

PACIFIC CAPSULAR MYRTACEAE XI

REDEFINITION OF METROSIDEROS BANKS EX GAERTN.
AND DEFINITION OF INFRAGENERIC CATEGORIES

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While preparing some of the earlier parts of this series I was inclined to the view that *Metrosideros* Banks ex Gaertn., as it had come to be understood, should be divided into several genera. I now feel that a wider concept is advisable at this time, although further information, particularly from other lines of evidence, may eventually lead to subdivision.

The present concept includes *Mearnsia* Merrill, but excludes *Nani* Adanson and *Kania* Schlecht. The first two were reviewed in Parts 3 and 4 of this series (Dawson, 1970b, 1972a) and the last will be the topic of a later part.

The genus contains about 50 species and ranges from the Bonin Islands and the Philippines in the west to New Guinea, north Queensland, New Caledonia, New Zealand, and all the high Pacific islands as far as Hawaii and Rapa in the east. An outlying species is found in South Africa. One species, *M. tetrasticha*, has not been placed in the scheme as it has not been collected in flower. It is only found on a few mountain tops in New Caledonia.

In the following descriptions the interpretation of the inflorescence is different from that in the earlier parts of this series. Now the basic inflorescence in *Metrosideros* is considered to be a dichasial cyme. Cymes are grouped into compound inflorescences, which terminate either (a) with a flower or (b) with a vegetative bud or leafy shoot. Compound inflorescences may be grouped in the same ways.

In the generic description features in italics are shared by all members of the genus. In each subgeneric category features in italics are peculiar, within the genus, to that category.

METROSIDEROS

Metrosideros Banks ex Gaertn., Fruct. 1, 1788, 170, t. 34. — *Metrosideros* sect. *Eumetrosideros* Niedenzu in Engl. and Prantl, Nat. Pfl. Fam. 3, 7 (1893) 87.

Trees or shrubs — terrestrial, hemi-epiphytic, or epiphytic — or root-climbing lianes; bark rough or flaky; branching monopodial or sympodial; bud scales present or absent; young parts, at least, more or less pubescent. Leaves opposite, dorsiventral, leptophyllous to mesophyllous, petiolate. Inflorescences of dichasial cymes, sometimes reduced to a single flower, usually pedunculate, aggregated into more or less clearly defined compound inflorescences of axillary or axillary and terminal cymes, sometimes ramiflorous; compound inflorescences may be aggregated in the same ways. Bracts and bracteoles linear to orbicular, sometimes adnate; terminal flowers usually ebracteolate, rarely bracteolate, sometimes abortive. Flowers pedicellate to sessile, usually pentamerous, red, pink, yellow, or white; hypanthium extending beyond the top of the ovary. Petals more or less orbicular, sometimes caducous. Sepals acute to obtuse, more or less equal or very unequal. Stamens two or

more times the length of the petals, rarely less, and three or more times their number, sometimes fewer, *free*, usually in a single series, sometimes in two or three series, sometimes stamens opposite the petals longer than those opposite the sepals. *Anthers dorsifixed, versatile, with one or more oil glands in the connective.* Style usually a little longer than the stamens, sometimes a little shorter, stigma small, truncate to convex. Ovary nearly superior, semi-superior, or inferior, three-locular, rarely four- or two-locular; *placentas axile, peltate. Ovules numerous, anatropous, attached randomly on the placenta, sometimes winged, all potentially fertile; integuments and nucellus each two-layered.* In the fruit the base of the style and the placentas either remaining close together as in the flower or becoming separated by extension of intervening tissue; fruit coriaceous; veins of hypanthium strongly or weakly developed; capsule included to exserted. Seeds narrow-linear to filiform, sometimes winged, *less than half of them with embryos.* Fertile seeds with: (a) *the cells of the outer layer of the outer integument enlarged*, usually with their outer walls thickened, and sometimes with a brown pigmentation developing before or after fertilisation; (b) *cells of the outer layer of the inner integument small, tangentially flattened with moderately thickened inner and outer walls* and sometimes with a brown pigmentation developing after fertilisation; (c) *cells of the inner layers of both integuments thin-walled, colourless and often collapsed*; cells of the inner layer of the outer integument rarely containing prismatic crystals; (d) *cells of the nucellus crushed and not readily discernable.* *Testa of sterile seeds probably derived from one or both layers of the outer integument*, with or without brown pigmentation, and with the outer and sometimes tangential walls heavily thickened or with all walls moderately and evenly thickened. *Embryo straight, narrow, the cotyledons about the same width as the hypocotyl and lying face to face; radicle not enclosed by a hypocotyl sheath.* Seed release either entirely through the free distal part of the capsule or partly through openings in the lower part of the hypanthium.

Lectotype species: *M. collina* (J. R. et G. Forst.) Gray. Designated by Rock (1917).

SUBGENUS 1. METROSIDEROS

Branching sympodial (pseudo-dichotomous) in adult plants; over-wintering buds with several to many pairs of caducous scales. Sepals more or less equal. In the fruit the base of the style and the placentas becoming separated by extension of the tissue between them. In the testa of the fertile seeds the cells of the outer layer of the outer integument with heavily thickened outer walls. Seeds not winged.

Distribution: About 22 species ranging from New Zealand, Lord Howe Island, New Caledonia, the Solomons, and the Bonin Islands in the west to all the high Pacific islands as far as Rapa and Hawaii in the east (Dawson 1970a).

SUBGENUS 2. CARPOLEPIS Dawson, *subgenus nova*

Balardia Montr., Mém. Acad. Lyon 10 (1860) 204 ('*Ballardia*'), *nom. illeg., non Cambess.* (1829).

Ramificatio monopodialis; gemmae squamis pluribus vel multis caducis instructae. Sepala valde inequalia. Sub fructu styli basi et placentis disjunctis. Cellulae testae epidermales seminis fertilis parietibus externis parum incrassatis provisae. Semina alata.

Branching monopodial; overwintering buds with several to many pairs of caducous scales. Sepals very unequal. In the fruit the base of the style and the placentas becoming

separated. *In the testa of the fertile seeds the cells of the outer layer of the outer integument with slightly thickened walls. Seeds with oblique dorsal wings.*

Type species: *M. elegans* (Montr.) Beauv.

Distribution: About 4 species restricted to New Caledonia (Dawson 1972b).

SUBGENUS 3. MEARNISIA (Merr.) Dawson, *subgenus nova*.

Mearnsia Merrill, Philip, J.Sc. 2 (1907) Bot. 284

Ramificatio monopodialis; gemmae sine squamis vel squama geminata solum instructae. Sepala plus minusve aequalia. Sub fructu styli basi et placentis non disjunctis. Cellulae testae epidermales seminis fertilis parietibus externis valde incrassatis provisae. Semina non alata.

Branching monopodial, rarely partly sympodial; *buds without scales or sometimes with one pair*. Sepals more or less equal. *In the fruit the base of the style and the placentas not becoming separated*. *In the testa of the fertile seeds the cells of the outer layer of the outer integument with heavily thickened walls. Seeds not winged.*

Type species: *M. halconensis* (Merrill) Dawson.

Section 1. *Mearnsia*

Terminal flowers never abortive and bracts not adnate. Petals persistent. *In testa of fertile seeds outer layer of the outer integument pigmented; inner layer of the outer integument without crystals. Cells of testa of sterile seeds heavily thickened. Seed release partly through openings in the lower part of the hypanthium.*

Subsection 1. *Crassivenis* Dawson, *subsectio nova*.

Venae sub fructu valde evolutae, hypanthium non in tres valvas dehiscens.

In the fruit, veins of hypanthium strongly developed, the hypanthium not separating into three valves.

Type species: as for subgenus.

Distribution: About 12 species in the Philippines, New Guinea, the Solomons, New Caledonia, and New Zealand (Dawson 1970b).

Subsection 2. *Trivalvis* Dawson, *subsectio nova*.

Venae sub fructu parum evolutae, hypanthium in tres valvas saepe dehiscens.

In the fruit, veins of hypanthium weakly developed, the hypanthium often separating into three valves.

Type species: *M. albiflora* Sol. ex Gaertn.

Distribution: 4 species in New Zealand (Dawson 1970b).

Section 2. *Calytropetala* Dawson, *sectio nova*

Flores terminale non abortivi et bractae non adnatae. Petala caduca. Testa seminis fertilis strato exteriori integumentum exterioris pigmentoso; strato inferiore integumentum exterioris sine crystallis. Cellulae testae seminis abortivi parum incrassatae. Fructus per partes liberas capsulae dehiscentes.

Terminal flowers never abortive and bracts not adnate. *Petals caducous*. *In testa of fertile seeds outer layer of the outer integument pigmented; inner layer of the outer integument*

without crystals. Cells of testa of sterile seeds only slightly thickened. Seed release entirely through free distal part of capsule.

Type species: *M. perforata* (J. R. et G. Forst.) A. Rich.

Subsection 1. *Exsertis* Dawson, *subsectio nova*.

Flores terminales ebracteolati, ovarium semisuperius, venae sub fructu parum evolutae, capsula exserta.

Terminal flowers ebracteolate. Ovary semi-superior. Veins of hypanthium weakly developed. Capsule exserted.

Type species: as for Section.

Distribution: 1 species in New Zealand (Dawson, 1972c).

Subsection 2. *Inclusis* Dawson, *subsectio nova*.

Flores terminales bracteolati, ovarium inferius, venae sub fructu valde evolutae, capsula inclusa

Terminal flowers bracteolate. Ovary inferior. Veins of hypanthium strongly developed. Capsule included.

Type species: *M. operculata* Labill.

Distribution: Perhaps 4 species in New Caledonia (Dawson 1972c).

Section 3. *Adnatae* Dawson, *sectio nova*.

Flores aliqui terminales abortivi et bractae adnatae. Petala persistentia. Testa seminis fertilis strato exteriori integumentum exterioris sine colore; strato interiore integumentum exterioris sine crystallis. Cellulae testae seminis abortivi valde incrassatae. Fructus per partes liberas capsulae dehiscentes.

Some terminal flowers abortive and bracts adnate. Petals persistent. In testa of fertile seeds outer layer of outer integument colourless; inner layer of outer integument without crystals. Cells of testa of sterile seeds heavily thickened. Seed release entirely through free distal part of capsule.

Type species: *M. queenslandica* L. S. Smith.

Distribution: 3 or 4 species in north Queensland and New Guinea (Dawson 1974).

Section 4. *Crystalla* Dawson, *sectio nova*.

Flores terminales non abortivi et bractae non adnatae. Petala persistentia. Testa seminis fertilis strato exteriori integumentum exterioris pigmentoso; strato interiore integumentum exterioris crystallis ornato. Cellulae testae seminis abortivi valde incrassatae. Fructus per partes liberas capsulae dehiscentes.

Terminal flowers never abortive; bracts not adnate. Petals persistent. In testa of fertile seeds outer layer of the outer integument pigmented; inner layer of the outer integument with prismatic crystals. Cells of testa of sterile seeds heavily thickened. Seed release entirely through the free distal part of the capsule.

Type species: *M. angustifolia* Smith.

Distribution: 1 species in South Africa (Dawson 1975).

NEW NAMES AND COMBINATIONS CONSEQUENT
ON MERGING OF MEARNISIA WITH METROSIDEROS

Metrosideros cordata (C. T. White and Francis) J. W. Dawson, *comb. nov.* — *Mearnsia cordata* C. T. White and Francis, Proc. Roy. Soc. Queensl. 34 (1928) 67.

Metrosideros halconensis (Merrill) J. W. Dawson, *comb. nov.* — *Mearnsia halconensis* Merrill, Philipp. Journ. Sci. 2 (1907) 284.

Metrosideros ovata (C. T. White) J. W. Dawson, *comb. nov.* — *Mearnsia ovata* C. T. White, Journ. Arn. Arb. 23 (1942) 81.

Metrosideros ramiflora var. **humilis** (Diels) J. W. Dawson, *comb. nov.* — *Mearnsia ramiflora* var. *humilis* Diels, Bot. Jahrb. 57 (1922) 420.

Metrosideros ramiflora var. **villosa** (C. T. White) J. W. Dawson, *comb. nov.* — *Mearnsia ramiflora* var. *villosa* C. T. White, Journ. Arn. Arb. 32 (1951) 142.

Metrosideros tetragyna J. W. Dawson, *nom. nov.* — *Mearnsia salomonensis* C. T. White, Journ. Arn. Arb. 32 (1951) 142.

The binomial *Metrosideros salomonensis* is not available for this species as it would be a later homonym of *Metrosideros salomonensis* C. T. White, Journ. Arn. Arb. 32 (1951) 143.

Metrosideros whiteana J. W. Dawson, *nom. nov.* — *Mearnsia scandens* C. T. White, Journ. Arn. Arb. 23 (1942) 81.

The binomial *Metrosideros scandens* is not available for this species as it would be a later homonym of *Metrosideros scandens* (J. R. et G. Forst.) Druce, Rep. Bot. (Soc.) Exch. Cl. Manch. for 1916 (1917) 635.

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 — 1970b. Pacific Capsular Myrtaceae 3. The *Metrosideros* Complex: *Mearnsia halconensis* Group and *Metrosideros diffusa* Group. *Blumea* 18: 447—452.
 — 1972a. Pacific Capsular Myrtaceae 4. The *Metrosideros* Complex: *Xanthostemon*, *Nani*, *Pleurocalyptus*, *Purpureostemon*. *Blumea* 20: 315—322.
 — 1972b. Pacific Capsular Myrtaceae 5. The *Metrosideros* Complex: *M. elegans* Group. *Blumea* 20: 323—326.
 — 1972c. Pacific Capsular Myrtaceae 6. The *Metrosideros* Complex: *M. perforata* and the *M. operculata* Group. *Blumea* 20: 327—329.
 — 1974. Pacific Capsular Myrtaceae 9. The *Metrosideros* Complex: *M. queenslandica* Group. *Blumea* 22: 151—153.
 — 1975. Capsular Myrtaceae 10. The *Metrosideros* Complex: *M. angustifolia* (South Africa). *Blumea* 22: 295—297.
 ROCK, J. F. 1917. The Ohia Lehua Trees of Hawaii. Board of Agric. and For. Terr. Hawaii Bull. 4: 12.