

14. CALLICARPA, Linn.

VERBENACEAE

Calyx truncate or 4- rarely 5-toothed. Corolla with a short tube, the limb spreading; of 4, rarely 5, lobes, nearly equal. Stamens 4, rarely 5, shortly exserted. Ovary 4-celled, with 1 ovule in each cell laterally attached at or above the middle; style filiform, dilated and truncate or very shortly 2-lobed. Fruit a small succulent drupe, the endocarp of 4 distinct 1-seeded nuts or pyrenes. Seed without albumen. —Shrubs, rarely undershrubs, more or less cottony or woolly with stellate hairs or rarely glabrous, and often with numerous resinous glandular dots especially on the under side of the leaves. Leaves opposite, undivided. Flowers small, in axillary cymes, with very small bracts.

A considerable tropical and subtropical genus, chiefly Asiatic, with a few African and American species. Of the three Australian species two are widely dispersed over the Indian Archipelago, one of them extending to the Khasia mountains and the other at least to the Malayan Peninsula; the third, supposed to be endemic in Australia, is also perhaps not sufficiently distinct from another Asiatic species. The genus is most readily distinguished from *Premna* by the inflorescence, and by the flowers more regular with isomerous stamens. The differences in the fruit may not be constant.

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| Leaves acute at the base, glabrous above, white-tomentose underneath. Cymes dense. Corolla glabrous | 1. <i>C. cana</i> . |
| Leaves rounded at the base, pubescent or velvety above, somewhat floccose underneath. Cymes dense. Corolla glabrous or nearly so, lilac or purple | 2. <i>C. pedunculata</i> . |
| Leaves acute at the base, green on both sides. Cymes very loose. Corolla densely pubescent, white | 3. <i>C. longifolia</i> . |

1. *C. cana*, Linn. Mant. 198. A "small shrub," the tomentum close and short, usually white, slightly floccose on the older branches. Leaves petiolate, ovate, very shortly acuminate; bordered by rather broad more or less mucronate teeth, acutely narrowed at the base, 2 to 3 in. long in most of the Australian specimens, much larger and more acuminate in those from the Indian Archipelago, glabrous above when full-grown except a slight tomentum on the principal veins which is rather more abundant in R. Brown's specimens, membranous when large, rather firmer and more rugose when small, white-tomentose underneath. Flowers small, in rather dense cymes, the common peduncle usually about as long as the petiole. Calyx about $\frac{3}{4}$ line long.

minutely 4- or 5-toothed. Corolla glabrous, twice as long as the calyx. Stamens exserted; anthers with small glands along the connectivum. Drupe depressed-globular, not above 1 line diameter, slightly succulent, the endocarp of 4 hard nuts.—Schau. in DC. Prod. xi. 643; *C. adenanthera*, R. Br. Prod. 513.

N. Australia. Victoria river, *F. Mueller*; Groote Island, Gulf of Carpentaria, *R. Brown*.

Queensland, *Bowman*; Edgecombe Bay and Port Denison, *Dallachy*; Gilbert river, *Daintree*.

The species extends over the Indian Archipelago to the Malayan peninsula and the Philippine islands. The Timor and Javanese specimens, correctly referred here by Schauer, differ but slightly from the Australian ones in their larger more acuminate leaves. The figure in Bot. Mag. t. 2107, represents a much more woolly plant, but is perhaps a variety only. *C. bicolor*, Juss., Schau. in DC. Prod. xi. 642, and *C. erioclona*, Schau. l. c. 643, appear to me both to be precisely the common Archipelago form of *C. cana*. The *C. adenanthera* referred by Schauer with doubt to *C. longifolia* Lam. appears to me to be the true *C. cana*.

16. CLERODENDRON, Linn.

VERBANACEAE

Calyx campanulate or inflated, 5-toothed or 5-lobed, enlarged and spreading under the fruit (except in *C. hemiderma* and in some species not Australian). Corolla-tube slender, often very long; limb spreading, nearly equally 5-lobed. Stamens 4, exserted and often very long. Ovary 4-celled, with 1 ovule in each cell laterally attached at or above the middle. Style filiform, with 2 short acute stigmatic lobes. Fruit a more or less succulent or almost dry drupe, the endocarp separating into 4 one-celled or rarely into 2 two-celled pyrenes.—Trees or shrubs or rarely herbs or woody climbers. Leaves opposite or in whorls. Flowers in loose heads or cymes, usually forming terminal corymbose or thyrsoid panicles or rarely axillary.

A considerable tropical genus, chiefly Asiatic, with a few African or American species. Of the Australian species—which are here limited to eight, but might almost equally well be raised to ten or eleven, or reduced to four or five—one is a sea-coast plant widely spread over tropical Asia, the others appear to be endemic.

- Calyx minutely toothed.
- Woody climber. Flowers small in compact cymes. Corolla-tube 3 lines long. Fruit oblong, pubescent, small 1. *C. hemiderma*.
 - Erect shrub. Flowers few in axillary loose cymes. Corolla-tube 1 in. long. Fruit obovoid, glabrous, rather large 2. *C. inerme*.
- Calyx 5-lobed to the middle.
- Corolla-tube about 3 lines long. Stamens shortly exserted. Leaves large and broad 3. *C. Tracyanum*.
 - Corolla-tube $\frac{3}{4}$ to nearly 1 in. long. Stamens long. Leaves usually tomentose. Leaves usually broad. Flowers mostly in dense terminal corymbs 4. *C. tomentosum*.
 - Leaves usually narrow. Flowers mostly in axillary cymes 5. *C. lanceolatum*.
 - Corolla-tube 1 to $1\frac{1}{2}$ in. long. Stamens long. Leaves usually glabrous or tomentose only when young 6. *C. floribundum*.
 - Corolla-tube 2 in. long or more. Stamens long. Leaves of *C. floribundum* 7. *C. Cunninghamii*.
 - Species insufficiently known, with broad tomentose, very rugose leaves 8. *C. costatum*.

6. *C. floribundum*, R. Br. Prod. 511. A tall shrub or small tree, usually quite glabrous or the young parts tomentose. Leaves on rather long petioles, usually ovate or elliptical, but varying from broadly ovate and cordate to lanceolate, obtuse acute or acuminate; acute rounded or cordate at the base, usually 2 to 3 in. long but sometimes twice as large. Cymes sometimes all loose and few-flowered in the upper axils, sometimes forming a broad terminal corymbose panicle. Flowers to the naked eye apparently glabrous, but often sprinkled with a minute pubescence visible under a lens. Calyx $2\frac{1}{2}$ to 3 lines long, more acute at the base than in *C. tomentosum*, the lobes acute, about as long as the tube or rather shorter. Corolla-tube usually rather above 1 in. long, but not exceeding $1\frac{1}{4}$ in., in other specimens rather longer, the lobes short in proportion. Stamens exerted by about 1 in. Fruiting-calyx expanding to above $\frac{1}{2}$ in. diameter, with a narrow base of 1 to 2 lines.—Schau. in DC. Prod. xi. 671.

N. Australia. N. Coast, *R. Brown*; N. W. Coast, *Bynoe*; Upper Victoria river, *F. Mueller*; islands of the gulf of Carpentaria, *Henne*.

Queensland. Endeavour river, *Banks and Solander*, Harvey's islands, Keppel Bay and Northumberland islands, *R. Brown*; Percy island and Port Curtis, *M' Gillivray*, Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy* and others; in the interior, *Mitchell*.

South Australia. Daly waters, *Waterhouse*.

The species is exceedingly variable. In general it is to be distinguished from *C. tomentosum* by the absence of pubescence, more acute calyxes, longer flowers and

looser inflorescence. Sometimes the inflorescence approaches that of *C. inermis*, more frequently it is at least on the main branches almost as abundant as in *C. Cunninghamii*. An apparently common abnormal state, produced evidently by the puncture of insects, has axillary cymes with few flowers, in most of which the corolla assumes a campanulate ovoid or globular form of considerable thickness and much regularity.

C. attenuatum and *C. medium*, R. Br. Prod. 510, 511, Schau. in DC. Prod. xi. 671, are very slight modifications, which I am quite unable to distinguish from the common forms.

C. ovatum, R. Br. Prod. 511, Schau. in DC. Prod. xi. 671, or *C. cardiophyllum*, F. Muell. Fragm. iii. 144, is a form with large, very broad, somewhat coriaceous leaves and loose inflorescence, which may at first sight appear very distinct, but there are quite as many specimens which might equally well be referred to this or to some of the commoner varieties.

C. coriaceum, R. Br. Prod. 511, Schau. in DC. Prod. xi. 671, of which the specimens are very indifferent, is much the same as *C. ovatum*, but with pubescent leaves, which connect it with *C. tomentosum*. I have not seen the flowers, and without the corolla there appears to be no positive character to distinguish *C. floribundum* from the two preceding and the following species. *C. ovatum* and *C. tomentosum* R. Br. are both much like the garden specimens figured by Ventenat as *Volkameria tomentosa*.

5. **C. lanceolatum**, *F. Muell. Fragm.* iii. 145. A tall shrub or small tree, the foliage and inflorescence softly velvety-pubescent or glabrous. Leaves on rather long petioles, lanceolate or ovate-lanceolate, acute or rather obtuse, 2 to 3 in. long. Cymes in the upper axils several-flowered, shorter than the leaves, on short peduncles. Bracts narrow, acute, or the outer ones more leafy. Calyx broadly campanulate, about $2\frac{1}{2}$ lines long when in flower, divided to near the middle into obtuse lobes. Corolla usually pubescent outside, the tube about $\frac{3}{4}$ in. long, or rather more, the lobes scarcely 3 lines. Stamens rather long. Fruiting calyx enlarged, coloured, very open, 4 to 5 lines diameter in the specimens seen, the lobes recurved. Drupe depressed-globular.

N. Australia. N. W. coast, Nickol Bay, *Gregory, Walcott*; Depuech Island, *Bynoe*. The leaves are narrower in most of the glabrous specimens than in the pubescent ones, but some of Bynoe's pubescent ones have them also very narrow. The species is not very definitely separated from *C. tomentosum*.

NIB

VERBENACEAE

Clerodendrum ovalifolium

4. **C. tomentosum**, *R. Br. Prod.* 510. A tall shrub or small tree, the foliage and inflorescence usually velvety-pubescent, the older leaves rarely quite glabrous. Leaves on rather long petioles, ovate elliptical or almost lanceolate, shortly acuminate, acute or rarely rounded at the base, 2 to 4 in. long. Flowers in the normal state numerous, in compact terminal corymbs, with rarely a few peduncles bearing small cymes in the upper axils. Calyx campanulate, softly pubescent, about 3 lines long when in flower, divided to about the middle into acute or rather obtuse lobes. Corolla-tube under 1 in. long, the lobes 3 to 4 lines. Stamens protruding by from $\frac{1}{2}$ to 1 in. Fruiting calyx expanding to $\frac{3}{4}$ in. diameter, the drupe black and shining.—*Andr. Bot. Rep.* t. 607; *Bot. Mag.* t. 1518; *Schau. in DC. Prod.* xi. 602.

Queensland. Brisbane river, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber*, n. 267, *Macarthur*, (Sydney woods, Paris Exhibition, 1855, n. 104), and many others; northward to Hastings, Macleay, and Clarence rivers, *Beckler* and others; southward to Kiama, *Harvey*.

Var. ? *mollissima*, very softly villous, referrible perhaps to *C. lanceolatum*, but with the broader leaves and terminal inflorescence of *C. tomentosum*.

N. Australia. Roebuck Bay, N.W. Coast, *Martin*; near Caledon Bay, Gulf of Carpentaria, *R. Gull*.

Ventenat's plate of *Volkameria tomentosa*, *Jard. Malm.*, t. 84, represents an abnormal garden state, flowering very sparingly in the upper axils, connecting this species as well with the following *C. lanceolatum* as with some pubescent small-flowered forms of *C. floribundum*.

11. **CYANOSTEGIA.** Turczan.

(Bunnya, *F. Muell.*)

Calyx broadly campanulate, expanding after flowering, opening very flat, membranous, reticulate, the margin sinuate-toothed or 5-lobed. Corolla broadly campanulate, glabrous inside, the limb 5-lobed, the 2 upper lobes rather longer than the 3 lower. Stamens 4, inserted near the base of the corolla; anthers large, oblong, without appendages. Ovary small, depressed, 2-celled, with 2 ovules in each cell laterally attached; style elongated, minutely and often unequally 2-lobed. Fruit in the centre of the enlarged calyx, small, hard, usually more or less oblique, and ripening 1 or 2 ascending or oblique seeds, resembling those of *Chloanthes* and *Pityrodia*.—Glabrous and apparently glutinous shrubs. Leaves opposite, undivided, not decurrent, the upper floral ones reduced to small bracts. Peduncles axillary, 1- or 3-flowered, forming a loose terminal panicle. Bracteoles small.

The genus is limited to Australia, and nearly allied to the two preceding ones although without any cottony wool.

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| Leaves linear, often folded lengthwise | 1. <i>C. angustifolia.</i> |
| Leaves lanceolate, flat | 2. <i>C. lanceolata.</i> |
| Leaves cuneate-oblong | 3. <i>C. Bunnyana.</i> |

NFB

VERBENACEAE

Cyanostegia cyanocal

NIB

VERBENACEAE

Dicrastylis gilesii

NIG

VERBENACEAE

Dicrastylis nicholasii

Calyx truncate or sinuately toothed. Corolla-tube short, the limb of 3, 4 or rarely 5 short teeth or lobes, nearly equal or slightly 2-lipped. Stamens 4, shorter than the corolla or rarely exserted. Ovary 4-celled, with 1 ovule in each cell laterally attached at or above the middle. Style filiform, with 2 short acute stigmatic lobes. Fruit a small succulent drupe, with a hard 4-celled undivided kernel. Seeds solitary in each cell, without albumen.—Shrubs or trees. Leaves opposite, undivided. Flowers small, in terminal trichotomous panicles, or in opposite cymes or clusters forming a terminal spike-like thyrsus.

A considerable genus, limited to the tropical and subtropical regions of the Old World. Although some, especially among the Asiatic species, are very well marked, there are a number of forms including the *P. integrifolia* and *P. serratifolia* of Linnæus which seem to pass into each other by numerous intermediates, and it would require a much more detailed study of good specimens from different localities than can now be devoted to them, to determine whether or not they can be classed into tolerably distinct races. To these would belong the first two of the following Australian forms here regarded as species, the next two are rather more distinct and apparently endemic; the fifth, also endemic, is a much more marked one.

Calyx very shortly and obtusely 3-lobed or obscurely 2-lipped.

Leaves very obtuse. Corolla-tube scarcely exceeding the calyx 1. *P. obtusifolia*.

Leaves shortly acuminate. Corolla-tube nearly twice as long as the calyx 2. *P. integrifolia*.

Calyx with a somewhat expanded obscurely toothed margin.

Leaves acuminate, thin, glabrous, the petiole short 3. *P. limbata*.

Calyx 5-toothed, the margin not dilated.

Leaves ovate, acuminate, on rather short petioles 4. *P. Dallachianu*.

Leaves deltoid, much acuminate (Poplar-like), on long petioles 5. *P. acuminata*.

5. **P. acuminata**, *R. Br. Prod.* 512. A small tree of spreading habit, the inflorescence and foliage more or less hoary with a short close tomentum. Leaves broadly cordate-ovate, deltoid or almost rhomboidal, acuminate, entire or coarsely and irregularly toothed, 2 to 4 in. long, more or less pubescent or tomentose on both sides, 3- or 5-nerved (the first and often the second pair of primary veins starting from the base of the midrib), the petioles usually more than half as long as the leaves. Panicles very loose, the primary branches trichotomous, the ulterior ones dichotomous, the whole panicle sometimes 8 to 10 in. broad. Flowers nearly sessile. Calyx tomentose, nearly $1\frac{1}{2}$ lines long, shortly and obtusely 5-toothed but the 3 upper teeth usually smaller and sometimes united as in *P. obtusifolia*. Corolla-tube shortly exserted, the lobes ovate, shorter than the tube, the upper inner one not very different from the others. Drupe depressed-globular, about 2 lines diameter.—*Schau.* in *DC. Prod.* xi. 637; *F. Muell. Fragm.* iii. 36; *P. cordata*, *R. Br. l. c.*; *Schau. l. c.*

N. Australia. Islands of the Gulf of Carpentaria and adjoining mainland, *R. Brown, Henne*; Point Cunningham, Cygnet Bay, N. W. coast, and Goulburn islands, *A. Cunningham*; Victoria river, *F. Mueller*; Escape Cliffs, *Hulse*; also from *M. Douall Stuart's Expedition*.

The species is readily distinguished by its Poplar-like foliage and loose inflorescence.

2. ***P. integrifolia***, Linn.? var. A tree or shrub, either quite glabrous or with a slight pubescence on the foliage and inflorescence. Leaves ovate, shortly acuminate, broad or rather narrow, usually rather smaller than in *P. obtusifolia*. Inflorescence and calyx entirely as in that species, but the corolla (in the Australian form) larger, the tube nearly twice as long as the calyx.—*P. ovata* and *P. media*, R. Br. Prod. 512; Schau. in DC. Prod. xi. 637.

N. Australia. Islands of the Gulf of Carpentaria, R. Brown.
The specimens I saw in Brown's herbarium did not appear to me to be at all different from some Asiatic ones of *P. integrifolia*, a very common sea-coast plant united by Schauer in DC. Prod. xi. 632 with *P. serratifolia*, Linn., under the latter name, which however appears to be the least appropriate of the two Linnæan ones for the consolidated species. The whole question however of the species of *Premna* requires a thorough revision.

NIB

VERBENACEAE

Tatea subacaulis

18. VITEX, Linn.

VERBENACEAE

Calyx 5-toothed or lobed. Corolla-tube short; limb spreading, 5-lobed, the lowest lobe larger and longer than the others and sometimes notched. Stamens 4, in pairs, ascending and exerted beyond the upper corolla-lobes. Ovary 2-celled or more or less perfectly 4-celled, with 1 ovule to each half-cell or cell, laterally attached at or above the middle. Style filiform, shortly and acutely 2-lobed. Fruit a succulent drupe, the putamen separating into 4 hard one-seeded pyrenes (or fewer by abortion). Seeds without albumen.—Trees or shrubs. Leaves opposite, usually of 3 or 5 digitate leaflets, very rarely single (or of a single leaflet). Flowers in cymes, sometimes axillary but usually in terminal panicles either simple and spike-like or branched. Bracts very small.

A considerable tropical and subtropical genus, chiefly Asiatic or African with a few American species, and one species extending to S. Europe. Of the four Australian species, one is widely spread over the Old World within the tropics, the three others are endemic.

- Leaves white underneath, undivided or of 3 or 5 leaflets 1. *V. trifolia*.
- Leaves green on both sides, undivided 2. *V. lignum vitae*.
- Leaves green on both sides, of 3 or 5 leaflets.
- Flowers in loose thyrsoid panicles, mostly terminal 3. *V. acuminata*.
- Flowers in very loose dichotomous cymes on axillary peduncles 4. *V. glabrata*.

3. *V. acuminata*, R. Br. Prod. 512. A small or large tree, the young shoots and inflorescence more or less hoary-pubescent, the adult leaves

glabrous or nearly so. Leaflets 3 or rarely 5, ovate-oblong, elliptical or almost lanceolate, mostly acuminate, contracted at the base into a petiolule sometimes very short, sometimes $\frac{1}{4}$ in. long, the terminal leaflets often 3 to 4 in. long or even more, the lateral ones usually shorter, all membranous, green on both sides, paler and usually glandular-dotted underneath, the common peduncle usually shorter than the leaflets. Flowers small, in loose thyrsoid panicles of 2 to 4 in., terminal or in the upper axils. Pedicels very short. Calyx 1 to $1\frac{1}{4}$ in. long, truncate or minutely toothed. Corolla pubescent outside, villous inside in the throat and the base of the limb, the tube about twice as long as the calyx, the lower lip nearly as long as the tube. Stamens shortly exerted beyond the upper lobes. Ovary 2-celled, with 2 ovules in each cell. Drupe in Dallachy's specimen nearly globular, about $\frac{1}{2}$ in. diameter, the putamen bony and 4-celled as in *Gmelina*, bearing outside a number of radiating riblike exerescences, and perhaps therefore diseased, in R. Brown's smaller and apparently more perfect. Seed not seen perfect.—Schau. in DC. Prod. xi. 695; F. Muell. Fragm. v. 34; *V. meliucepa*, F. Muell. Fragm. v. 35.

N. Australia. Vansittart and Careening Bays, N. W. Coast, *A. Cunningham*; Arnhem Bay and Islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Cape York, *M'Gillivray*, *W. Hill*, *Daemel*; Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy* and others.

V. Timoriensis, Walp.; Schau. in DC. Prod. xi. 686, from Timor, may be the same as *V. acuminata*.

4. **V. glabrata**, *R. Br. Prod.* 512. A tree or shrub, quite glabrous or rarely with a minute tomentum on the young shoots and inflorescence. Leaflets 3 or rarely 5, from broadly ovate and obtuse to elliptical-oblong and acuminate, 2 to 4 in. long, but usually much broader than in *V. acuminata* and less narrowed at the base, the petiolules about $\frac{1}{2}$ to $\frac{3}{4}$ in. long, and the common petiole above 2 in. Flowers white, rather small, in very loose dichotomous cymes on axillary peduncles sometimes nearly as long as the petiole, but the whole inflorescence almost always shorter than the leaf. Pedicels shorter or rarely longer than the calyx. Calyx about $1\frac{1}{4}$ lines long, truncate or minutely toothed. Corolla-tube at least twice as long as the calyx, and the lower lip nearly as long as the tube. Stamens shortly exserted beyond the upper lobes. Fruit, in the specimens seen, 1-seeded by abortion, obovoid, about $\frac{1}{2}$ in. long.—Schau. in DC. *Prod.* xi. 695; *V. Cunninghamii*, Schau. l. c. 691.

N. Australia. Careening Bay, N. W. Coast, *A. Cunningham*; Victoria and Fitzmaurice rivers and Macadam range, *F. Mueller*; Grootte island, Gulf of Carpentaria, *R. Brown*; Port Essington, *Armstrong*; Adams Bay, *Hulls*.

Queensland. Cape York, *Daemel*; Gilbert river, *Daintree*.

The cultivated specimen described by F. Muell. *Fragm.* v. 35 as *V. glabrata*, is the New Zealand *V. littoralis*, A. Cunn., remarkable for its large differently shaped corolla. C. Moore's George-river specimen may be the same, but if so, it is probably cultivated also.