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A TAXONOMIC REVIEW OF *LANTANA CAMARA* L. AND *L. MONTEVIDENSIS* (SPRENG.)BRIQ. (VERBENACEAE)¹ IN AUSTRALIA

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Abstract

The taxonomy of the two species of *Lantana* in Australia — *L. camara* and *L. montevidensis* is reviewed. Affinities and distribution are considered for the genus and for each species. A key to the species is provided and a detailed description of each species is supplemented by a habit sketch of a flowering branch and analytical drawings of the flowers and map of distribution.

Taxonomic history of the genus

The genus *Lantana* as described by Linnaeus (1753) contained seven species: *L. trifolia*, *L. annua*, *L. camara*, *L. aculeata*, *L. bullata*, *L. corymbosa* and *L. africana*. The syntypes of the first six came from tropical America, and the last one *L. africana* from Ethiopia. The genus was placed with *Lippia* among other genera of the present Verbenaceae in "Didynamia Angiospermia", where it was retained by Reichard (1778), Loureiro (1790), Gmelin (1792), Schreber (1791), Persoon (1797), Willdenow (1800), Swartz (1800), Ventenat (1803), Nuttall (1818), Sprengel (1825), Link & Otto (1826), Roxburgh (1832) and Dietrich (1842). Adanson (1763) placed the genus in section II of Verbenae, Gleditsch (1764) in Petalostemonum, Rüling (1774) in Asperifoliae, Scopoli (1777) in Personatae, Gaertner (1788) in Centuria Quarta, Jussieu (1789) in Vitices, Necker (1790) in Plasyrgophytorum, Giseke (1792) and Batsch (1802) in Personatar, Moench (1794) in Petalostemon, Ventenat (1799) in Pyrenaceae, Link & Otto (1826) in Viticeae, and Reichenbach (1828) under the tribe Verbenae in the Labiatae.

In 1805, Jaume Saint-Hilaire proposed the family Verbenaceae for *Lantana* and other related genera. The family Verbenaceae was accepted and the genus included in it by de Jussieu (1806), Kunth (1818), Bentham (1839, 1870, 1876), Endlicher (1838), Lindley (1847), Schauer (1847), Miquel (1858), Bailey (1883, 1901, 1906, 1913), Briquet (1895), Lam (1919) and most other botanists. Within this family, Jaume Saint-Hilaire distinguished the Premier Section with flowers opposite on a branched corymb, the Deuxieme Section (including *Lantana*) with flowers arranged in alternate spikes, and the Troisieme Section with genera having some affinity with the Verbenaceae.

In 1829, Dumortier divided the family Verbenaceae into two tribes, Verbenae and Viticeae, with *Lantana* in the tribe Verbenae. This tribe was accepted for the genus by Bartling (1830), Späch (1838), Bentham (1839, 1870), Schauer (1847), Miquel (1858), Grisebach (1864), Asa Gray (1886), Durand (1888), Bailey (1883, 1901, 1913), Fletcher (1938), Lemée (1943) and others. Endlicher (1838) divided the family Verbenaceae into three tribes: Lippieae with fruit drupaceous but splitting at maturity, Lantaneae (including *Lantana*) with fruit drupaceous but indehiscent, and Aegiphileae with fruit a berry. The tribe Lantaneae was accepted for the genus by Meisner (1840), Endlicher (1841), Dietrich (1842), Walpers (1845, 1847) and Bocquillon (1863). Schauer (1847) re-classified the Verbenaceae into the tribes Verbenae, Viteae and Avicennieae, and subdivided the tribe

¹The present treatment of the genus *Lantana* is the fifteenth in the series of taxonomic revisions in the family Verbenaceae in Australia. (See Munir, 1982, 1984a, 1984b, 1985, 1987a, 1987b, 1989, 1990a, 1990b, 1991, 1992, 1993a, 1993b, 1995.)

Verbeneae into the seven subtribes Spielmannieae, Monochileae, Casselieae, Verbeneae, Lantaneae (including *Lantana*), Durantaeae and Petreeae. The genus *Lantana* was divided by Schauer (1847) into three sections: *Sarcolippia*, *Camara* and *Callioreaes*, with the Australian species *L. camara* in *Camara* and *L. montevidensis* in *Callioreaes*.

Bentham (1876) proposed a new classification for the family Verbenaceae by dividing it into eight tribes: Phrymeae, Stilbeae, Chloantheae, Verbeneae, Viticeae, Caryopterideae, Symphoremeeae and Avicennieae, with *Lantana* in the tribe Verbeneae. In 1895, Briquet reclassified the Verbenaceae and upgraded the tribe Verbeneae to the subfamily Verbenoideae. The latter consisted of six tribes: Euverbeneae, Lantaneae (including *Lantana*), Priveae, Monochileae, Petraeeae and Citharexyleae. This classification was adopted by Dalla Torre & Harms (1904), Lam (1919), Junell (1934), Moldenke (1959, 1971), Melchior (1964), López-Palacios (1977), Verdcourt (1992), Raj (1983) and Yamazaki (1995). In the same treatment, Briquet (1895) subdivided the genus *Lantana* into four sections: *Callioreaes*, *Camara*, *Sarcolippia* and *Riedelia*. In this subdivision, the Australian species of the genus came under sections *Callioreaes* (*L. montevidensis*) and *Camara* (*L. camara*). The majority of botanists, however, have not divided the genus into sections, but have retained it within the Verbenaceae without reference to any subfamily or a tribe. In the present revision, Briquet's (1895) classification of the Verbenaceae is followed in retaining *Lantana* within the tribe Lantaneae. The subgeneric sections proposed for the genus may be useful, but not used here because there are only two species involved in this treatment.

Australian history of the genus

In view of Swarbrick's (1986) most comprehensive history of the genus *Lantana* in Australia, there is little need to go into detail here. Nevertheless, it seems desirable to make a very brief mention of its introduction into Australia and of the very early Australian collections from naturalised populations. Several *Lantana* taxa have been introduced to Australia, of which, only *L. camara* and *L. montevidensis* have become naturalised. The earliest known published reference to *Lantana* in Australia is that of J. Bailey (1841) who introduced *L. mista* (now a synonym of *L. camara*) to one of the early sites for the Adelaide Botanic Garden. In 1843, Macarthur cultivated it at Camden Park near Sydney (Swarbrick 1986, Parsons & Cuthbertson 1992), and later Shepherd (1851) advertised three types of *Lantana* for sale at his Darling Nursery in Sydney. Since then, numerous introductions have been made by nurseries (Parsons & Cuthbertson 1992). According to Swarbrick (1986), "seven forms [species?] of *Lantana* were grown in Australia by 1859". Parsons & Cuthbertson (1992) claim that *L. camara* "was naturalised along the Brisbane River, Queensland, by the late 1850s". On the contrary, Swarbrick (1986) states that "*Lantana* was not definitely recorded as a garden escape in the Brisbane area until F.M. Bailey & Tennison-Woods (1879) noted that it was flowering all summer along the river".

Swarbrick (1986) also reports that "the earliest herbarium specimen is in the National Herbarium in Melbourne and was apparently collected on the Brisbane River in August 1861, but the writing is unclear and the [herbarium] sheet lacks the collector's name. There is also a specimen with small thorns collected by B.T. Lowe in 1862 and labelled 'Near Sydney, common, an introduced species' in the herbarium of the Royal Botanic Gardens at Kew in England". Swarbrick noted that in 1986 "there are several undated collections of *Lantana* in the National Herbarium in Melbourne from this period", but the present author has not found any of these sheets. Nevertheless, *L. camara* was collected by H. Beckler in 1869 from Hasting River which is now preserved in Herb. MEL. It was described by Bentham (1870) as "naturalised on the Hasting and Clarence Rivers" in New South Wales. In 1879, F.M. Bailey described *L. camara* as "a most troublesome weed" in Queensland. He also reported it as "equally abundant all-round Port Jackson" in New South Wales. Since then, naturalised *Lantana* has been recorded by F.M. Bailey (1883, 1888, 1889, 1890, 1901, 1906, 1913), C. Moore (1884), Lauterer (1904), Dixon (1906) and C.T. White (1927,

1929). In early Australian records *L. camara* was mostly recorded as *L. mista* L., *L. crocea* Jacq. or *L. tiliaefolia* Cham., and *L. montevidensis* (Spreng.) Briq. as *L. sellowiana* Link & Otto.

Chromosome numbers

Cytological studies by Henderson (1969) "showed the genus *Lantana* to be dibasic with base numbers 11 & 12 and that there are polyploid series based on both these numbers", and this is supported by other botanists. Moldenke (1983) has given the base (i.e. haploid) numbers 8 and 11, though no one else is known to have recorded 8 as a basic number. Sinha and Sharma (1984) mentioned several cytological works on *Lantana*, in all of which the basic chromosome number was found to be 11 and 12. They also pointed out the existence in the genus of polyploid series based on these two numbers.

Chromosome counts of twenty *Lantana* species have been located, of which the majority are for *L. camara*. Excepting Henderson (1969), these counts are based on material from outside Australia. The highest number ($2n = 72$) was reported by Natarajan & Ahuja (1957) & Arora (1960), and ($2n = 66$) by Bir & Chatha (1983). The lowest number ($2n = 22$) was recorded by Tandon & Chandi (1955), Natarajan & Ahuja (1957), Lewis (1961c), Malik & Ahmad (1963), Bir & Chatha (1983), Sanders (1987, 1987a), Sandhu & Mann (1988) and Sen & Sahni (1955).

L. camara and *L. montevidensis* have basic chromosome numbers of 11 and 12 respectively. Chatha & Bir (1988), however, recorded a basic chromosome number of 11 for *L. montevidensis*. Both Australian species are reported to be polyploid in both cultivated and wild forms. According to Spies & Stirton (1982), "*L. camara* is today recognised as a polyploid aggregate species with a basic chromosome number of $x = 11$ and having diploid, triploid, tetraploid, pentaploid and hexaploid representatives (Schnack & Coves, 1947; Tjio, 1948; Singh, 1951; Sen & Sahni, 1955; Tandon & Bali, 1955; Tandon & Chandi, 1955; Natarajan & Ahuja, 1957; Henderson, 1969; Spies & Stirton, 1982)". In support of this, Spies (1984) re-affirmed that "the cytological data showed that chromosome numbers of $2n = 22, 33, 44, 55$ and 66 are found in the *Lantana camara* complex". According to Henderson (1969), two forms of *L. montevidensis* are known to occur in Australia. The garden form which does not produce fruit here is triploid ($2n = 36$) and the naturalised form is tetraploid ($2n = 48$). Overall, the haploid (i.e. basic) numbers 11 and 12 seem to be generally consistent in the genus.

LANTANA L.

Lantana L., Sp. Pl. edn 1, 2 (1753) 626; Gen. Pl. edn 5 (1754) 275;

Gaertn., Fruct. Sem. Pl. 1 (1788) 267; Juss., Gen. Pl. (1789) 109; Lour., Fl. Cochinch. 2 (1790) 376; Willd., Sp. Pl. 3 (1800) 315, no. 1165; J. St.-Hil., Expos. Fam. Nat. 1 (1805) 250; Juss., Ann. Mus. Natl. Hist. Nat. 7 (1806) 75; Kunth in Humb., Bonpl. & Kunth, Nov. Gen. & Sp. Pl. 2 (1818) 258; Nutt., Gen. N. Amer. Pl. 2 (1818) 41; Kunth in Humb., Bonpl. & Kunth, Synop. Pl. 2 (1823) 49; Spreng., Syst. Veg. 2 (1825) 761, no. 2126; Dumort., Anal. Fam. Pl. (1829) 22; Bartl., Ord. Nat. Pl. (1830) 180; Roxb., Fl. Ind. 3 (1832) 89; Endl., Gen. Pl. 1 (1838) 635, no. 3695; Schauer in A. DC., Prod. Syst. Nat. 11 (1847) 594; Walp., Repert. Bot. Syst. 6 (1847) 689; Miq., Fl. Ind. Bat. 2 (1858) 904; Bocq., Rev. Groupe Verbenac. (1863) 88, 151; Benth., Fl. Aust. 5 (1870) 34; Benth. in Benth. & Hook.f., Gen. Pl. 2 (1876) 1142; F.M. Bailey, Synop. Qld Fl. (1883) 375; C.B. Clarke in Hook.f., Fl. Brit. Ind. 4 (1885) 562; Briq. in Engl. & Prantl, Nat. Pflanzenf. 4, 3a (1895) 150; F.M. Bailey, Qld Fl. 4 (1901) 1170; F.M. Bailey, Weeds & Suspect. Poison Pl. Qld (1906) 140; King & Gamble, J. As. Soc. Bengal 74, Part 2 (1908) 792; H.J. Lam, Verbenac. Malay, Archip. (1919) 10; Ridl., Fl. Mal. Penin. 2 (1923) 611; Moldenke, Publ. Carnegie Inst. Wash. No. 522 (1940) 153; Moldenke in Pulle (ed.), Fl. Suriname 2, Part 2 (1940) 262; Moldenke, Résumé Verbenac. etc. (1959) 248, 250, 320, 343, 353, 393, 405, 458; J.F. Macbr., Field Mus. Nat. Hist. Bot. Ser. 13, Part 5, No. 2 (1960) 632; N.T. Burb., Dict. Aust. Pl. Gen. (1963) 169; Cooke, Fl. Pres. Bomb. 2, repr. edn (1967) 498; R.A. Howard, Arnoldia 29, No. 11 (1969) 73-78; D.N. Gibson in Standl. & L.O. Williams, Fl. Guatemala, Fieldiana 2, Part 9, nos 1 & 2 (1970) 201; Moldenke, Fifth Summary Verbenac. etc. 1 & 2 (1971) 40, 424, 533, 572, 618, 639, 735, 753, 883; Moldenke, Ann. Missouri Bot. Gard. 60 (1973) 47; López-Pal., Fl. Venezuela Verbenac. (1977) 327; Moldenke in Dassan. & Fosberg, Fl. Ceylon 4 (1983) 212; Rye in N.G. Marchant *et al.*, Fl. Perth Reg. 1 (1987) 550; Jans.-Jac. in Görtz, Fl. Guianas Ser. A. Phan. Fase. 4. Verbenaceae (1988) 42; R.W. Sanders in R.A. Howard, Fl. Lesser Antilles Dicot. Part 3 (1989) 226; W.L. Wagner, Fl. Pl.

Hawaii 2 (1990) 1319; A.C. Sm., Fl. Viti. 5 (1991) 171; Verdc. in Polhill (ed.), Fl. Trop. E. Afr. Verbenaceae (1992) 37.

Lectotype: *L. camara* L., designated by N.L. Britton, Fl. Bermuda (1918) 314. [A.S. Hitchcock & M.L. Green (1947) selected *L. trifolia* L. which was accepted by Moldenke (1983)].

Camara Plum. ex L., Gen. Pl. edn 5 (1754) 275, *nom. nud.* in syn. – *fide* Moldenke (1973, 1983), López-Pal. (1977).

Kamara Adans., Fam. Pl. 2 (1763) 12, *nom. nud.* – *fide* López-Pal. (1977), Moldenke (1983).

Myrobatindum Vaill. ex L., Gen. Pl. edn 5 (1754) 275, *nom. nud.*

Riedelia Cham., Linnæa 7 (1832) 240 [not Trin. ex Kunth (1833), nor Meisn. (1863), nor Oliver (1883)] – *fide* Moldenke (1940, 1973, 1983), López-Pal. (1977).

Type: *R. lippoides* Cham.

Tamonopsis Griseb., Abh. Königl. Ges. Wiss. Göttingen 19 (1874) 246; Kuntze, Rev. Gen. Pl. 2 (1891) 504 – *fide* Moldenke (1940, 1973, 1983), López-Pal. (1977).

Type: *T. spicata* Griseb.

Erect, scandent or prostrate herbs or shrubs. *Stems* branched, usually more or less scabrous and hirsute, sometimes armed with thorns or prickles. *Leaves* simple, decussate-opposite or ternate, often bullate or rugose, usually dentate or serrate, mostly aromatic, exstipulate, petiolate or subsessile. *Inflorescences* axillary, pedunculate, of contracted heads or dense cylindrical spikes. *Flowers* sessile, in axils of bracts, bisexual, hypogynous. *Calyces* small, persistent, gamosepalous, tubular, membranous, truncate or sinuate-dentate. *Corollas* gamopetalous, hypocrateriform, red, yellow, purple, blue, mauve or white, sometimes bicoloured with throat yellow to orange, often changing colour after fertilisation; tube narrow-cylindrical or somewhat ampliate above the middle, sometimes curved; limbs spreading, regular or obscurely 2-lipped, 4- or 5-lobed; lobes broadly obtuse or retuse at apex. *Stamens* 4, didynamous, included, inserted at or above the middle of the corolla tube; filaments very short; anthers dorsifixed, the cells parallel. *Ovaries* bicarpellary, syncarpous, but generally appearing 1-carpellate (see comments) due to only one carpel usually being developed, 2-locular with 1 basal erect ovule in each locule; style terminal, short, with thick oblique or sublateral stigma. *Fruits* drupe, the mesocarp fleshy when mature; endocarp hard, 2-locular or splitting into two 1-locular pyrenes. *Seeds* without endosperm.

Number of species: World ± 160 species and several infraspecific taxa; Australia 2 naturalised species introduced from tropical America.

Derivation of name

Most authors agree that the name *Lantana* is an ancient name of the *Viburnum* L., which it resembles a little in foliage and inflorescence. Wagner et al. (1990) state that “*Lantana* is the Latin name for the genus *Viburnum* L., which was transferred to *Lantana* by Linnaeus possibly based on the similarity of the inflorescences”. According to Parsons & Cuthbertson (1992), “*Lantana* is from the Latin *lento*, to bend, and was an ancient name for the European wayfaring tree, *Viburnum lantana*, and is used here because of some similarities in foliage and floral structure”.

Distribution

The genus *Lantana* is mostly native to subtropical and tropical America, but there are also a few taxa indigenous to tropical Asia and Africa. It was seemingly introduced to Europe as an ornamental from whence it was carried to various European colonies. It now occurs in about 47 countries (Parson & Cuthbertson, 1992) where several species are widely cultivated under hundreds of cultivar names (Howard, 1969). A few species, like *L. camara*, are aggressive weeds. In Australia, the genus is represented by two naturalised

species, both occurring chiefly in the coastal areas of Queensland and New South Wales. Here it occurs from the tip of Cape York Peninsula southwards along the coast to Narooma township in New South Wales. It has been recorded naturalised around Darwin in the Northern Territory in 1948, from near Perth, Western Australia in 1974 and around Adelaide, South Australia in 1904.

Comments

In *Lantana*, the ovary has been recorded as 1-carpellate by Moldenke (1939, 1940, 1956, 1971, 1973, 1983), Gibson (1970), López-Palacios (1977), Wagner et al. (1990) and a few others. According to Bentham (1870), however, "the ovary in this and the following genus [*Lippia*], as shown by Bocquillon, although containing only 2 cells corresponding to the half-cells of other genera, is yet bicarpellary, one half only of each carpel being developed". This view is supported by the above botanists in their description of the family Verbenaceae. They all agree that the gynoeceium in this family is "composed of 2 (rarely 4 or 5) united carpels" of which one sometimes aborts resulting in a monocarpellary ovary. López-Palacios (1977) has cited *Lantana* as an example of this change.

In recent publications the recorded number of *Lantana* species ranges from 50 (Gibson 1970, Sanders 1989) to 160 (Wagner et al., 1990, A.C. Smith, 1991, Verdcourt, 1992, A.J. Scott, 1994). In "Flora of the Guianas", Jansen-Jacobs (1988) recorded the highest estimate of 240 species. She may have meant 240 specific and infraspecific taxa, as Moldenke (1956, 1973, 1983) who has not given the number of species has quoted 208 to 270 specific and subspecific entities. Macbride (1960) stated that the species in this genus are "apparently not stable and may be fewer than described, ... there are probably about half as many genetic species (or even fewer) than names". As mentioned above, Verdcourt (1992) recorded "about 150 species" in the genus but he also wrote that "the true number of taxa is probably much less". A taxonomic revision of the whole genus is needed to ascertain the actual number of taxa.

A number of species are widely cultivated and there are numerous named cultivars. Howard (1969) admits that "the genus *Lantana* is not an easy one to consider taxonomically". He published a checklist of about 650 cultivar names used in this genus. In his opinion, "the descriptive information available on the cultivars of *Lantana* is mostly brief and is frequently confusing. Selections of *Lantana* may have inflorescences of varying shapes – flat vs. curved or globular – yet this distinction is a matter of the age of the inflorescence. Colors are important in the choice of special varieties, yet individual flowers vary in color with age and maturity". A more or less similar view has been expressed by Sinha & Sharma (1984) who stated that "the colour of the flowers varies from species to species. It even differs in different populations of the same species. ... Changes in flower colour subsequent to anthesis also occur in the same spike". These remarks suggest that from a taxonomic point of view the shape of inflorescence and the colour of flowers in *Lantana* are not reliable characters.

According to Wagner *et al.* (1990) and Verdcourt (1992) "hybridization appears to be widespread in the genus". Spies (1984) observed that "hybridization results in the continuous variation of characters between the parental extremes, and the hybrids may even exceed the parents in some instances. This fact is responsible for the exceedingly difficult task of classifying a hybrid complex according to normal morphological taxonomic procedures". He also pointed out that "it is unpractical to depend on cytological data alone for the classification of plants".

In some parts of the world including eastern Australia, a few *Lantana* species including *L. camara* are aggressive weeds. According to Jex-Blake (1957), however, "there are some, and many garden hybrids too, that are good and safe, and do not seed themselves as does *L. camara*".

Most *Lantana* species are reported to be poisonous to live stock, but in Africa a few are used for the cure of various human diseases (Irvine, 1961).

Affinities

Lantana is closely related to *Lippia*, in that its inflorescence is spicate or subspicate during anthesis, elongating in fruit and its flowers sessile and each subtended by a sessile bract; its calyx being small, membranous and usually hidden by the subtending bract; its 4 perfect stamens; its anthers without appendages; its stigma oblique; its fruit composed of 2 mericarps, mostly splitting at maturity; and its mericarps 1-celled and 1-seeded. Nevertheless, *Lantana* may easily be distinguished by its stem and leaves being harshly pubescent; its calyx-rim almost truncate or sinuate-dentate, not 2-lipped nor distinctly toothed; its ovary 1-carpellate due to abortion of the second carpel; and its fruit drupaceous with a fleshy and juicy exocarp and hard endocarp. For more information on the affinities between *Lantana* and *Lippia* see Jansen-Jacobs (1988, p. 42) and Munir (1993a, p. 113 & 1993b, p. 133).

There are a few characters common to *Lantana* and *Duranta*. Both have oblique stigmas and drupaceous fruits, but *Duranta* differs in its leaves being non-scabrous; its inflorescence racemose, not of contracted heads or dense cylindrical spikes; its flowers usually pedicellate; its calyces 5-ribbed and toothed; and its ovaries composed of 4 bilocular carpels.

According to Sinha & Sharma (1984), "the genus [*Lantana*] is closely allied to some members of the families Acanthaceae and Labiatae [Lamiaceae] from which it may be distinguished by the two-celled ovary with one ovule in each cell and the character of the fruit (Rendle 1925). *Lantana* also differs in the characters of inflorescence and the terminal style from Acanthaceae and Labiatae. It establishes a link with the members of Boraginaceae and can be separated from the latter by the ascending ovule (Takhtajan 1969) and in the arrangement of leaves (Cronquist 1968)".

Key to Australian species of *Lantana*

- 1a. Outer bracts of inflorescence similar in size to inner, linear-lanceolate, often 1–2 mm wide, not conspicuously involucrate; erect shrub; stems and branches often armed with prickles or spines, usually not rooting at nodes; lamina to 120 × 80 mm 1. *L. camara*
- b. Outer bracts of inflorescence much larger than inner, broadly ovate, often 5 mm wide, conspicuously involucrate; prostrate or decumbent woody herb or subshrub; stems and branches unarmed, usually rooting at nodes that touch the ground; lamina to 35 × 20 mm 2. *L. montevidensis*

1. *Lantana camara* L., Sp. Pl. edn 1, 2 (1753) 627, var. *camara*².

Willd., Sp. Pl. 3 (1800) 317; Spreng., Syst. Veg. 2 (1825) 762; Walp., Repert. Bot. Syst. 4 (1845) 61; Schauer in DC., Prod. 11 (1847) 598; Benth., Fl. Aust. 5 (1870) 34; F.M. Bailey & Ten-Woods, Proc. Linn. Soc. N.S.W. 4 (1879) 29 & 174; F.M. Bailey, Synop. Qld Fl. (1883) 375; C.B. Clarke in Hook.f., Fl. Brit. Ind. 4 (1885) 562; F.M. Bailey, Qld Fl. 4 (1901) 1170; Lauterer, Proc. Roy. Soc. Qld 18 (1904) 59; F.M. Bailey, Weeds & Suspec. Poison. Pl. Qld (1906) 141, fig. 241; F.M. Bailey, Comp. Cat. Qld Pl. (1913) 382; Domin, Biblioth. Bot. 89 (1928) 551; C.T. White, Qld Agric. J. 31, Part 4 (1929) 294, t. 87 p.p.; C.A. Gardner, Enum. Pl. Aust. Occ. Part 3 (1931) 111; Moldenke, Lilloa 4 (1939) 288; Moldenke, Publ. Carnegie Inst. Wash. No. 522 (1940) 162; L.J. Webb, Bull. C.S.I.R. No. 232 (1948) 168; Moldenke, Résumé Verbenac. etc. (1959) 209, 458; J.F. Macbr., Field Mus. Nat. Hist. Bot. Ser. Vol. 13, Part 4 (1960) 634; N.C.W. Beadle et al., Handb. Vasc. Pl. Syd. Dist. & Blue Mt. (1963) 416; Meikle in Hutch. & Dalziel, Fl. W. Trop. Afr. 2nd edn, 2 (1963) 435; Backer & Bakf., Fl. Java 2 (1965) 597; R.A. Howard, Arnoldia 29 (1969) 75; D.N. Gibson in Standl. & L.O. Williams, Fl. Guatemala, Fieldiana: Bot. 24, Part 9 (1970) 202; Moldenke, Fifth Summary Verbenac. etc. 1 & 2 (1971) 347, 884; Chippend., Proc. Linn. Soc. N.S.W. 96, Part 4 (1972) 256; Moldenke, Ann. Missouri Bot. Gard. 60 (1973) 57; López-Pal., Fl. Venezuela, Verbenac. (1977) 351, fig. 83; Kleinschmidt & R.W. Johnson, Weeds Qld (1977) 33,

²Of the several named varieties of *L. camara* the present author has been able to examine the microfiche of the typical variety and var. *aculeata*. The type of the typical variety matches well with the Australian material of the species. In view of geographical limit of this review, no attempt was made to examine the types of other varieties. In the synonymy, the names not used in Australia or the neighbouring regions have been excluded.

186, 260; Moldenke, Sixth Summary Verbenac. etc. Phytologia Mem 2 (1980) 337, 553; N.C.W. Beadle, Fl. Syd. Reg. edn 3 (1982) 510; L.S. & D.A. Smith, Qld Bot. Bull. No. 1 (1982) 1–21; Spies & C.H. Stirt., Bothalia 14, No. 1 (1982) 101–111; Moldenke in Dassan & Fosberg, Fl. Ceylon 4 (1983) 220; Raj, Rev. Palaeobot. Palynol. 39 (1983) 349; D.J. Carr (ed.), Syd. Park. Artist Cook End. Voy. (1983) 61, t. 56; N.C.W. Beadle, Stud. Fl. NE N.S.W. Part 5 (1984) 850, fig. 373B; S. Sinha & A. Sharma, Feddes Repert. 95 (1984) 621–633; Spies, S. Afr. J. Bot. 3, no. 4 (1984) 231–250; Stanley in Stanley & E.M. Ross, Fl. S.E. Qld 2 (1986) 365; Rye in N.G. Marchant et al., Fl. Perth Reg. Part 1 (1987) 550; Jans-Jac. in Görts, Fl. Guianas (1988) 43; R.A. Howard, Fl. Lesser Antilles, Dicot., Part 3 (1989) 227; W.L. Wagner et al., Fl. Pl. Hawaii (1990) 1320; A.D. Chapm., Aust. Pl. Name Index K–P (1991) 1746; A.C. Sm., Fl. Viti. Nova. 5 (1991) 172; W.T. Parsons & Cuthbertson, Noxious Weeds Aust. (1992) 627–632; Verdc., Fl. Trop. E. Afr. Verbenac. (1992) 39; Lazarides & Hince, Econ. Pl. Aust. (1993) 144; Dowling & McKenzie, Poison Pl. (1993) 136; P.S. Green, Fl. Aust. 49 (1994) 313; A.J. Scott, Fl. Mascar. Verbenac. (1994) 9; Pedley in R.J.F. Hend. (ed.), Qld Vasc. Pl. (1994) 336.

Type: “Linnean Herbarium No. 783/4, probably collected from cultivated material in the University garden at Uppsala, Sweden” (LINN, microfiche!). Designated by H.N. Moldenke (1983). “Type locality: Brazil” – *vide* P’ei (1932). [*Note*: The typification of var. *camara* has neither been adequately discussed by previous authors nor investigated by the present author.]

L. aculeata L., Sp. Pl. edn 1, 2 (1753) 627; Curtis, Bot. Mag. 3 (1790) t. 96; Willd., Sp. Pl. 3 (1800) 320; King & Gamble, Mat. Fl. Malay. Penin., J. Asi. Soc. Beng. 75 (1909) 796; H.J. Lam, Verbenac. Malay. Archip. (1919) 12; H.J. Lam, Bull. Jard. Bot. Buitenzorg. Ser. III, 3 (1921) 4; Ridley, Fl. Malay. Penin. 2 (1923) 612.

Type: Linnean Herbarium No. 786/6, specimen grown at the University of Uppsala Botanic Garden (LINN, microfiche!). Designated by H.N. Moldenke (1983) under *L. camara* var. *aculeata*. [*Note*: The typification of var. *aculeata* has neither been adequately discussed by previous authors nor investigated by the present author.]

L. mista L., Syst. Nat. edn 12, 2 (1767) 417; Willd., Sp. Pl. 3 (1800) 315; Walp., Repert. Bot. Syst. 4 (1845) 60. – *vide* D.N. Gibson (1970).

Type: From a plant cultivated in the garden of L. Sherard at Eltham, England, collected about 1726 (OXF, n.v.) – *vide* Moldenke (1983).

L. flava Medik., Hist. & Commentat. Acad. Elect. Sci. Theod.-Palat. 3, Phys. (1775) 225 – *vide* W.L. Wagner et al. (1990).

Type: (n.v.). According to Stafleu & Cowan (1981), Medikus’s herbarium and types are unknown.

L. sanguinea Medik., Hist. & Commentat. Acad. Elect. Sci. Theod.-Palat. 3, Phys. (1775) 229; Schauer in DC., Prod. 11 (1847) 600 – *vide* W.L. Wagner et al. (1990).

Type: (n.v.) According to Stafleu & Cowan (1981), Medikus’s herbarium & types are unknown.

L. splendens Medik., Hist. & Commentat. Acad. Elect. Sci. Theod.-Palat. 3, Phys. (1775) 226 – *vide* Moldenke (1980).

Type: “*Dillenius s.n.*, from James Sherard’s garden at Eltham, England (OXF)”, n.v. – *vide* Moldenke (1983).

L. nivea Vent., Jard. Malmaison 1, Part 2 (1803) 8, t. 8; Spreng., Syst. Veg. 2 (1825) 761; Walp., Repert. Bot. Syst. 4 (1845) 59; Schauer in Mart., Fl. Brasil 9 (1851) 225 – *vide* W.L. Wagner et al. (1990).

Type: Rio de Janeiro, Brazil (G-DC., microfiche!).

L. crocea Jacq., Pl. Hort. Schoenbr. 4 (1804) 37, t. 473; F.M. Bailey, Qld Fl. 4 (1901) 1171; F.M. Bailey, Comp. Cat. Qld Pl. (1913) 382; C.T. White, Qld Agric. J. Ser. 2, 27 (1927) 481; A.D. Chapm., Aust. Pl. Name Index K–P (1991) 1747 – *vide* Urban (1911), R. Knuth (1927).

Type: “Crescit in Jamaica. Floret in Caldario Aprili & May” (W, n.v.).

L. antidotalis Schumach. & Thonn., Beskr. Guin. Pl. (1827) 276; Schauer in DC., Prod. 11 (1847) 598; Moldenke, Résumé Verbenac. etc. (1959) 133, 135, 136, 142, 147, 219, 458; Moldenke, Fifth Summary Verbenac. etc. 1 (1971) 210, 215, 216, 230, 244, 364 – *vide* Meikle (1963), Verdcourt (1992).

Type: Thonning 125, loc. incert., “Ghana [Guinea] (C, syn., P-JU, isosyn.” n.v.) – *vide* Verdcourt (1992).

L. nivea Vent. var. *mutabilis* Hook., Curtis Bot. Mag. Vol. 58, N. Ser. Vol. 5 (1831) t. 3110 – *vide* W.L. Wagner et al. (1990).

Type: Plate 3110 in Curtis Bot. Mag. 58 (1831).

L. tiliaefolia Cham., Linnaea 7 (1832) 122; Schauer in DC., Prod. 11 (1847) 600; Moldenke, Fifth Summary Verbenac. etc. 1 & 2 (1971) 347, 889; Moldenke, Sixth Summary Verbenac. etc. Phytologia Mem. II (1980) 337,

557; S.W.L. Jacobs & J. Pickard, Pl. N.S.W. (1981) 209; N.C.W. Beadle, Student Fl. NE N.S.W., Part 5 (1984) 850; A.D. Chapm., Aust. Pl. Name Index K-P (1991) 1747 – *fide* D.N. Gibson (1970).

Type: Sieber s.n. for J.C. Hoffmannsegg, Bahia, Brazil, 1804 (B-W No. 11502, microfiche!).

L. hirsuta M. Martens & Galeotti, Bull. Acad. Roy. Sci. Bruxelles 11 (1844) 326; R. Knuth, Feddes Repert. Sp. Nov. Beih 43 (1927) 600 – *fide* D.N. Gibson (1970).

Type: Henrico Galeotti no. 749, loc. inc., Mexico, – (BR, n.v.).

L. viburnoides Blanco, Fl. Philipp. edn 2 (1845) 345 *nom. illeg.*, not *L. viburnoides* Vahl (1790) – *fide* H.J. Lam (1919), Merrill (1923), Moldenke (1983).

Type: According to E.D. Merrill (1905), “the types of all Blanco species have been destroyed”.

L. hybrida Hort. ex Neub., Deutsch. Gart. Mag. 10 (1857) 98 – *fide* W.L. Wagner et al. (1990).

Type: Plate on p. 98 in the protologue, otherwise no specimen cited.

Camara aculeata (L.)Kuntze, Rev. Gen. Pl. 1 (1891) 503 – *fide* Domin (1928), Moldenke (1940, 1983), López-Pal. (1977).

Type: As for L. aculeata L.

C. aculeata (L.)Kuntze var. *normalis* Kuntze, Rev. Gen. Pl. 1 (1891) 503 – *fide* Moldenke (1939, 1940, 1973, 1983).

Type: As for L. camara L.

Lantana camara L. var. *crocea* (Jacq.)L.H. Bailey, Cycl. Amer. Hort. 2 (1900) 884; L.J. Webb, Bull. Council Sci. Industr. Res. No. 232 (1948) 169; A.D. Chapm., Aust. Pl. Name Index K-P (1991) 1746 – *fide* D.N. Gibson (1970).

Type: As for L. crocea Jacq.

L. camara L. var. *mista* (L.)L.H. Bailey, Cycl. Amer. Hort. 2 (1900) 884; Moldenke, Ann. Missouri Bot. Gard. 60 (1973) 58; López-Pal., Fl. Venezuela Verbenac. (1977) 358, fig. 85; Moldenke in Dassan & Fosberg, Fl. Ceyl. 4 (1983) 229; A.C. Smith, Fl. Viti. 5 (1991) 173 – *fide* D.N. Gibson (1970).

Type: As for L. mista L.

L. camara L. var. *mutabilis* (Hook.)L.H. Bailey, Cycl. Amer. Hort. E-M (1900) 884; H. St. John, Fl. Pl. Hawaii. Isls (1973) 290 – *fide* W.L. Wagner et al. (1990).

Type: As for L. nivea Vent. var. *mutabilis* Hook.

L. camara L. var. *nivea* (Vent.)L.H. Bailey, Cycl. Amer. Hort. 2, E-M (1900) 883; H. St. John, Fl. Pl. Hawaii. Isls (1973) 290 – *fide* W.L. Wagner et al. (1990).

Type: As for L. nivea Vent.

L. camara L. var. *sanguinea* (Medik.)L.H. Bailey, Cycl. Amer. Hort. 2, E-M (1900) 884; C.T. White, Qld Agric. J. Ser. 2, 31, Part 4 (1929) 294; H. St. John, Hawaii. Fl. Pl. (1973) 290; A.D. Chapm., Aust. Pl. Name Index K-P (1991) 1746; – *fide* W.L. Wagner et al. (1990).

Type: As for L. sanguinea Medik.

L. camara L. var. *aculeata* (L.)Moldenke, Torreya 34 (1934) 9; Parham, Pl. Fiji Isls (1964) 215; Parham, Pl. Samoa (1972) 54; H. St. John, Fl. Pl. Hawaii. Isls (1973) 290; Moldenke, Ann. Missouri Bot. Gard. Fl. Panama 60 (1973) 58; López-Pal., Fl. Venezuela, Verbenac. (1977) 356, fig. 84; Moldenke, Sixth Summary Verbenac. etc. Phytologia Mem. II (1980) 337, 553; Moldenke, Phytologia 52, No. 2 (1982) 125; Moldenke in Dassan & Fosberg, Fl. Ceylon 4 (1983) 225; A.D. Chapm., Aust. Pl. Name Index. K-P (1991) 1746; A.C. Smith, Fl. Viti. Nova 5 (1991) 173 – *fide* R.A. Howard (1989), W.L. Wagner et al. (1990).

Type: As for L. aculeata L.

L. scandens Moldenke, Phytologia 2 (1941) 18 – *fide* D.N. Gibson (1970).

Type: George B. Hinton 12315, at Villa Victoria, Pto de Aire, alt. 1480 m, Coalcoman, Michoacán, Mexico, 3.x.1938 (NY, Herb. N.L. Britton, n.v.) – fide Moldenke (1941).

L. camara L. var. *flava* (Medik.)Moldenke, Geog. Distrib. Verbenac. & Avicenn. (1942) 77; Specht in Specht & Mountford, Rec. Amer. Aust. Sci. Exped. Arnhem Land, 3 Bot. & Pl. Ecol. (1958) 289; H. St. John, Hawaii. Fl. Pl. (1973) 290 – *fide* W.L. Wagner et al. (1990).

Type: As for *L. flava* Medik.

L. camara L. var. *hybrida* (Neub.)Moldenke, Phytologia 2, No. 1 (1941) 18; H. St. John, Fl. Pl. Hawaii. Isl. (1973) 290 – *fide* W.L. Wagner et al. (1990).

Type: As for *L. hybrida* Neub.

L. camara L. var. *splendens* (Medik.)Moldenke, Phytologia 33 (1976) 130; Moldenke in Dassan. & Fosberg, Fl. Ceylon 4 (1983) 223; A.D. Chapm., Aust. Pl. Name Index K–P (1991) 1747.

Type: As for *Lantana splendens* Medik.

L. camara L. f. *flava* (Medik.)Moldenke, Phytologia 45, No. 3 (1980) 296.

Type: As for *L. flava* Medik.

L. camara L. f. *mista* (L.)Moldenke, Phytologia 45, No. 3 (1980) 296.

Type: As for *L. mista* L.

L. camara L. f. *mutabilis* (Hook.)Moldenke, Phytologia 45, No. 3 (1980) 296.

Type: As for *L. nivea* Vent. var. *mutabilis* Hook.

L. camara L. f. *sanguinea* (Medik.)Moldenke, Phytologia 45, No. 3 (1980) 296.

Type: As for *L. sanguinea* Medik.

L. camara L. f. *splendens* (Medik.)Moldenke, Phytologia 45, No. 3 (1980) 296.

Type: As for *L. splendens* Medik.

Description (Fig. 1)

A sprawling or scandent shrub, 1–3 (-6) m tall, often forming dense thickets. *Stems* and branches ± quadrangular when young, slightly or copiously armed with short recurved prickles, sometimes almost unarmed, puberulous-glabrate, hirtellous or strigose, sometimes mixed with glands or glandular hairs. *Leaves* petiolate, decussate-opposite; lamina ovate, oblong-ovate, membranaceous-chartaceous, (3.5-) 4–10 (-12) cm long, (1.5-) 3–6 (-8) cm wide, often bullate-rugose or scabrous to scabrous-rugose with coarse tubercle-based hairs above, viscid-tomentose to strigose or glabrescent beneath, margin crenate-serrate, apex acute-acuminate, base rounded, subcordate or attenuate and abruptly decurrent, primary and secondary veins flat or slightly impressed above, prominent beneath, secondary veins 5–8 pairs; petiole (3-) 5–20 (-25) mm long, strigose or hirsute, sometimes mixed with glands or glandular hairs. *Inflorescences* densely flowered heads, pedunculate, axillary, solitary or sometimes with 2 peduncles per leaf-axil; heads capitate, hemispheric, many flowered, scarcely elongating after anthesis, 10–20 (-30) mm diam., the peduncle slender, (20-) 30–80 (-95) mm long, appressed pilose or puberulous; bracts linear-lanceolate to lanceolate or lanceolate-oblong, (3-) 4–6 (-8) mm long, 1–1.5 mm wide, usually shorter than the corolla-tube, subulate or acute apically, appressed strigose-pubescent outside, subglabrous inside, deciduous in fruit. *Flowers* sessile, bracteate. *Calyces* small, inconspicuous, membranous, almost truncate or weakly 2-lobed, pubescent mixed with minute glands outside, glabrous inside, 1–2 mm long, 0.8–1 mm wide. *Corollas* hypocrateriform, variously coloured, ranging from yellow, orange-yellow, deep orange, deep red, pink, rose-pink to white with a yellow throat or some with faint pinkish tinge, pubescent outside, subglabrous or puberulous inside the inflated part of the tube; tube cylindrical, somewhat curved and inflated from middle upwards, 7–10 (-12) mm long, (0.5-) 1–1.5 mm diam.; limbs 5–10 mm wide; lobes broadly elliptic-orbicular in outline, 1–3 mm long, 2–5 mm wide near base. *Stamens* inserted just above the middle of the corolla-tube; filaments glabrous, 0.5–1 mm long; anthers orbicular in outline, ± 0.5 mm long. *Ovaries* ellipsoid, glabrous, 0.5–1 mm long; style included, filiform, glabrous, 2–3 mm long, stigma oblique or sublateral,

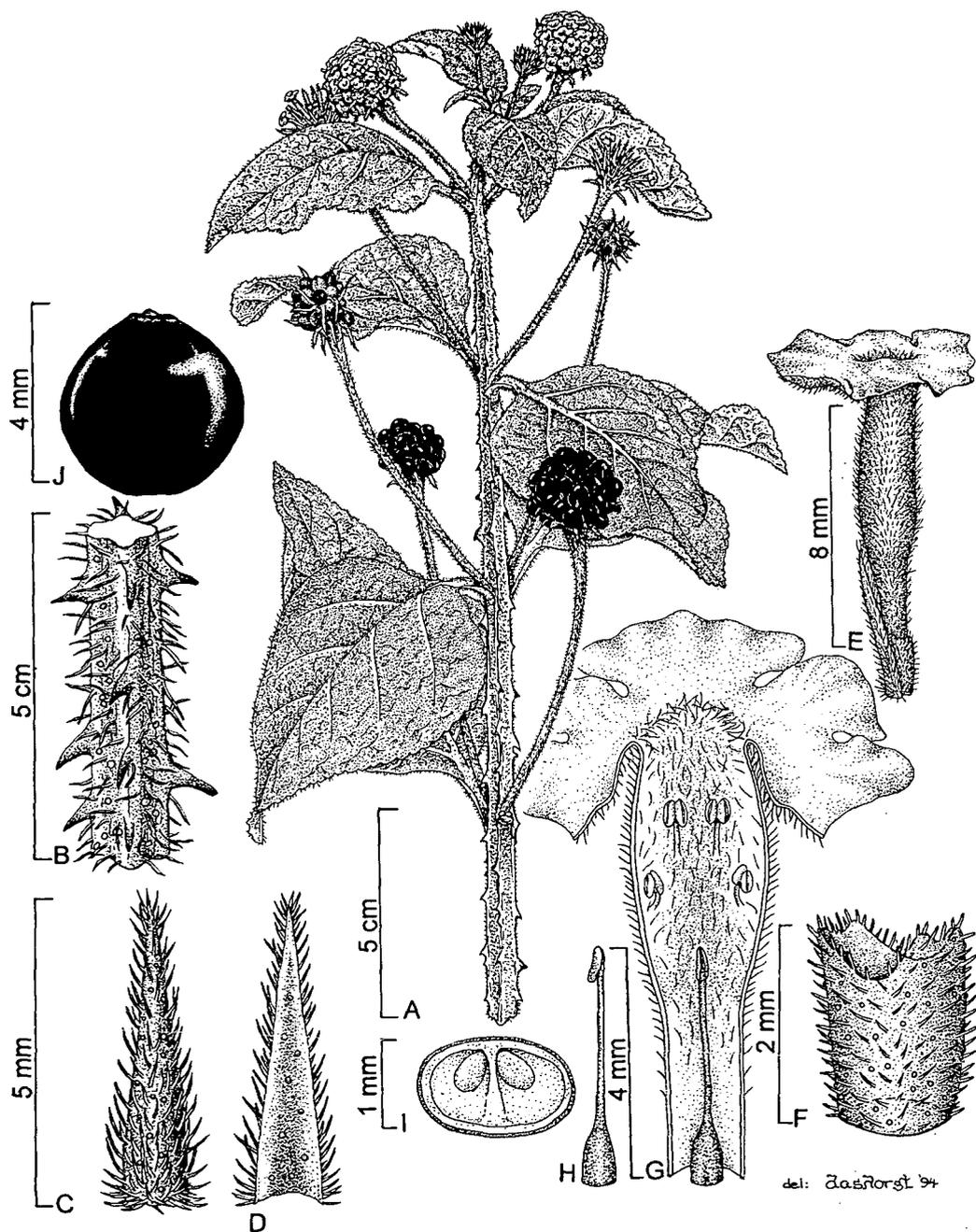


Fig. 1. *Lantana camara* L. var. *camara* (A–J, W.J. Jones 1635: CANB). A, habit sketch of a branch with flowers and fruit; B, portion of stem showing spines and hairs; C, abaxial view of bract; D, adaxial view of bract; E, flower with bract; F, calyx showing two shallow lobes; G, longitudinally cut open corolla showing androecium and gynoecium; H, gynoecium showing oblique stigma; I, transverse section of ovary; J, fruit.

minute, capitate. *Fruiting-heads* up to 15 mm long. *Drupes* purple or black, ellipsoid-globose or obovoid, glabrous, lustrous, partly enclosed by the bracts and calyx, 3–5 mm diam.; pyrenes 2, ovoid, 3–4 mm long.

Representative specimens (collections seen: Australian 295, non-Australian 362)

AUSTRALIA: QUEENSLAND: *Batianoff 11395*, *Champion s.n.*, *Thompson s.n.* & *Dilleward s.n.*, Chase Point, South Percy Island, 50 km NE of Arthur Point, Shoalwater-Bay, 25.x.1989 (BRI); *Briggs 1932*, 1.6 km S of Milla Milla, Atherton Tableland, 1.viii.1968 (NSW); *Clarkson 3877*, Boigu Island, 20.x.1981 (BRI, K); *Clarkson 6337*, 40 Mile Scrub, c. 4 km N of Gulf Development Road turnoff on the Kennedy Highway, 21.ii.1986 (AD, BRI, DNA, L, PERTH, QRS); *Everist 7657A*, Frenchville, suburb of Rockhampton, 25.viii.1964 (BRI, CANB, NSW); *Halliday 352*, Tusky Creek, 12 km SE of Rosedale on Bundaberg Road, 4.iv.1975 (BRI 2 spec., HO); *Lazarides 4240*, near Atherton Township, 1.iii.1954 (BRI, CANB 2 spec., K, MEL, NSW); *Moriarty 891*, St Lucia, Brisbane, 29.iii.1972 (BRI, CANB); *Moriarty 1524*, Alloah Ridge in Canungra Army Jungle Training Centre, SE of Canungra township, 25.iii.1974 (BRI, CANB); *Rogers s.n.*, Imbil, near Gympie, 5.v.1979 (BRI 470124); *Seawright 7*, Limestone Creek Bridge, Rockhampton district, 14.xi.1961 (BRI); *Simmonds s.n.*, Brisbane, Toowong, 22.x.1887 (BRI); *Smith 13121*, c. 1 km along Collins Av. Edge Hill, Cairns, 29.iii.1966 (BRI); *Specht 816* & *Reeves s.n.*, upper Kandanga Creek, W of Cooroy, 16.iii.1989 (BRI); *Stoddart 4363*, Low Island, Sandy Cay, 29.viii.1973 (BRI, K); *White 8829*, Oonoobah, near Townsville, 25.iii.1933 (BRI).

NEW SOUTH WALES: *Auld 1202*, Yamba, small island at W end middle sea wall in mouth of Clarence River, 18.iv.1982 (NSW); *Beckler s.n.*, Hastings River, 1869 (MEL 583702, MEL 583705); *Coveny 11147* & *Thomas s.n.*, La Perouse, 7.vii.1982 (K, L, MO, NSW 283270); *Coveny 6414* & *Powell s.n.*, loc. cit., 3.vi.1975 (CANB, G, HY, K, LE, MO, NSW); *Donabauer 7*, *Dunn s.n.* & *Coveny s.n.*, Park Beach, Coffs Harbour, 19.xi.1987 (DAO, NSW, PRE); *Forbes 2801*, Kooyong, between Ardilly and Tullymorgan, 21.ii.1985 (MEL, NSW); *Goode 348*, Sans Souci near Georges River, 27.ix.1961 (K, NSW); *Hawkes s.n.*, Ulladulla, 2.ii.1965 (NSW 283604); *L. Johnson s.n.* & *Rodd s.n.*, Kurmond, 14.iii.1973 (BRI, NSW 128275); *O'Ryan 73*, 6 km from Nowra, at Albatross Road and Flat Rock Creek crossing, 13.viii.1984 (AD, CBG, L, MEL, US); *Rodway s.n.*, Nowra, 29.iv.1942 (K, NSW 283607); *Symon 11532*, Manarm Creek near Repton, 22.i.1979 (AD, BH, L, LG, NSW); *Wilson 1583* & *1584*, 18 km SW of Warbro and Toorooka on Kookaburra Road, 23.iv.1976 (K, NSW 2 spec.).

NORTHERN TERRITORY: *McKean B288*, The Esplanade, Darwin, 6.ii.1972 (CANB, DNA, K); *Nelson 1085*, Fannie Bay, Darwin, 9.vi.1964 (AD, BRI, DNA, PERTH); *Russell-Smith 5937* & *Lucas s.n.*, Holmes Jungle, Darwin, 18.viii.1988 (DNA); *Specht 159*, Nightcliff, Darwin, 3.iv.1948 (AD, BRI, CANB).

VICTORIA: *Mulvaney s.n.*, Frankston, on railway line embankment near Frankston Flinders road, 19.xii.1986 (MEL 234520).

SOUTH AUSTRALIA: *Bates 14529*, Anstey Hill Reserve, 25.vi.1988 (AD); *Black s.n.*, Waterfall Gully, c. 10 km ESE of Adelaide, -ii.1904 (AD).

WESTERN AUSTRALIA: *Clark 29*, 80.47 km S of Cloister Ave, Canning River foreshore, 30.vii.1974 (PERTH).

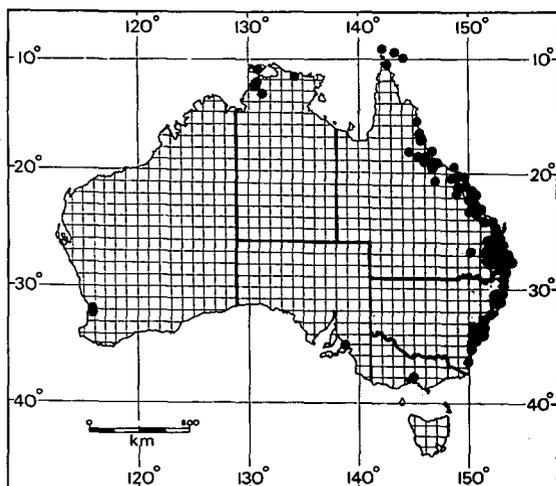
NORFOLK ISLAND: *Hoogland 11-279*, along Duncombe Road near Captain Cook Monument, 31.x.1967 (CANB).

Distribution and ecology (Map 1)

In Australia, *L. camara* var. *camara* is found chiefly in coastal regions of Queensland, New South Wales and the Northern Territory, with only a few records from other mainland States. Distribution in Queensland is along the east coast, particularly between Cooktown and the New South Wales border. Further north, it has been collected from the tip of Cape York Peninsula and several islands in the Torres Strait. This species has also been recorded from several off-shore islands along the Great Barrier Reef.

In New South Wales it occurs in the coastal area from the Queensland border to Narooma township but especially to the north. In the Northern Territory it occurs around Darwin, Adelaide River township, Maningrida Settlement and on Melville Island. In Western Australia it has been collected from the suburbs of Fremantle and Perth, and in South Australia mainly from eastern and northern metropolitan suburbs of Adelaide. The only known collection from Victoria (Melbourne) seems to be a garden escape. So far, no naturalised record of this species is known from the interior of mainland Australia or Tasmania. Parson & Cuthbertson (1992) have recorded it from near Broome, Carnarvon, Geraldton and south-east of Perth, and Swarbrick (pers. comm.) reported it "naturalised on

limestone cliffs in Kings Park" in Western Australia. The present author, however, has not seen any specimens from these areas.



Map 1. Distribution of *L. camara* var. *camara* in Australia

The cold climate of Tasmania seems unsuitable for the naturalisation of *L. camara* or perhaps any *Lantana* species, while the occurrence of var. *moritziana* in Queensland has not been confirmed so far.

According to Australian collectors' field notes, *L. camara* grows in diverse habitats. It is found in clay, sand, loam, sandstone, gravel or a mixture of these soil types. Generally it occurs in disturbed areas, such as open-forest areas recovering from fire, on wastelands near railway tracks, along roads, edges of cleared rainforest, at the beach front and in open mixed forests. Other recorded environments includes from the edge of mangroves, vine forest, monsoonal forest, mixed agricultural-pastoral areas and grazing paddocks. It has also been found along creek banks, in riverine plant community and on damp areas around dams. Parsons & Cuthbertson (1992) state that "the plant tolerates a wide range of environmental conditions, thriving in both dry and humid climates. Mainly found on rich soils, it occurs on lowlands, mountain slopes and in valleys at altitudes between sea level and 1800 to 2000 metres. It occurs as a weed along roadsides, creekbanks, fence lines, and in waste places and is a common component of weedy pastures, parklands and arable fields; it tolerates shade and may become the dominant understorey in open forests and tropical tree plantations".

Comments

L. camara (s.l.) is the most widespread species in the genus. It occurs widely as a weed in warmer parts of the world and owing to the considerable morphological and cytological variation it presents a complex taxonomical problem. In view of its extremely variable and polymorphic nature botanists have described it under different names. As a result, *L. camara* seems to have the largest number of synonyms in the genus. Due to variation in the many colour forms, it has been widely cultivated as an ornamental. On the basis chiefly of the difference in flower colour and sometimes in conjunction with the shape of corolla-lobes or vegetative characters Smith and Smith (1982) recognised 29 colour forms or taxa to which they gave names from eastern Australia. Previously, this variation, in particular

Naturalised material from outside Australia has been examined from Lord Howe Island, Norfolk Island, Marshall Island, Nauru, Papua New Guinea, New Caledonia, Tonga, Samoa, Tahiti, Fiji, Hawaii, Indonesia, Malaysia, Thailand, Philippines, China, India, South Africa, West Indies and Central America. According to Moldenke (1983), this taxon is "widely distributed in subtropical and tropical America from Florida, through the West Indies and S. America to Argentina, Bolivia and Peru; less common in Central America; introduced and naturalised in many other warmer parts of the world".

Moldenke (1982) recorded *L. camara* var. *aculeata* from Tasmania and *L. camara* var. *moritziana* (Otto & Dietr.)López-Pal. from Queensland.

the many colour forms, lead Howard (1969) to the description of about 650 cultivar names in the genus of which a majority seem to have been within the *L. camara* complex.

Several botanists have expressed their views on the variable nature of *L. camara*. For instance, Jansen-Jacobs (1988) states that "*Lantana camara* is a very variable species. The indumentum varies from strigose to glandular hairs. The fruiting capitula can be not prolonged or conspicuously prolonged. The flower colour can be orange, yellow, lilac or white. All intermediate character states occur. It is to be expected that *Lantana camara* has a large number of synonyms". On the same subject, Macbride (1960) reports that *Lantana* "species [are] apparently not stable and may be fewer than described ...; there are probably about half as many genetic species (or even fewer) than names". A more or less similar view has been expressed by Wagner et al. (1990), Smith (1991) and a few others. The change in shape and size of leaves, size of fruiting capitula, presence or absence of spines and presence of many colour forms has often lead to the description of new taxa. In fact all these characters are variable and intermediates often merge from one infraspecific taxon into another. Perceiving this complexity, Moldenke (1971) states that "probably a lifetime project could be made of a thorough and intensive study of the *Lantana camara* group". He expressed his doubt about "how many taxa can really be distinguished, how can they be keyed out, and what is their relationship to each other? How greatly is hybridity involved here?". So far, no one has come up with a satisfactory answer to these questions.

Regarding problems encountered in the *L. camara* complex, Parsons & Cuthbertson (1992) state that "there is, as yet, no evidence of hybridisation in the field but branches of plants occasionally revert to other forms and breed true. ... As there appears to be little correlation between chromosome number and the morphology of these groups, it was suggested that the South African complex is still in an active evolutionary phase and that most plants are intermediates in a transitional stage of speciation. It follows that attempts to recognise intraspecific entities within the group are unlikely to be successful. The same may be true of Australian material". On the same problem Spies (1984) reports that "*L. camara sensu lato* presents a complex taxonomical problem owing to the considerable morphological variation present within this species. This variation, in particular the many colour forms, has lead to the description of more than 650 cultivars (Howard 1969). These taxa were not distinguished by clear morphological differences and several nomenclatural ambiguities were also included (Stirton 1977)". He further states that "hybridization results in the continuous variation of characters between the parental extremes, and the hybrids may even exceed the parents in some instances. This fact is responsible for the exceedingly difficult task of classifying a hybrid complex according to normal morphological taxonomic procedures". In a later publication, Spies & Stirton (1982) wrote that "experience gained from a number of areas of the tropics over many decades has shown that *L. camara* is not a homogeneous species, but actually consists of a number of forms". On the same topic Sastri (1962) comments that "the varieties and types are so intermixed that it is difficult to differentiate between them morphologically". On the complex variation in *L. camara*, Smith and Smith (1982) comment that "no evidence has been noted of extensive spontaneous hybridisation in the field but some individuals are subject to branch mutation. A mutant branch may be produced with characters sufficiently distinct from the remainder of the plant to be regarded as a different taxon. Seeds from mutant branches have been found to produce plants similar to the mutant branch and in this way a new taxon may become established. The possibility also exists that these mutant branches may be reversion shoots ('throwbacks') representing the original parent material from which the plant that produce them was derived. With variation of such complexity it was found impossible to name each taxon according to the International Code of Botanical Nomenclature particularly since the literature on these plants is so confused. Consequently, for each of the taxa distinguished in eastern Australia, the field names used by Mr. Smith [unpublished reports 1966, 1967] have been cited. These are probably best regarded as cultivar names as defined in the International Code of Nomenclature for Cultivated Plants (1980)".

Moldenke (1940) also records that "*L. camara* is an extremely variable and polymorphic species. Races differ in the size and shape of leaves, the presence or absence of prickles, the amount of pubescence, and the size and color of the flowers". In a subsequent publication, Moldenke (1973) states that *L. camara* is "introduced and naturalized in the tropics and subtropics [mostly as var. *aculeata* (L.)Moldenke] of the Old World where it has become a troublesome weed in some places; widely cultivated in hundreds of cultivars; probably originally West Indian, but now widely misinterpreted". In spite of this awareness, the material referred to *L. camara* has been divided by Moldenke and others into several species and infraspecific taxa. The characters used in distinguishing these taxa, however, are variable and inconstant, and there appears to be every intermediate. Several species previously reduced by Moldenke (1934, 1941, 1947, 1976) to variety level were later (1980) further relegated to the category of form. Thus the value of infraspecific taxa in *L. camara* seems questionable. In an attempt to resolve the infraspecific problem, Spies (1984) undertook a cytotaxonomic study of *L. camara* from South Africa. He applied numerical taxonomic methods to the cytological data obtained from 97 *L. camara* plants, but no correlation was found to exist between the cytological data and plant morphology. According to Spies (1984), "the cytological data demonstrated that *L. camara* is in an active evolutionary phase and, because most plants are intermediates in a transitional stage of speciation, no attempt to recognise infraspecific entities will succeed".

In Australia, the *L. camara* complex can be divided into two major groups, namely thornless and thorny. The thornless group is the major garden ornamental biotype said to produce few if any seeds, whereas the thorny group is the weedy biotype reportedly producing abundant seeds. There are some weedy forms, however, with almost no thorns or sometimes with only a few sparse minute thorns. These plants seem to be intermediate forms and could not be clearly assigned to either group.

In Australian literature, material of var. *camara* has been published under the names: *L. aculeata* L., *L. crocea* Jacq., *L. tiliaefolia* Cham., *L. camara* var. *aculeata* (L.)Moldenke, *L. camara* var. *crocea* (Jacq.)L.H. Bailey, *L. camara* var. *flava* (Medik.)Moldenke, *L. camara* var. *mista* (L.)L.H. Bailey, *L. camara* var. *mutabilis* (Hook.)L.H. Bailey, *L. camara* var. *sanguinea* (Medik.)L.H. Bailey and *L. camara* var. *splendens* (Medik.)Moldenke. Of the above taxa Moldenke (1980) relegated the varieties *flava*, *mista*, *mutabilis*, *splendens* and 9 others to the category of form. In recent publications by others all these taxa have been treated as synonyms of the typical form of *L. camara*. It may be of interest to note that *L. aculeata* L. was first recognised as a synonym of *L. camara* by Schauer (1847). More recently Webb (1948) wrote that "the varieties *sanguinea* and *crocea* are barely separable botanically". Similarly Smith (1991) regarded the varieties *aculeata* and *mista* as "dubiously separable" taxa. Several other taxonomists have expressed their doubts on the status of the above named infraspecific taxa. As no reliable character is available to distinguish them taxonomically, therefore, they are being treated here as synonymous with the typical form.

Enormous literature has been devoted to *L. camara*, and many botanists have declared it a dangerous weed in very many parts of the tropics. In this respect, only a few comments made by Australian and overseas botanists are recorded here. Bailey (1906) wrote that "the plant has overrun many of the river scrubs, and become a well-known pest". Gamble (1956) reports that "the plant is most troublesome and measures for its destruction are often necessary though difficult". In the book on 'Gardening in East Africa', Jex-Blake (1957) states that "this plant is now scheduled as a dangerous weed, and, pretty as it is when in flower, should be extirpated on sight". According to Irvine (1961), "it is a most troublesome weed in parts of Ghana and elsewhere in tropics, and has proved a serious obstacle to forest regeneration in some districts". Duthie (1960) says that as an undergrowth in forest, although beneficial to some extent as offering shelter to young trees, it has nevertheless proved itself to be a very troublesome weed in deciduous forests, and very difficult to eradicate". Gibson (1970) reports that "this is a common weedy shrub in much

of tropical America". She considers it "a weed of banana plantations, often invading cultivated ground". Parsons & Cuthbertson (1992) state that in Australia the "weedy biotypes [of *L. camara*] are very serious weeds of pastures, citrus groves, ... and, sometimes, timber crops. They are estimated to infest some 4 million ha in Australia and have taken over many pasture areas, shading out useful species and reducing productivity". Attention is drawn by Howard (1969) to a poster distributed by the Department of Agriculture in Rhodesia (Zimbabwe) pleading for the extermination of *L. camara*. It reads "*Lantana camara*. A perfect pest! Get rid of it Now".

From an economic point of view, *L. camara* is said to form a useful hedge and is a popular garden plant for its spectacular coloured flowers. The leaves and flowers have a mint-like odour and are used as tea against fever, influenza and stomach ache. According to Irvine (1961), "the powdered root in milk is given to children for colic and stomach ache, and an infusion of the whole plant used for bronchitis and other catarrh infections. The leaf decoction is drunk there [in Ghana] for constipation and as a febrifuge and is applied externally to ophthalmia and festering sores, or used in baths and hot fomentations for dropsy. An aromatic oil from the leaves is used in fomentations (Ainslie). An aromatic infusion of leaves and flowering tops, sometimes with *Ocimum*, is used especially by W. Indian resident in W. Africa, as a febrifuge and diaphoretic. The leaves, with leaves of the banana and *Morinda lucida* and other herbs, are boiled together and the body steamed over the pot for 'yellow fever'. A quinine-like alkaloid, *lantanine*, has been isolated from this plant, the effect of which is anti-spasmodic". White (1929) states that "the red flowering variety (*L. camara* var. *sanguinea*) is by far the more virulent. *Lantana* causes a disease in cattle known colloquially as 'pink-nose'. In the opinion of Jex-Blake (1957), "the hybrid *Lantana* are safe; but that pernicious weed, the pretty pink-purple-yellow-flowered *Lantana camara*, should never be planted anywhere". Standley (1924) reports that "the plant blooms nearly all the year. The fruit is sweet and edible but not very palatable. A decoction of the leaves is sometimes employed as a remedy for rheumatism and as a tonic for the stomach. The plant is a favourite remedy for snake bites, a strong decoction of the leaves being taken internally and a poultice of crushed leaves applied to the wound". A field note with J.H. Camfield's (s.n.) collection (NSW 28328) from Woolloomooloo, N.S.W., states that *Lantana camara* is "mainly a weed of the North Coast. Somewhat difficult to eradicate, but it is generally considered as a good preparation for crops. Whilst useless in itself, it covers the ground below with a fine leaf mulch". A more or less similar view is expressed by Moldenke (1983) who records that "although this plant is usually regarded as a pest it may prove beneficial under certain conditions in forests. It improves the fertility of exhausted areas of rocky, gravel, or hard laterite soils. It enriches the soil and serve to retain humus in deforested areas and check soil erosion. It may serve as a nurse for sandalwood seedlings if not too dense and in the Pacific islands is used as support for yam vines. In India the leaves and twigs are often used as green manure (mulch) in forest areas and for paddy crops; they can also be composted along with other materials. *Lantana* ash is rich in soluble potassium salts and manganese and is useful for manuring coconut trees. The entire plant is bitter because of an active principle called 'Lantanin' The plant is not readily eaten by cattle, but may be browsed when pasturage is very scarce and may then result in symptoms of severe jaundice, exfoliation of the skin near the muzzle, profuse salivation, severe dermatitis, copious lachrymation, and loss of appetite in the cattle. The ripe fruits are eaten by children in many lands and can be employed as a flavouring. The stems are used as a tooth brush and the leaves for polishing wood" ... etc.

Verdcourt (1992) claims that this species is a "rather unpleasantly aromatic shrub 0.35–5 m tall but can be scandent to 12 m or even in cultivation over a long period become a tree to 8 m with a bole of 10–12 cm diameter". So far, such a long stem and thick bole has not been recorded in any *L. camara* collection in Australia.

According to Curtis (1790), Irvine (1961) and Howard (1969), *L. camara* can be propagated easily by seeds and/or cuttings.

Throughout its range, *L. camara* is known by more than 150 vernacular names. Some of the popular English names are : “common Lantana”, “camara”, “English sagebush”, “sweet sage”, “red sage”, “yellow sage”, “white sage”, “wild sage”, “Jamaican mountain sage”, “Bahama tea” and “prickly Lantana”.

Affinities

Of all *Lantana* species, *L. camara* seems more closely related to *L. moritziana* Otto & Dietr. in its inflorescence being capitate, not elongate spicate, flat or globose when mature, lower bracts not conspicuously larger than the rest nor broadly ovate, and indumentum on stems, peduncles, and foliage neither long-hirsute nor setulose. Nevertheless, *L. moritziana* may easily be distinguished by its indumentum on branches and peduncles being densely but minutely hirsute, and leaves usually densely puberulous or short-pubescent on both surfaces, especially beneath. In *L. camara*, the hairs on peduncles and branches are minute and inconspicuous and the leaves are usually scabrous above and sparsely pilose or strigose beneath and sometimes glabrescent.

There are some characters common between *L. camara* and *L. hodgei* Sanders. In both species the receptacle of the inflorescence rachis is fistulate and dilated relative to the peduncle; drupes blue-black; endocarp inflated with large hollow central chamber separating and many times larger than seed cavities, and hairs on lower surface of leaf blades restricted mostly to primary, secondary and tertiary veins. Nevertheless, *L. hodgei* may readily be identified by its leaf blades being mostly 1.5 to 2.5 times longer than wide, base shortly attenuate; upper surface at maturity lustrous, dark green, smooth, non-rugose, the hairs small, weak and often deciduous; lower surface pale grey-green, almost glabrous or with weak hairs strongly appressed to the surface, the secondary and tertiary veins weakly or not at all keeled.

2. *Lantana montevidensis* (Spreng.) Briq., Ann. Conserv. & Jard. Bot. Genève 7–8 (1904) 301; Moldenke, Résumé Verbenac. etc. (1959) 119, 209, 459; N.C.W. Beadle, O.D. Evans & Carolin, Handb. Vasc. Pl. Syd. Distr. & Blue Mtns (1963) 416; M. Neal, Gard. Hawaii, Rev. edn (1965) 724; R.J.F. Hend., Contr. Qld Herb. No. 3 (1969) 1, figs 1 & 2; Moldenke, Fifth Summary Verbenac. etc. 1 & 2 (1971) 152, 189, 347, 887; H. St. John, Fl. Pl. Hawaii Isls (1973) 290; Kleinschmidt & R.W. Johnson, Weeds Qld (1977) 37, 260; López-Pal., Fl. Venezuela Verbenac. (1977) 401, fig. 94; Moldenke, Phytologia Mem. 2, Sixth Summary Verbenac. etc. (1980), 337, 556; Everist, Poison. Pl. Aust. (1981) 747; S.W.L. Jacobs & Pickard, Pl. N.S.W. (1981) 209; N.C.W. Beadle, O.D. Evans & Carolin, Fl. Syd. Reg. 3rd edn (1982) 510; Moldenke in Dassan. & Fosberg, Fl. Ceylon 4 (1983) 215; N.C.W. Beadle, Stud. Fl. NE N.S.W., Part 4 (1984) 850; Lord & J.H. Willis, Macq. Dic. Trees & Shrubs (1986) 267; Stanley in Stanley & E.M. Ross, Fl. SE Qld 2 (1986) 365; Swarbrick, Pl. Protect. 1 (1986) 118, 119; Auld & R.W. Medd, Weeds (1987) 235; Hnatiuk, Cens. Aust. Vasc. Pl. (1990) 627; W.L. Wagner et al., Fl. Pl. Hawaii 2 (1990) 1320; A.D. Chapm., Aust. Pl. Name Index K–P (1991) 1747; A.C. Sm., Fl. Viti. Nov. 5 (1991) 173; W.T. Parsons & E.G. Cuthbertson, Noxious Weeds Aust. (1992) 632; Lazarides & Hince, Econ. Pl. Aust. (1993) 144; Pedley in R.J.F. Hend. (ed.), Qld Vasc. Pl. (1994) 336.

Type: “*Sellow s.n.*, from Montevideo, Uruguay, collected in 1822 (M. Orro herbarium)” – *vide* Moldenke (1983), n.v.

Lippia montevidensis Spreng., Syst. Veg. 2 (1825) 751, basionym; Spreng., Syst. Veg. 4, Part 2 (1827) 231; Schauer in DC., Prod. 11 (1847) 594.

Type: As for *Lantana montevidensis* (Spreng.) Briq.

Lantana sellowiana Link & Otto, Icon. Pl. Sel. Hort. Reg. Bot. Berol. (1826) 107, t. 50; Hook., Bot. Mag. N.S. 4 (1830) t. 2981; Cham., Linnaea 7 (1832) 126; Schauer in DC., Prod. 11 (1847) 604; Schauer in Mart., Fl. Brazil. 9 (1851) 261; F.M. Bailey & Ten-Woods, Proc. Linn. Soc. N.S.W. 4 (1879) 174; F.M. Bailey, Synop. Qld Fl. (1883) 376; F.M. Bailey, Qld Fl. 4 (1901) 1171; F.M. Bailey, Weeds & Suspec. Poison. Pl. Qld (1906) 141; F.M.

Bailey, Compr. Cat. Qld Pl. (1913) 382; C.T. White, Qld Agric. J. Ser. 2, 27 (1927) 148; C.T. White, Qld Agric. J. 31 (1929) 294; E.I. Hurst, Poison Pl. N.S.W. (1942) 341; L.J. Webb, Bull. Council Sci. Industr. Res. No. 232 (1948) 169; A.D. Chapm., Aust. Pl. Name Index K-P (1991) 1747. – *vide* Briquet (1904), Moldenke (1959, 1971 & 1983).

Type: See under typification.

Lippia megapotamica Spreng., Syst. Veg. 4, Part 2 (1827) 231; Schauer in DC., Prod. 11 (1847) 593 – *vide* Moldenke (1959, 1971, 1983).

Type: “*Sellow*” *s.n.*, “Rio grande” (n.v.). According to Stafleu & Cowan (1985) “Kurt Sprengel’s considerable and rich herbarium (21,806 species) came first to his son Anton. After the latter’s death, in 1851, it was sold in parts. ... A certain number of families and genera were sold to specialists, so e.g. ... the Labiatae and Verbenaceae to J.A. Schmidt in Heidelberg” (HEID). The latest edition of “Index Herbariorum” (edn 8) records the J.A. Schmidt herbarium going to Institute für Allgemeine Botanik in Hamburg (HBG).

Lantana delicatissima Poit. ex Gouault, Rev. Hort. Ser IV, 1 (1852) 461 – *vide* López-Pal. (1977), Moldenke (1959, 1971, 1983).

Type: (n.v.). No type cited in the protologue.

Camara sellowiana (Link & Otto)Kuntze, Rev. Gen. Pl. 2 (1891) 504 – *vide* Briquet (1904), Moldenke (1959, 1971, 1983), López-Pal. (1977).

Type: As for *Lantana sellowiana* Link & Otto.

Camara montevidensis (Spreng.)Kuntze, Rev. Gen. Pl. 3 (1898) 250 – *vide* Briquet (1904), Moldenke (1959, 1971, 1983), López-Pal. (1977).

Type: As for *Lantana montevidensis* (Spreng.)Briq.

Typification

In the protologues of *Lippia montevidensis* Sprengel and *Lantana sellowiana* Link & Otto the cited types are respectively: “Monte Video. Sello” and “Semina hujus plantae e Montevideo anno 1822 misit cl. Sellow, nomine Lantanae decumbentis, quam in honorem viri sagacissimi mutavimus”. It is interesting to note that at the same time that Friedrich Sello (erroneously Sellow) sent the herbarium voucher to Sprengel at the Museum in Berlin, he sent seeds of the same plant to H.F. Link at the botanical gardens in Berlin, which were separate from the museum at that time. Link and F. Otto subsequently described the same specimen as *Lantana sellowiana* with a drawing (plate no. 50). According to Smith (1991), “it is probable that both *Lippia montevidensis* and *Lantana sellowiana* were based on the same specimen collected about 1822 in Montevideo, Uruguay, and said to be in the M. Orro herbarium (Moldenke, 1983)”. It is worth mentioning here that between 1820 and 1828, Uruguay was part of Brazil and became an independent State only in 1828 [Encyc. Brit. vol. 22 (1958) 905].

Regarding the types of the above named taxa, enquiries in the herbaria at B, BM, HBG, HEID, K, TEX, U, US and personal communication with Dr. Moldenke have failed to locate the types or the whereabouts of the M. Orro herbarium. A photograph in Herb. US of one of Sellow’s voucher specimens has been annotated by H.N. Moldenke as “Photograph of TYPE of *L. sellowiana* Link & Otto”. The herbarium label of this photograph clearly shows that the plant was collected by Sellow from “Brasilia” and the voucher specimen was distributed “ex Herb. Reg. Berolinense”. The whereabouts of the specimen, however, is not indicated. The name “*Lantana sellowiana* Link et O” written on the label seems to be in the handwriting of one of the authors. As mentioned earlier, at the time of describing this taxon, Link and Otto were based at the botanical gardens in Berlin and Sellow’s specimen was most likely used by them in preparing the original description of this taxon. If the holotype in Herb. B was destroyed during the war and no material of the type collection exists, then the drawing (t. 50) published with the protologue of *L. sellowiana* may be a satisfactory replacement for the type.

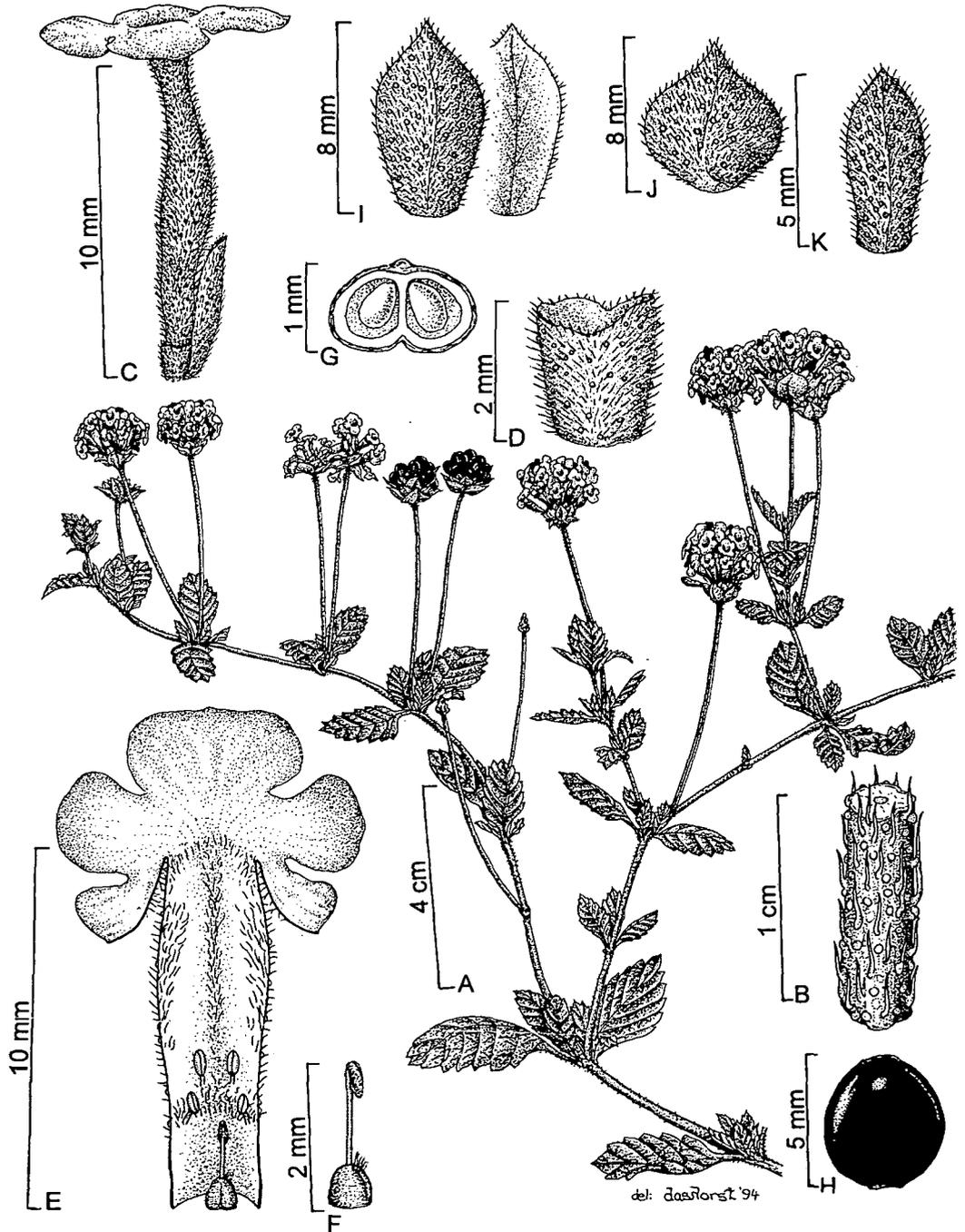


Fig. 2. *Lantana montevidensis* (Spreng.) Briq. (A-K, A.R. Bean 6734: BRI). A, habit drawing of a branch with flowers and fruit; B, portion of stem showing hairs and glands; C, flower with bract; D, calyx with 4 shallow teeth; E, longitudinally cut open corolla showing androecium and gynoecium; F, gynoecium with oblique stigma; G, transverse section of ovary; H, fruit; I, middle bract showing abaxial and adaxial view; J, out bract showing abaxial view; K, inner bract showing abaxial view.

Description (Fig. 2)

A creeping, trailing, decumbent or scrambling woody herb or low shrub, often mat-forming with very short but profusely flowered branches. *Stems* weak, 1–2 (-4) m long, 1–2 mm diameter and obtusely 4-angled first, but becoming subcylindrical and up to 7.5 mm diameter with age; branches usually slender, rooting at nodes that touch the soil, without prickles, subterete, strigose or hirsute-pubescent. *Leaves* decussate-opposite or sometimes ternate, shortly petiolate; lamina variable in size and shape, ovate, subrhomboid-oblong to ovate-lanceolate, (8-) 10–25 (-35) mm long, (5-) 8–17 (-20) mm wide, subacute to obtuse at apex, cuneate to attenuate into the petiole, crenate-serrate at margin, bright-green, rugose and scabrous or hirsute above (adaxially), densely resinous-glandular and tomentose below (abaxially), veins prominent and strigose below; petiole pubescent, 1–4 mm long. *Inflorescences* pedunculate, arising in the leaf axils, initially capitate and hemispheric, becoming oblong in fruit, 10–25 (“-40”) mm in diameter; peduncle longer than subtending leaves, pubescent, (15-) 20–80 (-100) mm long; *bracts* sessile, imbricate, herbaceous, concave, ciliate, resinous-punctate and strigose-hirtellous outside (abaxially), glabrous inside (adaxially), persistent, the outer ones somewhat rhomboid, broadly ovate-elliptic to oblong-ovate or sometimes almost orbicular, eventually spreading, 4–8 mm long, 2.5–5 mm wide, the inner ones successively narrower and smaller, \pm oblong. *Flowers* sessile, bracteate, about 20 in each flattish capitulum. *Calyces* small, membranous, obscurely 4-toothed, subvillous-pubescent and resinous-punctate outside, glabrous inside, 1–2 mm long, \pm 1 mm diameter. *Corollas* infundibular, slightly irregular, 4-lobed, varying from pink, lilac to violet, rose, purple, magenta or white or yellow form in cultivation, pubescent and resinous-punctate outside, villous inside the tube; tube slender, cylindrical, almost straight, slightly dilated about the middle, yellowish at the base, longer than the subtending bracts, conspicuously exerted in anthesis, (5-) 7–10 (-12) mm long, 1–2 mm in diameter; lobes spreading to 10 mm diameter, each lobe reniform-orbicular in outline, blunt or emarginate, 3–5 (-8) mm long, (2-) 3–5 (-8) mm wide, the upper one the largest, the side-lobes the smallest and equal. *Stamens* included, attached about the middle of the corolla-tube; filaments short, glabrous, \pm 0.5 mm long; anthers ellipsoid, up to 0.5 mm long. *Ovaries* ellipsoid-globose, glabrous excepting a few small hairs on one side at the top, 0.5–1 mm diameter; style included, filiform, glabrous, 1–1.5 (-2.5) mm long; stigma oblique, minute. *Drupe*s ellipsoid-globose, fleshy, half enclosed by calyx, green at first, purplish-black or dark-violet when ripe, 3–6 (-8) mm long, 2–5 (-8) mm diameter, the endocarp woody, 2-loculed, splitting septicidally into 2 pyrenes, the seeds incrassate dorsally.

Representative specimens (collections seen: Australian 58, non-Australian 60)

AUSTRALIA: QUEENSLAND: *Anderson s.n.*, Kholo, near Brisbane River, 13.iii.1961 (BRI 027188); *Bean 6734*, Glastonbury Creek, 1.5 km NE of Glastonbury, 7.x.1993 (BRI); *Blake 2300*, Coot-Tha Mt, Brisbane, 16.iii.1931 (BRI). *Court 57*, Rockhampton, 2.viii.1925 (BRI); *D. Cunningham 1024*, Port Curtis District, SW of Agnes Water near Mt Maria, 13.xi.1993 (AD, BRI, NSW); *Durrington 1373*, Fisherman Islands, mouth of the Brisbane River, c. 6.5 km N of Wynnum, -xii.1973 (BRI); *Epps 90* (F.55/321), Gin Gin Res. 169, St Agnes, -ii.1955 (BRI); *Everist 7657A*, Frenchville, Rockhampton, at the foot of Mt Archer, 25.viii.1964 (BRI, K); *Gibson T01560*, State Forest 150, Beecher, 10 km SW of Gladstone, 15.iv.1989 (BRI); *Henderson H448*, ground of D.P.I. Indooroopilly, Brisbane, 19.ix.1968 (BRI); *Johnson 20420*, Mt Gravatt, 3.vi.1951 (K, NSW); *Jones 3342*, Waterford, S Queensland, -xii.1966 (CANB); *Medd 161135*, Lockyer Creek, W of Gatton, 11.viii.1983 (NSW); *Melzer 14*, Mt Zamia Environmental Park, Springsure, 7.iii.1990 (BRI); *Pedley 476*, near Haighmoor Colliery, NE of Ipswich, 9.ix.1959 (BRI); *Poulsen s.n.*, Middle Road, Purga, 21.viii.1969 (BRI 085130); *Rawson R4*, Mt Lockerbie area, near Thangool, 3.i.1968 (BRI); *Salasoo 5497*, Highfields, 12.87 km N of Toowoomba, 30.xii.1974 (NSW); *Sharpe 981*, Griffith University Site, Kessels Road, Mt Gravatt, 1.i.1974 (BRI); *Shaw 5492*, Calliope, 22.x.1947 (CANB); *Simmonds 376*, Ipswich, 15–17.x.1888 (BRI); *Stanley 80196*, Townsville harbour, 13.ii.1980 (BRI); *Stanley 758*, near coal terminal, Gladstone, 20.ii.1980 (BRI); *Thomson 143*, Wambo, -iv.1931 (K 2 spec.); *Tutt s.n.*, Sandy Creek Road, Downsfield near Gympie, 8.ii.1967 (BRI 065067); *White s.n.*, Gayndah, 13.v.1917 (BRI 268381; NSW 283531).

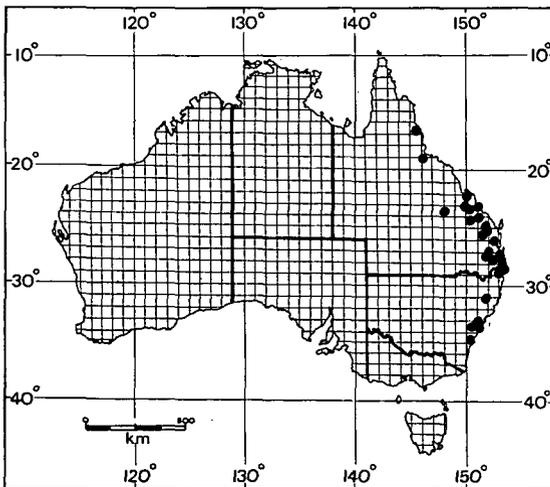
NEW SOUTH WALES: *Auld 120137*, Murwillumbah, 1.ii.1981 (NSW); *Benson 1221 & Rodd s.n.*, N end of Garden Island Naval Depot, Central Coast, 5.iv.1977 (NSW); *Briggs s.n.*, 6.43 km S of Penrith on Mulgoa Road, 20.vii.1964 (NSW); *Craig s.n.*, Byron Bay, N Coast, 8.xii.1968 (CBG 025780); *Hodges s.n.*, Casino district, -xi.1963 (NSW 283582); *Johnson s.n.*, Northbridge, Sailor's Bay, 4.xi.1967 (NSW 283571); *Mackay s.n.*,

Dyraaba Creek between Casino and Bonalbo, 20.i.1971 (NSW 283577); *Rodway s.n.*, Nowra, 11.v.1942 (NSW 283566).

NEW CALEDONIA: *Franc 502*, Noumea, 30.i.1909 (BM, CANB).

Distribution and ecology (Map 2)

In Australia *L. montevidensis* is known to occur chiefly in the eastern coastal and subcoastal regions of Queensland and New South Wales. Distribution in Queensland is particularly in the area between Cairns and the New South Wales border. The majority of localities within this area are in the "Pastoral Districts" of North Kennedy, Port Curtis, Wide Bay and Moreton. In New South Wales, the main distribution is in the north-eastern part of the State between Casino and the Queensland border, around Sydney and near Nowra township south of Wollongong. Besides, this species has been recorded from Oxley Park near Tamworth. It does occur as an ornamental in some Northern Territory towns where it has not yet been naturalised.



Map 2. Distribution of *L. montevidensis* in Australia

The only collections examined from outside Australia are from New Caledonia, Tahiti, Fiji, Costa Rica, Mexico and Panama. According to Moldenke (1983), however, this taxon is "a native of the area from southern Brazil, through Uruguay and Paraguay to Argentina."

According to Australian collectors' field notes, *L. montevidensis* grows in diverse habitats including well drained wasteland alluvial soil, open *Eucalyptus* forest loamy soil, disturbed areas behind mangroves, open woodland, along roadsides and river banks. It is also recorded from dry sclerophyll forest, red loam, sandy loam over sandstone rocks, on rocky hill near the sea and paddocks on a disturbed holding. Parson and Cuthbertson (1992) state that this

species grows in "subhumid to semi-arid regions of the tropics and subtropics, especially on shallow stony soils, readily replacing pasture species affected by prolonged drought". They also claim that "the presence of creeping lantana [i.e. *L. montevidensis*] thickets reduces the available grazing area and, hence, pasture productivity. It is an extremely efficient pioneer species, quickly encroaching on pasture areas weakened by prolonged drought". A more or less similar view has been expressed by Everist (1981) who reports that "it generally grows on rather shallow, often stony soils and during a succession of dry seasons can become an aggressive weed, replacing the native pasture grasses".

Comments

According to Everist (1981), *L. montevidensis* "is widely cultivated in warm countries as an ornamental scrambler, particularly for covering banks". In Australia, "one form has become naturalised in several localities in coastal and subcoastal Queensland and north-east New South Wales". Parsons & Cuthbertson (1992) report that this species is a native of Uruguay and southern Brazil from where "it has been introduced to most other tropical and subtropical regions as a ground-covering ornamental. It is considered a weed only in Australia, especially in Burnet and Wide Bay pastoral districts Queensland, northern New

South Wales and parts of the Sydney region". Its dispersal is said to have been "by fruit-eating animals and birds, water flowing across the soil surface during heavy rain, and in mud sticking to hooves and footwear".

Regarding the properties of this species, Lord & Willis (1986) describe it as "a very useful cover shrub for all but coldest districts" [in Australia]. It is "quick-growing and drought-resistant, it flowers freely for almost the whole year. May be grown in window boxes, garden vases or urns, to cover old palm or tree stumps, as a clipped bed edging or, as is most popular, over rockwork". The plant can be "clipped into shape during spring". Auld and Medd (1987) report that "it is a weed of unimproved pastures. The cultivated form of this species is a common hedge plant. It does not produce fruits".

In a cytological study of *L. montevidensis*, Henderson (1969) states that two forms of this species are known to occur in Australia. The common garden form which does not produce fertile fruits here is a triploid ($2n = 36$), and the naturalised or wild form which produces viable seeds is a tetraploid ($2n = 48$). In Swarbrick's (1986) view, "Australia is perhaps the only country outside South America to possess this [i.e. tetraploid] form of the plant". In his opinion, the triploid form is a free-flowering, seedless and "is very widely grown as a garden ornamental, being non-aggressive and capable of being trimmed into a low neat hedge or left to trail attractively over rocks and banks. It is propagated only by stem cuttings. The tetraploid form is similar but less flowery, more prostrate and widespreading in habit, and it readily roots at the nodes when in contact with the ground. It sets seeds freely and can be reproduced by seed, cuttings or division of established plants". He also states that the "creeping lantana [i.e. *L. montevidensis*] was introduced into Australia as an ornamental trailing shrub and subsequently escaped to become a minor weed in coastal and subcoastal New South Wales and Queensland". In the same publication, Swarbrick (1986) further records that "creeping lantana was also widely distributed by man in the 19th century, but it has only become a weed in Australia (Holm et al. 1979) and perhaps in America (Bailey 1927). It was introduced from Montevideo [Uruguay] to Europe in 1822 and not "1828" as recorded by Johnson (1872) and to Australia by 1851 (Shepherd 1851)". The then accepted name for this species was "*L. sellowiana*" or at least in the 1851 catalogues of the Sydney nurserymen Guilfoyle and Shepherd as "*L. sellowii*" and "*L. selowiana*"."

According to Moldenke (1983), "*L. montevidensis* contains camphor, menthol, and bornyl acetate. In South America it is employed in native medicine in the treatment of broncho-pulmonary diseases, headaches, sunstroke, and fevers and is often carried in amulets by the superstitious natives. Hurst (1942) states that feeding experiments with guinea pigs suggest that the ingestion of "reasonable amount" of the plant does not produce photosensitization effects. On the contrary, Everist (1981), Stanley (1986), Parsons & Cuthbertson (1992) and Lazarides & Hince (1993) believe that this species is suspected of cattle poisoning, similar to *L. camara*.

In Australia, the first written record of this species, as a garden escape or weed, was published by Bailey & Tennison-Woods (1879) under the name "*L. sellowiana*". Subsequently, Bailey (1883, 1890, 1901, 1906, 1913) recorded this taxon as *L. sellowiana*. According to White (1929), the specific epithet sellowiana is "in honour of Friedrich Sellow, a German botanist who travelled extensively in South America during the early part of the nineteenth century".

This species is known by some 20 vernacular names (Moldenke 1983). The most popular ones are: "Creeping Lantana", "Trailing Lantana", "Weeping Lantana", "purple Lantana", "Small Lantana", "Polecat-Geranium" or "Wild Verbena".

Affinities

L. montevidensis is closely related to *L. indica* Roxb. in its inflorescence being capitate, not elongate-spicate, flat or globose when mature; outer bracts much larger than the rest, broadly ovate, usually ± 5 mm wide, conspicuously involucrate. Nevertheless, *L. indica* may easily be distinguished by being an erect or rambling woody shrub; leaf-blades mostly ovate-lanceolate, acute, softly hairy above (adaxially), densely white-woolly beneath (abaxially); outer bracts often cordate at base, softly and loosely pubescent and corolla mostly "pink or white". On the contrary, *L. montevidensis* is a creeping or decumbent herb or low shrub with stems rooting at the nodes when touching damp soil; leaf-blades mostly rhomboid or very broadly ovate, obtuse or subacute, scabrous-hirsute above (adaxially), resinous-glandular and strigose-pubescent beneath (abaxially); outer bracts not cordate at base, resinous-punctate and strigose-hirtellous; corolla usually bright "magenta or lilac" or in cultivars white or yellow.

L. camara also has capitate inflorescences which do not elongate into a spike and become flat or globose when mature. For differences between these species see "Key to the species".

Excluded name

Charachera Forssk., Fl. Aegypt-Arab. (1775) 115.

This genus was published by Forsskål under the "class Didynamia" without reference to any modern family name. Bartling (1830) placed it in the synonymy of *Lantana* in the Verbenaceae. Subsequently, Schauer (1847), López-Palacios (1977) and Moldenke (1973, 1983) also recorded it as a synonym of *Lantana*. In "Index Nominum Genericorum (Plantarum)", vol. 1 Aa–Ep. (1979), however, *Charachera* Forssk. has been referred to the Acanthaceae and is, therefore, excluded here from the genus *Lantana*.

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