TAXONOMIC STUDIES OF THE GENUS *CHASSALIA* COMM. EX POIR. IN INDIA AND ADJOINING REGIONS

Chassalia Comm. ex Poir. Encycl. Meth. Bot. Suppl. 2: 450. 1812, *in obs.* & in Dict. Sci. Nat. 8: 298. 1817; Verdc. in Kew Bull. 30: 270. 1975 & Fl. Trop. E. Afr. Rubiac. (1)120. 1976; *Chassalia* ou *Chassalia* Poir. in Dict. Sci. Nat. 8: 198. 1817. *Chasalia* Juss. Nem. Mus. Hist. nat. Paris 6: 379. 1820; *Chasalia* DC. Prodr. 4: 531. 1830; Miq. Fl. Ind. Bat. 2: 279. 1857 & Ann. Mus. Lugd. Bat. 4: 202. 1869; Hook. f. in Benth. & Hook. f. Gen. Pl. 2: 126. 1873; K. Schum. in Engl. & Prantl, Pflanzenfam. 4(4): 116. 1891; Bremek. in Candollea 18: 195. 1962; *Chazalia* DC. Prodr. 9: 32. 1845; Petit in Bull. Jard. Bot. Etat. Brux. 29: 378. 1859 & 34: 20. 1964.

Type species: *Chasalia capitata* DC.

Shrubs, undershrubs, or small trees, branching above. *Leaves* simple, usually opposite, sometimes ternate or whorled, entire, mostly acuminate, membranous, usually glabrous, subsessile or distinctly petiolate; stipules interpetiolar, ovate to triangular, mostly bifid above to two filiform tips, often connate at the base with glandular axillary hairs, mostly persistent. *Inflorescence* terminal, erect, in trichotomously branched panicle, glabrous or pubescent. *Flowers* small, bisexual, 4-5 merous, heterostylous; bracts and bracteoles small. *Calyx* persistent, small, tube fused with the wall of the ovary, ovoid or oblong, limb very short, lobes 5, triangular or linear, very short. *Corolla* sometimes dimorphic, white or pinkish, tube cylindric, curved, hairy or glabrous inside, 5 lobed; lobes sometimes winged. *Stamens* 5, epipetalous, included or exserted; anthers linear, 2 lobed, dorsifixed. *Pistil* bicarpellary, syncarpous, heterostylous, erect from the base; ovary inferior, 2 locular, ovule one in each locule; stigma bifid; disc elevated, cylindric and distinct. *Fruits* ovoid, globose or oblong, fleshy, or 2 ventrally grooved pyrenes. *Seeds* dark brown, smooth, orbicular, ventrally concave.

40-50 species, mostly in tropical Africa and Madagascar; few in Sri Lanka, China, Burma and Malaya Peninsula extending to Philippines. 2 species: *C. curviflora* is represented by 4 varieties in India, while *C. lushaiensis* is known from the type material only.

KEY TO THE TAXA

1a. Leaves not falcate, broadly elliptic to obovate-lanceolate, oblanceolate or narrowly linear-oblong.. *C. curviflora*
  2a. Leaves elliptic to obovate-lanceolate:
    3a. Fruits globose or subglobose:
      4a. Midrib and nerves pubescent beneath .. var. *curviflora*
      4b. Midrib and nerves glabrous beneath .. var. *ophioxyloides*
    3b. Fruits ellipsoid .. var. *ellipsoides*
  2b. Leaves linear-lanceolate var. *longifolia*
1b. Leaves falcate, narrowly elliptic to lanceolate .. *C. lushaiensis*

Chassalia curviflora (Wall.) Thw. Enum. 150. 1864; Hook. f. Fl. Brit. Int. 3: 176. 1880, pp.—*Psychotria curviflora* Wall. in Roxb. Fl. Ind. ed Carey & Wall. 2: 167. 1824. (Type: Penang, 1819, *W. Jack* s. n. in *Wall. Cat.* 8360! K).

Shrubs 2-3 metre high, branching. *Leaves* 12-34 × 4-8 cm elliptic to obovate-lanceolate, oblanceolate, or linear-lanceolate or linear oblong, membranous, glabrous or pubescent, obtuse at the base, entire, acute cuspidate or caudate-acuminate at the apex, lateral nerves 6-10 pairs prominent on the lower surface; petiole slender, 1 - 3.5 cm long; stipules 2-3 × 1-2 mm ovate, bifid, often opposite ones connate at the base. *Inflorescence* 2-7 cm long, glabrous or pubescent; peduncles 1 - 2.5 cm long. *Flowers* sessile, white with pink-

ish tips, 1-2 cm long, bracteate; bracts short, ovate to lanceolate, pubescent or glabrous. *Calyx* glabrous, limb about 1 mm long; lobes 5, triangular. *Corolla* tube 1-2 cm long, curved, dimorphic, on one form with exserted anthers and included stigma and the other form with exserted stigma and included anthers; lobes 5, ovate-triangular, about 2 × 1 mm, acute; throat glabrous. *Stamens* shorter, filaments 2.0 - 3.5 mm or longer ones 3-5 mm, anthers 3 × 1 mm. Disc annular, 1-2 mm. *Pistil* style, shorter ones 3 mm, longer ones 10 mm, stigma bifid; ovary 5 × 1 mm. *Fruits* about 6-10 × 5-8 mm, more or less didymous, smooth. *Seeds* about 5 mm.

Chassalia curviflora (Wall.) Thw. var **curviflora** Thw. Enum. 150. 1864, pp. excl. *Psychotria ophioxyloides* Wall. et *P. ambigua* W. & A. in syn.; Hok. f. Fl. Brit. Ind. 3: 176. 1880, *p. p.*

Leaves 6-18 × 5-8 cm, obovate-lanceolate or linear-oblong, midrib and nerves pubescent beneath; petiole slender, 1-3 cm long; stipules 3 × 1 mm, ovate, bifid. *Inflorescence* 3-5 cm long glabrous or minutely pubescent; peduncles 1-2 cm long.

Flowering: May-August. *Fruiting*: June-November.

Distribution: Malaya Peninsula, Thailand and Sumatra.

Specimens examined: MALAYA: Near top of Penang hill, *King* s. n. (CAL): Jaffaria, *King* s. n. (CAL); Penang, *Curtis* 186 (CAL); Pulau langkawi, *Curtis* s. n. (CAL); Sumatra; Lampar, *Forbes* 2619 (CAL).

C. curviflora (Wall.) Thw. var. **ophioxyloides** (Wall.) Deb & Krishna comb. & Stat. Nov. *Psychotria ophioxyloides* Wall. in Roxb. Fl. Ind. ed Carey & Wall. 2: 167. 1824. (Type: Sylhet, *de Silva* s. n. in *Wall. Cat.* 8364 A!K!W). *C. curviflora* Wall. ex Kurz, For. Fl. Brit. Burma 2114. 1877; Hook. f. Fl. Brit. Ind. 3: 176. 1880, p. p.; Cooke, Fl. Pres. Bomb. 1: 618. 1903; Gamble, Fl. Pres. Madr. 4: 634. 1921; Haines, Bot. Bih. Or. 4: 441. 1922; Kanj. *et al.* Fl. Assam 3: 86. 1939. *Psychotria ambigua* Wt. & Arn. Prodr. 1: 433. 1834; Wt. Ill. 2: 80. t. 127. 1850. *Ixora attenuata* Wall. Cat. 6164. 1831, *nom. nud.* *C. ophioxyloides* (Wall.) Craib in Gard. Bull. Straits Settl. 6: 474. 1930; Santapau & Merchant in Bull. Bot. Surv. Ind. 3(2): 107. 1961; Gandhi in Saldanha & Nicholson, Fl. Hassan Dist. 575. 1976.

Inflorescence 4-6 cm long, lax to dense flowered. *Calyx* short, 5 lobed to the base. *Stamens* shorter filaments 2-3 mm, longer ones 3-5 mm; anthers included in shorter stamens and excluded in longer ones. *Fruits* globose, 6-9 mm across, more or less didymous, smooth.

Flowering: March-June. *Fruiting*: July-September.

Distribution: India: Arunachal Pradesh, Nagaland, Mizo Hills, Tripura, Assam, Andaman & Nicobar Islands, Tamil Nadu, Karnataka; Bangladesh; Sri Lanka; Burma, Borneo and Philippines.

Specimens examined: ARUNACHAL PRADESH: Aka Hills, *Bor* 19128 (ASSAM); Pashighat, *Deka* 17702 (ASSAM); Kameng, *Panigrahi* 15661 (ASSAM); Sonogodam to Dreye, Lohit, *Rao* 10416 (ASSAM); Lohitpur, *Rao* 47961 (CAL); Subansiri, *Subbarao* 24626 (ASSAM). NAGALAND: Mongsemdi, *Watt* 11812 (CAL); Kohima, *Clarke* 4136A (CAL); Kohima, *Prain* s. n. (CAL); Deligan, *Prain* 180 (CAL); Naga Hills, *Bor* 20772 (ASSAM). MIZORAM: Changsia, *Prazer* s. n. (CAL); Sialsuk, *Deb* 30768 (ASSAM) TRIPURA: Tlangsang, *Deb* 27169 (ASSAM). ASSAM: Nambar forest, *Watt* 11361 (CAL); Assam, *G. Man* 427 (ASSAM); Cachar, *Prazer* 30, 39, 50 (CAL); Goalpara, *Kanjilal* 5759 (ASSAM); Darrang, *Kanjilal* 3745 (CAL); Kamrup, *Panigrahi* 9566 (ASSAM);

Mikir Hills, *Deb* 35181 (ASSAM); Nowgong, *Balakrishnan* 39399 (ASSAM); N. Lakhimpur, *Verma* 46552, 46665 (ASSAM). MEGHALAYA: K. & J. Hills, *Clarke* 17700 (CAL); Khasia Hills, *Burkill & Banerjee* 184 (CAL); K. & J. Hills, *Deka* 18836 (ASSAM); Tura, Garo Hills, *Deb* 28984 (ASSAM); Nongpoh, *Joseph* 42334 (ASSAM). ANDHRA PRADESH: Visakhapatnam, *Subbarao* 30038 (MH). KARNATAKA: Judkal, S. Kanara, *Barber* 12854 (MH); N. Kanara, *Talbot* 337 (CAL); Balchally forest, Agumbe, *Srinivasan* s. n. (BSIS). Naravi, S. Kanara, *Raju & Naganatha* 18150 (MH); Sringeri forest, Chickmagalur, *Bhatt* s. n. (LWG). TAMIL NADU: Nilgiris, *Gamble* 20649 (CAL); Coimbatore, *Fischer* 1945 (CAL); Nilgiris, *Thomson* s. n. (MH); Kannikatti, Tirunelveli, *Barber* 481 (MH); Nadugani, Tirunelveli, *Barber* 11007; Kodumady forest, Tirunelveli, *Sebastine* 8392 (MH); Kannikatty, Tirunelveli, *Jacob* s. n. (MH); Therkumalai-courtallam, Tirunelveli, *Subramanyam* 5020 (MH); Ayilandappillai Estate, Tirunelveli, *Shetty* 27957 (MH); Kateru road, Nilgiri, *Sharma* 36054 (MH); Pambar forest, Madurai, *Deb* 30902 (MH); Sengaltheri, Tirunelveli, *Vajravelu* 29131 (MH); Silvercascadi-Kodaikanal, Madurai, *Ramamurthy* 23400 (MH); Nadugani, Nilgiris, *Ellis* 38523 (MH); Inchikazhai, Tirunelveli, *Henry* 16264 (MH); Panagudi, Kanyakumari, *Karthikeyan* 40109 (MH). KERALA: S. Malabar, *Fischer* 1601 (CAL); Travancore, *Calder & Ramaswamy* 114, 225 (CAL); Dhoni R. F., Palghat, *Joseph* 17182 (MH); Bhagavathikulam, Ernaculam, *Shetty* 33455 (MH); Anathod, Kottayam, *Deb* 30413 (MH); Trichur, *Ramamurthy* 27044 (MH). ANDAMAN AND NICOBAR ISLANDS: Anikhet Jungle Hills, S. Andamans, *King* s.n. (CAL); Manpur, Wimberloygung, *Heinig* 99H (CAL); Andaman, *Prain* 150 (CAL); S. Andaman, *Kurz* s.n. (CAL); Saitan Khari, S. Andaman, *Balakrishnan* 5676 (PBL). SIKKIM: Sikkim, *Hooker* s.n. (CAL); Sikkim, *King* s. n. (CAL); Sikkim, *Bor* 19890 (ASSAM); Teesta Valley, *Smith & Cave* 825 (CAL); Sikkim, *Rao* 28635 (ASSAM). BHUTAN: Nunai beat house to Bhutan border, *Nath* 13341 (ASSAM); Galeyphug, *G. Sengupta* 1400 (CAL). BANGLADESH: Dacca, *Clarke* 17056 (CAL). SRI LANKA: Sri Lanka, *Thwaites* 1714 (CAL); Sandapola forest, *Chatterjee* 665 (CAL). BURMA: Perak, *Scortechini* 557 (CAL); Kalay Hill, upper Burma, *Prazer* 105 (CAL); Kachin Hill, upper Burma, *Mokim* s. n. (CAL); Dunaon, Tenasserim, *Meebold* 14655 (CAL); upper Chindwin, *Mackenzie* 110 (CAL); Guneug Batu patch, *Wray* 265, 432, 162 (CAL). BORNEO: Sandakan, *Merrill* 20131 (CAL). PHILIPPINES: Palo, *Elmer* 7057 (CAL); Panay, *Edano* 31340 (CAL).

Chassalia curviflora (Wall.) Thw. var. **ellipsoides** Hook. f. in Fl. Brit. Ind. 3: 117. 1880 Type: Jarain, 3000 ft. in Jaintia 21.11. 1872, *C. B. Clarke* 17908A! K (Holotype) & 17908 E! a duplicate of the type which does not appear to have been examined by the author of the variety, Hook. f. is extant in CAL].

Leaves 10-18×3-6 cm broadly elliptic-lanceolate, glabrous, membranous, acuminate at the apex, sub-acute at the base; lateral nerves 7 12 pairs, prominent on the lower surface, petiole slender, 1-2 cm long; stipules deciduous. *Fruits* elliptic, 10×7 mm broad, black, smooth.

Flowering: Not known. *Fruiting*: July-November.

Distribution: India; Jarain in Jaintia Hills, Meghalaya.

Note: Taxonomic status of *Psychotria tetrandra* Bl. Bijdr. Fl. Ned. Ind. 961. 1826, *P. lurida* Bl. l. c. 959, *Chasalia sanguiana* Miq. Fl. Ind. Bat. Suppl. 223. 1860 and *Zwaardekronia lurida* Korth. Ned. Kruidk, Arch. 2: 252. 1851, could not be properly determined as the types were not available for scrutiny. On the basis of distribution

these appear to represent the typical variety, but the descriptions of the leaves as glabrous, tend to represent the variety *ophioxyloides*, but it is not likely to be so.

Specimens examined: The type and its duplicate.

Note: This variety is described only on the basis of the type collected by C. B. Clarke as distinguished by Hook. f. (l.c.) for the characteristic form of the fruit. It has not been collected since then, though Jarain has been repeatedly explored by many workers during the last one hundred years.

Chassalia curviflora (Wall.) Thw. var. **longifolia** (Dalz.) Hok. f. Fl. Brit. Ind. 3: 177. 1880. *Psychotria longifolia* Dalz. in Hook. Journ. Bot. 2: 133. 1850. (Type: *Malacca, Maingay* 3052! K & CAL.)

Leaves much longer, glabrous, 11 - 34 × 1 - 4 cm linear-lanceolate, obtuse at the base, acute at the apex, nerves more numerous, prominent and spreading, petiole slender, 1 - 2 cm long; stipules ovate, 2 - 3 mm. *Inflorescence* 2 - 5 cm long, glabrous, peduncle fleshy, pink. *Fruits* globose, smooth, didymous.

Flowering: January-June. *Fruiting*: April-September.

Distribution: India and Malaya Peninsula.

Specimens examined: ASSAM: Bhubankhal, Cachar, *De* 21644 (ASSAM). TRIPURA: Damchara, *Deb* 26882 (ASSAM). MALAYA: Malaya, *Maingay* 931 (CAL); Ayer Panas, *Ridley* 1606 (CAL).

C. lushaiensis (Fischer) Fischer in Kew Bull. 1931: 282. 1931; Kanjilal *et al.* Fl. Assam 3: 87. 1939. *Gaertnera lushaiensis* Fischer in Kew Bull. 141. 1928. (*Type*: Taxzaul, *Parry* 180! K).

Trees small, branches terete, fistular. *Leaves* opposite, 12 - 30 × 3 - 7 cm; elliptic-lanceolate, falcate, membranous, glabrous, attenuate at the base, acuminate at the apex; petiole slender, 1 - 2.5 cm long; stipules connate at the base, upper part caducous. *Inflorescence* pedunculate, densely flowered, glabrous; bracts cuspidate, ovate, 0.8 cm long. Flowers small, narrow, clavate, costate. *Calyx* lobes 5, triangular, acute. *Corolla* much longer than the calyx, curved. *Stamens* inserted in the middle of the corolla tube; anthers linear. *Ovary* conical, truncate, 2 lobed; style filiform, stigma bifid. *Fruits* subglobose, smooth, didymous.

Flowering: May-September. *Fruiting*: August-December.

Distribution: India: Mizoram.

Specimens examined: Only the type cited above.

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