst. Pl. (1760) 19. – Jussiaea octovalvis (Jacq.) Sw., Observ. Bot. (1791) 142. – Jussiaea octofila DC., Prodr. 3 (1828) 57, nom. illegit. (superfl.). – Jussiaea suffructiosa var. octofila H.Lev., Le Monde des Plantes (1894) 3. – Ludwigia octovalvis var. octofila Alain, Bull. Torrey Bot. Club 90 (1963) 191, nom. illegit. (superfl.). — Type: [published illustration] Plummer, Pl. Am. (?)(1758) t. 175, f. 1 (Lectotype designated by Bizzarri & Raven, Webbia 27 (1972) 490).

Jussiaea pubescens L., Sp. Pl. ed. 2 (1762) 555. – Ludwigia pubescens (L.) H.Hara, J. Jap. Bot. 28 (1953) 293. — Type: Anon. s.n. (Lectotype LINN 5523, designated by Dorr & Wiersema, Taxon 59 (2010) 1573).

Jussiaea hirsuta Mill., Gard. Dict. ed. 8 (1768) no. 5. — Type: Houston s.n. (Lectotype BM [BM000957916], designated by Raven, Reinwardtia 6 (1964 ['1963']) 357).

Jussiaea angustifolia Lam., Encycl. 3 (1789) 333. – Jussiaea suffructiosa var. angustifolia (Lam.) F.M.Bailey, Syn. Queensl. Fl. (1883) 131. — Type: Java, Anon. s.n. (Lectotype P-LA – IDC 6207 LM-243/5, designated by Raven, Reinwardtia 6 (1964 ['1963']) 357).

Jussiaea hirta Lam., Encycl. 3 (1789) 331. — Type: Brazil, Commerson s.n. (Lectotype P-LA LM-243/9, designated by Munz, Darwiniana 4 (1942) 238).

Jussiaea octonervia Lam., Encycl. 3 (1789) 332. – Jussiaea suffructiosa var. octonervia (Lam.) Bertoni, Descr. Fis. Econ. Paraguay (1910) 17. – Jussiaea suffructiosa subsp. octonervia (Lam.) Hassl., Bull. Soc. Bot. Genève ser. 2, 5 (1913) 271. — Type: Martinique, Anon. 33b (Lectotype P-LA LM-243/3, designated by Munz, Darwini-
Jussiaea villosa Lam., Encycl. 3 (1789) 331. – Jussiaea suffruticosa var. villosa (Lam.) F.M. Bailey, Syn. Queensl. Fl. (1883) 197. – Jussiaea suffruticosa forma villosa (Lam.) A. Br., Handb. Fl. Ceylon 6 (Suppl.) (1931) 131. – Ludwigia pubescens var. villosa (Lam.) H. Harra, J. Jap. Bot. 28 (1953) 293. — Type: Anon., s.n., India (Lectotype P-LA LM 243/6 designated by Raven, Reinwardtia 6 (1964 ['1963']) 362).

Epilobium fruticosum Lour., Fl. Cochinch. (1790) 226. – Jussiaea fruticosa (Lour.) DC., Prodr. 3 (1828) 57. — Type: not traced.

Epilobium tetragonum Lour., Fl. Cochinch. (1790) 225, nom. illegit., non L. (1753). – Jussiaea tetragona Spreng., Syst. Veg. 2 (1825) 158.

Jussiaea erecta Roxb. ex Andrews, Bot. Repos. 10 (1811) t. 621, as ‘Jussiaea’. – Jussiaea erecta var. exaltata (Roxb. ex Andrews) Ridl., J. Bot. 59 (1921) 259. — Type: [published illustration] Andrews, Bot. Repos. 10 (1811) t. 621 (lectotype designated here).

Jussiaea exaltata Roxb., Hort. Bengal. (1814) 33, as ‘Jussiaea’, nom. illegit., non Roxb. ex Andrews (1811). — Type: [published illustration] ‘Cattucarambu’, Rheed, Hort. Malab. 2 (1679) t. 50 (lectotype designated by Turner, Taxon 62 (2013) 158).

Jussiaea ligustrifolia Kunth, Nov. Gen. Sp. 6 (1823) 100. – Jussiaea suffruticosa var. ligustrifolia (Kunth) Griseb., Mem. Amer. Acad. Arts (n. s.) 8 (1860) 187. – Ludwigia pubescens var. ligustrifolia (Kunth) H. Harra, J. Jap. Bot. 28 (1953) 293. – Ludwigia octovalvis var. ligustrifolia (Kunth) Alain, Bull. Torrey. Bot. Club 90 (1963) 191. — Type: Mexico, Humboldt & Bonpland s.n. (Lectotype P-Bonpl. [P00679564], designated by Raven, Reinwardtia 6 (1964 ['1963']) 358).

Jussiaea salicifolia Kunth, Nov. Gen. Sp. 6 (1823) 99. — Type: Colombia, Guaduas, Humboldt & Bonpland 1756 (Lectotype P-Bonpl. [P00679563], designated at the first step by Raven, Reinwardtia 6 (1964 ['1963']) 358, and at the second step here; Isolectotypes P [P00136827, P01819477]).

Jussiaea ovalifolia Sims, Bot. Mag. 52 (1824) t. 2530, as ‘Jussiaea’. — Type: [published illustration] Sims, Bot. Mag. 52 (1824) t. 2530 (lectotype designated here).

Jussiaea angustifolia Blume, Bijdr. Fl. Ned. Ind. (1827) 1132, nom. illegit., non Lam. (1789). – Jussiaea blumeana DC., Prodr. 3 (1828) 55. — Type: Java, Buitenzorg, August [sine anno], Blume 1050 (Lectotype L [L008658], designated by Raven, Reinwardtia 6 (1964 ['1963']) 358; possible Isolectotype L [L008659]).

Jussiaea burmannii DC., Prodr. 3 (1828) 57. — Type: not designated.

Jussiaea marcgravii DC., Prodr. 3 (1828) 58. — Type: [published illustration] Camaranbaya in Marcgravius, Historia Naturalis Brasiliae Historiae Plantarum 1 (1648) 30 (Lectotype, upper illustration on page, designated here).

Jussiaea parviflora Camb. in St. Hil., Fl. Bras. Merid. 2 (1829) 263. — Type: Brésil, Province de Minas Geraes, 1816-1821, A. de Saint Hilaire 692 (Lectotype P [P01819478], designated here, Isolectotype P [P01819479]).

Jussiaea calycina C. Presl, Reliq. Haenk. 2 (1831) 34. — Type: not traced.

Jussiaea hirsuta C. Presl, Rel. Haenk. 2 (1831) 34, nom. illegit., non Mill. (1768), nec Vell. (1829). – Jussiaea haenkeana Steud., Nom. ed. 2, 1 (1840) 836. — Type: not traced.

Jussiaea macrocopolis C. Presl, Reliq. Haenk. 2 (1831) 35. – Jussiaea suffruticosa var. macrocopolis (C. Presl) Munz, Darwiniana 4 (1942) 239. – Ludwigia pubescens var. macrocopolis (C. Presl) H. Harra, J. Jap. Bot. 28 (1953) 293. – Ludwigia octovalvis subsp. macrocopolis (C. Presl) P. H. Raven, Kew Bull. 15 (1962) 476. – Ludwigia octovalvis var. macrocopolis (C. Presl) Shinners, Sida 1 (1964) 385. — Type: In Peruvia prope urbum Lima, T. P. X. Haenke s.n. (Lectotype PRC [PRC450096], designated here).

Jussiaea venosa C. Presl, Reliq. Haenk. 2 (1831) 33. — Type: Mexico, T. P. X. Haenke s.n. (Lectotype PR, designated by Raven, Reinwardtia 6 (1964 ['1963']) 358).

Jussiaea persicariifolia Schltdl., Linnaea 12 (1838) 271, as ‘persicariaefolia’. — Type: not traced.

Jussiaea persicariifolia Schltdl. forma major Schltdl., Linnaea 12 (1838) 271. — Type: Mexico, near Hacienda de la Laguna, August 1829, Schiede s.n. (Lectotype HAL [HAL0069536], designated by Raven, Reinwardtia 6 (1964 ['1963']) 358).

Jussiaea occidentalis Nutt. ex Torr. & A. Gray., Fl. N. Am. 1 (3) (1840) 521. — Type: USA, Arkansas, Nuttall s.n. (Lectotype PH [PH00016619], designated by Raven, Reinwardtia 6 (1964 ['1963']) 358).

Jussiaea linearis Hochst., Flora 27 (1844) 425, nom. illegit., non Willd. (1799). – Jussiaea angustifolia var. linearis Harv. in Harvey & Sond., Fl. Capensis. 2 (1862) 504. — Type: South Africa, Port Natal, Krantz 73 (Lectotype K [K000310870], designated here).

Jussiaea sagrana A. Rich. in de la Sagra, Hist. Phys. Cuba, Pl. Vasc. (1846) 534, as ‘sagraeana’. – Ludwigia sagrana (A. Rich.) M. Gómez, Anales Soc. Esp. Hist. Nat. 23 (1894) 66. — Type: Ramón de la Sagrana s.n. (Lectotype P [P01819476], designated by Raven, Reinwardtia 6 (1964 ['1963']) 358).
Jussiaea velutina Kunze, Linnaea 20 (1847) 56, nom. illegit., non G.Don (1832). — Type: Austria, Beschke, cultivated (LZT).

Jussiaea costata C. Presl, Ephem. Bot. 1849 (1849) 217. — Type: Philippines, Luzon, Laguna Prov., Calawang. Cumming 655 (Lectotype BM [BM000984335], designated here; islectotypes K, L).

Jussiaea junguhnumiana Miq., Fl. Ned. Ind. 1 (1) (1856) 627. — Type: Sumatra, Padang, bij Lumut, October [sine anno], Junguhnm s.n. (Lectotype L [L0008657], designated by Raven, Reinwardtia 6 (1964 ['1963']) 363).

Jussiaea octonervia forma sessiflora Micheli in Martius, Fl. Bras. 13 (2) (1875) 171. — Jussiaea suffruticosa var. sessiflora (Micheli) Hassl., Bull. Soc. Bot. Genève, ser. 2, 5 (1916) 57. — Jussiaea pubescens var. sessiflora (Micheli) H. Harra, Jap. Bot. 28 (1953) 293. — Ludwigia octovalvis subsp. sessiflora (Micheli) P.H. Raven, Kew Bull. 8 (1953) 162 (1962) 476. — Ludwigia octovalvis var. sessiflora (Micheli) Shinners, Sida 1 (1964) 385. — Type: Brazil, Rio de Janeiro, Burchell 927 (Lectotype K [K000911823], designated by Munz, Darwiniana 4 (1942) 237; Isolectotype GH [GH00054202]).

Jussiaea suffruticosa var. subglabra Thwaites ex Trimen, Handb. Fl. Ceylon 2 (1894) 233. — Type: Ceylon, Thwaites 170 (not traced).

Jussiaea suffruticosa var. angustifolia Chod. & Hassler, Bull. Herb. Boiss. sér. 2, 3 (1903) 909, nom. illegit., non (Lam.) F.M. Bailey (1883). — Type: Paraguay, Iguatemi, November 1898, Hassler 5541 (Holotype G [G00442815] 2 sheets).

Jussiaea suffruticosa var. sintenisii Urb., Symb. Antill. 4 (1910) 469. — Type: Puerto Rico, prope Hato Grande in collibus graminosus ad montem “Gregorio” versus, 31 August 1885, Sintenis 2719 (Lectotype B [B 10 0367942], designated by Munz, Darwiniana 4 (1942) 242).

Jussiaea suffruticosa var. linearifolia Hassl., Repert. Spec. Nov. Regni Veg. 12 (1913) 277. — Jussiaea suffruticosa forma linearifolia (Hassl.) Munz, Darwiniana 4 (1942) 243. — Ludwigia pubescens var. linearifolia (Hassl.) A. Fern. & R. Fern., García de Orta 5 (1957) 115. — Type: Paraguay, Camp San Luis, Fiebrig 4128 (Lectotype G [G00442814], designated by Raven, Reinwardtia 6 (1964 ['1963']) 359).

Jussiaea suffruticosa var. hirta Ridl., Trans. Linn. Soc. Bot. 9 (1916) 57. — Type: New Guinea, Camp VIII to IX, C. Boden Kloss s.n. (Lectotype K, designated by Raven, Reinwardtia 6 (1963) 363; Isolectotype BM [BM013717213]).

Jussiaea suffruticosa var. hawaiiensis Hochr., Candollea 2 (1925) 479. — Type: Isles Sandwich [Hawaii], Kauai, Weimea-village, 21 April 1905, Hochreutiner 3592 (Lectotype G [G00442813], designated by Raven, Reinwardtia 6 (1963) 359.

Jussiaea suffruticosa var. samoensis Hochr., Candollea 2 (1925) 479. — Type: Hochreutiner 3280, Samoa, ile d’Upolu, lac de Lanuto, 22 March 1905 (Lectotype G [G00442809], designated by Raven, Reinwardtia 6 (1964 ['1963']) 359.

Jussiaea clavata M.E. Jones, Contr. W. Bot. 15 (1929) 131. — Type: Mexico, Acaponeta, Nayarit, 24 February 1927, M.E. Jones 22871 (Lectotype WIS [WISv0255953WIS], designated here).

Jussiaea suffruticosa auctt. plur., non L.

Description and distribution. Raven (1964: 356), Vu & Vidal (1973: 20), Khan & Shamsunnahar (1977: 6), Raven (1977: 101), Kostermans et al. (1987: 372), Thompson (1990: 226), Wagner (1995: 349), Barua (2010: 65), Boufford & Raven (2014: 603), Ummul-Nazrah (2017: 58).

Notes. Raven (1964) considered the pantropical Ludwigia octovalvis to be represented by four subspecies, two of which (subsp. octovalvis and subsp. sessiflora (Micheli) P.H. Raven) occurred in Malesia. However, Raven (1977) retracted this infraspecific classification in favour of one broadly defined and variable species. The synonymy above only includes names relevant to the two former subspecies recognised for Malesia. When Bailey published Jussiaea suffruticosa var. angustifolia and var. villosa he provided a brief description of each variety, but did not cite any potential basionyms for new combinations. Later however, Bailey (1913: 215) did cite Jussiaea angustifolia Lam. and J. villosa Wight & Arn. as synonyms of his varieties. The first can be taken directly as a basionym, the second provides a direct citation of J. villosa Lam. I therefore consider that it was Bailey’s intention to make new combinations at varietal rank when he published these names and take them as such based on the Lamarck species names.

5. LUDWIGIA PERENNIS L.

Ludwigia perennis L., Sp. Pl. 1 (1753) 119. — Jussiaea perennis (L.) Brenan, Kew Bull. 8 (1953) 163. — Type: Herb. Hermann 2: 9, No. 66 (Lectotype BM [BM000621529], designated by Brenan in Turrill & Milne 1953) 13.

Jussiaea suffruticosa L., Sp. Pl. (1753) 388. — Ludwigia suffruticosa (L.) M. Gómez, Anales Soc. Esp. Hist. Nat. 23 (1894) 66, nom. illegit., non Walter (1788). — Type: [published illustration] “Carmibu’” in Rheede, Hort. Malab. 2 (1679) t. 49 (Lectotype designated here).

Ludwigia oppositifolia L., Syst. Nat., ed. 12, 2 (1767) 125. — Type: Herb. Hermann 2: 9, No. 66 (Lectotype BM [BM000621529], designated here).
Jussiæa caryophyllææ Lam., Encycl. 3 (1789) 331. — Ludwigia caryophyllææ (Lam.) Merr. & F.P.Metcalf, Lingnan Sci. J. 16 (1937) 396. — Type: India, Sonnerat s.n. (Lectotype P-LA [IDC 243/7], designated by Raven, Reinwardtia 6 (1964 ['1963']) 367).

Ludwigia parviflora Roxb. Fl. Ind. 1 (1820) 440. 1820. — Isnardia parviflora (Roxb.) Kunz. Revis. Gen. Pl. 1 (1891) 250. — Type: [unpublished illustration] Icons Roxburghianæae 1340 (Lectotype K, designated here).

Ludwigia lythroides Blume, Bijdr. Fl. Ned. Ind. 17 (1826-1827) 1134. — Type: Java, Batavia, Blume 1132 (Lectotype L [L0008663], designated by Raven, Reinwardtia 6 (1964 ['1963']) 367).

Isnardia multiflora Guill. & Perr., Fl. Senegamb. Tent. (1838) 295. — Ludwigia multiflora (Guill. & Perr.) Walp., Repert. Bot. Syst. 2 (1843) 75. — Type: Sénégal, Richardtal, 1824, Leprièr s.n. (Lectotype G [G00383323], designated by Brenan in Turrill & Milne Tent. (1838) 295).

Ludwigia gracilis Miq., Fl. Ned. Ind. 1 (1) (1856) 629. — Type: Sumatra, Padang, Junghuhn s.n. (Lectotype L [L0008662], designated by Raven, Reinwardtia 6 (1964 ['1963']) 367).

Ludwigia nesaeoides H.Perr., Not. Syst. 13 (1947) 141. — Type: Madagasc. Boina, near Maroovay, May 1922, H. Perrier de la Bâthie 17965 (Lectotype P [P00412981], designated at the first step by Raven, Reinwardtia 6 (1964 ['1963']) 368 and at the second step here; Isolectotype P [P00412982]).

Ludwigia humbertii Robyns & Lawralrée, Bull. Jard. Bot. État Bruxelles 18 (1947) 291. — Type: Congo, south of Lake Edward, Apr-May 1929, H. Humbert 8709 (Lectotype BR [BR000000897374], designated by Raven, Reinwardtia 6 (1964 ['1963']) 368; Isolectotype P [P00412957]).

Description and distribution. Raven (1964: 367), Vu & Vidal (1973: 27), Khan & Shamsunhah (1977: 7), Raven (1977: 103), Kostermans et al. (1987: 374), Thompson (1990: 227), Wagner (1995: 338), Barua (2010: 65), Boufford & Raven (2014: 605), Ummul-Nazarah (2017: 50).

Notes. Jussiæa suffruticosa L. was, for many years, the accepted name for what is now called Ludwigia octovalvis. In the protologue Linnaeus gave a brief description, ‘Jussiæa erecta villosa, floribus tetrapetalis octandris pedunculis’, cited a few references and stated ‘Habitat in India’. The only cited element eligible as type material is Rheede’s Carambu, more specifically Rheede’s t. 49. This is generally identified as Ludwigia perennis L. and was cited by Linnaeus in the protologue of that name. Ludwigia perennis is notable for having four stamens, rather than the eight noted in Linnaeus’s description of Jussiæa suffruticosa. It has been suggested that Linnaeus really intended to cite Rheede’s ‘Cattu-carambu’ (Rheede, Hort. Malab. 2 (1679) t. 50) (Nicolson et al., 1988), but there is no evidence of Linnaeus correcting himself in this regard in later publications. Fortunately, as Ludwigia suffruticosa Walt. makes the combination in Ludwigia for Jussiæa suffruticosa illegitimate, there are no nomenclaturally disruptive consequences from typifying Jussiæa suffruticosa on t. 49. Given the lack of an alternative under current rules, this is done here.

Linnaeus appears to have changed his mind about the name Ludwigia perennis and used Ludwigia oppositifolia from 1767, citing the former as a synonym of the latter in 1774. While Ludwigia oppositifolia L. has been referred to as an illegitimate superfluous name it fails to meet the requirements of the code for being superfluous (Art. 52). In the protologue Linnaeus did not cite Ludwigia perennis, or all the elements cited under that name, or use the exact phrase name. Therefore, as it is can clearly be inferred that Linnaeus was basing L. oppositifolia on the same elements as L. perennis., I here lectotypify it to the same specimen as L. perennis.

6. LUDWIGIA PERUVIANA (L.) H.Hara Ludwigia peruviana (L.) H.Hara, J. Jap. Bot. 28 (1953) 293. — Jussiæa peruviana L., Sp. Pl. (1753) 388. — Jussiæa grandiflora Ruiz & Pav., Anales Inst. Bot. Cavanilles 14 (1956) 753, nom. illegit., superfl., non Michx. (1803). — Type: [published illustration] "Onagra Laurifolia, flore amplo, pentapetalo" in Feuillée, J. Obs. 2 (1714) t. 9 (Lectotype designated by Raven, Reinwardtia 6 (1964 ['1963']) 346).

Oenothera hirta L., Syst. Nat. ed. 10, 2 (1759) 998. — Jussiæa hirta (L.) Sw., Obs. Bot. (1791) 142, nom. illegit., non Lam. (1789). — Ludwigia hirta (L.) M.Gómez, Anales Soc. Esp. Hist. Nat. 23 (1894) 66. — Type: [published illustration] ‘Oenothera hirsuta’ of Plumier in Burman, Pl. Amer. 8 (1758) 167 (Lectotype designated by Ramamoorthy & Zardini, Monogr. Syst. Bot. Missouri Bot. Gard. 19 (1987) 29).

Jussiæa macrocarpa Kunth, Nov. Gen. Sp. 6 (1823) 102. — Jussiæa peruviana var. macrocarpa (Kunth) Bertoni, Descr. Fis. Econ. Paraguay (1910) 13. — Type: Colombia, Guaduas, Humboldt & Bonpland 1758 (Lectotype P-Bonpl. [P00679566], designated at the first step by Raven, Reinwardtia 6 (1964 ['1963']) 345), and at the second step here; Isolectotype P [P00135180]).
Jussiaea mollis Kunth, Nov. Gen. Sp. 6 (1823) 102. — Type: Venezuela, Sucre, Bordones, Humboldt & Bonpland 414 (Lectotype P-Bonpl. [P00679567], designated by Raven, Reinwardtia 6 (1964 [‘1963’]) 345).

Jussiaea hirsuta Vell., Fl. Flumin. (1829) 186, nom. illegit., non Miller (1768). — Type: [unpublished illustration] ‘lussieva hir-
suta’ [original drawing for Vellozo, Fl. Flumin. Icon. 4 (1831) t. 144] (Lectotype Biblioteca Nacional Manuscript Section mss1198653, designated here).

Jussiaea peruviana var. ausralis Hassl., Repert. Spec. Nov. Regni Veg. 12 (1913) 369. — Type: Paraguay, in regione fluminis Alto Paraná, 1909/1910, Fiebig 6063 (Lectotype B [B100249031], designated here; isoelectotypes G, SI, US).

Jussiaea peruviana var. glaberrima Donn.Sm., Bot. Gaz. 16 (1891) 6. — Type: Guatemala, Dep. Zacatepequez, Dueñas, April 1890, J. Donnell Smith 2130 (Lectotype US [US00123985], designated by Ramamoorthy & Zardini, Monogr. Syst. Bot. Missouri Bot. Gard. 19 (1987) 30; isoelectotypes GH, K [K000533294], NY).

Jussiaea peruviana f. hirsuta Hassl., Repert. Spec. Nov. Regni Veg. 12 (1913) 269. — Type: Paraguay, in vicinis Caaguazú, Paraguay, Hassler 9167 (Lectotype B [B100249033], designated by Raven, Reinwardtia 6 (1964 [‘1963’]) 345).

Jussiaea peruviana f. tomentosa Hassl., Repert. Spec. Nov. Regni Veg. 12 (1913) 269. — Type: Paraguay, in altoplanitie et decliviis Sierra de Ma-
racayú, Hassler 5011 (Lectotype B [B100249032], designated here; isoelectotypes G, GH, P, POM).

Jussiaea speciosa Ridl., J. Bot. 59 (1921) 259. — Type: India, Madras, Vellangiri Hills, Devala, No-
ember 1886, Gamble 18361 (Lectotype BM [BM01371212], designated by Raven, Reinwardtia 6 (1964 [‘1963’]) 345; Isolectotype K [K001129807]).

Jussiaea sprengeri L.H.Bailey, Stand. Cycl. Hort. 3 (1915) 1730. — Type: USA, in cultivation, John-
son s.n. (Lectotype POM, designated by Ram-
amoorthy & Zardini, Monogr. Syst. Bot. Missouri Bot. Gard. 19 (1987) 31).

Description and distribution. Raven (1964: 345), Raven (1977: 100), Kostermans et al. (1987: 376), Ramamoorthy & Zardini (1987: 29), Thompson (1990: 226), Wagner (1995: 334), Barua (2010: 66), Boufford & Raven (2014: 606), Ummul-Nazrah (2017: 60).

Notes. Raven (1964) cited the type of Jussiaea mollis Kunth as no. 878. I take this as a typographic error and correct it to 414. Although Ummul-Nazrah (2017) noted the occurrence of Ludwigia peruviana in Sabah and Sarawak, she did not cite any specimens. I have seen collections from Kalimantan (Leeuwenberg 13381, Ambri & Arifin A.A.455, Arbainsyah AA1861) that confirm the species is naturalized in Borneo.

7. LUDWIGIA PROSTRATA Roxb.

Ludwigia prostrata Roxb., Fl. Ind. 1 (1820) 441. — Nematopyxis prostrata (Roxb.) Miq., Fl. Ned. Ind. 1 (1) (1856) 630. — Isnardia prostrata (Roxb.) Kuntze, Revis. Gen. Pl. 1 (1891) 250. — Jussiaea prostrata (Roxb.) H.Lév., Repert. Spec. Nov. Regni Veg. 8 (1910) 138. — Type: [unpublished illustration] Icons Buxoro- bighianae 1945 (Lectotype K, designated by Vu & Vidal, Fl. Cambodia, Laos & Vietnam 14 (1973) 30).

Ludwigia diffusa Buch.-Ham., Trans. Linn. Soc. London 14 (1824) 301. — Type: India, Goyalpara, 2 September 1808, F. Buchanan-Hamilton s.n. [EIC 6336A] (Lectotype K-W [K001123615], designated here).

Ludwigia fruticulosa Blume, Bijdr. Fl. Ned. Ind. (1827) 1133. — Nematopyxis fruticulosa (Blume) Miq., Fl. Ned. Ind. 1 (1) (1856) 630. — Type: Java, Blume s.n. (Lectotype L [L0008664], designated by Raven, Reinwardtia 6 (1964 [‘1963’]) 374).

Ludwigia leucorhiza Blume, Bijdr. Fl. Ned. Ind. (1827) 1133. — Type: Java, circa Buitenzorg ad flumen Tjeliwong, Blume s.n. (not traced). Nematopyxis pusilla Miq., Fl. Ned. Ind. 1 (1) (1856) 630. — Type: Java, Horsfield s.n. (Holotype K [K000742277]).

Description and distribution. Raven (1964: 374), Vu & Vidal (1973: 30), Khan & Shamsunnahar (1977: 9), Raven (1977: 103), Wagner (1995: 339), Barua (2010: 68), Boufford & Raven (2014: 607), Ummul-Nazrah (2017: 60).

Species excludenda

Ludwigia decurrens Walt. Ramamoorthy & Zardini (1987: 95) reported a collection of Ludwigia decurrens Walt. from near Laguna in the Philippines (Parchs 6608 [MO]). I have not found any more herbarium material of this species from Malesia and it does not appear to have naturalised in the Philippines (R. Joshi pers. comm., R. Lubigan pers. comm.).

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