NIB

SAPINDALEAE

Allophylus crenatus

Radlk.

## 8. ATALAYA, Blume.

Flowers regular, polygamous. Sepals 5, much imbricate in the bud. Petals 5, exceeding the sepals, with an inner scale or tuft of hairs. Disk annular. Stamens 8, inserted inside the disk. Ovary 3-celled, with 1 ovule in each cell. Style short, undivided. Fruit separating into 3 distinct carpels or samaræ, 1-celled, 1-seeded and indehiscent at the base, terminating in a long wing. Seeds without any arillus, testa coriaceous; cotyledons thick, unequal.—Trees or shrubs. Leaves pinnate or rarely simple. Flowers usually larger than in *Cupania* and *Ratonia*, in axillary or terminal panicles.

The genus is endemic in Australia, with the exception of one species, which extends to Timor. The flowers are nearly those of Sapindus, with the fruit of Thouinia and Acer.

Flowers and fruit, as well as the whole plant, quite glabrous Flowers and fruit more or less pubescent or tomentose.	1. A. salicifolia.
pedunculate, many-flowered. Carpels divaricate.  Leaflets narrow-oblong or linear, or leaves undivided, the petiole often winged. Carpels diverging	
Plant glabrous, except the flowers  Branches, young leaves, and panicles velvety-tomentoes. Ladden	
and petiole-wings much reticulate	4. A. variifolia.

3. A. hemiglauca, F. Muell. Herb. A tall shrub or small tree, quite glabrous except the flowers, and more or less glaucous. Leaves usually pinnate; leaflets few, from narrow-oblong to linear, obtuse or scarcely acute, from 2 or 3 to 7 or 8 in. long, often somewhat falcate, narrowed at the base but rarely petiolulate, rigidly coriaceous, with numerous pinnate and reticulate veins and a somewhat thickened margin, the common petiole terete or nearly so; sometimes, however, the petiole becomes winged, or the leaves are quite simple, oblong, or linear, or the leaflets are decurrent on the petiole forming simple, oblong, or linear, or the leaflets are decurrent on the petiole forming a large 2- or 3-lobed leaf, or rarely the simple leaf is ovate-lanceolate, and 8 to 10 in. long. Panicles rather dense, the rhachis and branches glabrous or nearly so; pedicels 1 to 2 lines long. Sepals orbicular, nearly glabrous, 1½ or the inner ones nearly 2 lines long. Petals pubescent, oblong, 3 to 4 lines long, with a hirsute scale at the base. Filaments pubescent. Ovary densely silky-pubescent. Samaræ pubescent, with minute appressed hairs, 1 to 11 in long including the ming which is nearly as bread as long that 1 to  $1\frac{1}{2}$  in. long, including the wing, which is nearly as broad as long, the cavity hairy or nearly glabrous inside. - Thouinia hemiglauca, F. Muell. Fragm. i. 98.

N. Australia. N.W. coast, Bynoe; Hammersley Range, Nichol Bay, F. Gregory;

Albert river, Henne.

Queensland. E. coast, R. Brown; Oxley's Station, Leichhardt; Rockhampton, Thozet; Brisbane river, A. Cunningham, Fraser; Mooni river, Mitchell.

N. S. Wales. Liverpool plains, A. Cunningham; Bowen and Castlereagh rivers, F. Expedition and others.

1. A. salicifolia, Blume, Rumphia, iii. 186. A small tree, quite glabrous, green or somewhat glaucous. Leaflets in our specimens 2 to 5, oblong or oblong-lanceolate, 3 to 5 in. long, narrowed at the base, but not petiolulate, thinly coriaceous, with numerous pinnate veins, and more or less reticulate, the margins not thickened. Panicles loose, perfectly glabrous, as well as the flowers, except a few hairs on the filaments and petal-scales. Flowers otherwise those of A. hemiglauca. Samaræ about \(\frac{2}{3}\) to 1 in. long, including the wing, and perfectly glabrous.—Sapindus salicifolius, DC. Prod. i. 608; Cupania salicifolia, Dene. Herb. Tim. Descr. 115; Thouinia australis, A. Rich. Sert. Astrol. 31, t. 12.

N. Australia. Careening Bay, N.W. coast, A. Cunningham; Mclville Island (not Moreton Bay), Fraser and A. Cunningham. Also in Timor, the specimens precisely similar to the Australian ones.

Atalaya simplicifolia W.V. Fitzg. 4. A. variifolia, F. Muell. Herb. A tall shrub or small tree, the young

branches and panicles softly velvety-tomentose. Leaves or leaflets from oblong to linear, apparently as variable as in A. hemiglauca, but longer, often above 8 in., very much more reticulate, the common petiole usually broadly winged, the wing also much reticulate. Panicle loose. Sepals silky-pubescent, about 1½ lines long. Petals twice as long. Filaments hairy. Samaræ softly tomentose, 2 in long including the wing, which is fully twice as long as broad, the cavity pubescent inside.—Thouinia variifolia, F. Muell. Fragm. i. 46.

N. Australia. Sea range, Macadam range, and near Fitzmaurice river, F. Mueller.

# SAPINDACEAE

### 1. CARDIOSPERMUM, Linn.

Flowers polygamous. Sepals 4, broadly imbricate, the 2 outer ones small. Petals 4, 2 larger with a large scale, 2 smaller with a crested scale. Disk one-sided, almost reduced to 2 prominent glands opposite the lower petals. Stamens 8, oblique. Ovary excentrical, 3-celled, with 1 ovule in each cell; style very short, with 3 stigmatic lobes. Capsule vesicular, membranous, more or less 3-cornered, 3-celled, opening loculicidally. Seeds globose, with a thick funicle or small aril; testa crustaceous; cotyledons large, transversely folded.—Herbs or undershrubs, mostly climbing. Leaves dissected. Flowers few, small, on long axillary peduncles, which usually bear a tendril under the panicle.

A small genus, chiefly American, of which 2 species are also spread over the Old World within the tropics, and a third is perhaps confined to the Old World. The Australian species is one of those most widely diffused in both worlds.

1. C. Halicacabum, Linn.; DC. Prod. i. 601. A straggling or somewhat climbing annual or perhaps perennial, attaining several feet in length, glabrous or slightly pubescent. Leaf-segments usually twice ternate, ovate or ovate-lanceolate, coarsely toothed or lobed, the upper leaves smaller, narrower and less divided. Peduncles 2 to 3 in. long, bearing a double or treble short recurved tendril under the small panicle, which is often reduced to an umbel of few small white flowers. Capsules flat on the top, usually pubescent.—A. Gray, Gen. Ill. t. 181; Wight, Ic. t. 508.

N. Australia. Victoria river, Sea range, etc., F. Mueller; Albert river, Henne. Queensland. N.E. coast, R. Brown; Rockhampton, Thozet.

The species is common in most tropical regions. The Australian specimens belong either to the variety with fruits scarcely \(^{\frac{1}{4}}\) in. diameter, often considered as a distinct species (C. microcarpum, H. B. and K.), or are intermediate between that and the typical form, with fruits above 1 in. diameter.

#### 5. DIPLOPELTIS, Endl.

Flowers polygamous. Sepals 5, persistent, imbricate in the bud. Petals 4, the place of the fifth vacant, clawed, without any scale inside. Disk very oblique, produced into a concave or apparently double scale. Stamens 8, within the disk, turned to one side. Ovary 2- or 3-lobed, 2- or 3-celled; style ascending, usually twisted; ovules 2 in each cell, superposed halfway up the inner angles. Capsule 2- or 3-celled, opening loculicidally in as many valves, or separating into cocci. Seeds usually solitary in each carpel; testa crustaceous; arillus small; embryo spirally rolled.—Shrubs or undershrubs, more or less glandular-pubescent. Leaves alternate, entire or pinnatifid. Panicles terminal, with scorpioid racemes. Flowers white pink or violet, larger than in most Sapindaceæ.

The genus is limited to Australia.

 SAPINDACEAE

NEB

SAPINDACEAE

Diplopeltis eriocarpa

Hemsl.

3. **D. Stuartii,** F. Muell. Fragm. iii. 12. A shrub apparently diffuse, the branches pubescent and glaudular. Leaves linear or cuneate, entire or 3-lobed at the end,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, nearly glabrous above, hirsute underneath. Racemes simple in one specimen, divided into two in the other (both mere fragments), glandular-pubescent and hirsute. Flowers rather smaller than in D. Huegelii. Margins or lobes of the disk nearly equal. Ovary very hirsute. Capsule 4 or 5 lines long (3-lobed?), membranous, opening loculicidally in 3 valves.

N. Australia. Between Mount Morphett and Bonny river, M. Douall Stuart (Herb F. Muell.)

## 16. DISTICHOSTEMON, F. Muell.

Characters of *Dodonæa* except that the sepals vary from 5 to 8, and the stamens are indefinite, usually above 20, closely packed in 2 or more series.—Pubescent shrub. Leaves simple. Inflorescence more nearly an interrupted spike than in any *Dodonæas*.

spike than in any Dodonæas.

The genus is limited to a single species, endemic in Australia, scarcely sufficiently distinct from Dodonæa.

SAPINDALEAE

Distichostemon

Cilomentosus

S. moore

NIB

SAPINDACERE

Distichostemon hispidulus (Endl.) Baill.

#### 15. DODONÆA, Linn.

(Empleurosma, Bartl.)

Flowers polygamous or unisexual, often diœcious. Sepals 5 or sometimes fewer, valvate in the bud. Petals none. Disk small or inconspicuous. Stamens usually 8, sometimes fewer, rarely 10; filaments very short, anthers ovoid or linear-oblong. Ovary 3- or 4-, rarely 5- or 6-celled, with 2 ovules in each cell; style short or, in some flowers, very long, shortly lobed at the end. Capsule membranous or coraceous, opening septicidally in as many valves as cells, each valve with a dorsal angle often produced into a vertical wing, and in falling off leaving the dissepiment attached to the persistent axis, or rarely the dissepiment splitting and remaining attached to the valves, thus closing the carpels and leaving only the central filiform axis persistent. Seeds 1 or 2, nearly globular or more frequently compressed, with a thickened funicle, but not arillate; testa crustaceous; embryo spirally curled.—Shrubs, often tall, but scarcely truly arborescent; the young shoots usually viscid, and often the whole plant. Leaves simple or pinnate, with small leaflets, with or without a terminal odd one. Flowers terminal or axillary by the abortion of the flowering branches, solitary, clustered, or in short racemes or panicles.

With the exception of D. viscosa, which is widely dispersed over almost all hot countries, and possibly one distinct Sandwich Island species, one from S. Africa, and one or two from Mexico, the Dodoncas are all endemic in Australia, and very difficult to distinguish by positive characters. The form of the wings of the capsule, which has been much relied on, is as variable as that of the leaves, and the species, which at first sight appear the most distinct, often pass one into the other by the most insensible gradations. Even the exceptional dehiscence of the capsule, in those species where the disseptiments are carried off with the valves, appears sometimes to be not quite constant, and is at most a purely artificial character separating species in all other respects very closely allied. Several species have in some, occasionally in nearly all the female flowers, a remarkably long style, sometimes \(\frac{1}{2}\) to 1 in., whilst other female flowers on the same specimen, or on other specimens of the same species, have no style at all, the stigma or stigmatic surface sessile on the overy.

Series I. Cyclopteræ.—Leaves entire, toothed or rarely lobed. Wings of the capsule extending from the base to the style or nearly so, each carpel, including its wing, nearly orbicular or longer than broad.

Leaves flat, elliptical, oblong-lanceolate or spathulate or, if linear, not

filiform, entire or obscurely sinuate, usually above 2 in. long,
rarely between 1 and 2 in.
Young branches very angular. Seeds smooth and shining. Leaf- veins indistinct.
Sepals minute. Anthers linear 1. D. triquetra.
Sepals 1 to 1½ lines long, from half as long to as long as the
anthers
Young branches very angular. Seeds opaque. Leaves long and narrow, often serrate
narrow, often serrate
Leaves oval-oblong, on a rather long petiole, rounded at the base 3. D. petiolaris.
Leaves narrowed into the petiole, the lateral veins more or less
conspicuous. Leaves elliptical-oblong, lauceolate or spathulate, rarely almost
linear-cuncate 4. D. viscosa.
Leaves narrow, linear-cuneate or long and linear 5. D. attenuata.
Leaves flat, more or less cuneate, entire or toothed at the end, rarely
exceeding 12 in., and usually under 1 in.
Much-branched, erect or divaricate shrubs. Terminal flowers
clustered or shortly racemose.  Leaves broad-cuneate, rounded or truncate at the end 6. D. cuneata.
Leaves narrow-cuneate, rather acute, acuminate or 3-toothed at
the end 7. D. peduncularis.
Prostrate shrub. Leaves rather narrow-cuneate, mostly toothed or
lobed. Flowers solitary 8. D. procumbens.  Leaves linear-filiform, heath-like or pine-like.
Leaves crowded, under 1 in. long 9. D. ericifolia.
Leaves 1 to 3 in. long, not crowded 10. D. filifolia.
Leaves linear or lanceolate, mostly serrate or pinnatifid.
Branches terete or nearly so. Leaves linear or linear-cuneate, ob-
tuse, mostly under $1\frac{1}{2}$ in long
to 4 in. long
Series II. Platypteræ.—Leaves quite entire, flat. Wings of the capsule very diver-
gent or divaricate, not reaching to the style nor to the base, each carpel, including its
wing, broader than long, transversely ovate or oblony.
Leaves linear or lanceolate. Branches very angular. Dissepiments
persisting on the axis
Leaves oblong-elliptical
Leaves oblong-elliptical
Series III. Cornutæ.—Leaves entire or toothed at the end, the margins revolute or
rarely flat. Wings of the capsule reduced to erect or divergent, usually falcate, horn-like
appendages at the upper outer angle of the carpels.
Leaves narrow-linear or subulate
Leaves oblong or oblong-cuneate, obtuse, ½ to 1 in. long 17. D. ceratocarpa.  Leaves linear or cuneate, acute or 3-toothed, 2 to 4 lines long 18. D. divaricata.
Leaves broadly ovate or orbicular, mostly toothed
,

slightly and irregularly dilated into very narrow wings.	
Leaves flat, cuneate or obovate, rigid.  Sepals lancecolate. Buds ovoid or globular.  Dissepiments persisting on the axis of the fruit.  Branches scarcely angled. Leaves obovate, cuneate, or triangular, glabrous or pubescent. Flowers mostly axillary.  Sepals narrow, short.  Branches acutely angled. Leaves obovate, glabrous. Raceines short, terminal. Sepals broad-lanceolate. 20. D. aptera.  Dissepiments splitting and coming off with the valves. Branches terete. Leaves obovate or obloug, glabrous. 21. D. bursarifolia.  Sepals broad-ovate. Buds very angular.  Erect divaricate shrub. Leaves obovate or orbicular, usually toothed	
toothed Prostrate shub. Leaves oblong-cuneate, often 3-toothed 23. D. humifusa.  Leaves short, linear, with recurved or revolute margins. Quite glabrous. Stamens usually 6	
Series V. <b>Pinnatæ</b> .—Leaves all pinnate or very rarely a few simple ones at the base of the branches. Capsule of the Cyclopteræ, except in D. oxyptera and D. inæquifolia, where it approaches that of the Platypteræ, and in D. humilis, where it is apterous.	
Tall shrubs or small trees. Leaflets flat, oblong, lanceolate or obovate, not coriaceous. Racemes or panicles terminal, loose.  Leaflets usually numerous, lanceolate or oblong. Capsule not inflated, the wings broad.  Leaflets ½ in. or less; rhachis scarcely winged. Sepals 3 to 4 lines long	
The second of the second more entirestations.	

- 5. D. attenuata, A. Cunn. in Field, N. S. Wales, 353. A viscid shrub, closely resembling the narrowest-leaved forms of D. viscosa on the one hand, and almost passing into D. lobulata on the other. Leaves linear or narrowly linear-cuneate, obtuse, often slightly sinuate-toothed, rather thick and rigid, 1-nerved, the lateral veins inconspicuous,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  in. long in the original form, but sometimes longer. Flowers and ovate sepals of D. viscosa, in short usually simple racemes. Capsule of D. viscosa, usually intermediate between the extremes of the varieties a and b of that species. Seeds opaque.—Bot. Mag. t. 2860; D. Preissiana, Miq. in Pl. Preiss. i. 226; F. Muell. Fragm.
- N. S. Wales. Blue Mountains, A. Cunningham and others, and apparently common westward in the Darling and Murray desert, Mutanie ranges, Mount Brown, etc., Herb. F. Mueller.

Mueller.
Victoria. In the Murray desert and N.W. interior, F. Mueller.
S. Australia. Towards Spencer's Gulf, Warburton.
W. Australia. Mount Hardy, near York, Preiss, n. 2437; between Swan River and King George's Sound, Drummond, 4th Coll., n. 257; in the interior, Roe. The latter specimens have narrower, more rigid wings to the capsule, and more coriaceous leaves.
Var. linearis. Leaves long, narrow-linear, mostly acute, rigid, the margins often recurved. Capsule (only seen in few specimens) rather small, but with the terminal sinus between the wings narrow.—New England, C. Stuart; Mitta-Mitta, Genoa and Buchan rivers in Victoria, F. Mueller; Kangaroo Island, Waterhouse, Sealy; Swan River, Drummond, n. 203. The foliage nearly resembles that of D. stenophylla, which has a very different capsule. capsule.

14. **D. platyptera,** F. Muell. Fragm. i. 73. A tall shrub with the habit of the larger forms of D. viscosa, glabrous and viscid. Leaves elliptical-oblong or broadly lanceolate, rather obtuse,  $1\frac{1}{2}$  to  $2\frac{1}{3}$  in. long, entire, almost coriaceous, the pinnate veins rather numerous, but very fine, narrowed into a short petiole. Petals few, slender, in short racemes. Sepals narrow-ovate. Capsule flat at the top, the wings very diverging, obovate-oblong, not reaching to the style nor to the base of the carpels; dissepiments splitting and falling off with the valves, leaving only the filiform axis persistent.

N. Australia. Cygnet Bay, N.W. coast, A. Cunningham; Fitzmaurice river, F. Mueller. The specimens are not satisfactory. F. Mueller's have no flowers and only a few fruits; in A. Cunningham's the flowers are mostly fallen off, and I found amongst the capsules only one far enough advanced to identify them.

26. **D. polyzyga,** F. Muell. Fragm. i. 74. A tall shrub, the short flowering branches nearly terete and, as well as the leaves, sparingly pubescent and glandular-viscid. Leaves pinnate, the rhachis slightly dilated or nearly terete; leaflets numerous, often above 30, oblong, acute, rarely exceeding  $\frac{1}{2}$  in., entire, obliquely rounded at the base and almost petiolulate, flat, 1-nerved, rather rigid but not coriaceous. Flowers not seen. Fruiting racemes terminal, loose, but much shorter than the leaves; pedicels recurved,  $\frac{1}{2}$  in. long. Sepals lanceolate, foliaceous, 3 to 4 lines long. Capsule like the larger ones of D. viscosa, the wings rather broad but variable in shape, the terminal sinus usually open. the terminal sinus usually open.

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

28. D. physocarpa, F. Muell. Fragm. i. 74. A tall shrub, the 28. **D. physocarpa,** F. Muell. Fraym. i. 74. A tall shrub, the flowering branches short, nearly terete, and as well as the leaves slightly pubescent as in D. polyzyga, but much less viscid. Leaves pinnate, the rhachis angular but scarcely dilated; leaflets rarely more than 10 and often only 4 to 6, obovate or oblong, obtuse or mucronate, mostly 3 to 4 lines long, entire or rarely obscurely 2- or 3-toothed, flat, 1-nerved, sometimes rather thick but not coriaceous. Racemes terminal, short, loosely fewflowered. Sepals lanceolate, obtuse, nearly 2 lines long. Anthers short, obtuse. Style often elongated. Capsule large, somewhat inflated, often 5-or 6-celled, the axis above \(\frac{1}{2}\) in long; wings not very broad, rounded above and below, but much injured in our specimens. Seeds opaque.

N. Australia. Sea range, Victoria river, F. Mueller.

31. D. oxyptera, F. Muell. Fragm. i. 74. A shrub of several ft., the

branches virgate, terete, pubescent as well as the leaves and more or less branches virgate, terete, pubescent as well as the leaves and more or less viscid. Leaves pinnate, the rhachis angular but scarcely dilated; leaflets usually 5 to 1'h, narrow-oblong or oblong-cuneate, obtuse, 2 to 4 lines or rarely \( \frac{1}{2} \) in long, the margins recurved. Flowers small, sessile or very shortly pedicellate. Sepals broad, acute, about 1 line long. Anthers obtuse, not exceeding the calyx, often hirsute. Capsule small, slightly hairy, the axis 2 to 3 lines long, the wings rigid, divergent, almost triangular and acute.

N. Australia. Islands of the Gulf of Carpentaria, R. Brown; dry rocky hills, Fitzmaurice river, Arnhem's Land, F. Mueller. Several of R. Brown's specimens have numerous male flowers and fruits on the same individual.

2. **D. lanceolata,** F. Muell. Fragm. i. 73. Very closely allied to D. triquetra, with the same angular branches, smooth, almost veinless leaves, slender pedicels, and very shining seeds, and scarcely distinguishable except by the sepals, which are from 1 to  $1\frac{1}{2}$  lines long. The leaves are perhaps generally rather narrower, and the capsule-wings broader, but neither of these characters can be relied upon.

N. Australia. Capstan Island, N.W. coast, A. Cunningham (the specimens rather doubtful, not being in fruit); Victoria river and Sea range, F. Mueller; islands of the Gulf of Carpentaria, R. Brown.

Queensland. Northumberland Islands, R. Brown; Cape Cleveland, A. Cunningham; Sunday Island, M'Gillivray; Palm Island, Henne; Port Denison, Fitzalan.

N. S. Wales. Clarence river, Beckler.

7. **D. peduncularis,** Lindl. in Mitch. Trop. Austr. 361. A very much branched glabrous and viscid shrub, closely allied to D. cuneata, the smaller branches terete, slender but rigid. Leaves from linear-cuneate to smaller branches terete, slender but rigid. Leaves from linear-cuneate to broadly spathulate, either acute or very shortly acuminate or rounded or truncate at the end, and often 3-toothed, \( \frac{1}{4} \) to \( \frac{1}{3} \) in., or very rarely (when narrow) 1 in. long, coriaceous and rigid, 1-nerved, the margins often thickened, the lateral veins inconspicuous. Pedicels rather slender, mostly axillary, solitary or clustered, or in short terminal racemes. Sepals ovate, thicker than in \( D. \) cuneata. Capsule of \( D. \) viscosa.—\( D. \) pubescens, Lindl. in Mitch. Trop. Austr. 342 (the supposed pubescence apparently a mistake).

Queensland. Near Lindley's Range and on the Maranos, \( Mitchell. \)

N. S. Wales. Eurylean scrub in the N.W. interior, Liverpool plains, Hastings river, etc., \( Fraser, A. Cunningham. \)

etc., Fraser, A. Cunningham.