

4. CORCHORUS, Linn.

Sepals 5, rarely 4. Petals as many, without any cavity at the base. Stamens indefinite, rarely few, inserted on a torus scarcely raised, but occasionally expanded in a disk round their base; anther-cells opening longitudinally. Ovary 2- to 5-celled, with several ovules in each cell; style short, simple. Capsule either long without prickles, or short or globular and more or less warted, muricate or echinate, opening loculicidally in 2 to 5 valves, with several seeds in each cell, rarely separated by transverse partitions. Seeds pendulous or horizontal, albuminous; embryo usually curved, with leafy cotyledons.—Herbs, undershrubs, or shrubs, with simple or stellate hairs. Leaves serrate. Peduncles very short, lateral or leaf-opposed, bearing 1 or several flowers. Bracts small. Flowers usually small, yellow.

A considerable genus, of which a few species appear to be limited to tropical America or to Australia, the remainder generally dispersed over various tropical regions in the Old as well as the New World. Of the 13 Australian species 9 are endemic, the remaining 4 are common weeds in tropical Asia and Africa. The fruit in this genus is often indispensable for determining the species.

Annuals (or biennials), glabrous or loosely pubescent.

- Capsule globular or ovoid, very obtuse.
 - Capsule echinate, 3- or 4-celled 1. *C. echinatus*.
 - Capsule slightly warted, 2- or 3-celled 2. *C. hygrophilus*.
- Capsule ($\frac{1}{2}$ to $\frac{3}{4}$ in. long) rather thick, angular or winged.
 - Capsule acute or acuminate, angular but not winged. Stamens numerous 3. *C. Cunninghamii*.
 - Capsule 3-winged, truncate at the top, with 3 diverging points. Stamens under 20. Flowers very small 6. *C. acutangulus*.
- Capsule linear, not winged.
 - Capsule $\frac{1}{2}$ to 2 in. Lower pair of serratures of the leaves ending in fine setæ. Stamens numerous.
 - Capsule 5-celled, the transverse partitions conspicuous 4. *C. oltorius*.
 - Capsule 3- or 4-celled, without transverse partitions 5. *C. tridens*.
 - Capsule under $\frac{1}{2}$ in., 2- or 3-celled. Leaves without setæ. Flowers very small. Stamens few. Pubescent plants.
 - Capsule 3-celled, erect or spreading, 3-toothed at the top 7. *C. fascicularis*.
 - Capsule 2-celled, reflexed, very hirsute, rather acute 8. *C. pumilio*.

Undershrubs or shrubs more or less tomentose or hirsute.

- Fruiting pedicels recurved. Capsule linear, curved or twisted, more or less torulose, 2- or 3-celled.
 - Low diffuse shrubs or undershrubs. Capsule few-seeded.
 - Sepals under 2 lines. Stamens about 10. Capsule 3 or 4 lines long, very hispid, slightly curved 8. *C. pumilio*.
 - Sepals under 2 lines. Stamens about 20. Capsule elongated, much twisted, torulose, glabrous 9. *C. vermicularis*.
 - Sepals 3 to 4 lines. Stamens numerous. Capsule tomentose, slender but not twisted 10. *C. tomentellus*.

T 2

- Erect shrubs. Capsule tomentose, elongated, many-seeded.
 - Tomentum scabrous or almost villous. Sepals 2 or 3 lines. Petals narrow 11. *C. sidoides*.
 - Tomentum soft, close and hoary. Sepals 4 lines or more. Petals broad 12. *C. leptocarpus*.
 - Capsule erect, straight, not twice as long as the calyx, 5-celled. 13. *C. Walcottii*.

6. **C. acutangulus**, Lam.; *W. and Arn. Trov.* 13. An annual, sometimes very small, but attaining 2 ft., decumbent or erect, slightly pubescent and often sprinkled with a few rigid hairs. Leaves petiolate, ovate, serrulate, without setæ. Flowers 1 to 3, nearly sessile, and very small. Sepals little more than 1 line long. Stamens 15 to 20. Capsule straight, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, rather thick, prominently 3-angled, or with 3 longitudinal wings, truncate at the top, with 3 spreading points or teeth, 3-celled. Seeds numerous. Very rarely the capsule has 4 cells, and as many wings and teeth.—Wight, Ic. t. 739.

N. Australia. Upper Victoria river, *F. Mueller*. The species is common in tropical Asia and Africa, and occurs also, perhaps introduced, in some parts of S. America.

NIG

TILIACEAE

Corchorus allenii F. Muell

NIB

TILIACEAE
Corchorus crassifolius Domin.

NIO

TILIACEAE
Corchorus fascicularis Lam.

12. **C. leptocarpus**, *A. Cunn. Herb.* An erect shrub of several feet, hoary all over with a minute close tomentum. Leaves petiolate, from ovate to lanceolate, obtuse, 2 to 4 in. long, irregularly crenate, cordate at the base, minutely but softly tomentose on both sides. Flowers in nearly sessile clusters. Buds tomentose, angular, tipped with the long points of the sepals. Sepals 4 lines long or rather more. Petals broad, almost foveolate at the base. Stamens numerous, on a prominent torus. Capsule slender, incurved at the base, densely tomentose, 1 to 1½ in. long, slightly torulose, 3-celled. Seeds numerous, oblong, with incomplete transverse partitions between them.

N. Australia. Water Island, N.W. coast, *A. Cunningham.*

NIB

TILIACEAE

Corchorus macropetalus (F. Muel.)
Domir

4. **C. olitorius**, *Linn.*; *W. and Arn. Prod.* 73. An erect annual, of 2 ft. or more, glabrous or nearly so. Leaves from ovate-acuminate to lanceolate, 2 to 3 in. long or more, serrate, the lowest pair of serratures ending in spreading or recurved setæ. Flowers single or 2 together, on very short pedicels, the buds obovoid-globular. Stamens numerous, on a small torus. Capsule linear, often above 2 in. long, slightly 5-angled, 5-celled, with numerous seeds, separated by almost complete transverse partitions.

N. Australia. Van Diemen's Gulf, *A. Cunningham*. The species is common in tropical Asia and Africa.

N16

TILIACEAE

Corchorus parviflorus Domin

11. *C. sidoides*, *F. Muell. Fragm. m. 9*. An erect shrub of several feet, the branches densely but rather loosely tomentose. Leaves shortly petio- late, from oval-oblong to oblong-lanceolate, obtuse, 1 to 2 in. long, rather thick, crenate, plicate and rugose or on luxuriant specimens longer and thinner, scabrous-tomentose above, more densely tomentose underneath. Flowers in nearly sessile clusters. Calyx tomentose-villous, 2 to 3 lines long, the buds often tipped by the tooth-like points of the sepals. Petals narrow, in some flowers very small. Stamens numerous, on a small torus. Capsule slender, $\frac{3}{4}$ to near 2 in. long, tomentose or villous, more or less torulose, 2- or 3-celled. Seeds oblong, often distant in each cell, although rather nu- merous on the whole.

N. Australia. N.W. coast, *Bynoe*; Cygnet Bay, *A. Cunningham*; frequent in sterile places on the Victoria river, *F. Mueller*; islands of the Gulf of Carpentaria, *R. Brown*.

5. **C. triens**, *Linn.*; *W. and Arn. Prod.* 73. A glabrous, hard annual, with decumbent ascending or erect branches. Leaves mostly lanceolate, rather obtuse, 2 to 3 in. long, crenate-serrate, the lowest pair of serratures terminating in setæ as in *C. oltorius*. Flowers small, nearly sessile, usually 2 or 3 together. Stamens numerous, the torus scarcely raised. Capsule linear, rigid, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, straight or curved, glabrous, 3- or 4-celled, and often terminating in as many very short spreading points or teeth. Seeds numerous, without any, or with very imperfect, transverse partitions.

N. Australia. Islands of the N. coast, *R. Brown*; Upper Victoria river, *Sturt's* and *Hooker's* creeks, *F. Mueller*. The species is widely spread over tropical Asia and Africa.

9. **C. vermicularis**, *F. Muell. Fragm.* n. 11. A low shrub or undershrub, with numerous slender branches, like *C. pumilio* in habit, but more diffuse, and rather stellate-tomentose than hirsute. Leaves petiolate, oblong, obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, serrate-crenate, rugose and plicate, rather roughly stellate-tomentose. Flowers very small, 2 or 3 together, and shortly pedicellate. Buds obovoid. Sepals linear-cuneate, $1\frac{1}{2}$ lines long. Petals broadly obovoid. Stamens about 20. Ovary glabrous. Capsule reflexed, linear, slender and very much twisted, contracted between the seeds; 2-valved. Seeds ovoid-oblong, few and distant, the cells usually closed between them.

N. Australia. Upper Victoria river, *F. Mueller.*

13. **C. Walcottii**, *F. Muell. Fragm.* iii. 9. A shrub or undershrub of 1 to 3 ft., densely and softly tomentose or woolly. Leaves petiolate, from broadly ovate to ovate-oblong, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, coarsely toothed or crenate, not cordate, thick, soft and densely tomentose. Peduncles nearly as long as the petioles, with 3 to 6 rather large pedicellate flowers. Sepals woolly-tomentose, 5 or 6 lines long, lanceolate with long soft subulate points. Petals broad. Stamens numerous. Capsule erect and straight, from about

the length of the calyx to twice as long, very tomentose, 5-celled. Seeds few, without partitions between them.

N. Australia. Enderby Island, N.W. coast, *A. Cunningham*; Hearson Island and Nichol Bay, *F. Gregory*.

Var. (?) *parviflora*. Leaves smaller, often narrow, tomentum closer, and flowers much smaller. N.W. coast, *Bynoe*; Nichol Bay, *F. Gregory*.

Var. (?) *densiflora*. Foliage various, pedicels very short, flowers intermediate in size. Gulf of Carpentaria, *F. Mueller*. The specimens are insufficient for correctly estimating the constancy of these forms.

Sepals 5, distinct. Petals 5, with a foveola or thickened cavity at the base, usually shorter than the calyx, inserted round the base of the torus. Stamens indefinite, inserted on the raised torus. Ovary 2- to 4-celled, with 2 or more ovules in each cell; style subulate, minutely toothed or lobed. Drupe containing 1 to 4 pyrenes or nuts, entire or 2- or 4-lobed, the nuts either 1-seeded or 2- or more seeded, and then divided by transverse partitions between the seeds. Seeds ascending or horizontal, the albumen usually copious, the cotyledons flat.—Trees or shrubs, the hairs or tomentum stellate. Leaves entire or serrate, 3- to 7-nerved. Stipules narrow, deciduous. Flowers usually yellow, the umbel-like cymes axillary or terminal. In the Australian species (except *G. breviflora*) the ovary is 2-celled, but each cell is subdivided by a vertical, nearly complete partition, so as to appear 4-celled, with two or rarely more superposed ovules in each half-cell, each half-cell forming in the fruit a separate nut, with 1 or rarely more superposed seeds in each.

The genus is a large one, widely spread over the tropical and subtropical regions of the Old World. Of the Australian species, 3 extend over tropical Asia, the remaining 5 are endemic.

Leaves glabrous or nearly so, 3-nerved at the base. Flowers hermaphrodite.

- Sepals 7 to 9 lines. Petals small, the foveola very large. Torus elongated. Fruit depressed-globose, not lobed, $\frac{1}{2}$ in. diameter or more 1. *G. orientalis*.
- Sepals about 4 lines. Petals very small, the foveola large. Torus short. Fruit small, 2-lobed (unless reduced to one carpel) 2. *G. multiflora*.
- Sepals about 2 lines. Petals more than half as long, the foveola very small. Torus short. Fruit small, entire 3. *G. breviflora*.
- Leaves softly velvety-tomentose underneath, 3 or 5-nerved. Flowers hermaphrodite. Petals small, foveola large 4. *G. latifolia*.
- Leaves white-tomentose underneath or scabrous, 3- or 5-nerved. Flowers polygamo-dioecious.
- Leaves obovate-oblong to lanceolate. Foveolate base of the petals broader than the lamina 5. *G. polygama*.
- Leaves ovate or orbicular. Foveolate base of the petals small.
- Leaves ovate-cordate, acuminate, often 3 to 4 in. Stamens in the female flowers numerous, clavate, without anthers 6. *G. xanthopetala*.
- Leaves small, ovate-obtuse. Stamens in the female flowers 1 or 2 apparently perfect, without stamens. Buds not striate 7. *G. scabrella*.
- Leaves small, orbicular, very scabrous. Buds striate. (Female flowers unknown.) 8. *G. orbifolia*.

3. **G. breviflora**, *Benth.* A large spreading shrub or small tree, the young shoots slightly tomentose, otherwise nearly glabrous. Leaves petiolate, obliquely ovate, acuminate, 2 to 4 in. long, glabrous or slightly scabrous. Peduncles usually 3 or 4 together, 3- to 5-flowered, unequal in length, but rarely exceeding the petioles. Sepals elliptical-oblong, more obtuse than in any other species, not exceeding 2 lines, rather thick, tomentose outside. Petals more than half as long, with a very small foveolate base. Stamens numerous. Ovary hirsute, 2-celled, with 2 superposed ovules in each half-cell. Drupe depressed-globular, quite entire, about 3 lines diameter, glabrous or slightly hairy, broad and flat-topped, the hard almost woody endocarp scarcely

separating into 2 nuts, each one containing when perfect 2 superposed pairs of seeds placed singly in separate compartments, but often fewer by abortion.

N. Australia. Cygnet Bay, *A. Cunningham*; N.W. coast, *Bynoe*; islands of the Bay of Carpentaria, *R. Brown*.

1. **G. orientalis**, *Linn.*; *W. and Arn. Prod.* 76. A tall, rather weak shrub, glabrous, except a minute tomentum on the young shoots, or sparingly sprinkled on the under side of the leaves and more abundant on the inflorescence. Leaves shortly petiolate, from oval-oblong to oblong-lanceolate, acuminate, 3 to 4 in. long, minutely crenulate, 3-nerved at the base. Peduncles 1- or 2-flowered, axillary or the upper ones forming a short terminal panicle. Sepals rusty-tomentose, 7 to 9 lines long. Petals not half so long, the foveolate base broader than and almost as long as the lamina, pubescent round the edge. Torus elongated. Stamens very numerous. Drupe depressed-globular, $\frac{1}{4}$ to $\frac{3}{4}$ in. diameter, flat-topped, slightly furrowed but not lobed, minutely tomentose with a few short straight hairs intermixed, containing usually 4 nuts, each with 2 or 3 horizontal, superposed seeds, separated by transverse partitions.

N. Australia. Van Diemen's Gulf, *A. Cunningham*; islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. N.E. coast, *Banks and Solander*; Northumberland Islands, *R. Brown*. The species is not uncommon in Ceylon and a part of the Indian peninsula.

Var. latifolia. Leaves ovate-cordate, crenate, fruit more densely pubescent. Port Denison, *Fitzalan*.

5. **G. polygama**, *Koeb. Fl. Ind. II. 588.* An erect shrub, the branches tomentose or softly hirsute. Leaves almost sessile, from obovate-oblong to oblong-elliptical or almost lanceolate, 2 to 3 in. long, serrate, wrinkled and softly pubescent or scarcely scabrous above, velvety-tomentose underneath. Flowers diœcious, 3 or 4 together on very short peduncles. Sepals about 4 lines long, silky-tomentose outside. Petals about one-third as long, the oblong lamina twice as long as the broad foveolate base. Male fl. : Stamens about 20, on the very hirsute torus, with a very rudimentary pistil or none at all. Female fl. : Stamens very short, with small anthers. Ovary very hirsute, with 2 superposed ovules in each half-cell. Style short, with broad, spreading, fringed stigmatic lobes. Drupe depressed-globular, 5 or 6 lines diameter, hirsute when young, at length smooth and shining, 2-lobed, each lobe containing 2 1-seeded nuts and slightly furrowed between them.

N. Australia. Victoria and Fitzmaurice rivers and Arnhem's Land, *F. Mueller*; Goulburn Island, *A. Cunningham*; islands of the Gulf of Carpentaria, *R. Brown*; Swears Island, *Henne*.

Queensland. Cape York and Port Molle, *M' Gillivray*; Bay of Inlets, *Banks*; Keppel Bay, *R. Brown*; Percy Islands, *A. Cunningham*; Rockhampton, *F. Mueller*; Port Denison, *Fitzalan*.

The species spreads over a great part of East India.

NIG

TILIACEAE

Grewia ramulosa W.V. Fitzg

3. TRIUMFETTA, Linn.

Sepals 5, distinct, usually concave, or with a dorsal point or appendage at the top. Petals 5, thickened and globular, or foveolate at the base, inserted round the base of the torus, rarely wanting. Stamens indefinite, or rarely reduced to 5 or 10, free, inserted on the raised torus; anther-cells opening longitudinally. Ovary 2- to 5-celled, with 2 collateral ovules in each cell; style filiform, stigma minutely 2- to 5-toothed. Fruit globular or nearly so, echinate or bristly, indehiscent or (in species not Australian) separating into cocci. Seeds in each coccus or cell solitary, or, if 2, separated by vertical dissepiments, pendulous, albuminous; embryo straight; cotyledons flat, leafy.—Herbs, undershrubs, or shrubs, with the hairs or tomentum stellate. Leaves serrate, entire, or 3- or 5-lobed. Flowers yellow, in little pedunculate or almost sessile cymes or clusters, either leaf-opposed or lateral, rarely strictly axillary. Petals usually narrow and not exceeding the calyx, especially in the Old World species.

A considerable genus, widely spread over the tropical regions of both the New and the Old World. Of the Australian species, one, a maritime plant, extends to several of the South Pacific islands, the others are all endemic.

- Ovary 3- to 5-celled. Fruit 3- to 8-celled, with 1 seed in each cell.
 Leaves round-cordate, entire or lobed. Fruit rather large, with two cells and seeds to each carpel.
 Stems prostrate. Leaves mostly lobed. Sepals 4 to 5 lines with minute pointed appendages 1. *T. procumbens*.
 Shrub densely woolly-tomentose. Leaves undivided. Sepals above $\frac{1}{2}$ in. with leafy toothed appendages 2. *T. appendiculata*.
 Leaves ovate to lanceolate. Fruit small, with as many cells and seeds as carpels. Erect tomentose shrubs.
 Broader leaves obovate-rhomboid. Calyx appendages ovate-peltate. (Fruit unknown) 3. *T. glaucescens*.
 Broader leaves cordate-lanceolate. Calyx appendages small, obtuse. Fruit depressed-globular, 5-celled, nearly glabrous 4. *T. denticulata*.
 Broader leaves obovate-cordate. Calyx appendages small, acute. Fruit ovoid-globular, 4-celled, very tomentose 5. *T. micracantha*.
 Ovary 2-celled. Fruit 1-seeded.
 Fruit covered with long soft plumose setæ 6. *T. plumigera*.
 Fruit very small, scarcely pubescent, shortly echinate 7. *T. parviflora*.
A. Cunningham's herbarium contains also specimens from the N.W. coast of two other species apparently either of *Triumfetta* or *Grewia*, but too imperfect to determine.

T. appendiculata, *T. mucro*, *Frugm.* III. 1. Shrubby, the whole plant densely tomentose-villous, or almost woolly. Leaves petiolate, broadly ovate-cordate, obtuse, 2 to 4 in. long, crenate, and sometimes sinuate-lobed, very soft and thick. Peduncles mostly 3-flowered. Sepals above $\frac{1}{2}$ in. long, woolly-tomentose, the dorsal appendages leafy and toothed, spreading, and forming on the bud a kind of cup. Ovary hirsute, 3-celled. Capsule globular, hard, indehiscent, very villous, about as large as in *T. procumbens*, but the prickles not so rigid, and sometimes wearing off; endocarp hard, divided into 6 one-seeded cells.

N. Australia. Nichol Bay, N.W. coast, *F. Gregory*; islands of the Gulf of Carpentaria, *R. Brown*.

NIO

TIHIACEAE

Triumfetta chaeto

4. **T. denticulata**, *R. Br. Herb.* An erect, much-branched shrub, of 2 or 3 ft., the branches tomentose-villous. Leaves petiolate, from ovate-cordate to lanceolate, acute, $1\frac{1}{4}$ to 3 in. long, slightly serrate-crenate, scabrous-pubescent above, tomentose underneath. Peduncles very short, several-flowered. Sepals about 3 lines long, pubescent, the small glabrous dorsal appendages obovate or cuneate, and quite distinct round the top of the truncate buds. Fruit depressed-globular, about 2 lines diameter, umbilicate, glabrous or nearly so, tuberculate or muricate with minute fine prickles, 5-celled, with 1 ovule in each cell.

N. Australia. Cavern Island and Groote Eyland in the Gulf of Carpentaria, *R. Brown.*
(*Hb. R. Br.*)

3. **T. glaucescens**, *R. Br. Herb.* Shrubby, with tomentose branches. Leaves petiolate, from obovate-rhomboid to lanceolate, acute, or somewhat obtuse, $1\frac{1}{2}$ to 2 in. long, serrate-crenate, rather thick, roughly tomentose-pubescent above, hoary-tomentose underneath. Peduncles very short, few-flowered. Sepals about 3 lines long, tomentose, the dorsal appendages broadly ovate-peltate, thick and gland-like, forming a radiating disk on the thick truncate buds. Ovary 3-celled. Fruit not seen.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.* (*Hb. R. Br.*)

NES

TIWIACEAE

Triumfetta leptacantha

F. Muell

5. **T. micracantha**, *F. Muell. Fragm.* iii. 7. Shrubby, erect, the branches closely tomentose or almost villous. Leaves petiolate, from broadly obovate-cordate to narrow rhomboid-oblong, or the upper ones lanceolate, the larger ones 2 to 3 in. long, serrate, with the lower teeth glandular, soft and thick with a close whitish tomentum or villous-tomentose on both sides. Peduncles about as long as the petioles, with about 4 pedicellate flowers. Sepals about 3 lines long, the dorsal appendage small and pointed. Petals none (in the buds I have opened). Fruit ovoid-globose, scarcely above 3 lines long, densely tomentose, the small prickles often scarcely exceeding the wool; endocarp hard, 4-celled, with one seed in each cell.

N. Australia. Victoria river, Hooker's and Sturt's creeks and Abel Tasman river, *F. Mueller*. There are two forms, differing in the tomentum either close and whitish or dense and almost woolly. The species much resembles in aspect the common African *T. glandulosa*, Forsk. (*T. Vahlii*, Poir., *T. glandulosa*, Lam., and *T. velutina*, Vahl), which however has separable cocci.

6. **T. plumigera**, *F. Muell. Fragm.* i. 69. Shrubby, with erect nearly simple branches, closely or loosely tomentose. Leaves from cuneate-oblong to lanceolate, 1 to 2 in. long, rather thick, and either closely whitish tomentose or roughly tomentose-villous on both sides. Cymes or clusters several-flowered, nearly sessile, or the lower ones pedunculate. Sepals scarcely above 2 lines long, the dorsal appendages small and pointed. Stamens rather numerous. Ovary 2-celled. Fruit 1-seeded (or sometimes 2-seeded?), small, but covered with long soft plumose-villous setæ, which often attain 4 lines when the fruit is ripe.

N. Australia. Montague Sound, *A. Cunningham*; N.W. coast, *Bynoe*; Depot Creek, sources of the Victoria river, *F. Mueller*. The species is nearly allied to the S. African *T. trichocarpa*, *Sond.*, which has however larger flowers, and the setæ of the fruit more than $\frac{1}{2}$ in. long.