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## Some small-leaved coprosmas (Rubiaceae)

Rhys Gardner

### Introduction

It seems fair to say that while NZ's large-leaved coprosmas (*Coprosma*, Rubiaceae) are almost too easy to identify (e.g., Gardner 2003) the small-leaved ones, especially those of the South Island, are rather too hard (e.g., Jane 2006). This article then deals only with the small-leaved North Island species. It is based on previous accounts (Oliver 1935; Allan 1961; Taylor 1961; Poole & Adams 1963; Webb & Simpson 2001; Gardner 2002; Eagle 2006) together with observations of my own on the collections in AK (Auckland War Memorial Museum herbarium).

These notes apply mainly to dried material, and their use on live plants should be done with caution, since characters such as texture and vein visibility can change during drying. Floral characters do not feature (pace Oliver), but those of the ripe fruit, particularly colour (in life) and shape (live or dry), are very informative. We can be glad that coprosma fruits are not any smaller, but unfortunately their colour and shape change in drying, and, since these species are dioecious, female plants can be expected to turn up only half the time. The stipule, small and soon distorted by the urgencies of stem growth, has been referred to as little as possible (pace Druce); for an appreciation of its diversity see especially Nancy Adams' representations (Allan 1961; Poole & Adams

1963).

First here is a list of 49 "spot-characters", the features shown by relatively few taxa and hence with higher diagnostic value. Fig. 1 illustrates a few of them. A key follows to a particularly troublesome group, the higher altitude coprosmas of the Volcanic Plateau. Leaf silhouettes are shown in Figs. 2-4. For information on distribution and habitat see Eagle (2006).

Twenty-eight taxa are considered. Omitted are: *C. brunnea* and *C. distantia* (considered part of *C. acerosa* and *C. obconica* respectively); *C. atropurpurea* (one dubious North Island locality, Volcanic Plateau); *C. pseudociliata* (in North Island, Tararua Range only). Also omitted are the forms of *C. neglecta* other than the typical one (that of the Surville Cliffs; see Eagle 2006). *Coprosma cheesemani* is treated in the broad sense to include the taxon known informally as *C. "oreophila"* (Druce, mss.; treated in (Eagle 2006: (750) as *C. aff. cheesemani*).

### Spot-characters

Use fully developed leaves for texture characters. Use stipule at penultimate or antepenultimate node, preferably on a vigorously growing shoot. Brackets

indicate that the stated condition occurs occasionally or rarely. Otherwise, the condition is near-invariable. Exceptions will be found, for example, the apex of the *C. cheesemanii* leaf is almost always glabrous, having a minutely papillose appearance at x25 — only rarely does the apex have one or two (very short) hairs. This contrasts with the condition of the *C. decurva* leaf, for example, where the apical hair-tuft is almost always much better developed.

1. Tree 5 m tall or more: arborea, (foetidissima), (linariifolia) (pedicellata), (wallii)
2. Tree or treelet, lightly branched, not divaricating: arborea, foetidissima, spathulata
3. Apical bud frequently aborting, giving Y-shaped branching; said to be deciduous at least in the south of the South Island: virescens
4. Alpine plants, subherbaceous, mat-forming (stems rooting at lower nodes): perpusilla, petriei
5. Subalpine plants, relatively woody, prostrate to low-sprawling but stems not generally rooting at lower nodes: cheesemanii, decurva, depressa, rugosa
6. Tissues foetid when crushed: foetidissima, arborea — seedlings only
7. Foliage planate: microcarpa, (neglecta), parviflora, tayloriae
8. First-formed leaves of a growth flush much narrower than the subsequent ones, persisting to give the foliage a polymorphic character: rhamnoides
9. New stems soon getting a reddish brown bark: arborea, crassifolia, (neglecta), rigida, rubra, rugosa
10. New stems soon getting a whitish corky bark: colensoi, depressa, foetidissima
11. Stipule glabrous except for marginal hairs (i.e., "cilia"), more than 2.5 mm long, with a prominent central keel and a large terminal denticle: arborea, (foetidissima), spathulata
12. Stipule glabrous except for its cilia, to 1 mm long, with a prominent central keel and a large terminal denticle: colensoi
13. Stipule leathery, maturing dark brown, 1/3-1/2 sheathing, margins densely ciliate with tangled hairs: arborea
14. Stipule becoming corky-thickened and brownish, 1/2 sheathing, most of the margin with dense long tangled hairs, apex sometimes bifid even before stipule is widened and split in stem growth: pseudocuneata

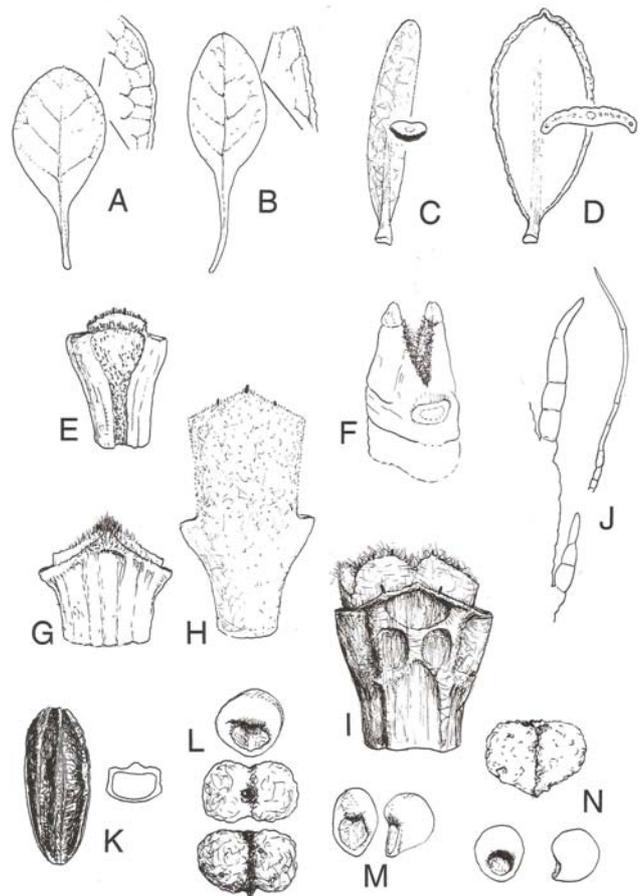


Fig. 1. *Coprosma* spp., various features (idealized; scales various).

A. *C. arborea*, leaf and enlargement of crenulate margin.; B. *C. foetidissima*, leaf and enlargement of serrulate margin.; C. *C. cheesemanii*, leaf and cross-section showing lower epidermis detaching from mesophyll; air-gap shown black.; D. *C. obconica*, leaf showing strongly recurved margins and apical prolongation.; E. *C. acerosa*, stipule.; F. *C. arborea*, stipule.; G. *C. crassifolia*, stipule.; H. *C. linariifolia*, stipule; note the covering of dense minute patent hairs.; I. *C. pseudocuneata*, stipule.; J. *C. rotundifolia* leaf margin with stout hairs; *C. areolata*, a slender hair; K. *C. rigida*, pyrene (abaxial view and cross-section), showing furrowed surface.; L. *C. rotundifolia*, didymous fruits (side view and top view, and pyrene with deep adaxial pit.; M. *C. obconica*, pyrenes with deep adaxial pit.; N. *C. wallii*, didymous fruit and pyrenes with deep adaxial pit

15. Stipule becoming corky-thickened and whitish, 1/4-1/3 sheathing, margin with dense straight long hairs near apex: depressa
16. Stipule thin, sheathing for 1/2 its length or more, minutely or sparsely hairy: linariifolia, propinqua
17. Stipule thin, sheathing for at least 1/3, margin almost glabrous, face densely clothed with white hairs and some long darker hairs: areolata, rotundifolia
18. Stipule very thin, not sheathing, low-rounded to

- subtruncate and with a few cilia and small brownish denticles of similar size: *acerosa*, *rugosa*
19. Stipule with cilia that more or less hide the central denticle: (*cheesemanii*), *decurva*, *depressa*, *linariifolia*, *microcarpa*, *obconica*, (*petriei*), *pseudocuneata*, *tayloriae*
20. New stem with hairs in infrastipular bands, the hairs short but us. rather stout and becoming subscabrid as the new stem matures: *colensoi*, *spathulata*
21. New stem with hairs mainly in infrastipular bands, the hairs relatively slender and us. soon lost: *acerosa*, (*arborea*), *foetidissima*, (*virescens*)
22. Stem hairs with some long (dark-)brownish hairs over a dense cover of paler shorter hairs: *areolata*, *rotundifolia*
23. Leaf with an indistinct petiole, which is winged to base by green tissue and with an indument that (if present) does not differ from that of the laminar part: *arborea*, *areolata*, *depressa*, *perpusilla*, *petriei*, *propinqua*, *rigida*, *rubra*, *spathulata*, (*tenuicaulis*), (*wallii*)
24. Leaf (incl. petiole and blade apex) entirely glabrous: *acerosa*, *cheesemanii*, *microcarpa*, *obconica*, *perpusilla*, *pseudocuneata*
25. Leaf lower surface with small stout forward-curved hairs, giving the surface a bristly feel: *neglecta*, *tenuicaulis*
26. Leaf lower surface with loosely appressed long pale to golden hairs (these to c. 1 mm long, not obviously septate): *areolata*
27. Leaf lower surface notably paler than upper surface (cuticle microscopically thickened and "bumpy"): *crassifolia*
28. Leaf lower surface appearing inflated: (*acerosa*), *cheesemanii*
29. Leaf upper and lower surfaces with loosely appressed, long, pale to darkish hairs: *rotundifolia*
30. Leaf upper and lower surfaces and margins with short, solitary to grouped, pale retrorse hairs: *petriei*
31. Leaf upper surface with small stout forward-curved hairs, giving it a bristly feel: (*rotundifolia*), *rubra*
32. Leaf upper surface deeply rugose: (*obconica*), (*pseudocuneata*)
33. Leaf upper surface with midrib, laterals and reticulation all obviously sunken: *arborea*, (*crassifolia*), (*tayloriae*)
34. Leaf upper surface with a conspicuously raised midrib, at least in proximal half of blade: *arborea*, *colensoi*, *foetidissima*, *spathulata*
35. Leaf upper surface with visible raphides (pale streaks c. 0.25 mm long): *areolata*, (*rhamnoides*), (*rotundifolia*), (*tenuicaulis*)
36. Leaf margin thickened, rounded, abruptly and conspicuously recurved: (*crassifolia*), (*pseudocuneata*), *obconica*
37. Leaf margin weakly crenulate, especially towards apex, the indents mostly against the ends of the adjacent perpendicularly-running veinlets: *arborea*
38. Leaf margin minutely crenulate-serrulate, especially towards apex, with blunt projections c. 0.1 mm deep, formed by the cuticle of the upper epidermis: *foetidissima*
39. Leaf margin with short forwards-curved septate hairs: (*rhamnoides*), *rubra*, *tenuicaulis*, *wallii*
40. Leaf towards apex contracted then expanded again into a thickened terminal subovate prolongation: (*obconica*), (*cheesemanii*).
41. Domatia pocket-like (base of the lateral vein and the midrib joined together as a roof): *areolata*, *rotundifolia*, *rubra*, *tenuicaulis*
42. Domatia vestigial or lacking: *arborea* — adults
43. Domatia usually lacking: *decurva*, *rugosa*
44. Domatia always lacking: *acerosa*, *cheesemanii*, *depressa*, *perpusilla*, *petriei*, *pseudocuneata*
45. Fruit us. with 4 "seeds" (pyrenes): *perpusilla*
46. Ripe fruit (living or dry) 2-lobed : *rigida*, (*rotundifolia*), *wallii*
47. Ripe fruit (living) "white", ie., without strong red/orange or blue coloration: *arborea* (white), *crassifolia* (white to yellowish), *linariifolia* (white to blueish), *microcarpa* (white), *obconica* (white to yellowish), *rubra* (white), *tayloriae* (white, some tinged with pink or violet), *virescens* (white)
48. Pyrene ventrally deeply notched: (*decurva*), *obconica*, *propinqua* var. *martinii*, *rotundifolia*, *wallii*
49. Pyrene abaxially with us. 2 or 3 longitudinal grooves, making the surface notably ridged: *rigida*

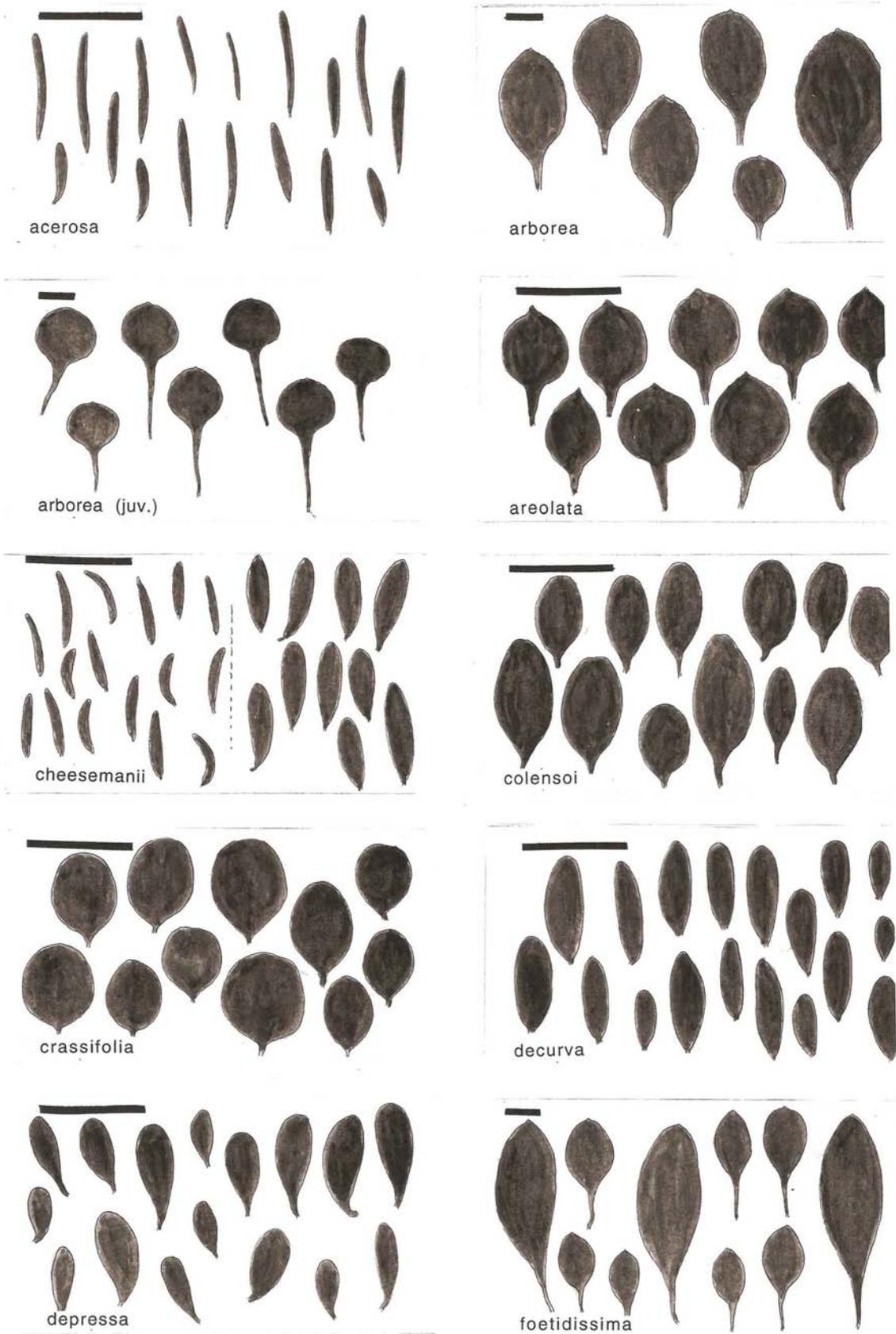


Fig. 2. *Coprosma* spp., leaf silhouettes. *C. acerosa* AK 304189; *C. arborea* AK 273402; *C. arborea* (juv.) AK 138963; *C. areolata* AK 178583; *C. cheeseemanii* Left of dotted line, AK 266368); right, *C. aff. cheeseemanii*, AK 129700 – see Eagle (2006: 750); *C. colensoi* AK 40283; *C. crassifolia* AK 181956; *C. decurva* AK 165989; *C. depressa* AK 36873; *C. foetidissima* AK 135254

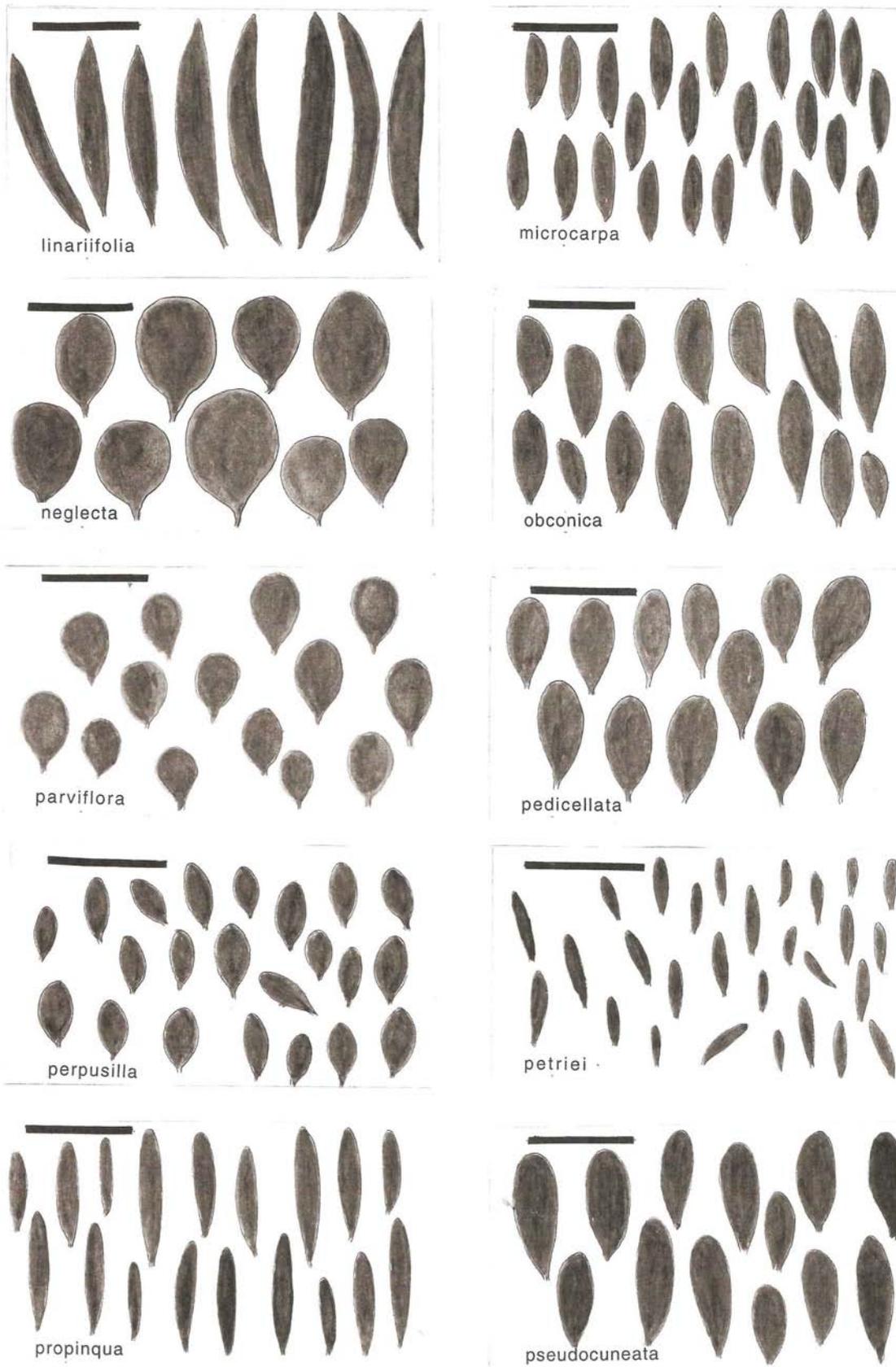


Fig. 3. *Coprosma* spp., leaf silhouettes.  
*C. linariifolia* AK 283296; *C. microcarpa* AK 261272; *C. neglecta* AK 149851; *C. obconica* AK 273821; *C. parviflora* AK 252711; *C. pedicellata* AK 228922; *C. perpusilla* AK 36891; *C. petriei* AK 155863; *C. propinqua* AK 236178; *C. pseudocuneata* AK 279432.

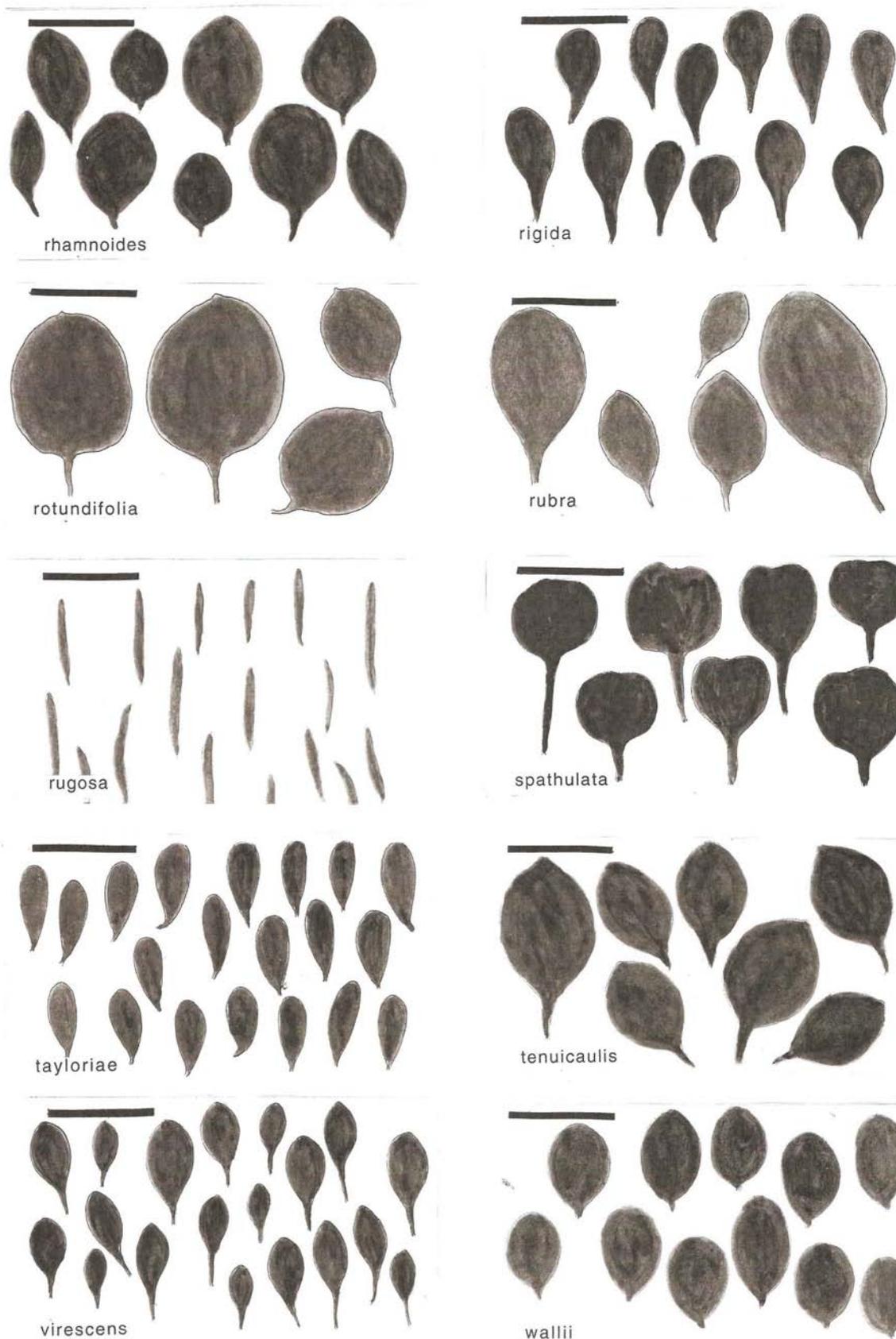


Fig. 4. *Coprosma* spp., leaf silhouettes.

*C. rhamnoides* AK 109770; *C. rigida* AK 61990; *C. rotundifolia* AK 275890; *C. rubra* AK 46125; *C. rugosa* AK 209013; *C. spathulata* AK 292734; *C. tayloriae* AK 266333; *C. tenuicaulis* AK 127218; *C. virescens* AK 302061; *C. wallii* AK 273368

Key to the small-leaved shrubby coprosmas of the forest and subalpine scrub of the central North Island.

*C. perpusilla* and *C. petriei*, being weakly woody prostrate alpine plants, are excluded, as is *C. foetidissima*. *C. depressa* is included, but perhaps occurs in this region only near Waiouru. *C. linariifolia* is included, although its northern limit would seem to be further to the south-east, in the Kaweka Range.

A. Leaves spatulate, the petiole winged to base by green tissue

B. Low-sprawling bush; stipules densely long-ciliate, quickly becoming white corky-crustaceous (like the stem); domatia lacking; fruit globose, red.....*C. depressa*

BB. Divaricately branched small trees (to c. 5 m tall); new stems becoming reddish brown

C. Leaf blade oblong-obovate, glabrous on margin; fruit more or less obovoid and somewhat 2-lobed, orange .....*C. rigida*

CC. Leaf blade broadly oblong-obovate to suborbicular, with a few stout hairs on margin; fruit strongly 2-lobed, red ..... *C. wallii*

AA. Leaves linear

D. Foliage planate; stipules triangular, not sheathing; domatia lacking; fruit white..... *C. microcarpa*

DD. Foliage not planate; stipules truncate, not sheathing; domatia us. lacking; fruit us. pale blue *C. rugosa*

DDD. Foliage not planate; stipules sheathing; domatia us. present and often conspicuous (as large open pits); fruit whitish, sometimes with blue flecks

E. Leaves often more than 2 cm long, subcoriaceous, shortly acuminate at apex; stipule sheathing for several mm ..... *C. linariifolia*

EE. Leaves rarely more than 1.5 cm long, chartaceous, us. subacute at apex; stipule sheathing for c. 1 mm ..... *C. propinqua*

AAA. Leaves narrowly elliptic or oblong or narrowly obovate, mostly subcoriaceous (not *C. wallii*); stipules mostly nondescript (triangular, hardly sheathing, shortly ciliate) except in *C. pseudocuneata*

F. Hairs of internode confined to a pair of infrastipular bands; leaf blade glabrous except for apical hair-tuft, shortly notched or rounded at apex, domatia sometimes present, upper surface us. with a prominent midrib, at least near base; fruit red ..... *C. colensoi*

FF. Hairs of each internode distributed more or less uniformly around stem; leaf apex rounded to subacute, never notched

G. Stipule wider than tall, sheathing for half or more of its length, densely villous on margin; leaf entirely glabrous, the blade lacking domatia, midrib sunken above; fruit orange to red ..... *C. pseudocuneata*

GG. Stipule about as wide as tall or taller

H. Leaf us. more than 2.5 mm wide, the petiole relatively long, short-hairy distally; blade broadly oblong-elliptic to suborbicular, chartaceous (ie., relatively thin) and us. drying almost flat or irregularly curved, margins with some stout forward-curved short hairs, undersurface with midrib and us. several lateral veins evident; hairs of stem relatively short (to c. 0.1 mm long) and sparse .....*C. wallii*

HH. Leaf seldom more than 2.5 mm wide (seldom more than c.1 mm wide in *C. cheesemanii* s.s.), petiole less than c. 1 mm long

I. Leaf glabrous (rarely with a very small apical hair-tuft), domatia lacking, the undersurface often appearing inflated in the older leaves and never with the lateral veins evident; fruit red .....*C. cheesemanii* agg.

II. Leaf us. with a few hairs at apex and sometimes also on petiole; undersurface never inflating on death or in drying

J. Foliage weakly or not planate, with the side-branches relatively short and downcurved; leaf blade oblong, mostly less than 2 mm wide, passing relatively abruptly into the petiole, undersurface with only the midrib evident; hairs of stem relatively long (to c. 0.25 mm); fruit red .....*C. decurva*

JJ. Foliage planate; leaf blade oblong to obovate, mostly 2-2.5 mm wide, passing relatively gradually into the petiole, undersurface us. with the midrib and one to several lateral veins evident; hairs of stem short (to c. 0.15 mm); fruit us. white, sometimes tinged with pink or violet .....*C. tayloriae*

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